



**Kampus  
Merdeka**  
INDONESIA JAYA

# CERTIFICATE

No. 9414/UN5.2.1.3/SSA/2022



**Transformation  
Towards the Ultimate**

is proudly presented to

**Veriani Aprilia, Nurul Kusumawardani, Rizal Fauzi, Daru Estiningsih and Dwi  
Kusumawati**

As  
**Authors**

in Recognition of His/Her Valuable Participation in  
**The 6<sup>th</sup> International Conference on Agriculture, Environment and Food Security 2022**

Medan, October 27, 2022

Organized by Faculty of Agriculture, Universitas Sumatera Utara



Dean

**Dr. Ir. Tavi Supriana, MS**



Chair Person

**Prof. Dr. Ir. Elisa Julianti, M.Si**





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**Veriani Aprilia**

As

**Oral Presenter**

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Medan, October 27, 2022

Organized by Faculty of Agriculture, Universitas Sumatera Utara



Dean

**Dr. Ir. Tavi Supriana, MS**



Chair Person

**Prof. Dr. Ir. Elisa Julianti, M.Si**



# IC AEFS 2022

## International Conference on Agriculture, Environment and Food Security 2022

“Strengthening Sustainable Agriculture  
for A Better Future”.

**BOOK OF ABSTRACT**

Indonesia, 27 October 2022

**IOP** Conference Series  
Earth and Environmental Science

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3. Indonesian Society of Agricultural Economics (PERHEPI)
4. Indonesian Phytopathological Society (IPS/PFI)
5. Indonesian Association of Nutrition and Feed Science (AINI)
6. Indonesian Agribusiness Association (AAI)







**Prof. Dr. Elisa Julianti**

*(Chairman of 6<sup>th</sup> International Conference on Agriculture Environment and Food Security)*

**Welcome Speech from Committee Chairman**

On behalf of the Organizing Committee, we would take great pleasure to welcome you to the 6<sup>th</sup> International Conference on Agriculture, Environment, and Food Security (AEFS), in Medan. Mainly focusing on the theme "**Strengthening Sustainable Agriculture for a Better Future**". This year, AEFS 2022 is conducted hybrid in Medan and virtually by Zoom on 27 October 2022. AEFS International Conference is one of the leading international conferences for presenting research and study in the fields of agriculture, environment, and food security. It also serves to foster communication among scientists, researchers, scholars, resource managers, practitioners, students, policy makers and all those interested in agricultural and environmental sciences and food security from all around the world. The main scope of this conference is to invite the experts to discuss the innovation and technologies on agricultural and environmental sustainability systems to improve food security and the environment.

AEFS 2022 is organized by the Faculty of Agriculture, Universitas Sumatera Utara (or we called USU). USU manages more than one hundred study programs consisting of various levels of higher education, which is covered in ten faculties and one graduate program. In the process, some faculties at USU environment have become an establishment embryo of three new public universities, namely Kuala University in Banda Aceh (from the Faculty of Economics and Faculty of Veterinary Medicine and Animal Husbandry), Medan State Teachers Training College which is now turned into a State University of Medan (from the Faculty Teacher Training and Science Education), Medan State Polytechnic (Polytechnic of USU).

Organizing AEFS is the result of the dedication of a large number of individu who gave their time and efforts whole heartedly. We would like to thank the organizing committee and all of our generous sponsors for all the valuable helps and advices during the preparation and realization of the conference.

In this conference, we are here, gather from so many universities, companies and government office. In total there are incorporated 53 universities, 14 government agencies and 2 companies within the country, Indonesia. Moreover, there are 31 universities and 5 government agencies from abroad namely :

- 1 Aceh Landscape Development Centre, Langsa, Indonesia
- 2 Agency for Plantation and Livestock, Kalimantan Barat
- 3 Andalas University, Padang
- 4 Armenian State Pedagogical University, Yerevan





- 5 Badan Perencanaan dan Pembangunan Daerah Kabupaten Buton Utara
- 6 Batumi State University, Georgia
- 7 Bina Nusantara University
- 8 Binus University, Indonesia.
- 9 Branch of Green Power Co., LTD, Ben Tre Province, Vietnam
  
- 10 Coord. of Social Forestry of Konsu Mandiri, lamandau, Central Kalimantan, Indonesia
- 11 Corvinus University of Budapest
- 12 Directorate of Cereals Crop-Directorate General of Food Crops, Ministry of Agriculture Indonesia
- 13 Djuanda University
- 14 Engineering Research Center of Chestnut Industry Technology, China
  
- 15 Far Eastern Federal University (FEFU)
- 16 Gadjah Mada University
- 17 GMichigan State University, United States of America
- 18 Gorontalo Assessment Institute for Agricultural Technology Ministry of Agriculture, Gorontalo
- 19 Gulistan State University, Syrdarya, Uzbekistan
- 20 Halu Oleo
- 21 Hasanuddin University
- 22 Health Polytechnic of the Ministry of Health of Medan, Indonesia
  
- 23 Hebei Normal University of Science and Technology, China
- 24 Indonesian Catholic University
- 25 Indonesian research Institute for Animal Production
- 26 Indonesian Spice and Medicinal Crops Research Institute (ISMCRI)
  
- 27 Indonesian Vegetable Research Institute (Balai Penelitian Tanaman Sayuran - BALITSA)
- 28 Institut of Agrarian and Membran Technology of Batumi Shota Rustaveli State University, Georgia
- 29 Institut Pertanian Stiper
- 30 Institute of Technology of Surabaya
- 31 IPB University
- 32 Jambi University
- 33 Janabadra University, Yogyakarta
- 34 Lamandau Central Kalimantan Indonesia
- 35 M.B.Ch.B, Scripps Research Institute, National University, USA
  
- 36 Manado Health Polytechnic Department of Medical Laboratory Technology
- 37 Ministry of Agriculture
- 38 Ministry of Industry, Yogyakarta, Indonesia
- 39 Moscow State University of Civil Engineering





- 40 National Chiayi University, Taiwan
- 41 National Research and Innovation Agency, Subang, Indonesia
- 42 National University of Life and Environmental Science, Kiev, Ukraine
- 43 Nguyen Tat Thanh University, Vietnam
- 44 Organization for Agriculture and Food National Research and Innovation Agency of the Republic of Indonesia
- 45 Pangkajene Kepulauan State Polytechnic of Agriculture
- 46 Pangkep State Polytechnic of Agriculture (Polipangkep)
- 47 People's Friendship University of Russia (RUDN University)
- 48 Perwira Purbalingga University
- 49 Plekhanov Russian University of Economics
- 50 Polytechnic of Agricultural Development Yogyakarta-Magelang
- 51 PT Bumitama Gunajaya Agro
- 52 Research and Innovation Agency of Indonesia (BRIN)
- 53 Research Institute for the Development of Digital Technologies and Artificial Intelligence, Tashkent, Uzbekistan
- 54 Riau University
- 55 Russian Academy of Sciences
- 56 Sakhalin State University
- 57 Samara State Agrarian University, Russia
- 58 Saratov State Vavilov Agrarian University, Russia
- 59 Scientific Center of Vegetable and Industrial Crops of the Ministry of Economy of the Republic of Armenia, Armenia
- 60 Sekolah Tinggi Ilmu Tarbiyah Al-Hilal Sigli, Sigli, Indonesia
- 61 Slaughterhouse and Animal Health Center, Jambi Province, Indonesia
- 62 Syiah Kuala University
- 63 Tanjung Pura University
- 64 Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Uzbekistan
- 65 Tashkent University of Information Technologies, Uzbekistan
- 66 Tashkent University of Information Technologies Uzbekistan
- 67 The University of Islam Lamongan
- 68 Ulyanovsk State Agrarian University, Russia
- 69 Universitas Alma Ata, Yogyakarta
- 70 Universitas Brawijaya
- 71 Universitas HKBP Nommensen
- 72 Universitas Islam Negeri Sultan Syarif Kasim Riau
- 73 Universitas Islam Riau
- 74 Universitas Islam Sumatera Utara
- 75 Universitas Katolik Santo Thomas







- 76 Universitas Labuhanbatu
- 77 Universitas Malikussaleh Aceh
- 78 Universitas Methodist Indonesia
- 79 Universitas Muhammadiyah Sumatera Utara
- 80 Universitas Negeri Gorontalo
- 81 Universitas Proklamasi 45,
- 82 Universitas Sam Ratulangi Indonesia
- 83 Universitas Sari Mutiara Indonesia
- 84 Universitas Sebelas Maret
- 85 Universitas Simalungun
- 86 Universitas Sultan Ageng Tirtayasa
- 87 Universitas Sumatera Utara
- 88 Universitas Teuku Umar
- 89 Universiti Malaysia Terengganu
- 90 Universiti Putra Malaysia
- 91 Universiti Sains Malaysia
- 92 Universiti Teknologi MARA (UiTM) Negeri Sembilan
- 93 Universiti Teknologi MARA (UiTM) Shah Alam, Selangor
- 94 University of Al-Qasim Green, Iraq.
- 95 University of Darussalam Gontor,
- 96 University of Darussalam Gontor, Indonesia
- 97 University of Jember
- 98 University of Lambung Mangkurat
- 99 University of Lampung
- 100 University of Panca Bhakti, Pontianak
- 101 University of the Philippines Los Baños
- 102 Universtas Medan Area
- 103 UPTD Peternakan Provinsi Sulawesi Tenggara
- 104 Uzbek Scientific Research Institute of Agricultural Mechanization, Uzbekistan
  
- 105 Volgograd State Agrarian University

Finally, we would like to thank all the authors who submitted their paper to AEFS 2022, the reviewers, the session chairs and our volunteers for all their work in preparing and running the conference.

We wish you a very warm welcome and hope that you will have a very productive and enjoyable time at AEFS 2022.

**Sincerely,**

**Prof. Dr. Ir. Elisa Julianti, M.Si**  
**Chairman of 6<sup>th</sup>AEFS International Conference**





**Dr. Muryanto Amin S.Sos., M.Si.**

*(Rector of Universitas Sumatera Utara)*

**Welcome Speech from Rector of Universitas  
Sumatera Utara**

Ladies and gentlemen, let us praise the Lord, God Almighty, Allah SWT, for his mercy, compassion, and blessings so that we could gather here, in the very event of **"The 6th International Conference Of Agriculture , Environment, And Food Security (AEFS) 2022"**, which is conducted by Faculty of Agriculture Univesitas Sumatera Utara.

**Ladies and Gentlemen, and all conference participants,**

My highest appreciation for this international conference that would be categorize as an effort to elevate our class. Belong with this conference, we would like to share and exchange the knowledge and the latest information. As our expectation to open ourself and joining the international community for better achievement especially in the scientific field.

Internationalization is one of our priority project. Our spirit is to bring Universitas Sumatera Utara become one of the World Class University. Various strategy are made to proceed the goal, and this event is one of the strategy to reach it. By conducting international conference, we give a place for our people to meet expert from abroad. In case to be one of World Class University, we have to change our mind as we are the entity of international community.

International conference also give as possibility to adapt a new approach in scientific field. The speakers that provided in this conference are well-known scientist in their expertise. We do recognize them with a strong knowledge background, and it is a chance for all the participant to receive a comprehensive explanation towards the theme. This beneficial conference will give a new point of view for conducting further discussion.

Regarding to the conference, we do expect there will be a progress in the number of scientific publication. Besides holding an international conference, the after plan also become the important point to concern. As we know, the scientific publication is a subject to increase the university class. Numerous research could be conducted by lecture, students, and all participants after this event. In addition, cross-country research also could be made as the result of our meeting today.

The collaboration should be maintain, because we do believe that in collaboration will raising the point of view. The issue will be much more effective and useful to fulfil our obligation as university. The Tridarma, namely teaching, researching, and community service should be come into new concept after this event by propose the collaboration project. A brand new innovation will be made as the result of the collaboration.





Further, this conference is expected to support all of effort to reach all our criteria in ranking. The cooperation and participation of all the academicians to succeed our goal become the key point. Our rank maybe increased time by time, but not become a reason for us to stop our effort. We have to keep our spirit in Transformation Towards the Ultimate.

Sincerely,

**Dr. Muryanto Amin, S.Sos., M.Si.**

**Rector of Universitas Sumatera Utara**





**Prof. Budiman Minasny**

*(The University of Sydney, Australia)*

Professor Budiman Minasny is a Professor in soil-landscape modelling at the University of Sydney. He is the theme leader of Soil, Carbon, and Water at Sydney Institute of Agriculture. He is a soil scientist, previously awarded the QEII and the Future Fellowships from the Australian Research Council. He is recognized as a Highly Cited Researcher in 2019 to 2021 by the Web of Science. He was recently awarded the Richard Webster medal in pedometrics.

He has an undergraduate degree from Universitas Sumatera Utara in Indonesia and a MAg and PhD degrees in soil science from the University of Sydney. He is passionate about the role of soil in managing climate change, food, water, energy security, and maintaining biodiversity. He has more than 200 international journal publications and is recognised as the leader in digital soil mapping and modelling.







## **Digital Agriculture and Technology to Boost Sustainable Agriculture**

There is a global demand for soil data and information for food security in the face of climate change. Agricultural production depends on the inherent capability of the soil and its subsequent management. Farmers and investors need to access real-time estimates of soil and climate variability to make decisions on crop choice, management intervention and yield prediction. This digital information will provide a reduction in risk and better matching of production to climate. Subsequently, it will provide economic benefits to the agriculture system.

Current method for providing soil data relies on expensive survey techniques that produce soil maps with no clear link to agriculture production. This paper presents digital agriculture technology, an integrated system of soil and climate to provide agriculture suitability for Tasmania in Australia.

Digital soil mapping by combining field observations and remote sensing data can comprehensively characterize the soil making detailed assessments of agricultural suitability, versatility and inherent capital.

Farmers, agriculture extension agents, and policymakers can gain comprehensive information on soil conditions based on soil security dimensions to determine the best inputs and practices to employ. A fine resolution digital soil maps enable climatologists, hydrologists, crop modellers, and forest and agricultural scientists to better predict the effects of climate change or new technologies on food production. In some instances, crop failure due to drought or excessive wetness could be identified in early-warning systems.





**Prof. Henry M. Manik**

*(IPB University, Indonesia)*

Prof. Henry M Manik is a Professor in Marine Science and Technology at the IPB University. He is an expert scientist in Marine Geological Institute, Lecturer in Indonesian Navy, Indonesian Navy Post Graduate School, Indonesian Navy Technology School, Institute of Teknologi Bandung (ITB) and Center for Oceanography Indonesian Navy. He is also an Assesor for Indonesia Hydrographic Council. Moreover, he is a reviewer at the Ministry of Finance, the Ministry of Marine Affairs and Fisheries and the Ministry of Education, Culture, Research and Technology.

He has an undergraduate degree from IPB University, Indonesia with major in Marine Science and Technology. Then, he has a M.Eng from Institute of Technology Bandung (ITB) with major in Geophysical Engineering and Ph.D from Tokyo University of Marine Science and Technology, Japan with major in underwater accoustics and ocean instrumentation.





## STRENGTHENING SUSTAINABLE FISHERIES ON BLUE ECONOMY-BASED FOR FOOD SECURITY

**Henry M. Manik**

*Department of Marine Science and Technology  
Faculty of Fisheries and Marine Sciences  
Bogor Agricultural University (IPB University)  
Bogor 16680 INDONESIA  
E-mail : [henrymanik@apps.ipb.ac.id](mailto:henrymanik@apps.ipb.ac.id)*

**Abstract.** Our oceans consist of 98% of the world's water resources. Oceans ecosystems are the key contributors to human lives, livelihoods, and blue economic development. Marine fisheries sector plays a crucial role in securing food, nutrition, employment, and income for millions of people. According to the Marine Affairs and Fisheries Ministry, most fish stocks in Indonesia are completely depleted or already overfished. The problem of overfishing is a serious threat to the fish in our sea. Other threats to the fisheries sector such as ocean acidification, ghost fishing, marine pollution, climate change, and ocean global warming. Careful management of this essential ocean resource is a key feature of a sustainable fisheries to support Sustainable Development Goals (SDGs).

Keywords : sustainable, fisheries, blue economy, food security, SDGs





**Dr. Rulianda Purnomo Wibowo, S.P., M.Ec**

*(Universitas Sumatera Utara, Indonesia)*

Dr. Rulianda Purnomo Wibowo is a lecturer in Agribusiness Study Program, Faculty of Agriculture, Universitas Sumatera Utara. He is also member of American Agricultural Economic Association (AAEA), Member of Phi Kappa Phi Honor Society USA and Fulbright alumnus. Moreover, he got an honourable mention Global food security workshop for study case in food insecurity in Northern Ghana organized by North Carolina State University and Department of State USA, 2012, after that the People choice award for favourite poster presentation at Energy symposium in Kansas State University Centre for Sustainable Energy, 2014 and popular award for favourite poster presentation at Energy symposium in Kansas State University Centre for Sustainable Energy, 2015. Moreover, he was nominated for Outstanding Dissertation Award from Department of Agricultural Economics KSU at AAEA meeting Chicago, 2017.

He has an undergraduate degree from IPB University, Indonesia with major in Agribusiness. After that, he has his Master of Economics from University of Malaya, Malaysia and his Ph.D in Agricultural Economics in Kansas State University, USA. His interest is in the environmental and resource economics, production economic, risk analysis and marketing economic.







**Prof. Serafim Bakalis**

*(University of Copenhagen, Denmark)*

Professor Bakalis has an interdisciplinary background. He has a degree in Chemical Engineering from National Technical University of Athens and a PhD in Food Science from Rutgers University in the USA. He has been working in the UK (University of Birmingham) for more than 10 years in the area of Formulation Engineering. His interests lie in developing modelling and experimental techniques aiming process to develop Sustainable cleaning formulations. Since 2020 he has been appointed at the University of Copenhagen, Department of Food Science. Bakalis' current interests include developing digital tools for sustainable processing.

***Future Foods:***

Foods have a significant environmental and health impact. To change our current paradigm we will need to develop new ways of designing and manufacturing foods. This will include develop digital tools to test functionality of foods, as well as digital tools to ensure that food manufacturing is done under hygienic conditions.





## PROGRAM OVERVIEW

Thursday, October 27 <sup>th</sup> 2022															
Topic: 6th International Conference on Agriculture, Environment, and Food Security (AEFS) 2022															
Time: Oct 27, 2022 07:30 AM Jakarta															
Join Zoom Meeting															
<a href="https://tinyurl.com/aefszoom">https://tinyurl.com/aefszoom</a>															
Meeting ID: 994 6431 2852															
Passcode: 6aefs2022															
Program	Time														
	Medan UTC+7	Sydney UTC+11	Copenhagen UTC+2	Kyiv UTC+3	Moscow UTC+3	Baghdad UTC+3	Armenia UTC+4	Georgia UTC+4	Uzbekistan UTC+5	Hanoi UTC+7	Taipei UTC+8	Manila UTC+8	Malaysia UTC+8	China UTC+8	Washington DC* UTC-4
<b>MC Opening</b>	08.00	12.00	03.00	04.00	04.00	04.00	05.00	05.00	06.00	08.00	09.00	09.00	09.00	09.00	21.00
<b>Welcome Address and Opening Ceremony</b>															
Chairman of 6 <sup>th</sup> IC-AEFS 2022 Prof. Dr. Ir. Elisa Julianti, M.Si.	08.30	12.30	03.30	04.30	04.30	04.30	05.30	05.30	06.30	08.30	09.30	09.30	09.30	09.30	21.30
Rector of Universitas Sumatera Utara Dr. Muryanto Amin, S.Sos., M.Si.	08.45	12.45	03.45	04.45	04.45	04.45	05.45	05.45	06.45	08.45	09.45	09.45	09.45	09.45	21.45
<b>Keynote Speeches and Discussion (Parallel Session I)</b> (Moderator: Lukman Adlin Harahap, S.TP., M.Si., Ph.D.)															
Prof. Budiman Minasny (The University of Sydney, Australia)	09.00	13.00	04.00	05.00	05.00	05.00	06.00	06.00	07.00	09.00	10.00	10.00	10.00	10.00	22.00
Program	Medan UTC+7	Sydney UTC+11	Copenhagen UTC+2	Kyiv UTC+3	Moscow UTC+3	Baghdad UTC+3	Armenia UTC+4	Georgia UTC+4	Uzbekistan UTC+5	Hanoi UTC+7	Taipei UTC+8	Manila UTC+8	Malaysia UTC+8	China UTC+8	Washington DC* UTC-4





Prof. Henry M. Manik (IPB University, Indonesia)	09.30	13.30	04.30	05.30	05.30	05.30	06.30	06.30	07.30	09.30	10.30	10.30	10.30	10.30	22.30
Discussion	10.00	14.00	05.00	06.00	06.00	06.00	07.00	07.00	08.00	10.00	11.00	11.00	11.00	11.00	23.00
<b>Parallel Session I</b>	10.30	14.30	05.30	06.30	06.30	06.30	07.30	07.30	08.30	10.30	11.30	11.30	11.30	11.30	23.30
<b>Break</b>	12.00	16.00	07.00	08.00	08.00	08.00	09.00	09.00	10.00	12.00	13.00	13.00	13.00	13.00	01.00
<b>Keynote Speeches and Discussion (Parallel Session II and III)</b> (Riswanti Sigalingging, S.TP., M.Si., Ph.D.)															
Rulianda Purnomo Wibowo, S.P., M.Ec., Ph.D. (Universitas Sumatera Utara, Indonesia)	13.30	17.30	08.30	09.30	09.30	09.30	10.30	10.30	11.30	13.30	14.30	14.30	14.30	14.30	02.30
Prof. Serafim Bakalis (University of Copenhagen, Denmark)	14.00	18.00	09.00	10.00	10.00	10.00	11.00	11.00	12.00	14.00	15.00	15.00	15.00	15.00	03.00
Discussion	14.30	18.30	09.30	10.30	10.30	10.30	11.30	11.30	12.30	14.30	15.30	15.30	15.30	15.30	03.30
<b>Parallel Session II</b>	15.00	19.00	10.00	11.00	11.00	11.00	12.00	12.00	13.00	15.00	16.00	16.00	16.00	16.00	04.00
<b>Break</b>	16.00	20.00	11.00	12.00	12.00	12.00	13.00	13.00	14.00	16.00	17.00	17.00	17.00	17.00	05.00
<b>Parallel Session III</b>	16.30	20.30	11.30	12.30	12.30	12.30	13.30	13.30	14.30	16.30	17.30	17.30	17.30	17.30	05.30
<b>Closing Ceremony</b>															
Dean of Faculty of Agriculture, Universitas Sumatera Utara Dr. Ir. Tavi Supriana, M.S.	17.30	21.30	12.30	13.30	13.30	13.30	14.30	14.30	15.30	17.30	18.30	18.30	18.30	18.30	06.30

*\*: Wednesday, October 26<sup>th</sup> 2022 in Washington DC, USA*





## ROOM 1 HYBRID

**Moderator** : *Dr. Lisnawita SP., M.Si.*  
**PIC** : *Hafnes Wahyuni SP., MP*  
*Rahmatika Alfi SP., MSi*

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	18382	Online	AEC	A A Rouf, E Retnawati, S Munawaroh, and M Rusliyadi	Policy Analysis of Cocoa Intensification Program in Gorontalo Province
10.40-10.50	18399	Online	AEC	Priyotomo, Subejo, Panagribowo	Determinant factors on intergenerational occupation among household farmers in Indonesia
10.50-11.00	18443	Online	AEC	Darsani, Hairani, Alwi, Saleh	Feasibility of Farming and Farmer's Perceptions of Introduction Technology of Rice Cultivation on Tidal Swampland
11.00-11.10	18491	Online	AEC	Wijiono, Kusumastuti, Putra	Value Chain Analysis of Fresh Dairy Milk In Sleman Regency
11.10-11.20	18497	Online	AEC	Ferdynanda	The Development Of The Value Chain Equivalency Model Analysis Of Tuna Fish Sector In Banda Aceh
11.20-11.30	18502	Online	AEC	Ika	Does COVID-19 Pandemic Impact on Business Performance of Big Agricultural Companies in Indonesia?
11.30-11.40	18436	Online	AEG	Satyanto Krido Saptomo, Chusnul Arif, Willy Bayuardi Suwarno, Budi Indra Setiawan, Rusianto Rusianto	Automatic Water Table Control System with Remote Telemetry and Control Unit
11.40-11.50	18511	Online	AEG	Yusuf Hendrawan, Muhammad Yonanta Cahyo Prabowo, Sumardi Hadi Sumarlan, Dimas Firmanda Al Riza, Mochamad Bagus Hermanto, Sandra Malin Sutan, Retno Damayanti	Identification of chicken meat quality using a digital portable microscope 1000X WIFI and convolutional neural network
11.50-12.00	18422	Online	ANS	Nanung Agus Fitriyanto, Anky Alfadilla Saputri, Muhammad Kenantan Jayamahendra, Nonik Nur Azizah Prabawati, Ragil Adi Prasetyo, Ambar Pertiwiningrum, Viagian Pastawan, Mohammad Zainal Abidin, Yuny Erwanto	Characterizing hydrolysate from duck feather degradation by Bacillus cereus TD5B, Bacillus cereus LS2B, and Pseudomonas sp. PK4
<b>BREAK</b>					







Time	ID	Attendance	Track	Authors	Title
15.00-15.10	18236	Online	AEG	Zamuco	Development of an automated precision planter for solanaceous vegetable seeds
15.10-15.20	18358	Online	AEG	Thien Hien, Tan Phat, Le, Long, Minh	Volatile compounds of grapefruit ( <i>Citrus grandis</i> (L.) Osbeck) peel essential oil by cold pressing and hydrodistillation methods
15.20-15.30	18426	Online	AEG	Ermатов	Justification of the width of the tooth spacing and the distance between the rows of teeth of the ripper for the harrower.
15.30-15.40	18435	Online	ANS	Khafaji	Effects of Coriander ( <i>Coriandrum sativum</i> L.) Leaf and Seeds on Biochemical and Hematological feature.
15.40-15.50	18172		AEC	Zhichkin	Impact of counter-sanctions on agricultural production in Russia
15.50-16.00	18442	Online	ANS	Dela Heraini, Duta Setiawan, Rakhmad Perkasa Harahap, Musa Alfius, Ria Puspitasari, Khaeriyah Nur	Level of Microorganism Contamination in Chiken Meet From Traditional Markets in Melawi Regency West Kalimantan Province
<b>BREAK</b>					
16.30-16.40	18445	Online	ANS	Mirwandhono	Giving earthworm flour ( <i>Lumbricus rubellus</i> ) to the total population of <i>Salmonella</i> sp. in the small intestine of super native chickens infected with <i>Salmonella</i> sp.
16.40-16.50	18494	Online	ANS	Satiagraha, Andarwati, Putra	Contribution of Household's Male and Female Labor among Dairy Farmer Households
16.50-17.00	18104		AEC	Mahendra, Kinding	The Impact Of The Upland Program For Highland Farmers In Central Java
17.00-17.10	18417		AEG	Sari, Mansyur, Malik, Sukandaru	Sawdust Into Briquettes In Residents Of Wonosari Hamlet, Sambirembe Village, Kalijambe District, Sragen Regency
17.10-17.20	18093		ANS	Allaily Allaily, Akmal Fahmi, Yurliasni, Muhammad Aman Yaman, Sitti Wajizah	The effect of giving probiotics with a combination of garlic extract and the method of administration on the performance index of broilers
17.20-17.30	18500		ANS	Dalle	Effect of The Use of Fermented Chicken Feather Flour as Feed Source of Protein in Rations with Different Levels on Nutritional Digestibility and IOFC of Peranakan Landrace Pig Livestock





## ROOM 2 HYBRID

**Moderator : Tasya Chairuna Pane S.P., M.P.**

**PIC : Kennie Cendekia Desnamrina S.Pt., M.Pt**

**Kristiawan Hadinata Ginting SE, M.Si**

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	18066	Offline	AEC	Mozard Bahauddin Darus, Lindawati	ANALYSIS OF PROBLEMS IN INCREASING BEEF PRODUCTION WITH THE INTERPRETATIVE STRUCTURAL MODELING (ISM) APPROACH IN NORTH SUMATERA
10.40-10.50	17575	Online	AEC	Arbianti Arbianti, Endang Siti Rahayu, Joko Sutrisno	IMPACT OF COVID-19 PANDEMIC ON THE POVERTY STATUS OF CASSAVA FARMERS IN THE WONOGIRI REGENCY, INDONESIA
10.50-11.00	18120	Offline	AEC	T Athaillah, Adib, Shalwati	ANALYSIS OF FARMERS' SATISFACTION WITH THE USE OF COMBINE HARVESTER FOR RICE HARVESTING IN GAMPONG UJONG TANOH, KECAMATAN SETIA, KABUPATEN ACEH BARAT DAYA
11.00-11.10	17581	Online	AEC	A F Cahyaningsih, E S Rahayu, Kusnandar	EFFICIENCY OF CASSAVA FARMING WITH AN INPUT-OUTPUT ANALYSIS APPROACH IN THE WONOGIRI REGENCY, INDONESIA
11.10-11.20	18459	Offline	AEC	Y Maryunianta and S I Kesuma	STRATEGY FOR SUSTAINABLE AGROINDUSTRY DEVELOPMENT OF GRASS JELLY ORIGIN FROM GARUNGGANG VILLAGE, KUALA DISTRICT, LANGKAT REGENCY
11.20-11.30	17904	Online	AEC	M Marpaung, Z Nasution, Sirojuzilam and L S Andayani	THE INFLUENCE OF INTEGRATED AGRO-TOURISM CLUSTER DEVELOPMENT ON REGIONAL DEVELOPMENT IN NORTH SUMATRA PROVINCE, INDONESIA
11.30-11.40	18468	Offline	AEC	R B M I Fatoni*, M Khaliqi, K H Ginting and H L Panjaitan	ANALYSIS OF THE TOBA CARP BUSINESS CYCLE IN THE CITY OF MEDAN, NORTH SUMATRA PROVINCE
11.40-11.50	18130	Online	AEC	R Agustiar, A Triatmojo, B Guntoro, E Baliarti	INDUSTRIAL ANALYSIS OF CATTLE FEEDLOT COMPANIES IN INDONESIA
11.50-12.00	18469	Offline	AEC	R B M I Fatoni, H L Panjaitan and K H Ginting	BUSINESS FEASIBILITY STUDY OF A SMALL HYDROPONIC BUSINESS IN MEDAN CITY, NORTH SUMATRA PROVINCE
<b>BREAK</b>					
15.00-15.10	18152	Online	AEC	R S Pirngadi, Rahmawaty, S F Ayu and A Rauf	ESTIMATION OF LOSS OF RICE FARMERS DUE TO FLOOD AT KRUENG KLUET WATERSHED (WITH THE ECLAC METHOD APPROACH)
15.10-15.20	18486	Offline	AEC	P S I Situmorang, S F Ayu*, Lindawati	MARKET SHARE OF INDONESIAN MANGOSTEEN IN CHINA MARKET
15.20-15.30	18266	Online	AEC	R M Ramadhanty, M A U Muzayyanah and R A R S Putra	CONSUMER'S ATTITUDE AND WILLINGNESS TO PAY ON PURCHASING LOW-FAT MILK PRODUCTS





Time	ID	Attendance	Track	Authors	Title
15.30-15.40	18488	Offline	AEC	R Rizieq*, Ekawati, Ellyta, H D Bancin	SUSTAINABLE ADOPTION OF NEW IMPROVED VARIETY INNOVATIONS IN RICE COMMODITY IN WEST KALIMANTAN PROVINCE: AN OVERVIEW OF ECONOMIC ASPECTS.
15.40-15.50	18319	Online	AEC	I P Tamburaka*, S Samai, M Zian	FACTORS AFFECTING CAYENNE CHILI PRODUCTION IN KONDA DISTRICT, SOUTH KONAWA REGENCY
15.50-16.00	18504	Offline	AEC	U Sianturi, K H Ginting, D Pebriyani, S M Damanik	FAIRTRADE POLICY ON COFFEE FARMING IN TAKENGON DISTRICT, CENTRAL ACEH REGENCY
<b>BREAK</b>					
16.30-16.40	18360	Online	AEC	A Purwoko, I Azhar, S E Damanik, W B N E Taufik	FEASIBILITY OF UTILIZATION OF EUCALYPTUS LEAVES (EUCALYPTUS SPP) FROM LOGGING WASTE IN INDUSTRIAL PLANTATION FORESTS TO PRODUCE ESSENTIAL OILS
16.40-16.50	18490	Offline	AEC	E Junita, T C Pane* and M B Darus	PROCESSING COCONUT COIR WASTE TO GAIN PROFIT IN TANJUNG PURA SUBDISTRICT, LANGKAT REGENCY, NORTH SUMATERA PROVINCE
16.50-17.00	18361	Online	AEC	A Purwoko, Priyanto, C Manalu, U A Daulay	ECONOMIC FEASIBILITY AND DEVELOPMENT STRATEGY OF JABON (ANTHOCEPHALUS CADAMBA) CULTIVATION IN URBAN AREAS TO MEET THE NEEDS OF TIMBER AND GREEN OPEN SPACE
17.00-17.10	18493	Offline	AEC	G S B Ginting, T C Pane and T Supriana	PRODUCTION FUNCTION ANALYSIS OF GREEN ONION IN MERDEKA SUBDISTRICT, KARO REGENCY, NORTH SUMATERA PROVINCE
17.10-17.20	18379	Online	AEC	S H Purnomo, A I Sari, S Emawati and E T Rahayu	FACTOR INFLUENCING THE SUCCESS OF INTEGRATED AGRICULTURAL SYSTEM IN FARMER'S GROUP IN BOYOLALI REGENCY, CENTRAL JAVA
17.20-17.30	18535	Offline	AEC	N Sihombing, T Supriana* and Salmiah	FINANCIAL ANALYSIS AND CONTRIBUTION OF ARABICA COFFEE FOR SUSTAINABLE COFFEE FARMING IN SITOLU BAHAL VILLAGE, LINTONGNIHUTA SUBDISTRICT, HUMBANG HASUNDUTAN DISTRICT





### ROOM 3 HYBRID

**Moderator : Dr. Ir. Ma'ruf Tafsir M.Si.**  
**PIC : Uswatun Hasanah S.Pt., M.Si**  
**Peni Patriani S.Pt., M.P**

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	17602	Online	ANS	Albarki, Agustin, Permana, Jayanegara	Identification of adulterated rice bran with rice husks by using the image analytics
10.40-10.50	18374	Offline	ANS	U Hasanah, K C Desnamrina, G A W Siregar	Evaluation of feeding on the production and quality of dairy buffalo milk (Murrah) at superior livestock breeding center and fodder forage in Siborong-Borong
10.50-11.00	17730	Online	ANS	Agustin, Albarki, Martin, Jayanegara	Analysis of Fish Meal Adulteration with Rice Bran using Image Analysis Method
11.00-11.10	18423	Offline	ANS	K S Hasibuan, M Tafsir, S Umar	Study of Broiler Chicken Performance with different Lighting Time and Vitamin B-Complex Doses in Close House
11.10-11.20	18190	Online	ANS	Sumantri, Widi, Prastowo, Hanafi	Seasonal grass production carrying capacity of buffalo grazing area in Paminggir, South Kalimantan
11.20-11.30	18429	Offline	ANS	P Patriani, T V Sari, U Hasanah	Incorporation of Funugreek ( <i>Trigonella foenum</i> ) seed powder on the physical quality of buffalo meat patty during frozen storage
11.30-11.40	18265	Online	ANS	Edy Susanto, Anik Fadlilah, Muhammad Fathul Amin, Wahyuni, Edi Sutanto, Ike Mawarni Handayani, Rohmatus Sholiha, Galur Fitria Yolanda, Nur Khasanah	Amino Acids Characterization of The Ongole Crossbreed Cattle Edible Head Skin Using Lc MS/MS
11.40-11.50	18430	Offline	ANS	P Patriani and Rosadi	Physical quality of beef patty with substitution mocaf flour (modified cassava flour) and bread crumbs
11.50-12.00	18303	Online	ANS	I Roychan, N Umami, and C T Noviandi	Nitrogen Utility on Income Over Feed Cost in Complete Feed Napier Grass cv Gama Umami Basal with Different Calliandra ( <i>Calliandra calothyrsus</i> ) Substitution Levels
<b>BREAK</b>					
15.00-15.10	18475	Offline	ANS	Rumahorbo, Ilyas, hutahaean, zuhra,...	Oral Acute Toxicity Study of Nanoherbal Sikkam Leaves ( <i>Bischofia javanica</i> )
15.10-15.20	18284	Online	MFS	Anna Litvinenko, Nadezhda Khristoforova, Dmytriy Danilin and Vasily Tsygankov	Geochemical conditions of the seas of the northwestern Pacific and their reflection on the trace element composition of Pacific salmon
15.20-15.30	18519	Offline	ANS	T Saili, L O Nafiu, A Bain, F Lopulalan, S Rahadi, A S Aku	Sperm quality of Bali bull following sexing and frozen using different cryoprotectants
15.30-15.40	18365	Online	MFS	Norjasmin Hussin, Izzati Adilah Azmir, Yuzine Esa And Amiruddin Ahmad	Diversity, Distribution, and Conservation status of the World's Smallest Fish, Cyprinidae, <i>Paedocypris progenetica</i>





Time	ID	Attendance	Track	Authors	Title
15.40-15.50	18492	Offline	MFS	R A Harahap, T A Barus* and H Wahyuningsih	Bivalvia assemblage in the estuary and mangrove of Belawan Waters, North Sumatra
15.50-16.00	18375	Online	ANS	Adani, Sari, Ibrahim, Panjono, Maharani	Preliminary Analysis of Single Nucleotide Polymorphism (SNP) in Several Indonesian Local Sheep
<b>BREAK</b>					
16.30-16.40	18496	Offline	MFS	T A Ginting, T A Barus* and H Wahyuningsih	Phytoplankton abundance and trophic status of Belawan Waters, North Sumatra
16.40-16.50	18414	Online	ANS	Yendraliza	EFFECTIVENESS TIME EQUILIBRATION SPERM BUFFALO IN DILUENT...
16.50-17.00	18509	Offline	MFS	J S Hasibuan, M R Ramadan, Desrita, V R Manurung, P S Sabila	Bioeconomic Analysis of Mackerel Resources Management ( <i>Rastrelliger</i> spp) Landed at Tanjung Beringin's Auction Place Serdang Bedagai, Sumatera Utara
17.00-17.10	18549	Online	MFS	Hardamin, La Ode M.Aslan, Wa Iba, Parhan, Harmin Hari, La Ode Aslin, Manat Rahim	The effect of different planting distance on the growth <i>Sargassum plagiophyllum</i> using longline method cultivated in Bungin Permai coastal waters, South Konawe, Indonesia
17.10-17.20	18520	Offline	MFS	Desrita, J S Hasibuan, V R Manurung and J Sinaga	Length and Weight Relationship, Condition Factors, and Growth Parameters of Gulamah Fish ( <i>Johnius trachycephalus</i> ) Landed at Tanjung Beringin's Fish Auction Place (TPI) Serdang Bedagai District, North Sumatera Province
17.20-17.30	18550	Online	MFS	Febri Setiawan, La Ode M. Aslan, Wa Iba, Yusnaini, Ruslaini Ongko, Muis Balubi	Growth of Seaweed <i>Kappaphycus alvarezii</i> cultivated along with <i>Sargassum plagiophyllum</i> using the long line method





## ROOM 4 Hybrid

**Moderator : Dr. Nauas Domu Marihot Romauli STP., M.Eng**

**PIC : Astrid Fauzia Dewinta S.St.Pi., M.Si**

**Edy Syahputra Harahap S.TP., M.Si**

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	18278	Online	EVS	B B Pratama, D Pratiwi and M A Qirom	MONITORING AND IDENTIFYING FOREST BURNT AREA USING NBR LANDSAT AND LANDUSE IN CENTRAL KALIMANTAN
10.40-10.50	18285	Online	EVS	R Rizka, Yuandani and Sumaiyah	DESIGN OF A GEL SPRAY FORMULATION WITH EXTRACT BANANA PEELS (MUSA PARADISIACA L.): ANTIMICROBIAL ACTIVITY AND SKIN IRRITATION TESTING IN RABBITS
10.50-11.00	18289	Online	EVS	S M Soebagiyo, Martius, Iswadi, M A F Lubis, A M Amin, A Fathurrahman, J H Samek, B Supriyanto	AN ASSESSMENT OF TREE BIODIVERSITY, FOREST INTEGRATED ASSESSMENT AND CARBON STOCKS IN KONSU MANDIRI SEJAHTERA (KMS) SOCIAL FORESTRY, LAMANDAU, INDONESIA
11.00-11.10	18478	Online	FST	M BT A Bungsu, M M Tahir, Zainal, Rahmaniar	CHARACTERIZATION OF THE ADDITION OF CRUDE EXTRACT OF YELLOW PUMPKIN (CUCURBITA MASCHATA) AS A NATURAL COLORING AGENT IN SEAWEED WET NOODLES
11.10-11.20	18518	Online	FST	R Efendi, Rahmayuni, E Rossi, Y Zalfiatri	ANTIMICROBIAL ACTIVITY OF LACTIC ACID BACTERIA FROM FERMENTED PALM SAP AGAINST THE GROWTH OF ESCHERICHIA COLI AND STAPHYLOCOCCUS AUREUS
11.20-11.30	18527	Online	FST	M D Saputra, A F Hadi, B Sartono, E Ramadhani, A F Zulva	SUPPORT VECTOR MACHINE AND SHAPLEY ADDITIVE EXPLANATIONS FOR FOOD-INSECURE INCIDENCE IN EAST JAVA
11.30-11.40	18529	Online	FST	Y Khasanah, A W Indrianingsih, P Triwitono, Agnes Murdiati	ANTIOXIDANT, TOTAL PHENOLIC CONTENT, AND PHYSICOCHEMICAL PROPERTIES OF MODIFIED CASSAVA FLOUR
11.40-11.50	18534	Online	FST	R S Hamidah, N F Sadek, I A Murwani	PHYSICOCHEMICAL AND ORGANOLEPTIC CHARACTERIZATION OF DRIED TAPIOCA NOODLES WITH SORGHUM-MORINGA SUBSTITUTION
11.50-12.00	18539	Online	FST	V Aprilia, N Kusumawardani, R Fauzi, D Estiningsih, D Kusumawati	THE CALCIUM OXALATE LEVELS, GLUCOMANNAN LEVELS, AND THE ANTIOXIDATIVE ACTIVITY OF AMORPHOPHALLUS ONCOPHYLUS IN DIFFERENT SIZE OF PARTICLE AND THE MACERATION OF STROBILANTHES CRISPUS
<b>BREAK</b>					
15.00-15.10	18559	Online	FST	M Muzaiifa, Y Abubakar, Safrida, C Nilda, M Sapitri	ALCOHOL CONTENT AND CHEMICAL CHARACTERISTICS OF FERMENTED BEVERAGES IN ACEH PROVINCE-INDONESIA







Time	ID	Attendance	Track	Authors	Title
15.10-15.20	18166	Online	FST	Yuhua Zhao, Jie Lu, Xueying Guo, Xuedong Chang	RESPONSE SURFACE METHOD TO OPTIMIZE THE PROCESSING OF CHINESE CHESTNUT STUFFING
15.20-15.30	18331		PLS	D T Muhamediyeva and N U Tukhtamuradov	SOIL AND CROP MONITORING ON THE BASIS OF EARTH REMOTE SENSING DATA
15.30-15.40	18419		PLS	D K Muhamediyeva and A Kh Madrakhimov	APPROACHES TO SOLVING A PROBLEM OF A BIOLOGICAL POPULATION WITH CONVECTIVE TRANSFER
15.40-15.50	18431		PLS	S Yuri	INFLUENCE OF SILICON NANO FERTILIZER ON CUCUMBER'S PRODUCTIVITY IN GREENHOUSES
15.50-16.00	18585	Online	FST	Jufrinaldi, A B Sitanggang, E Y Purwani, Slamet Budijanto	RHEOLOGICAL AND FUNCTIONAL CHARACTERISTICS OF STARCH AND FLOUR OF BENENG TARO ON DIFFERENT DRYING METHODS
16.00-16.10	18523	Online	PLS	N M Istiqomah, O Cahyono, M Mujiyo, D P Ariyanto, S Maro'ah, M R Romadhon, and V Irmawati	ASSESSMENT OF POTENTIAL SOIL DEGRADATION ON VARIOUS LAND USES IN KEDUANG WATERSHED
<b>BREAK</b>					
16.30-16.40	18582	Online	PLS	R S Handayani, N Bachri, R Rusydi, M. Nazaruddin, Monalisa	THE EFFECT OF CALCIUM CHLORIDE AND SODIUM BENZOATE ON QUALITY OF CRUDE PALM OIL (ELAEISGUINEENSISJACQ.) AS A SOURCE OF BIOFUELS
16.40-16.50	18637	Online	PLS	M Hamawi, E Rosanti and R A A Rahma	CHLOROPHYLL AND ROOT NODULES AT VARIOUS AGES OF SOYBEAN (GLYCINE MAX L.) PLANTS IN WET DRY SEASON
16.50-17.00	18238		EVS	A F Abus, T Lubis, N Saputra, A A Abus and N A A Abus	LANDSCAPE CONCEPT FOR OUTDOOR RECREATION AT HUTAN KOTA LANGSA, ACEH, INDONESIA
17.00-17.10	18350		FST	Yefrida, M Fadhil, Refilda, Humaira	APPLICATION OF HYDROXYETHYL CELLULOSE AND SODIUM ALGINATE EDIBLE COATING CONTAINING SUNGKAI LEAF EXTRACT (PERONEMA CANESCENS JACK) TO INCREASE THE SHELF LIFE OF POSTHARVEST STRAWBERRIES
17.10-17.20	18230		PLS	S E Pakasi, F J Paat, D D Pioh, S R Sentinuwo, D A S Turang, T B Ogie, R Nangoi and M Shofiyati	WEB-GEOGRAPHIC INFORMATION SYSTEM FOR RICE FIELDS IN BUNGKO VILLAGE, SOUTH KOTAMOBAGU DISTRICT
17.20-17.30	18763		PLS	Hapsoh, I R Dini, Wawan, M Rifa'i and F Khoiruddin	THE GROWTH AND PRODUCTION OF PADDY RICE (ORYZA SATIVA L.) THROUGH APPLICATION COMBINATION OF VARIOUS DOSES OF N,P,K FERTILIZERS WITH ORGANIC FERTILIZERS





## ROOM 5 HYBRID

**Moderator : Ir. Hotnida Sinaga M.Phil. Ph.D**  
**PIC : Syahira Addina S.Pi, M.Si**  
**Fuad Hasan S.Pt, M.Si**

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	17819	Online	FST	Lydia and R Surya	Development of Ready-to-Drink Milk Coffee with Almond Milk and Isolated Soy Protein Using Kano Model and Quality Function Deployment Analysis
10.40-10.50	18133	Offline	FST	R Efendi, N A Harahap, D F Ayu, E Saputra, Y Nopiani	The shelf life of smoked catfish coated with edible coating chitosan, red ginger, and red galangal essential oil using the acceleration method
10.50-11.00	18277	Online	FST	G Supriyanto, B Rahardjo, T Supriyanto, A A Hidayat, B Pardamean	Convective Heat Transfer Analysis in A Heat Exchanger with Two Coaxial Tubes for Aseptic Processing of Foods
11.00-11.10	18455	Offline	FST	R Hasibuan, F B S Pane, M A Sianipar, and R Fazillah	Purification of pecan shell liquid smoke using the distillation method to separate polycyclic aromatic hydrocarbons (PAHs)
11.10-11.20	18290	Online	FST	D F Ayu, J P Pratama, V S Johan, Y K Dewi, F H Hamzah	Effect of deodorization temperature on red palm oil in the making of mayonnaise
11.20-11.30	18472	Offline	FST	M Nurminah, L M Lubis dan R M Munthe	Comparison of Virgin Coconut Oil (VCO) quality with fermentation and centrifugation methods from genjah and hybrid variety of coconut based on Indonesian local environment resources
11.30-11.40	18299	Online	FST	H Hariadi, R C Nissa, E A Cahya, Hidayat, A E Ferdiansyah, M Rifqi	Physical and chemical properties of anthocyanin powder from dragon fruits ( <i>Hylocereus polyrhizus</i> ) peels as a result of encapsulation with various additional concentrations of maltodextrin
11.40-11.50	18476	Offline	FST	R R Simanjuntak, G Siahaan, U Sihotang, T L Bakara	The Effect Of Provisioning Snakehead Fish Nugget On Haemoglobin (Hb) And Albumin Levels In Breastfeeding Women In Medan
11.50-12.00	18309	Online	FST	Refilda, M F Tanjung, Yefrida	Effect of Sungkai Leaf Water Extract Addition to Aloe Vera Gel Edible Coating on Quality and Shelf Life of Strawberries ( <i>Fragaria Sp.</i> )
<b>BREAK</b>					
15.00-15.10	18482	Offline	FST	R Oppusunggu, M Manalu, N Suharti, S A Aulia	Physical quality analysis and proximate test of cookies with belor flour substitution (eel and moringa leaf) as a snack
15.10-15.20	18385	Online	FST	R O Khastini, N Maryani, S Haryati, R Athifah Rahmah, A Sa'ban, H Aisyah, T N Fadhillah, S Nadia	Understanding The Traditional Knowledge of Picungan Bandeng, A Fermented Fish Food From Banten Province





Time	ID	Attendance	Track	Authors	Title
15.20-15.30	18503	Offline	FST	H Sinaga, T Karo-Karo, M Nurminah, A Hilman and A E Sitanggang	Effect of various packaging and storage time on the physicochemical characteristics of Gayo Arabica coffee processed with full-washed method
15.30-15.40	18456	Online	FST	A P Darmanyan, Sch Maignan, S I Bogdanov, O V Novoselova, D E Kucher and A. M.,	Comparative Analysis of Volume and Growth Trends of Grain Production and World Population
15.40-15.50	18528	Offline	FST	Abdelraouf	Bioactive compounds in tinuktuk, Simalungun traditional food
15.50-16.00	18460	Online	FST	N Tarigan, E Julianti, J Silalahi, H Sinaga	Development of Arabica coffee fermentation using yeast starter
<b>BREAK</b>					
16.30-16.40	18531	Offline	FST	E Julianti, Ridwansyah, and E.Yusraini,	Color Stability of Anthocyanin Extract from Wastewater of Purple Sweet Potato Starch Processing
16.40-16.50	18464	Online	FST	G Supriyanto, S Achadiyah, B Rahardjo, T Suparyanto, J P Trinugroho, B Pardamean	Modifying the Particle Density of Cocoa Powder Using Puffing Method
16.50-17.00	18540	Offline	FST	A S Rohani, S N Rudang, R N Daulay, T I Hanum and N A Juwita	Characterization, Phytochemistry Screening and Acute Toxicity of Allium cepa fermented
17.00-17.10	18466	Online	FST	I A Nur, A B Tawali, M Asfar	The effect of immersion of seaweed eucheuma cottonii on physicochemical carrageenan flour
17.10-17.20	18545	Offline	FST	S Addina, E S Harahap	Analysis of Antioxidant Activity of Balakka Barks And Fruits (Phyllanthus emblica) From South Tapanuli
17.20-17.30	18477	Online	FST	R Wulandari, N E Suyatma, F S Budi, R R Utami	Optimization of pectin extraction from cacao pods by microwave assisted extraction (MAE) using response surface methodology (RSM)





## ROOM 6 HYBRID

**Moderator** : *Ir. Revandy Iskandar Muda Damanik MSi., M.Sc., Ph.D*  
**PIC** : *Nur Ulina Warnisyah Br Sebayang SP, M.Agr*  
*Nursa'adah S.ST., M.Agr*

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	17628	Online	PLS	Sabam Malau and Maria Rumondang Sihotang	Components of genetic of coffee leaf rust symptoms in genotypes of Arabica coffee ( <i>Coffea arabica</i> L.)
10.40-10.50	18498	Offline	PLS	Y Hasanah, H Hanum, NA Harahap, AS Harahap	The Role of Molybdenum in Relation to Rhizobium in Increasing Biological Nitrogen Fixation and Soybean Growth
10.50-11.00	18179	Online	PLS	Nurdin, Asda Rauf, Yunnita Rahim, Nikmah Musa, Suyono Dude, Rival Rahman, Alfia Shalsa Malatani, Rizkiya Mooduto, Sinta Mobilingo, Suryadi	Determination of Water Availability and Long Growth Periods of Maize Plant in Boalemo Regency, Indonesia
11.00-11.10	18499	Offline	PLS	Y Hasanah, L Mawarni, FR Wirawan, I Kurniawan	The Content of Nitrogen, Phosphorus and Potassium of Shallot ( <i>Allium ascalonicum</i> L.) Varieties with Different Cultivation Methods and Altitude
11.10-11.20	18224	Online	PLS	F J Paat, M M Toding, S E Pakasi, S Tumbelaka, J B Kaligis, D A S Turang, J V Porong, and R J Linggi	Identification on chemical organic compounds of pericarp nutmeg <i>Myristica fragrans</i> North Minahasa by using GC-MS
11.20-11.30	18516	Offline	PLS	M Jannah, R I Damanik	Production of biomass and flavonoids in black cumin tissue culture
11.30-11.40	18287	Online	PLS	Agustinur, Evi Julianita Harahap, Sumeinika Fitria Lizmah, Yuliatul Muslimah, Birul Irfan	The effect of various natural growth regulatory substances and the origin of stem cuttings on the vegetative growth of white jasmine ( <i>Jasminum sambac</i> L.)
11.40-11.50	18521	Offline	PLS	N Rahmawati, T Irmansyah and D Yudhitama	Mycorrhizal inoculation and application of chicken manure to increase sweet potato production in acidic soil
11.50-12.00	18347	Online	PLS	NS Vinolina, Meiriani, and THF Tobing	Impact of Biofertilizer and Organic Fertilizer in Enhancing the Biomass of Pegagan ( <i>Centella asiatica</i> L. Urb.)
<b>BREAK</b>					
15.00-15.10	18522	Offline	PLS	Hasbullah Syaf*, Takdir Saili, and Asramid Yasin	Spatial Mapping of Tinondo Swamp Spatial Patterns in Kabupaten Kolaka Timur to Increase Land productivity
15.10-15.20	18424	Online	PLS	Thien Hien Tran, Ton Nu Thuy An, Dao Tan Phat, Ly Thi Ngoc Minh	Pomelo ( <i>Citrus maxima</i> . Merr) essential oil extraction by cold pressing and hydrodistillation methods and comparison of chemical compositions





Time	ID	Attendance	Track	Authors	Title
15.20-15.30	18524	Offline	PLS	N Rahmawati, E H Kardhinat and B D Savana	The effect of planting material and organic fertilizer on growth of elephant foot yam ( <i>Amorphophallus oncophyllus</i> Prain.).
15.30-15.40	18349	Online	PLS	Y Pujiharti, S Salma, Sarno, J Barus and D Meithasari	Liquid fertilizer formulation is based on cow urine and its concentration for maize in Indonesia
15.40-15.50	18526	Offline	PLS	D Kusbiantoro , L A M Siregar, C Hanum, L Mawarni	Effect of mulch weight on temperature, soil moisture and vegetative growth of Sigambiri Merah in lowlands
15.50-16.00	18366	Online	PLS	I R Saadah, J Pinilih, N Faoji, C Azmi, P Soedomo	Performance of 34 shallot accessions in Lembang highland
<b>BREAK</b>					
16.30-16.40	18530	Offline	PLS	T Widyawati, DK Sari, IB Sumantri, LF Mustanti, NA Yusoff	Phytochemical Screening of <i>Colocasia gigantea</i> Ethanol Leaf Extract
16.40-16.50	18378	Online	PLS	M R Romadhon, M Mujiyo, O Cahyono, S Maro'ah, N M Istiqomah, and V Irmawati1	Potential Soil Degradation of Paddy Fields Through Observation Approaches From Various Sources of Environmental Diversity
16.50-17.00	18533	Offline	PLS	Asmanizar, Aldy Waridha, Fenti Maimunah Simbolon, Edy Sumantri	Exploration of <i>Spodoptera frugiperda</i> Natural Enemies on Zea mays Cultivation Area
17.00-17.10	18446	Online	PLS	Charloq, AS Thoha, DY Putra and A Muammar	Unmanned aerial vehicles (UAV) utilization for mapping the health of oil palm plants ( <i>Elaeis guineensis</i> Jacq)
17.10-17.20	18501	Online	PLS	Muhidin, G R Sadimantara, L O M Hyudi, M Eviyani, DN Yusuf and S Leomo	The effect of fertilizer on the growth of dwarf banana cavendish ( <i>Musa acuminata</i> L. ) seedling under the natural shade
17.20-17.30	18462	Online	PLS	G R Sadimantara, Muhidin and W Nuraida	Evaluation of yield attributing characters and grain yield insome promising lines of red rice ( <i>Oryza sativa</i> L.) grown in the lowland conditions





## ROOM 7 OFFLINE

**Moderator** : Putri Chandra Ayu STP, M.Si

**PIC** : Vindy Rilani Manurung S.Pi., M.P

**Ir. Achmad Sadeli S.Pt., M.Sc., IPM**

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	18257	Offline	AEG	Putri Chandra Ayu	Environmental friendly method using NIR Spectroscopy to determine the water content in robusta coffee
10.40-10.50	18312	Offline	AEG	Lukman Adlin Harahap	Bone Powder Miller Optimization
10.50-11.00	18323	Offline	AEG	Riswanti Sigalingging	Analysis of energy used on shallot farming in Food Estate, Hutajulu, North Sumatra
11.00-11.10	18376	Offline	AEG	Eprida Sinta Br Sebayang	Corn Stem Fiber Fractionation By Acid Hydrolysis
11.10-11.20	18440	Offline	AEG	Yunita Maharani	Comparison of Biogas Production from Various Blends of Biomass
11.20-11.30	18441	Offline	AEG	Yunita Maharani	Utilization of Biogas in Generators to Generate Electricity
11.30-11.40	18512	Offline	AEG	Delima Nasution	Determining Discharge Rating Curve of Karai Sub Watershed
11.40-11.50	18513	Offline	AEG	Delima Nasution	Erosion and Sedimentation Control at Karai Sub Watershed
11.50-12.00	18525	Offline	AEG	Lukman Adlin Harahap	Tea Waste Briquette Molder as an Effort To Reuse Organic Waste
<b>BREAK</b>					
15.00-15.10	18342	Offline	EVS	Bode Haryanto Tarigan	Natural Operation in Removing Waste Compounds within Cooking Oil Using Corn Cob as Adsorbent
15.10-15.20	18353	Offline	EVS	Bode Haryanto Tarigan	Study on Batch Sorption Ability of Corncob Naturally as Adsorbent in Removing Waste with Cooking Oil Base on The Turbidity
15.20-15.30	18188	Offline	EVS	Rudi Hartono	The Effect of Compressing Time on Quality of Jabon Wood ( <i>Anthocephalus cadamba</i> )
15.30-15.40	18281	Offline	EVS	Defri Elias Simatupang	Location of Early Residence of the Sisingamangaraja Dynasty (Resources and Environment Overview of Lake Toba)
15.40-15.50	18453	Offline	EVS	Arif Nuryawan	Physical Properties of Five Species of Twigs from Mangrove Forest
15.50-16.00	18508	Offline	EVS	Ridahati Rambey	Association of <i>Amorphophallus gigas</i> on rubber land cover in the Sabungan Village, Sungai Kanan District, South Labuhanbatu Regency, North Sumatra
<b>BREAK</b>					
16.30-16.40	18581	Offline	EVS	Tengku Kemala Intan	The Relevancy-Analysis of Air Quality Index to Acute Respiratory Infection (ARI) in A Landfill Site of Medan







Time	ID	Attendance	Track	Authors	Title
16.40-16.50	18558	Offline	PLS	Dewi Nurhayati Yusuf	Identification of the distribution and characteristics of local sago from Kendari, Southeast Sulawesi
16.50-17.00	18589	Offline	PLS	Gusti Ayu Kade Sutariati	Seed biopriming using saline soil rhizobacteria from the coast of Kolaka Regency for enhancing seed viability and vigor of tomato ( <i>Lycopersicum esculentum</i> L.)
17.00-17.10	18557	Offline	PLS	Noverita Sprinse Vinolina	The Effect of Biological Fertilizer and Organic Fertilizer in Growth and Biomass of Pegagan ( <i>Centella asiatica</i> (L.) Urban) from Simalungun Accession
17.10-17.20	18208		AEG	Indra Surya	Oleamide as palm-oil based substance for silica-loaded styrene butadiene rubber compound: The cure and crosslinks behaviors
17.20-17.30	18237		EVS	Tasnim Lubis	Nature conservation campaign on building a balancing ecosystem in Simeulue Island





## ROOM 8 OFFLINE

**Moderato** : *Dr. Ir. Yaya Hasanah M.Si*

**PIC** : *Wida Akasah S. Agr., M. Sc*

*Julia Syahrani Hasibuan, S.Pi., M.Si*

Time	ID	Attendance	Track	Authors	Title
10.30-10.40	18060	Offline	PLS	A Z Siregar*, H Erwina, I T D Tjahjaningrum	Biodiversity of Paddy Insects in Northern Sumatera
10.40-10.50	18087	Offline	PLS	Sarifuddin*, Darmayanti	Effect of Zeolite and Neem Oil on N-Soil Form and Efficiency of Urea Fertilization in Rice Fields
10.50-11.00	18088	Offline	PLS	U M Putri, Sarifuddin*, Bintang	Characteristic of Mahogany Leaves as Biochar and its effect with Urea Fertilization on Nitrogen Status and Growth of Corn in Ultisol
11.00-11.10	18212	Offline	PLS	Musfal	The Study Of Largo Super Technology Packages In Rainfed Land
11.10-11.20	18213	Offline	PLS	N Chairuman, Rosmayati, H Hanum, and A Jamil	Potassium and phosphorus availability due to fertilization of potassium and organic matter for rice in rainfed rice fields
11.20-11.30	18263	Offline	PLS	Meiriani*, R R Lahay dan M R Sutra	Increased production of pruned okra plant ( <i>Abelmoschus esculentus</i> L. Moench) by applying IAA and Urea fertilizer
11.30-11.40	18273	Offline	PLS	S Hannum, S Pahlevi, I Nurwahyuni, S Rahayu and A Hartanto	Isolation of partial $\beta$ -tubulin gene from balakka ( <i>Phyllanthus emblica</i> L.)
11.40-11.50	18282	Offline	PLS	L Sidauruk, E Panjaitan dan P Sipayung	Study biology of <i>Coccinella transversalis</i> Fabricius (Coleoptera: Coccinellidae) as potential predator on Aphid in Karo District, Indonesia
11.50-12.00	18294	Offline	PLS	N A Lubis*, B Hidayat, T Sabrina	The Effect of Dispensing Biochar of Palm Oil Empty Bunch and Palm Oil Fronds on the Population of Soil Organisms
<b>BREAK</b>					
15.00-15.10	18201	Offline	PLS	O Shainidze, Z Mikeladze, S Lominadze, S Lamparadze, N Beridze, G Chkubadze and M Turmanidze	Results of the Study of Algae and Cyanobacteria in Various Ecotypes of Soils in Adjara, Georgia
15.10-15.20	18295	Offline	PLS	A Rodiansah, M Sinuraya and D S Hanafiah	Oryzalin Delays germination and Induces Putative Polyploid Plants in Local North Sumatra Garlic ( <i>Allium sativum</i> L.)
15.20-15.30	18318	Offline	PLS	B Hidayat, N U W Sebayang, Jamilah and A M Akbar	Potential of Marine Organic Waste: Chemical Characteristics of Compost from Marine Organic Waste Kuala Indah Beach, North Sumatra
15.30-15.40	18335	Offline	PLS	A Susilowati, H H Rachmat, K S Yulita, I M Ginting, A H Iswanto, T Sucipto	Seed morphology and germination of pasak bumi ( <i>Eurycoma longifolia</i> )





Time	ID	Attendance	Track	Authors	Title
15.40-15.50	18336	Offline	PLS	A Susilowati, D Elfiati, A Hidayat, S A Rangkuti, I M Ginting, H H Rachmat, T Sucipto, AH Iswanto, S H Larekeng	Distribution and association pattern of Keruing ( <i>Dipterocarpus</i> sp.) in Tangkahan, Gunung Leuser National Park
15.50-16.00	18348	Offline	PLS	A Z Siregar, Tulus, E Julianti	Use of Yellow Sticky Trap (YST) and Coffee Experts (Pakar Kopi) Reduces Coffee Pest Attacks in Perteguhan Hamlet, Telagah Villages, Langkat District, North Sumatra
<b>BREAK</b>					
16.30-16.40	18405	Offline	PLS	Alridiwersah, K Tampubolon, M Basyuni, and N E Mustamu	SPAD Total Chlorophyll as an Initial Indicator of the Effect of 2,4-D Dimethyl Amine Herbicide for Lowland Rice and Barnyardgrass Weed
16.40-16.50	18447	Offline	PLS	F H Hibatullah and M Sembiring*	Effect of giving biochar and chicken manure compost enriched with phosphate solubilizing fungi to the growth and production of potato ( <i>Solanum tuberosum</i> L.) in Andisol soil
16.50-17.00	18448	Offline	PLS	H Wahyuni*, R Alfi and J Hariani	Exploration and Quantitative Character of Local Gogo Rice Padang Lawas
17.00-17.10	18451	Offline	PLS	W Akasah and L S Chou	Visual Screening of Potassium Solubilizing Bacteria for Increasing Solubilization of Potassium Mineral
17.10-17.20	18463	Offline	PLS	L J Sembiring, R I Damanik, C Hanum	Growth of arabica coffee seeds ( <i>Coffea arabica</i> L.) sigarar utang variety as a response to the provision of various growth regulators and types of shade
17.20-17.30	18470	Offline	PLS	H Wahyuni*, R Alfi and M I Pakpahan	Performance of Qualitative Characters of Head and Grain of Local Gogo Rice from Padang Lawas





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## Impact of COVID-19 Pandemic on the Poverty Status of Cassava Farmers in the Wonogiri Regency, Indonesia

*Arbianti, E S Rahayu\*, J Sutrisno*

*Department of Agribusiness, Faculty of Agriculture, Universitas Sebelas Maret, Ir. Sutami No.36, Kentingan, Jebres District, Surakarta City, Central Java 57126 Indonesia*

\*Email : [endangsiti@staff.uns.ac.id](mailto:endangsiti@staff.uns.ac.id)

**Abstract.** Global extreme poverty increased in 2020 for the first time in more than 20 years as the disruption of the COVID-19 pandemic under the power of conflict and climate change, which slowed progress in poverty reduction. Wonogiri Regency is the largest cassava producer in Central Java, with a poverty rate of 11.55% in 2021. This study aims to determine the impact of the COVID-19 pandemic on the poverty status of cassava farmers in the Wonogiri Regency. The analysis method uses the Foster-Greer-Thorbecke (FGT) index and logistic regression. The analysis showed a poverty index of cassava farmers of 0.254, a poverty gap index of 0.095, and a poverty severity index of 0.036. COVID-19 had an impact on increasing the poverty of cassava farmers. Factors affecting the poverty status of cassava farmers, in addition to COVID-19, are education, farming experience, land area, and farmer group membership. The implication is that it is necessary to increase the intensity of counselling for cassava farming, maximize the participation of farmer groups, use of non-productive land, and regenerate highly educated and quality farmers. The government is expected to stabilize the price of production inputs and selling prices of cassava and establish an agro-industry in farmer groups to increase incomes and reduce the poverty of cassava farmers.

**Paper ID: 17575**





## Efficiency of Cassava Farming with an Input-Output Analysis Approach in the Wonogiri Regency, Indonesia

*A F Cahyaningsih<sup>1</sup>, E S Rahayu<sup>2\*</sup>, Kusnandar<sup>3</sup>*

*<sup>1,2,3</sup> Department of Agribusiness, Faculty of Agriculture, Sebelas Maret University, Ir Sutami 36 St, Kentingan, Jebres District, Surakarta City, Central Java, Indonesia*

*\*Email: [endangsiti@staff.uns.ac.id](mailto:endangsiti@staff.uns.ac.id)*

**Abstract.** Wonogiri Regency was the area with the highest cassava production in Central Java in 2021, but the level of productivity is lower than the national productivity. The level of productivity is related to the inefficiency of using inputs. The purpose of this study is to analyze the efficiency of cassava farming through the relationship of inputs and outputs of cassava and socioeconomic factor which affects the efficiency. The research method is descriptive quantitative, with primary data obtained from 105 cassava farmers. Input-output analysis of the efficiency level use approach of Data Envelopment Analysis (DEA) and analysis of socioeconomic factors affecting the efficiency level with Tobit's regression. The input-output analysis with DEA results showed that 32% of cassava farmers in Wonogiri were already technically efficient, with an average value of 0.855. Increasing productivity through efficiency can be done by reducing the use of excess inputs (*slack inputs*), especially the use of seed, organic fertilizer and urea fertilizer. The Tobit regression results showed that farmers' experience, education, and participation in the farmers' group positively affected cassava's efficiency in the Wonogiri Regency. The study's implication is to increase farmer groups' role in providing information on the efficient use of inputs needed to increase cassava productivity.

**Paper ID: 18066**





## **The Influence of Integrated Agro-tourism Cluster Development on Regional Development in North Sumatra Province, Indonesia**

***M Marpaung\*, Z Nasution, Sirojuzilam and L S Andayani***

*Universitas Sumatera Utara, Medan, Indonesia*

E-mail: [marimbunmrp@gmail.com](mailto:marimbunmrp@gmail.com)

**Abstract.** This study analyzes the relationship between the agro-tourism cluster development and regional development in North Sumatra Province, Indonesia. Through this research, various opinions from the Government and society of 18 Regencies/Cities in North Sumatra have been collected using in-depth interviews and structured questionnaires. The statistical analysis used to test the hypothesis is the coefficient of determination test ( $R^2$ ), simultaneous test (F test), and partial test (t-test). The results showed that the development of integrated agro-tourism clusters positively and significantly impacted regional development in North Sumatra Province. These results affect the importance of agro-tourism cluster development policies in North Sumatra Province.

***Paper ID: 17904***





## **Analysis of problems in increasing beef production with the Interpretative Structural Modeling (ISM) approach in North Sumatera**

***M B Darus, Lindawati\****

*Department of Agribusiness, Faculty of Agriculture, University of Sumatera Utara, Medan, Indonesia*

Email: [lindatan84@usu.ac.id](mailto:lindatan84@usu.ac.id)

**Abstract.** The consumption rate is not in line with the rate of beef production, causing problems in fulfilling beef. This study aims to explore problems in increasing beef production and to create graphs and hierarchical diagrams of priority problem solving using the Interpretative Structural Modeling method. The shortage of beef production is caused by several problems, including 1) slaughtering productive female cattle, 2) reproductive disorders due to disease and malnutrition, 3) limited productive females as breeders, 4) limited skilled workers in the field of artificial insemination, 5) limited superior bulls, 6) limited knowledge about cattle farming, 7) small business ownership scale, 8) lack of motivation of farmers, 9) limited insight in feed processing technology, 10) limited capital, 11) limitations sources of feed or limited supply of grazing land due to land conversion, 12) Imports of cattle, 13) Sales of cattle outside North Sumatra, 14) Prices of beef. The final results of the Reachability Matrix have 3 categories of problem solving based on graphs and hierarchies, namely Top Level variables sub elements E1 and E2, then Middle Level variables sub elements E11, (E2 with E3), E9, E6, E14, E4 and E7 and Low Level Variables sub elements E10, E5, E12 and E13.

***Paper ID: 18066***





## The Impact of The Upland Program for Highland Farmers in Central Java

*B Mahendra and D P N Kinding*

*Perwira Purbalingga University, Purbalingga, Central Java, Indonesia*

E-mail: [31bayumahendra@gmail.com](mailto:31bayumahendra@gmail.com)

**Abstract.** Government policies are needed to increase productivity and income of upland farmers. The UPLAND program of the ministry of agriculture is expected to increase the productivity and income of upland farmers in Indonesia. The purpose of this study is to analyze the increase in the income of upland farmers in Purbalingga district. The analysis is carried out by comparing the productivity and income of farmers before the UPLAND program and after the UPLAND program, so that the significance of the increase can be known. The benefit of the results of this research is that it can be used as a reference for the government in designing and implementing programs related to agriculture. The average net income of farmers before joining the UPLAND program was IDR. 817500,- per month. After participating in the UPLAND program, the income of upland farmers can increase up to IDR. 110,000,-. The results of the paired t test analysis showed that the value of Sig. is 0.00 or  $<0.05$ , which means that there is a significant increase in income between before and after the UPLAND program. Respondents in this study were upland farmers who participated in the UPLAND program with the same area of land

**Paper ID: 18104**







## **Analysis of Farmers Satisfaction with The Use of Combine Harvester for Rice Harvesting in Gampong Ujong Tanah, Kecamatan Setia, Kabupaten Aceh Barat Daya**

***T Athaillah<sup>1</sup>, Adib<sup>2</sup>, Shalwatî<sup>3</sup>***

*<sup>1,3</sup>Department of Agribusiness, Universitas Teuku Umar, Jl Alue Peunyereng Meulaboh- Aceh Barat, Aceh, Indonesia.*

*<sup>2</sup>Department of Industrial Engineering, Universitas Teuku Umar, Jl Alue Peunyereng Meulaboh- Aceh Barat, Aceh, Indonesia.*

Email : [athaillah.teuku@utu.ac.id](mailto:athaillah.teuku@utu.ac.id)

**Abstract.** The development of agricultural machinery has a big role in agriculture to increase farmers' income. One type of agricultural machinery in the development of modern agriculture today is harvesting using a Combine Harvester. The purpose of this study was to see how the level of farming community satisfaction with the use of the Combine Harvester machine in Gampong Ujong Tanah, Kecamatan Setia, Kabupaten Aceh Barat Daya. The method used in this study is the Customer Satisfaction Index (CSI) to obtain valid (direct) data so that the level of satisfaction of the farming community with the use of the Combine Harvester can be determined. Based on the results of the study, it was found that the Customer Satisfaction Index for the confirmation of expectation indicators was 0.6126 or 61.26%. Customer Satisfaction Index to the indicator of interest in reuse is 0.6477 or 64.78%. Customer Satisfaction Index to the indicator of willingness to recommend is 0.6429 or 64.29%. The average Customer Satisfaction Index for farming community satisfaction with the use of a combine harvester is 0.6344 or 63.44% and is in the criteria of Quite Satisfied.

***Paper ID: 18120***





## Industrial analysis of cattle feedlot companies in Indonesia

**R Agustiar\*<sup>1</sup>, A Triatmojo<sup>1</sup>, B Guntoro<sup>1</sup>, E Baliart<sup>2</sup>**

<sup>1</sup>Department of Livestock Socio-Economics, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia

<sup>1</sup>Department of Animal Production, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia

\*Email: [robi.agustiar99@gmail.com](mailto:robi.agustiar99@gmail.com)

**Abstract.** Cattle fattening increases following the increase of beef demand. Feedlot business is changing their structure recently. The policy of importing buffalo meat is suspected to have resulted in new market segmentation and changes in the supply chain of the beef market. This study aims to analyze the internal and external environment of the beef cattle fattening industry. The research design used in this study through a mix of methods is descriptive quantitative and qualitative. The determination of the company's research object in this study was determined by purposive sampling to analyze the internal and external environment of the industry. Based on porter's internal mapping analysis, the business strategy is focused on controlling the impact of the growing issue based on the five strengths of the variable Porter analyzed. On the other hand, based on the external mapping of pestel analysis, political and regulatory actors are the main factors that have an impact as a threat to the environmental condition of the beef cattle fattening industry. This study concluded that changes in the internal and external environment of the beef cattle fattening industry formed changes in the supply chain of local beef from imported cattle.

**Paper ID: 18130**





## Estimation of Loss of Rice Farmers Due to Flood at Krueng Kluet Watershed (With The Eclac Method Approach)

*R S Pirngadi<sup>1,4</sup>, Rahmawaty<sup>2,3\*</sup>, S F Ayu<sup>4</sup> and A Rauf<sup>4</sup>*

<sup>1</sup> Doctoral Program of Agricultural Science, Faculty of Agriculture, Sumatera Utara University, Medan, Indonesia.

<sup>2</sup> Faculty of Forestry, Sumatera Utara University, Medan, Indonesia.

<sup>3</sup> Natural Resources and Environmental Management Study Program, Postgraduate School, Sumatera Utara University, Medan, Indonesia

<sup>4</sup> Faculty of Agriculture, Sumatera Utara University, Medan, Indonesia.

\*E-mail : [rahmawaty@usu.ac.id](mailto:rahmawaty@usu.ac.id)

**Abstract.** Krueng Kluet is one of the largest watersheds in Aceh. The rampant deforestation in protected areas in the upstream Krueng Kluet watershed has brought a serious threat to the people living in the downstream watershed, where in the rainy season this area is very often flooded which has an impact on most important sectors of the community's economy, especially in the agricultural sector. Lowland rice which is one of the mainstays of the farming community living in the Krueng Kluet watershed area. The purpose of this study is to analyze the area and area of rice fields affected by the Krueng Kluet watershed flood and calculate the estimated economic value of rice farmers' losses due to flooding in the Krueng Kluet watershed using the ECLAC method. The results obtained in this study there are four classifications of flooding in lowland rice farming land, namely, very high, high, medium and low prone, with a total of 1.391 ha of lowland rice land affected by flooding in the Krueng Kluet watershed. The estimated value of the total loss from the impact of floods that hit lowland rice farming in the Krueng Kluet watershed area is Rp. 9,052,640,500.

**Paper ID: 18152**





## Impact of counter-sanctions on agricultural production in Russia

***K A Zhichkin<sup>1</sup>, V V Nosov<sup>2,3</sup>, L N Zhichkina<sup>1</sup>, A N Stolyarova<sup>3,4</sup>, M V Rusakovich<sup>4</sup>, M V Eryushev<sup>5</sup> and N.P. Ayugin<sup>6</sup>***

*<sup>1</sup> Samara State Agrarian University, 2 Uchebnaya str., Kinel, 446442, Russia*

*<sup>2</sup> Peoples' Friendship University of Russia (RUDN University), 6 Miklukho-Maklaya str., Moscow, 117198, Russia*

*<sup>3</sup> Plekhanov Russian University of Economics, 36 Stremyanny lane, Moscow, 117997, Russia*

*<sup>4</sup> State University of Humanities and Social Studies, 30 Zelenaya str., Kolomna, 140400, Russia*

*<sup>5</sup> Saratov State Vavilov Agrarian University, 1 Teatralnaya square, Saratov, 410012, Russia*

*<sup>6</sup> Ulyanovsk State Agrarian University named after P.A. Stolypin", 1 boulevard Novy Venets, Ulyanovsk, 1432017, Russia*

E-mail: [zskirill@mail.ru](mailto:zskirill@mail.ru)

**Abstract.** The problem of the effectiveness of the sanctions mechanism in the modern world is acute. Currently, Western countries have introduced six packages of sanctions against the Russian economy. However, not all types of sanctions are negative for Russian enterprises. Food counter-sanctions introduced by Russia in 2014 had a positive impact on agricultural production in the country. Thanks to them, to a large extent, it was possible to eliminate the negative consequences of the 1990s. in agriculture. The purpose of the study is to determine the impact of counter-sanctions on agricultural production in 2014-2019. As part of this work, it is necessary to solve the following tasks: - determine the change in the volume of agricultural production in 2014-2019 in the conditions of the Samara region; - to analyze the change in the system of state support for agricultural production; - to identify factors that affect the performance of agricultural producers. During the period of counter-sanctions (even with a decrease in the amount of state support), it was possible to increase crop yields, put unused arable land into circulation, and renew the machine and tractor fleet of agricultural enterprises).

**Paper ID: 18172**





## Consumer's attitude and willingness to pay on purchasing low-fat milk products

*R M Ramadhanty<sup>1</sup>, M A U Muzayyanah<sup>2</sup> and R A R S Putra<sup>2</sup>*

*<sup>1</sup>Undergraduate Student, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, 55281, Indonesia.*

*<sup>2</sup>Department of Livestock Socio-economic, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, 55281, Indonesia*

\*E-mail: [m\\_anggriani\\_um@ugm.ac.id](mailto:m_anggriani_um@ugm.ac.id)

**Abstract.** This study aims to analyze the value of willingness to pay for low-fat milk and analyze the demographic factors that influence the WTP of low-fat milk products. Primary data collection using a survey method with open and closed questionnaires. Respondents, as many as 239 people, were taken using the non-probability sampling purposive sampling technique. The data analysis used was the Contingent Valuation Method (CVM) to determine the WTP value of low-fat milk and binary logistic regression to analyze the demographic factors that influenced the WTP of low-fat milk. The results showed that 80.3% of respondents were willing to pay more for low-fat milk, and 19.7% were unwilling to pay more. The average WTP value of low milk is Rp.2,665. The average value of the percentage increase in WTP of low-fat milk is 13.39% higher than the current price, with a total aggregation value of Rp. 17,126,400. Factors that significantly affect WTP are gender, income or pocket money, and the number of family members, while age, length of education, marital status, and occupation have no significant influence.

**Paper ID: 18266**





## **Factors Affecting Cayenne Chili Production In Konda District, South Konawe Regency**

**<sup>1</sup>I P Tamburaka\*, <sup>2</sup>S Samaj, <sup>3</sup>M Zian**

<sup>1,3</sup>*Departement of Economics Development Faculty of Economics and Bussines*

<sup>2</sup>*Departement of Biology Education, FKIP Halu Oleo University Kendari*

\*Email: [irmatamburaka19@gmail.com](mailto:irmatamburaka19@gmail.com)

Abstract. Horticulture is an important sub-sector in meeting basic human needs. In particular, fruit and vegetable crops are horticultural commodities that are growing rapidly in Indonesia. Cayenne chilli is one of the horticultural sub-sector products that are in great demand by the public because it contains nutrients that are beneficial to health. The purpose of this study was to determine and analyze the influence of labor production factors, land area, seeds, fertilizers on cayenne chili production in Konda District, South Konawe Regency. The research method is descriptive quantitative. The research location in Konda District, South Konawe Regency. The sampling method is *simple random sampling*. The sampling method is simple random sampling with a total of 38 cayenne chili farmers. The analytical tool is Multiple Linear Regression. The results of the study obtained that the factors of labor production, land area, seeds and fertilizers had a real and significant effect on the production of cayenne chili in the research area.

**Paper ID: 18319**







## **Feasibility of utilization of eucalyptus leaves (*Eucalyptus spp*) from logging waste in industrial plantation forests to produce essential oils**

***A Purwoko<sup>1\*</sup>, I Azhar<sup>1</sup>, S E Damanik<sup>2</sup>, W B N E Taufik<sup>1</sup>***

*<sup>1</sup>Forestry Study Program, Faculty of Forestry, Universitas Sumatera Utara, Medan, North Sumatra, Indonesia 20155*

*<sup>2</sup>Faculty of Agriculture, Universitas Simalungun, Simalungun, Indonesia*

E-mail: [\\*agus9@usu.ac.id](mailto:*agus9@usu.ac.id)

**Abstract:** Eucalyptus is a type of industrial plantation forest tree (HTI) that has high economic value. Almost all parts of the eucalyptus can be utilized. In addition, wood can be used as a raw material for pulp, leaves, and branches that contain cineol can be used as raw materials for essential oils. This study aimed to analyze the feasibility of utilizing eucalyptus leaves from a financial aspect for the production of essential oils in the plantation forest area of PT. Toba Pulp Lestari Tbk. The analysis method used is descriptive analysis, financial analysis with two selling price scenarios, namely the high target scenario and the low target scenario with the criteria of Net Present Value (NPV), Benefit Cost Ratio (BCR), and Internal Rate of Return (IRR). The results showed that the use of eucalyptus leaves as raw materials for essential oils from logging waste in plantation forest areas is financially feasible. With the details of the high target scenario, it produces an NPV value of IDR 134,903,510,450 (equivalent to USD 8,895,714.5), an IRR value of 33.01,% and a BCR value of 3.76. The NPV value of the low target scenario is IDR 84,029,947,498 (equivalent to USD 5,541,045), the IRR value is 21.90% and the BCR value is 2.72.

***Paper ID: 18360***





## **Economic feasibility and development strategy of jabon (*Anthocephalus cadamba*) cultivation in urban areas to meet the needs of timber and green open space**

***A Purwoko<sup>1\*</sup>, Priyanto<sup>2</sup>, C Manalu<sup>1</sup>, U A Daulay<sup>1</sup>***

*<sup>1)</sup> Forestry Study Program, Faculty of Forestry, Universitas Sumatera Utara, Medan, North Sumatra, Indonesia 20155*

*<sup>2)</sup> Department of Forest Management, Faculty of Forestry and Environment, IPB University, Bogor, West Java, Indonesia 16680*

E-mail: [\\*agus9@usu.ac.id](mailto:*agus9@usu.ac.id)

**Abstract.** The rapid population growth caused the demand for wood to increase. On the other hand, to become a green city with a demand for green open space of at least 30% is far from enough. One solution to meet the needs of timber and the lack of good green open space (especially private) is the development of forest plantation cultivation in urban areas. One type of fast-growing tree that has the potential to be developed in urban areas is jabon (*Anthocephalus cadamba*). This study aims to determine the economic value and feasibility as well as strategies for developing jabon cultivation businesses in urban areas. The analysis method used is quantitative descriptive analysis in the form of economic value valuation, business feasibility analysis, and SWOT analysis. The results showed that the economic value of jabon plantation forests aged 3-5 years in Medan City was IDR 40,083,106/ha (USD 2,626,7/ha). The feasibility test of the jabon crop cultivation business resulted in an NPV value of IDR -38,474,957 (USD -2,520), an IRR value of 0,8%, and a BCR of 0,262, and all three of them fall into the "unfit" category. Based on the SWOT analysis, the position of the Jabon plantation forest business is currently in quadrant I. The offensive development strategy is recommended by optimizing the strength and opportunities possessed so that the cultivation of jabon plants can be in demand as a financially viable business and can add to the adequacy of green open space in urban areas

***Paper ID: 18361***





## Factor Influencing the Success of Integrated Agricultural System in Farmer's Group in Boyolali Regency, Central Java

*S H Purnomo<sup>1</sup>, A I Sari<sup>1</sup>, S Emawati<sup>1</sup> and E T Rahayu<sup>1</sup>*

*<sup>1</sup>Department of Animal Science, Universitas Sebelas Maret, Jl. Ir. Sutami 36 A, Surakarta, 57126, Indonesia*

E-mail: [sutrisnohadi@staff.uns.ac.id](mailto:sutrisnohadi@staff.uns.ac.id)

**Abstract.** The agricultural sector mainly consists of crops and livestock which is an integrated system which has the aim of utilizing each other's waste so as to reduce production costs (LEISA). This study aims to determine the factors that influence the success of an integrated farming system between rice and beef cattle in Boyolali Regency. This research was conducted by purposive sampling of 153 respondents of rice farmers as well as beef cattle breeders in Boyolali Regency. The data collection method used is a survey by filling out questionnaires by respondents. The data analysis used is validity, reliability, multiple linear regression analysis followed by determination test (R<sup>2</sup>), F test, t test and classical assumption test. The results of the validity and reliability test showed valid and reliable results. Multiple linear regression analysis obtained the equation  $Y = 4.421 + 0.211 X_1 + 0.003 X_2 + 0.591 X_3$ . The value of R<sup>2</sup> is 0.706. The F test shows the value of F-count  $42.414 > 2.779$ . Based on the t-test, individual factors and environmental factors of farmers have a significant effect on farmers' business performance, while business behaviour factors have no effect. The results showed that individual factors and environmental factors of farmers can affect the performance of farmers' businesses in achieving success in running an integrated farming system business between rice and beef cattle.

**Paper ID: 18379**





## Policy Analysis of Cocoa Intensification Program in Gorontalo Province

*A A Rouf<sup>1\*</sup>, E Retnawati<sup>1</sup>, S Munawaroh<sup>1</sup>, and M Rusliyad<sup>2</sup>*

*<sup>1</sup>Gorontalo Assessment Institute for Agricultural Technology, Agency for Agricultural Research and Development, Ministry of Agriculture, Gorontalo 96183, Indonesia<sup>2</sup>Polytechnic of Agricultural Development Yogyakarta-Magelang, Ministry of Agriculture, Magelang 56192, Indonesia*

*\*E-mail: [ariabdrouf@gmail.com](mailto:ariabdrouf@gmail.com)*

**Abstract.** Cocoa is one of the main plantation crops grown in Gorontalo Province, but the productivity remains well below its potential. In order to increase productivity, the government has implemented a cocoa intensification program. Therefore, this study was conducted to analyze the sustainability of cocoa intensification program in Gorontalo Province. Primary data being obtained from interviews with respondents selected by simple random sampling. Multidimensional scaling analysis with the rapid appraisal technique for fisheries (RAPFISH) program was used to measure the sustainability index of cocoa intensification, along with an analysis of incomes and the adoption of cocoa cultivation technology. The results showed that intensification of cocoa farming increased productivity, with a level of 612 kg/ha/year and an income of IDR 6,281,592/ha/year. Conversely, without intensification, productivity values were 421 kg/ha/year and income was IDR 4,732,823/ha/year. Based on economic, social and ecological aspects, the sustainability of cocoa intensification is categorized as sufficient. Cocoa intensification program needs to be continuously developed in Gorontalo in the future.

**Paper ID: 18382**





## Determinant factors on intergenerational occupation among household farmers in Indonesia

*E Priyotomo<sup>1</sup>, Subejo<sup>2</sup>, E H Pangaribowo<sup>3</sup>*

*<sup>1</sup>Doctoral Program of Islamic Economy and Halal Industry, Graduate School of Universitas Gadjah Mada, Universitas Gadjah Mada, Indonesia*

*<sup>2</sup>Extension and Development Communication, Graduate School of Universitas Gadjah Mada, Universitas Gadjah Mada, Indonesia*

*<sup>3</sup>Faculty of Geography, Universitas Gadjah Mada, Indonesia.*

\*E-mail: [ekopry@mail.ugm.ac.id](mailto:ekopry@mail.ugm.ac.id).

**Abstract.** A number of countries are faced with the age of farmers who are mostly elderly and have no successors. The rural youth are generally not interested in working in agriculture. This study aims to analyse the factors influence the ever-changing of children's work from the agricultural sector to the non-agricultural sector. Binary logistic regression was used to analyse Indonesia Family Life Survey (IFLS) data wave 1 to 5. Based on the analysis that has been done, education level ( $p < 0.01$ ), age ( $p < 0.05$ ), number of household dependents ( $p < 0.05$ ), agricultural land ownership ( $p < 0.01$ ), road quality ( $p < 0.01$ ), and the existence of joint business group (KUBE) ( $p < 0.05$ ) is a variable that plays a role and has a strong influence on the shift of work of children of farmers from the agricultural sector. If you look at the category of poor and nonpoor farming families, the existence of KUBE does not significantly encourage employment in the agricultural sector, while for children of farmers with poor parents, the existence of KUBE significantly encourages employment in the agricultural sector. Modernization, both in terms of institutions, business management, and agricultural management facilities, encourages the next generation of agriculture and is more profitable.

**Paper ID: 18399**





## Feasibility of Farming and Farmer's Perceptions of Introduction Technology of Rice Cultivation on Tidal Swampland

*Yanti Rina D<sup>1</sup>, A Hairani<sup>2\*</sup>, M Alwi<sup>2</sup>, and M Saleh<sup>2</sup>*

<sup>1</sup> *Research Center for Behavioral and Circular Economics, Research Organization for Governance, Economy, and Community Welfare, National Research and Innovation Agency*

<sup>2</sup> *Research Center for Food Crops, Research Organization for Agriculture and Food, National Research and Innovation Agency*

\*E-mail: [anna010@brin.go.id](mailto:anna010@brin.go.id)

**Abstract.** Tidal swampland has great potential for increasing rice production through the application of introduction technology of rice cultivation. In 2021, research has been conducted at Terusan Karya Village, Bataguh District, Kapuas Regency, Central Kalimantan to obtain information on the feasibility of farming and farmer's perceptions as well as extension workers on the introduction technology of rice cultivation on tidal swampland. The survey was conducted on 10 farmers (14 hectares) who were purposively selected, while 11 extension workers and 10 farmers (20 hectares) who were not implementing technology introductions were randomly selected as comparisons. The introduction of rice cultivation technology includes water management, land preparation, amelioration and fertilization, adaptive varieties, and management of plant-disturbing organisms. Data were collected through interviews with farmers using a structured questionnaire. These data include inputs and outputs of rice farming and perceptions of farmers and extension workers on the introduction technology of rice cultivation. The data were analyzed using the balance of costs and revenues and the average method. The results showed that the introduction technology of rice cultivation increased rice production by 27.79% compared to farmer technology. The introduction technology of rice cultivation is profitable and feasible to be developed on a large scale with an Marginal Benefit Cost Ratio (MBCR) value >2. The perception of farmers and extension workers towards the introduction technology of rice cultivation is positive.

**Paper ID: 18443**







## **Strategy for sustainable agroindustry development of grass jelly origin from Garunggang Village, Kuala District, Langkat Regency**

***Y Maryunianta\* and S I Kesuma***

*Agribusiness Department, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

E-mail: [yusak.maryunianta@usu.ac.id](mailto:yusak.maryunianta@usu.ac.id)

**Abstract.** Grass jelly (*cincau*) are the mainstay commodities for farmers in Garunggang Village because it is cultivated by more than 90% of farmers, but that is still carried out with the traditional cultivation system. The objectives of this research are to identify and analyze internal and external factors of grass jelly agroindustry development from Garunggang Village and to analyze the strategy of developing sustainable grass jelly agroindustry from Garunggang Village. The sample size was determined using the Slovin method to obtain a sample of 75 farmers. Sampling was done by simple random sampling method. To assess strategies for developing sustainable grass jelly agroindustry, ten categories of respondents were determined, namely officials of the Langkat Regencial Agriculture Official, North Sumatera Provincial SME Association, North Sumatera Provincial Agriculture Official, extension worker, NGOs, village officer, lecturer, traders, and grass jelly consumers. In addition to the category of farmers, each category was represented by 1 respondent. Data were analyzed using SWOT Analysis Method. The results showed that the internal factors of grass jelly agroindustry development include the spirit of business actors/farmers, land area suitable for grass jelly cultivation, labor availability, and raw material prices; while the eksternal factors include market/consumer demand for processed grass jelly and the development of the tourism sector in the region. Strategy for sustainable agroindustry development of grass jelly from Garunggang Village should be implemented with a diversification strategy.

***Paper ID: 18459***





## **Analysis of the toba carp business cycle in the city of Medan, North Sumatra Province**

***R B M I Fatoni\*, M Khaliqi, K H Ginting and H L Panjaitan***

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

\*E-mail: [rbmibrahimfatoni@usu.ac.id](mailto:rbmibrahimfatoni@usu.ac.id)

**Abstract.** Toba carp is a commodity that is very popular with the people of Medan city. Toba carp is a carp caught or cultivated using floating net cages in the Lake Toba area, North Sumatra province. Carp fish originated from the Lake Toba area usually measure 1 to 2 kg each. Although the price each kilo is more expensive than local Carp Fish, it does not reduce the interest of the Medan community to consume Toba Carp. This causes some fresh fish shops to always run out of Toba Carp stock. This study aims to analyse the business cycle of the Toba Carp to find a strategy in meeting the market needs of the Toba Carp in the city of Medan. The method used is the assessment of risk appetite, marketing margin and marketing efficiency as well as marketing strategy using SWOT. Based on the results of the study, it can be concluded that for the marketing margin of carp, the price difference between Toba Carp Farmer and Consumers is around Rp. 15,000/Kg. the level of marketing efficiency is 11.5%, which means that marketing can be said to be efficient.

***Paper ID: 18468***





## **Business feasibility study of a small hydroponic business in Medan City, North Sumatra Province**

***R B M I Fatoni\*, H L Panjaitan and K H Ginting***

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

Email: [\\*rbmibrahimfatoni@usu.ac.id](mailto:*rbmibrahimfatoni@usu.ac.id)

**Abstract.** Public awareness of a healthy lifestyle makes consumers more selective in choosing vegetables to be consumed. Pesticide-free Hydroponic vegetable products are an alternative for consumers who have a healthy lifestyle. This study aims to assess the sustainability of the hydroponic vegetable business through a feasibility study of the hydroponic vegetable business in a city which incidentally has a narrow area of land. The study approach regarding business feasibility is carried out through 6 aspects, namely management, finance, law, market potential, social, and environment. The number of respondents studied were 18 hidroponic business in Medan City, using purposive sampling. The results of the study show that small-scale hydroponic business is not profitable because the cost of treating vegetable crops is very high. not to mention the problem of competition in the vegetable market where the price of hydroponic vegetables can even reach 10 times that of ordinary vegetables.

***Paper ID: 18469***





## Market share of Indonesian mangosteen in China market

*P S I Situmorang, S F Ayu\*, Lindawati*

*Department of Agribusiness, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

Email: [\\*sfa@usu.ac.id](mailto:*sfa@usu.ac.id)

**Abstract.** Mangosteen is one of the Indonesian fruits that has market opportunities in the international market. Mangosteen fruit from Indonesia is a huge potential for exports to foreign countries. One of the largest export destinations for mangosteen fruit from Indonesia is China. China is one of the largest countries in importing mangosteen fruit from Southeast Asia. Besides Indonesia, there are Thailand and Malaysia as mangosteen producing countries that export to China. This study aims to review and analyze the market share of mangosteen fruit from Indonesia, Thailand, and Malaysia in the Chinese market. Market share is an indicator in reviewing the marketing performance of mangosteen fruit products. To support the import volume of mangosteen and the market share of mangosteen, it is necessary to calculate the volume and total value of mangosteen imports in the Chinese market. This market share is usually expressed as a percentage (%), the market share analysis referred to in this study is useful for determining the percentage of the potential market for increasing Indonesian mangosteen production. This research was conducted using secondary data from 2011-2020.

**Paper ID: 18486**





## **Sustainable Adoption of New Improved of New Variety Innovations in Rice Commodity in West Kalimantan Province: An Overview of Economic Aspects**

***R Rizieq\*, Ekawati, Ellyta, H D Bancin***

*Department of Agribusiness, Faculty of Agriculture, University of Panca Bhakti, Pontianak 78115, West Kalimantan, Indonesia*

\*E-mail: rahmatullahrizieq@gmail.com

**Abstract.** New Improved varieties (NIV/VUB) are the cheapest technological innovations that can increase rice production. Therefore, using this VUB is an absolute thing that must be maintained. This paper aims to determine the index and sustainability status of adopting VUB innovation and its leveraging factors in terms of the economic aspect. The information must be needed regarding levers from the economic aspect so that the use of VUB can be sustainable. The research data was taken in two stages. The first stage is to seek information about the aspects and driving factors of the sustainable adoption of VUB innovations using the FGD method. The second stage is conducting interviews with experts regarding the conditions and predictions of these various driving factors. This study used Multiaspect Sustainable Analysis to analyze the status of sustainability and the driving factors. The results showed that adopting VUB innovation was sustainable from an economic point of view. Moreover, in the future, the economic aspect will have increased performance in terms of encouraging the sustainability of the adoption VUB innovations. The most significant driving factor from the economic aspect is the provision of credit.

***Paper ID: 18488***





## Processing coconut coir waste to gain profit in Tanjung Pura Subdistrict, Langkat Regency, North Sumatera Province

*E Junita<sup>1,2</sup>, T C Pane<sup>2\*</sup> and M B Darus<sup>2</sup>*

<sup>1</sup> Student in Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia.

<sup>2</sup> Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia.

E-mail: [\\*tasyacpane@usu.ac.id](mailto:*tasyacpane@usu.ac.id)

**Abstract.** Processing coconut coir waste not only gives value-added and profit but is also beneficial for the environment and food security since coconut is another source of vegetable oil besides palm oil. This study aimed to analyse the value-added, revenue, and income from the processing industry of coconut coir into Cocopeat (coir powder) and Cocobristle (coir fibre) in Tanjung Pura Subdistrict, Langkat Regency, North Sumatera Province. The research locations were purposively chosen in Tanjung Pura District, Suka Maju Village and Pantai Cermin Village because there are many coconut coir processing industries in these villages. Data analysis was carried out using the Hayami method and income analysis. The results showed that, in the processing of cocopeat, the highest value-added obtained was IDR 564.85 per Kg with a value-added ratio of 75.11%, and the lowest value-added was IDR 125.62 per Kg with a value-added ratio of 33.69%. In the processing of coco-bristle, the highest value-added obtained was IDR 15,973.64 per Kg with a value-added ratio of 99.94%, and the lowest value-added was IDR 9,779.89 per Kg with a value-added ratio of 99.79%. The revenue obtained from processing coconut coir into cocopeat and coco-bristle was IDR 12,725.31 per quintal of raw materials. Ultimately, processing coconut coir into cocopeat and coco-bristle earned an income of IDR 94,073.00 per quintal of raw materials.

**Paper ID: 18490**







## Value chain analysis of fresh dairy milk in Sleman Regency

*F L Wijiono, T A Kusumastuti, A R S Putra*

*Department of Livestock Socio Economics, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia*

E-mail: [ahmadromadhoni@ugm.ac.id](mailto:ahmadromadhoni@ugm.ac.id)

**Abstract.** This paper aimed to analyse the fresh dairy milk channel, marketing margin, and marketing efficiency in Pakem Subdistrict and Cangkringan Subdistrict, Sleman Regency. The research was conducted to collect data from 35 farmers, actors involved, and dairy cooperatives as respondents who were selected using purposive and snowball sampling techniques. The results showed that there are four marketing channels for fresh dairy milk but ineffective due to high marketing margins and a low Farmer's Share (FS) value of <60.

**Paper ID: 18491**





## **Production Function Analysis of Green Onion in Merdeka Subdistrict, Karo Regency, North Sumatera Province**

***G S B Ginting<sup>1,2</sup>, T C Pane<sup>2\*</sup> and T Supriana<sup>2</sup>***

<sup>1</sup> Student in Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia.

<sup>2</sup> Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia.

E-mail: [\\*tasyacpane@usu.ac.id](mailto:*tasyacpane@usu.ac.id)

**Abstract.** Merdeka Subdistrict is one of the sub-districts that produce green onions in Karo Regency since green onions are the most widely cultivated commodity by the local community. However, overall green onions production in Karo Regency was still far below the production of green onions throughout Indonesia. This study aimed to analyze the effect of variables of land area, seeds, labour, fertilizer, and technology on green onions production, and analyse the efficiency of those production factors for the production of green onions. Determination of the research area was done purposively or intentionally. The data used in this study were primary and secondary data. The method used was the simple random sampling technique with a total sample of 78 farmers. The data analysis method used in this study was the Ordinary Least Square method with Cobb-Douglas's production function. The results of the analysis showed that in model 1 which used a technology dummy variable, the variables of land area, seeds, and labour had a positive significant effect. In model 2 which did not use technology dummy variable, the variables of land area and seeds had a positive significant effect. In model 3 on farmers with land area < 1000 m<sup>2</sup>, the variables of seeds, labour, and fertilizers had a positive significant effect. Estimations on the three models showed that the variables were not yet efficient or had an increasing return to scale. In model 4 on farmers with land area > 1000 m<sup>2</sup>, the variables of area and seeds had a positive significant effect, while labour and fertilizers had an insignificant effect with efficient estimation results or had a decreasing return to scale.

**Paper ID: 18493**





## The development of the value chain equivalency model analysis of tuna fish sector in Banda Aceh

*Al-Hulil Akbar Ferdynada<sup>1, 2</sup> Juanda, <sup>3</sup> Asmawati,*

*<sup>1</sup> Master Program in Agroindustrial Technology Department, Faculty of Agriculture, Syiah Kuala University*

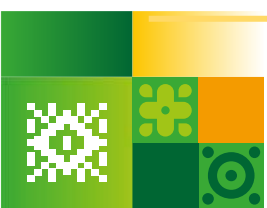
*<sup>2</sup> Agroindustrial Technology Department, Faculty of Agriculture, Syiah Kuala University*

*<sup>3</sup> Agroindustrial Technology, Faculty of Agriculture, Syiah Kuala University*

E-mail: [alhulilakbar135@gmail.com](mailto:alhulilakbar135@gmail.com)

**Abstract.** Tuna fish are fish that have oceanic characteristics that try to move from one water to another that have oceanographic, biological, and meteorological conditions following their habitat. The fishery industrialization program aimed at improving the welfare of coastal fishermen or other waters has been implemented for a long time, this is done by increasing the added value of the industry. Indonesia plays an important role in the tuna fish commodity. Definition of Value Chain Analysis is a tool to understand the value chain that forms a product. This value chain comes from the activities carried out, from raw materials to the hands of consumers. The preparation of the Tuna fishery value chain model was carried out using the SEM (Structural Equation Modeling) method which was compiled based on field data patterns. The interpretation model is carried out to explain the interaction pattern of business actors in the development of the Tuna fishery value chain and the formulation of strategies to minimize barriers to synergies in the development of the Tuna fishery value chain more precisely and following real needs. The value chain is a perspective in which a business is seen as a chain of activities that transform inputs into outputs that are feasible for customers. Value chain analysis (VCA) seeks to understand how something creates value for customers by proving the different contributions of activities to that value.

**Paper ID: 18497**





## Does the COVID-19 Pandemic Impact on Business Performance of Big Agricultural Companies in Indonesia?

*S R Ika<sup>1</sup>, R A Nugroho<sup>1</sup>, B A Santoso<sup>1</sup>, N F Takri<sup>2</sup>, A K Widagdo<sup>3\*</sup>*

<sup>1</sup> Department of Accounting, Janabadra University, Jl Tentara Rakyat Mataram 55-57 Yogyakarta, 55225, Indonesia

<sup>2</sup> Department of Accounting and Finance, Selangor International Islamic University College, Persiaran Putra, Bandar Seri Putra, 43000 Kajang, Selangor, Malaysia

<sup>3</sup> Department of Accounting, Sebelas Maret University, Jl Ir Sutami 36 A Surakarta, 57771, Indonesia

\*E-Mail: [widagdo1998@staff.uns.ac.id](mailto:widagdo1998@staff.uns.ac.id)

**Abstract.** This research aims to investigate whether the COVID-19 pandemic affects the business performance of big agricultural companies in Indonesia. Big agricultural companies are represented by companies listed on Indonesia Stock Exchange in the agricultural industry in 2019 and 2020. Meanwhile, the companies' business performance was measured by some financial ratios, namely liquidity, profitability, leverage, and Altman Z's financial distress prediction model. The Altman Z score is used to identify whether the company's financial condition is healthy, in the grey area, or in bad performance. Surprisingly, our data analysis shows an increase in the sample company's Z score, liquidity, and profitability from 2019 to 2020. The average Altman Z score indicates that big agricultural companies are financially healthy. Results of the paired t-test show no difference in the business performance of big agricultural companies in Indonesia. This study provides evidence that big agricultural companies are resilient in facing the COVID-19 pandemic.

**Paper ID: 18502**





## Fairtrade policy on coffee farming in Takengon District, Central Aceh Regency

*U Sianturi<sup>1</sup>, K H Ginting<sup>1</sup>, D Pebriyani<sup>1</sup>, S M Damanik<sup>2</sup>*

<sup>1</sup> Department of Agribusiness, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.

<sup>2</sup> Universitas Sari Mutiara Indonesia

E-mail: [\\*sianturi.ujiana68@gmail.com](mailto:*sianturi.ujiana68@gmail.com)

**Abstract.** Fairtrade in coffee farming has been widely applied in several coffee-producing countries. Not only providing a quality guarantee to coffee consumers, but fair trade also guarantees higher price and benefit for coffee farmers in exchange for all the efforts made during coffee cultivation. Gayo Coffee is one of the commodities that is being produced and becomes exporting commodity in Indonesia. The Fairtrade system has been implemented by coffee gayo farmers in Takengon District Since 2018. There are two groups of Gayo Coffe farmers in Takengon District, non-fairtrade and fairtrade coffee farmers. The result of study shows that productivity of non-fairtrade and fairtrade coffee farmers increased in 2018. However non-fairtrade farmers have a greater increasing percentage of productivity than fair-trade farmers. It is due to the requirements farmers must follow such as the use of organic fertilizers which causes farmers' production to be lower. In addition, the increasing percentage of fairtrade farmers price is greater than the non-fairtrade farmer. This is due to additional price that is only given to the fairtrade farmer.

**Paper ID: 18504**





## **Financial analysis and contribution of arabica coffee for sustainable coffee farming in Sitolu Bahal Village, Lintongnihuta Subdistrict, Humbang Hasundutan District**

***N Sihombing, T Supriana\* and Salmiah***

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

E-mail: [\\*tavi@usu.ac.id](mailto:*tavi@usu.ac.id) or [rosanela9@gmail.com](mailto:rosanela9@gmail.com)

**Abstract.** Coffee is one of the leading plantations commodities which has an important role in the economy. Coffee acts as a provider employment, a source of income, and foreign exchange through exports. However, in carrying out coffee farming, farmers experience obstacles that can affect the level of income contribution from coffee farming which ultimately affects family income and the sustainability of coffee farming. The purpose of this study was to determine the financial feasibility of Arabica coffee farming and to determine the contribution of Arabica coffee agribusiness income to family income and sustainable Arabica coffee farming. The determination of the research area was carried out by purposive sampling (sampling with a specific purpose), because Sitolu Bahal Village has the largest land area in Lintongnihuta Subdistrict. The analytical method used is the feasibility analysis, namely the method of analysis of NPV, Net B/C and IRR, and the method of analysis of proportions (contribution of family income). The result of the research is a feasibility analysis, namely the NPV of IDR 10,682,488.69 and Net B/C which is 28.85 and IRR is 44.24% and the contribution of Arabica coffee farming income to family income is 13%.

***Paper ID: 18535***





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## **Oleamide as palm-oil based substance for silica-loaded styrene butadiene rubber compound: The cure and crosslinks behaviors**

*I Surya and Marpongahtun*

*Department of Chemical Engineering, Universitas Sumatera Utara, Medan, 20155, Indonesia*

*Department of Chemistry Science, Universitas Sumatera Utara, Medan, 20155, Indonesia*

E-mail: [isurya@usu.ac.id](mailto:isurya@usu.ac.id)

**Abstract.** Oleamide is an amide substance that can be made from oleic acid of palm oil with urea. This substance was applied in making the silica-loaded of synthetic rubber, styrene butadiene rubber (SBR) at an opened two-roll mills. In this study, effects of oleamide incorporations on cure and level of crosslinks of silica-SBR compounds were observed. The SBR was loaded with thirty parts per hundred (phr) of SBR and, they and other compounding substances i.e., stearic acid, zinc oxide, antioxidant, accelerator, antioxidant and sulphur were compounded with semi-efficient formulation. The oleamide was incorporated with a series of amounts from 2 to 8 phr. It was found that the oleamide incorporations exhibited faster times in cure and scorching; The oleamide also exhibited a lifting up of delta torque and crosslinks level for the silica-SBR compound. The 2 phr incorporation of oleamide to silica-SBR was the optimum concentration which exhibited the greatest delta torque and level of crosslinks of silica-SBR vulcanizate.

**Paper ID: 18208**





## Development of an automated precision planter for solanaceous vegetable seeds

*C T Zamuco\*, R M C Amongo, D C Suministrado and E K Peralta*

*Institute of Agricultural Engineering, Agricultural Machinery Division, College of Engineering and Agro-Industrial Technology, University of the Philippines Los Baños, Pedro R. Sandoval Ave, Los Baños, Laguna, 4031. Philippines.*

Email: [\\*ctzamuco@up.edu.ph](mailto:*ctzamuco@up.edu.ph)

**Abstract.** An automated precision planter was developed to mechanize the seedling preparation process. The machine was fabricated based on the size of seeds and distance of seedling tray cells. It can precisely place single seeds in one row of cells in a seedling tray continuously until all the cells were filled. Tomato, eggplant, and pepper were used as test materials. Three vacuum pressures (0.68 kPa, 0.93 kPa, and 1.18 kPa) were used to determine the performance of the machine. Evaluated in terms of single seeds, double seeds, multiple seeds, missing cells, singulation efficiency, seed utilization efficiency, seeding efficiency and seeding capacity. Results showed that it can plant single seeds with 57.81–86.98%, double seeds with 4.95–29.43%, multiple seeds with 0.09–4.25%, and missing cells with 4.43–36.89%. Also, the machine has a singulation efficiency of 63.98–93.91% with a seed utilization efficiency of 70.69–94.17%, seeding efficiency of 63.11–95.57% and a seeding capacity between 3,310 – 5,011 cells per hour which was 3.8 times faster than manual labor. The total cost of the planter was Php 30,878.90 with a payback period of 1.41 years with a return on investment of 60.36 % using a custom rate of Php 3.00/tray.

**Paper ID: 18236**





## Environmental friendly method using NIR Spectroscopy to determine the water content in robusta coffee

*P C Ayu\*, N U W Sebayang and K N Sinamo*

*Study Program of Agricultural and Biosystem Engineering, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

*Study Program of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

*Study Program of Food Technology, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

E-mail: [\\*pputricandra@usu.ac.id](mailto:*pputricandra@usu.ac.id)

**Abstract.** Water content of green bean coffee is known as an important quality which influence the quality of coffee. Along the storage, the water content must be low and for coffee export it must be below 12.5%. Nowadays, the determination of water content is still using the chemical method such as gravimetry method which spend time, destructive also can not represent all of the products, so it is not suitable for industries which need a fast, nondestructive and environmentally friendly measurement. This study aimed to build a PLS and SMLR model to determine the water content of robusta coffee. This study used robusta mandailing coffee, a NIR wave of 1000-2500 nm, followed by determination of water content using gravimetry method, normalization, first and second derivative, multiple scatter correction and standard normal variate as NIR data pretreatment. Result showed that water content of robusta coffee could be well predicted using FT-NIRS.

**Paper ID: 18257**





## Bone Powder Miller Optimization

*Harahap, L.A., Daulay, S.B., Munir, A.P.*

*Department of Agricultural Engineering, Faculty of Agriculture, University of Sumatera Utara*

Email: [1 lukman.adlin@usu.ac.id](mailto:1_lukman.adlin@usu.ac.id), [2 saipul@usu.ac.id](mailto:2_saipul@usu.ac.id), [3 achwilmunir@yahoo.com](mailto:3_achwilmunir@yahoo.com)

**Abstract:** Bone waste has started to emerging problem worldwide with the rise of meat consumption, thus the further processing of bone waste would help in tackling the problem as the powdered bone itself can be used for various use, from animal feed additive to cement replacement in concrete making. The built bone powder miller has performance of effective capacity of 12.03 kg/hour, 8% damaged product, and 0.35% bone powder moisture, in order to attain better performance, the miller thus optimized through the means of varying drying temperature, sieve hole size, rotation speed and testing several levels of workloads and finally testing various bone material to be powdered. Individual optimization procces was able to show best performance for optimized variables, but has no improvement to miller performance using original setting.

**Paper ID: 18312**





## **Analysis of energy used on shallot farming in Food Estate, Hutajulu, North Sumatra**

***R Sigalingging<sup>1,2</sup>, J Simanihuruk<sup>3</sup>, N S Vinolina<sup>4</sup>, L A Harahap<sup>5</sup> and C Sigalingging<sup>1</sup>***

*1. Department of Agricultural and Biosystem Engineering, Universitas Sumatera Utara, Prof. A. Sofyan No. 3 Kampus  
USU, Medan, Indonesia Republic-20155.*

*2. Laboratory of Energy and Electrification, Faculty of Agriculture, Universitas Sumatera Utara, Prof. A. Sofyan No. 3  
Kampus USU, Medan, Indonesia Republic-20155.*

*3. Department of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, Prof. A. Sofyan No. 3 Kampus  
USU, Medan, Indonesia Republic-20155.*

*4. Department of Food Science and Technology, Universitas Nahdlatul Ulama Sumatera Utara, Jl. H. A. Manaf Lubis  
No.2 Helvetia, Medan, Sumatera Utara*

Email: [\\*riswanti@usu.ac.id](mailto:*riswanti@usu.ac.id)

**Abstract.** Food Estates is a government program as a solution to meet the food needs of a growing population. Data from the field show the use of diesel fuel, electricity and chemicals in the application of pesticides, fertilizers and fungicides that have a negative impact on the environment and require strategies to improve energy efficiency. This study was to analysis of energy used for shallot farming of 0.2 ha. Shallot cultivation involves the following stages: 2) plowing with a tractor along with a trailer. 3) planting and maintenance; 4) harvesting, and 5) transportation. Each stage of shallot cultivation uses input from natural resources or energy. Result shows that the highest energy total and energy specific were 1,820.98 MJ and 9,104.9 MJ/ha, respectively, while the lowest was energy of fertilizer.

**Paper ID: 18323**







## Volatile compounds of grapefruit (*Citrus grandis* (L.) Osbeck) peel essential oil by cold pressing and hydrodistillation methods

**Thien Hien Tran<sup>1,2,\*</sup>, Tan Phat Dao<sup>1,2</sup>, Xuan Tien Le<sup>3,4</sup>, Bao Long Huynh<sup>5</sup>, Ly Thi Ngoc Minh<sup>6</sup>**

<sup>1</sup>*Institute of Applied Technology and Sustainable Development, Nguyen Tat Thanh University, Ho Chi Minh City, Vietnam.*

<sup>2</sup>*Faculty of Food and Environmental Engineering, Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam*

<sup>3</sup>*Faculty of Chemical Engineering, Ho Chi Minh City University of Technology (HCMUT), 268 Ly Thuong Kiet, District 10, Ho Chi Minh City, Vietnam*

<sup>4</sup>*Vietnam National University Ho Chi Minh City, Linh Trung Ward, Thu Duc District, Ho Chi Minh City, Vietnam*

<sup>5</sup>*Ho Chi Minh City University of Food Industry, Ho Chi Minh City, Vietnam*

<sup>6</sup>*Branch of Green Power Co., LTD, Ben Tre Province, Vietnam*

E-mail: [hientt@ntt.edu.vn](mailto:hientt@ntt.edu.vn)

**Abstract:** The study of the essential oils (EOs) extraction with high medicinal properties is necessary to contribute to the use of natural compounds. By using cold pressing and hydrodistillation methods, the content of grapefruit peel (*Citrus grandis* (L.) Osbeck) EOs was extracted. The chemical composition of essential oils was determined by gas chromatography coupled to mass spectrometry. Results have shown that 10-12 compounds were detected in the grapefruit peel EOs, which are mainly monoterpenes such as D-Limonene (71.21%-74.83% and  $\gamma$ -Terpinene (15.70%-17.68%). The findings from the present study demonstrated a new research direction on chemical composition of the grapefruit EO, thereby contributing to applications of the natural compounds with high medicinal properties from grapefruit.

**Paper ID: 18358**





## Corn Stem Fiber Fractionation By Acid Hydrolysis

*E S B Sebayang and S Panggabean\**

*Department of Agricultural and Biosystem Engineering, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

E-mail: [\\*sulastrupanggabean@usu.ac.id](mailto:*sulastrupanggabean@usu.ac.id)

**Abstract.** Fractionation was carried out by hydrolyzing corn stalk powder with 0.3 M HCl. The hydrolysis process was carried out with 3 variations of acid volume with 3 replications in each variation. This hydrolysis will be carried out at a temperature of 100 – 120°C for  $\pm$  60 minutes. The glucose level before hydrolysis was 9.7%. The average glucose levels produced after hydrolysis in each volume treatment were 8.56% at a volume of 600 ml, 8.4% at a volume of 650 ml, and 7.92% at a volume of 700 ml.

**Paper ID: 18376**





## **Sawdust Into Briquettes In Residents Of Wonosari Hamlet, Sambirembe Village, Kalijambe District, Sragen Regency**

***R J Sari<sup>1</sup>, S Mansyur<sup>2</sup>, M Malik<sup>3\*</sup>, F B Sukandar<sup>1</sup>***

*<sup>1</sup>Mechanical Engineering Department, Universitas Proklamasi 45, Indonesia*

*<sup>2,3</sup>Industrial Engineering Department, Universitas Proklamasi 45, Indonesia*

\*Emil: [m.malik@up45.ac.id](mailto:m.malik@up45.ac.id)

**Abstract.** Sawdust briquettes are one of the alternative energy sources derived from biomass waste, to reduce dependence on fossil energy. The purpose of this study was to evaluate the quality of the wood sawdust charcoal briquettes produced and the technical test of the briquette equipment used. The test results show that the capacity of the briquette tool used is 75 Kg/hour. The resulting briquettes have a moisture content of 5.1%. The water content of briquettes is following SNI, which is < 8%. The average briquette density is 9.66 g/cm<sup>3</sup>. The carbon content value reached 93.91%. The resulting calorific value is also very high at 6290.16.

**Paper ID: 18417**





## Justification of the parameters of the ripper of the harrowing unit

***Bababekov U.J.<sup>1</sup>, Kurbanov E.S.<sup>1</sup>, Tukhtakuziev A.<sup>2</sup>, Sultanov D.R.<sup>1</sup>, Otabayev M.F.***

*<sup>1</sup>Gulistan State University, Gulistan city 4-microdistrict.120100, Uzbekistan*

*<sup>2</sup>Uzbek Scientific Research Institute of Agricultural Mechanization.110800, Uzbekistan*

**Abstract.** The following article describes the disadvantages of existing trailed harrowing units while preparing fields before sowing in early spring, such as: inconvenience in cleaning toothed harrows from weeds, attracting additional transport and labor when moving the trailed unit from one field to another, excessive labor costs, time losses, and eliminating these disadvantages by creating highly efficient wide-reach mounted units, as well as substantiating the parameters of working bodies based on theoretical and experimental studies. In addition, the article contains the results of scientific, theoretical and experimental studies on the operation of a highly efficient and easy-to-use wide-reach unit for high-quality soil preparation for planting.

**Paper ID: 18426**





## Automatic Water Table Control System with Remote Telemetry and Control Unit

*S K Saptomo*<sup>1\*</sup>, *C Arif*<sup>1</sup>, *W B Suwarno*<sup>2</sup>, *B I Setiawan*<sup>1</sup>, *Rusianto*<sup>3</sup>

<sup>1</sup>*Department of Civil and Environmental Engineering, IPB University, Bogor, Indonesia*

<sup>2</sup>*Department of Agronomy and Horticulture, IPB University, Bogor, Indonesia*

<sup>3</sup>*PT Meteo Nusantara Instrument, Bogor, Indonesia*

Email: [saptomo@apps.ipb.ac.id](mailto:saptomo@apps.ipb.ac.id)

**Abstract.** An automatic control system for water table management has been developed utilizing perforated pipes for irrigation and drainage. Water levels are detected using sensors connected to the Remote Telemetry Control Unit (RTCU), which also controls irrigation and drainage solenoid valves. This system is connected to a cloud server via the internet and can be accessed remotely through the user dashboard. Through this dashboard, users can observe data on the condition of the water level above the pipe and in the ground and can set the water table remotely. This system allows the regulation of water status in the land according to cultivation needs such as flooded, non-flooded and unsaturated. The laboratory scale of the system has been in operation for several months to date. This paper presented the performance of the system in the controlling water table based on the recorded data. The data shows that the system responds well to the decrease in the water table by providing irrigation automatically. When rain causes the water table to increase, the system also responds with drainage automatically as well as if the water table is set to be lower. By controlling the water table, soil moisture can also be well preserved at the level that is available to the plant's roots. This system had been showing good performance in maintaining water table and soil moisture.

**Paper ID: 18436**





## Comparison of Biogas Production from Various Blends of Biomass

*Raju<sup>1\*</sup>, S Panggabean<sup>1</sup>, and Y Maharani<sup>2</sup>*

*Department of Agricultural and Biosystem Engineering, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

\*E-mail: muhammadraju@usu.ac.id

**Abstract.** Because of its high organic content, biomass waste from agriculture and animals can serve as a source of raw materials for the production of biogas. The goal of this study is to determine the ideal volume and rate of biogas generation as well as the digester temperature, and material pH. This research was conducted by experimental method with 3 treatments and 3 replications, namely a mixture of cow dung with rice straw (P1), corn cobs (P2), and water hyacinth (P3). The results showed that the best biogas yield was obtained from a mixture of cow dung and rice straw (P1) with the highest initial and final temperature values of 29.8 °C and 27.3 °C, and the highest initial and final pH of 6.8 and 7.0. The highest biogas volume was 66.03 L and the highest gas production rate was 7.45 L/day.

**Paper ID: 18440**





## Utilization of Biogas in Generators to Generate Electricity

*Raju<sup>1\*</sup>, S Panggabean<sup>1</sup>, dan Y Maharani<sup>2</sup>*

*Department of Agricultural and Biosystem Engineering, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

*\*E-mail: [muhammadraju@usu.ac.id](mailto:muhammadraju@usu.ac.id)*

**Abstract.** Agricultural and livestock biomass waste is a potential source of basic materials in producing biogas because the organic content it has is quite high so it needs to be used in generators as engine fuel mixtures. The purpose of the research is to get the best treatment by looking at the time the generator operates and the highest electrical power produced. This research was conducted using an experimental method with 3 treatments with 3 replications, namely using a mixture of cow dung with rice straw (P1), cow dung with corn cobs (P2), and cow dung with water hyacinth (P3), and the use of biogas and LPG as generator fuel. with biogas levels of 5, 10, and 15% and LPG 95, 90, and 85%. The results showed that the best biogas yield was obtained from a mixture of cow dung and rice straw (P1) with a level of 5%. Biogas with a level of 5% can turn on the generator for longer. The generator can operate for 10.10 minutes by producing 946 watts of electrical power.

**Paper ID: 18441**







## **Identification of chicken meat quality using a digital portable microscope 1000X WIFI and convolutional neural network**

***Y Hendrawan<sup>1</sup>, M Y C Prabowo<sup>1</sup>, S H Sumarlan<sup>1</sup>, D F Al Riza<sup>1</sup>, M B Hermanto<sup>1</sup>, S M Sutan<sup>1</sup>, R Damayanti<sup>1</sup>***

*<sup>1</sup>Department of Biosystem Engineering, Universitas Brawijaya, Jl. Veteran, Malang, ZIP 65145, Indonesia*

E-mail: [yusuf\\_h@ub.ac.id](mailto:yusuf_h@ub.ac.id)

**Abstract.** Meat adulteration can harm human health, therefore a simple non-destructive method is needed to identify the quality of meat quickly and accurately. This study aimed to build a convolutional neural network model to classify the quality of chicken meat into four categories i.e. fresh chicken, carrion chicken, rotten chicken, and formalinized chicken. The method used was a combination of computer vision and a convolutional neural network. A digital portable microscope 1000X WIFI was used as a sensor in computer vision. The pre-trained convolutional neural network of AlexNet and GoogLeNet were used in this study. The image data used in this study were 2000 images with a training and validation data ratio of 70:30. Testing data of 600 data were taken on meat samples outside the training and validation data samples. From the performance of the convolutional neural network model, the validation accuracy was 97.83% and the testing accuracy was 99.15%.

***Paper ID: 18511***





## Determining Discharge Rating Curve at Karai Sub Watershed

*M S Tanjung and D L S Nasution*

*Department of Agricultural Engineering, Faculty of Agriculture, Universitas Sumatera Utara. Jl. Prof. Dr. A. Sofyan  
No.3 Kampus USU Medan 20155*

email: [nasutiondelima@usu.ac.id](mailto:nasutiondelima@usu.ac.id)

**Abstract.** The availability of discharge rating curve equation in a watershed is very important to predict river discharge in a watershed, while discharge shown the water availability in a watershed. This research aims to determine discharge rating curve equation at Karai Sub Watershed in rainy season. This research was conducted by recording water level using water level logger and measuring river discharge using current meter and then analyze the relation of the water level and river discharge data to make the equation of discharge rating curve. The equation of discharge rating curve determined by using several methods that are polynomial, linear, power function, logarithmic and exponential. The equation which obtained by that methods will be examined by the value of coefficient determination (R) and root mean square error (RMSE). The result shown the best methods in obtaining the equation was polynomial method which performs the  $R = 0.849$  and  $RMSE = 0.01$  with the equation  $Q = -1.327h + 3.807h - 0.215$

**Paper ID: 18512**





## Erosion Control at Karai Sub Watershed

*D L S Nasution and P C Ayu*

*Department of Agricultural Engineering, Faculty of Agriculture, Universitas Sumatera Utara. Jl. Prof. Dr. A. Sofyan  
No.3 Kampus USU Medan 20155*

Email: [nasutiondelima@usu.ac.id](mailto:nasutiondelima@usu.ac.id)

**Abstract.** Karai Sub watershed was part of Ular Watershed that reported landuse changed nowadays. This condition risk to this watershed health condition especially for erosion. This study aims to calculate erosion in existing condition then determine the erosion control scenario based on landuse change scenario. This study is conducted by calculate the erosion value by USLE Method using Geographic Information System (GIS). The scenarios of landuse change simulation determined by change the production and shrub landuse into forest landuse for several varying scenario by increasing the existing forest to ten percent higher at scenario 1 and twenty percent higher at scenario 2. The best rational scenario in reducing erosion will be chosen as erosion control at Karai Sub Watershed. The result of study shown the erosion value at existing condition is 220.02 ton/ha/yr and classified as high level hazard. The best scenario is in controlling erosion and sedimentation condition was the second scenario by increasing the forest landuse up to fourty percent that reduce erosion in to 148.27 and classified as medium hazard level

**Paper ID: 18513**





## Tea Waste Briquette Molder as an Effort To Reuse Organic Waste

*L A Harahap<sup>1\*</sup>, S B Daulay<sup>1</sup>, A P Munir<sup>1</sup>*

*<sup>1</sup>Department of Agricultural Engineering, Faculty of Agriculture, University of Sumatera Utara*

Email : [l.altan.harahap@gmail.com](mailto:l.altan.harahap@gmail.com)

**Abstract.** Production and consumption of tea in Indonesia can be considered moderate, thus giving rise to the generation of tea waste. The same potential also exists in tea producing and consuming countries such as China and India. Tea waste itself can be processed further to make charcoal briquettes. The technology in said briquettes has been existed since long, dated to 1989 and up to today. Nowadays various biowaste has been evaluated for use as briquette material. This paper will talk about a series of research that designed a tea waste briquette molder, a modification to the molder while also considering the mix of tea waste with other biowaste materials such as corncob and rice husk. It is generally understood that the molder is feasible to use as means to produce tea waste briquettes, but the mixture of the material itself can be explored further since there is other potential biowaste to use, while corncob and rice husk itself shows not far from standard performance if not beyond it.

**ID Paper: 18525**





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## Identification of adulterated rice bran with rice husks by using the image analytics

*HR Albarkj, AF Agustin, AT Permana, and A Jayanegara\**

*Department of Nutrition and Feed Technology, Faculty of Animal Science, IPB University, Bogor 16680, Indonesia.*

Email : [anuraga.jayanegara@gmail.com](mailto:anuraga.jayanegara@gmail.com)

**Abstract.** Rice bran is often adulterated with milled rice husks which can lead to losses and decreased production of livestock. Testing of rice bran adulteration is still carried out manually which is quite subjective, and thus it is necessary to test using the image analysis method based on convolutional neural network (CNN) through a visual image analysis process. The purpose of this study was to evaluate the accuracy of training, validation, and test data on rice bran adulteration with rich husks using the CNN-based image analysis. This study employed staining treatment using phloroglucinol. The stages of this research consisted of the process of mixing forgery, coloring treatment, taking pictures, sharing data, and building the CNN model. This study found that the results of the accuracy of training data, validation data, and test data with phloroglucinol staining treatment had accuracy that was still far from 100% accuracy. This result is due to the epoch value, quantity of datasets, and the different viewing angles when capturing an image.

**ID Paper: 17602**





## **Analysis of Fish Meal Adulteration with Rice Bran using Image Analysis Method**

***AF Agustin, HR Albaraki, SRH Martin, and A Jayanegara\****

*Department of Nutrition and Feed Technology, Faculty of Animal Science, IPB University, Bogor 16680, Indonesia.*

Email : [anuraga.jayanegara@gmail.com](mailto:anuraga.jayanegara@gmail.com)

**Abstract.** Adulteration of feed ingredients is one of the main problems in ensuring quality. This study aimed to evaluate the adulteration of fish meal with rice bran based on image analysis with a convolutional neural network algorithm. The number of datasets in this study were 3,200 images which were divided into 2,400 images for training data and 800 images for test data. The treatments consisted of P0=100% fish meal, P1=90% fish meal+10% rice bran, P2=80% fish meal+20% rice bran, P3=70% fish meal+30% rice bran, and P4=100% rice bran. In the CNN algorithm, the image is processed through the input layer, feature extraction layer, and fully connected. The results of this study obtained a training data accuracy value of 100% and a validation data accuracy value of 100%. In the testing through the confusion matrix table, the results of 99% accuracy using 20 epochs were obtained. In conclusion, adulteration of fish meal with rice bran can be identified accurately by using the image analysis method through the CNN algorithm.

***ID Paper: 17730***





## The effect of giving probiotics with a combination of garlic extract and the method of administration on the performance index of broilers

*A Fahmi<sup>1</sup>, Yurliasni<sup>1</sup>, M A Yaman<sup>1</sup>, S Wajizah<sup>1</sup> and Allaily<sup>1\*</sup>*

*<sup>1</sup>Master of Animal Husbandry, Department of Animal Husbandry, Agriculture Faculty, Universitas Syiah Kuala University, Darussalam-Banda Aceh, 23111, Indonesia*

Email : [allaily@unsyiah.ac.id](mailto:allaily@unsyiah.ac.id)

**Abstract.** The use of antibiotics as growth promoters is prohibited. This study aims to find alternative antibiotics using different types of probiotics, garlic, and administration techniques. The treatment factors are; Factor A: A1 = No garlic extract and no probiotics, A2 = Microgen probiotic and garlic extract, and A3 = Pro-chick probiotic and garlic extract (composition of 2% probiotic and 3% garlic extract). Factor B is the administration technique: B1 = force drinking, B2 = feed, and B3 = drinking water, each treatment was repeated 3 times, each unit had 5 DOCs. The parameters measured were performance indices: body weight gain, mortality, FCR, and ration consumption. The results showed that the administration of garlic extract with a combination of probiotics and the technique of administration tended to increase all parameters with the control. Meanwhile, mortality tends to be suppressed by treatment. The performance index due to treatment shows results that tend to be better than the control with a performance index value of 380-420 which is categorized as very good-special. In conclusion, garlic extract with a combination of probiotics and different ways of administration can improve the performance index and reduce mortality.

**ID Paper: 18093**





## Seasonal grass production carrying capacity of buffalo grazing area in Paminggir, South Kalimantan

*I Sumantri<sup>1\*</sup>, T S M Widi<sup>2</sup>, S Prastowo<sup>3</sup> and Hanafi<sup>1</sup>*

<sup>1</sup>Faculty of Agriculture, University of Lambung Mangkurat, Banjarbaru, South Kalimantan

<sup>2</sup>Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta

<sup>3</sup>Faculty of Agriculture, Universitas Sebelas Maret, Surakarta, Central of Java

Email : [isumantri@ulm.ac.id](mailto:isumantri@ulm.ac.id)

**Abstract.** The population and performance of Kalimantan swamp buffalo are declining. Diminishing grazing area and pasture biomass availability, especially in the rainy season, contribute to inadequate buffalo feed consumption. This study was conducted to investigate the seasonal productivity of palatable native grasses and to estimate the carrying capacity of the swamp grazing area. One year of observation indicated that kumpar haruan and sumpilang had higher dry matter production in the deep-water season, whereas kumpai minyak was in the shallow-water season, and padi hiyang had similar production in both seasons. Dry matter production in the deep-water season was higher than in the shallow-water season (5.18 vs 4.61 ton DM/ha/month) as well as for the carrying capacity of swamp grazing area (15.5 vs 13.6 AU/season). It is concluded that the swamp grazing area in Paminggir District could carry higher than the existing buffalo population.

**ID Paper: 18190**





## Amino Acids Characterization of The Ongole Crossbred Cattle Edible Head Skin Using Lc MS/MS

**Edy Susanto<sup>1\*</sup>, Anik Fadlilah<sup>1</sup>, Muhammad Fathul Amin<sup>1</sup>, Wahyuni<sup>1</sup>, Edi Sutanto<sup>2</sup>, Ike Mawarni Handayani<sup>2</sup>, Rohmatu Sholiha<sup>2</sup>, Galur Fitria Yolanda<sup>2</sup>, Nur Khasanah<sup>2</sup>**

<sup>1</sup>Lecturer of Animal Science Faculty, The University of Islam Lamongan, Lamongan, Indonesia

<sup>2</sup>Lecturer Assistant of Animal Science Faculty, The University of Islam Lamongan, Lamongan, Indonesia

Email : [edysusanto@unisla.ac.id](mailto:edysusanto@unisla.ac.id)

**Abstract.** This study aimed to characterization of amino acids using lc ms/ms at the edible head skin as edible by-product of ongole crossbred cattle (OCC). The research was conducted in the Lamongan district of East Java. The method was field exploration with laboratoric analitic. The variables observed included amino acids profile with LC-MS/MS. The results of studies shown The edible head skin of OCC amino acids profiles appears to have higher contents of *L-arginin*, *glysine*, and *L-proline* as essential category of amino acids and *L-glutamic acid* as non essential category of amino acids. There are several defference between male and female amino acids profile of the OCC edible head skin, including: *L-glutamic acid*, *L-alanin*, *L-arginin*, *glysine*, *L-lisin*, *L-aspartid acid*, and *L-proline* from female OCC higher than male OCC. The peak absorption of mass spectofotometry between samples in males and females shows different.

**ID Paper: 18265**





## **Nitrogen Utility on Income Over Feed Cost in Complete Feed Napier Grass cv Gama Umami Basal with Different Calliandra (*Calliandra calothyrsus*) Substitution Levels**

***I Roychan<sup>1</sup>, N Umami<sup>2\*</sup>, and C T Noviand<sup>2</sup>***

*<sup>1</sup>Postgraduate Programe of Animal Science, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Jl. Fauna No.3, Bulaksumur, Yogyakarta, Indonesia*

*<sup>2</sup>Departement of Animal Science and Feed Science, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Jl. Fauna No.3, Bulaksumur, Yogyakarta, Indonesia*

Email : [nafiatul.umami@ugm.ac.id](mailto:nafiatul.umami@ugm.ac.id)

**Abstract.** The purpose of this study was to determine the N efficiency and economics of complete feed based on Napier grass cv Gama umami with different levels of Calliandra (*Calliandra calothyrsus*). The Ewes used in this study were 15 weighing 10 kg at the age of 8 months. Complete feed treatment given to livestock objects, namely T0 = Napier grass cv GU 60% + Concentrate 40%; T1 = Napier grass cv GU 45% + Concentrate 40% + Calliandra 15%; T2 = Napier grass cv GU 30% + Concentrate 40% + Calliandra 30%. The sample collection phase consisted of treatment feed, leftover feed, and urine which were collected for seven days. The resulting data was then processed using One-way ANOVA with data that had differences in further testing using DMRT ( $p < 0.05$ ). The experimental results showed that the addition of Kaliandra levels in complete feed did not affect nitrogen retention in sheep ( $p > 0.05$ ). Economic analysis on feed with the addition of Calliandra to complete feed showed a higher income when compared to feed without using Calliandra ( $p < 0.05$ ). The most effective use of Calliandra level with the highest income is seen in giving as much as 30%.

**ID Paper: 18303**







## **Evaluation of feeding on the production and quality of dairy buffalo milk (*Murrah*) at superior livestock breeding center and fodder forage in Siborong-Borong**

***U Hasanah\**, *K C Desnamrina* and *G A W Siregar***

*Department of Animal Husbandry, Universitas Sumatera Utara, Medan, Indonesia*

Email : [u.hasanah@usu.ac.id](mailto:u.hasanah@usu.ac.id)

**Abstract.** Buffalo is one of the livestock that produces milk with good quality protein and fat contents. Feed is one of the factors that can affect the production and quality of milk. The purpose of this research is to evaluate feed quality on the production and quality of Murrah buffalo milk on The Siborong-Borong farm. This research is using six buffalo from The Murrah species. The variables observed in this research were nutrient contents of feed (crude protein, crude fiber, crude fat, and dry matter contents), milk production, milk quality (protein, fat, and contamination of *Escherichia coli*), buffalo body weight, temperature, and relative humidity. The result shows that the quality of feed is still low, especially the quality of the forage. It has low protein (6.34%) and high fiber (49.56%). High ratio of concentrate in the ration is for fulfilling the requirement of buffalo. The milk production is  $4.68 \pm 0.17$  L/head/day, and protein and fat contents in buffaloes milk are  $3.72 \pm 0.68$  and  $3.54 \pm 1.15$  respectively. The low milk production is caused by the quality of forage and month lactation. *Escherichia coli* contamination of milk up to 8.7 APM/mL. It is caused by low hygiene during milking.

***ID Paper: 18374***





## Preliminary Analysis of Single Nucleotide Polymorphism (SNP) in Several Indonesian Local Sheep

*F Adani<sup>1</sup>, A P Z N L Sari<sup>1</sup>, A Ibrahim<sup>2</sup>, Panjono<sup>2</sup>, and D Maharani<sup>1\*</sup>*

<sup>1</sup>*Animal Breeding and Reproduction Department, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia*

<sup>2</sup>*Animal Production Department, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta, Indonesia*

Email : [d.maharani@ugm.ac.id](mailto:d.maharani@ugm.ac.id)

**Abstract.** The Melanocortin-4 Receptor (MC4R) gene affected feed intake and energy homeostasis. This preliminary study aimed to identify the polymorphism and restriction enzyme for PCR-RFLP within the partial coding sequence (cfs) and 3'UTR regions of the MC4R gene in local Indonesian sheep. A 642 bp of product PCR was amplified from sixteen blood samples consisting of two Sakub sheep and three Wonosobo, Sapudi, Garut, Dorper, and Garut-Dorper cross sheep each. Sequence alignments between the samples and Genbank acc no. NC\_056076 discovered five SNPs; there were 1039A>G, 1068G>C, 1403G>A, 1511C>A, and 1526G>C. The SNPs 1039A>G and 1068G>C were found in the coding sequence region, while the other three SNPs were in the 3'UTR region. The SNP 1039A>G was categorized as a missense mutation; the amino acid changed from Met to Val. However, SNP 1068G>C was a silent mutation (Ala to Ala). The restriction enzyme analysis showed that SNPs 1039A>G and 1403G>A were recognized by *BssSI* and *SfaNI*. SNPs 1068G>C, 1511C>A and 1526G>C were not recognized by the enzyme. In conclusion, there are two SNPs in the coding region and three SNPs in the 3'UTR region of the MC4R gene found in local Indonesian sheep. The *BssSI* and *SfaNI* enzymes are eligible for further study in genotyping sheep samples using the PCR-RFLP method.

**ID Paper: 18375**





## **Effectiveness time equilibration sperm buffalo in diluent tris yellow eggs added 4% extract skin mangosteen (*Garcinia mangostana L.*)**

**Yendraliza<sup>1\*</sup>, F Nurcholish<sup>1</sup>, J Handoko<sup>1</sup>, RSG Siantur<sup>2</sup>, DA Kusumaningrum<sup>2</sup>**

<sup>1</sup>Program Studi Peternakan, Faculty of Agriculture and Animal Science, Universitas Islam Negeri Sultan Syarif Kasim Riau. Jl. HR Soebrantas KM 15 Simpang Baru, Panam, Pekanbaru, Riau, Indonesia 28293

<sup>2</sup>Indonesian research Institute for Animal Production, PO Box, Bogor 16002

Email : [yendraliza@uin-suska.ac.id](mailto:yendraliza@uin-suska.ac.id)

**Abstract.** The study at to determine the best equilibration time for buffalo sperm using egg yolk tris diluent with 4% mangosteen peel extract. The study used a completely randomized design (CRD) with 4 treatments and 10 replications. The sperm used came from three buffaloes from Balitnak Ciawi . The research treatment consists of equilibration time of 2 hours, 3 hours, 4 hours and 5 hours. Parameters measured were motility, live sperm, intact plasma membrane (MPU). Equilibration time did not affect motility, live sperm and MPU of buffalo sperm. the range of motility, live sperm and MPU was 43.75%-55.00%; 76.50%-82.25%; 71.75%-74.75%, equilibration time of 2 hours has produced motility, live sperm and MPU in buffalo sperm diluted with egg yolk tris diluent with 4% mangosteen rind extract.

**ID Paper: 18414**





## Characterizing hydrolysate from duck feather degradation by *Bacillus cereus* TD5B, *Bacillus cereus* LS2B, and *Pseudomonas* sp. PK4

N A Fitriyanto<sup>1\*</sup>, A A Saputri<sup>1</sup>, M K Jayamahendra<sup>1</sup>, N N A Prabawati<sup>1</sup>, R A Prasetyo<sup>1</sup>, A Pertiwinigrum, V. Pastawan<sup>1</sup>, M Z Abidin<sup>1</sup>, and Y Erwanto<sup>1</sup>

<sup>1</sup>Faculty of Animal Science, Universitas Gadjah Mada, Jl. Fauna No.3 Bulaksumur, Yogyakarta, 55281, Indonesia

Email : [nanungagusfitriyanto@ugm.ac.id](mailto:nanungagusfitriyanto@ugm.ac.id)

**Abstract.** Duck feathers are mainly composed of keratin, which is difficult to degrade. This study aimed to determine the ability of indigenous *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, and *Bacillus cereus* TD5B in producing keratinase to degrade duck feathers keratin and observing the amino acid profile of the hydrolyzate. As a result, *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, and *Bacillus cereus* TD5B were confirmed to produce keratinase from the formation of clear zones on agar medium. The highest enzyme activity on casein substrate by *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, and *Bacillus cereus* TD5B were 16.42 U/mL, 10.52 U/mL, and 6.24 U/mL. In addition, when growing on the keratin substrate, *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, and *Bacillus cereus* TD5B have activity of 11.3 U/mL, 5.23 U/mL, and 7.01 U/mL, respectively. The level of substrate degradation for *Pseudomonas* sp. PK4, *Bacillus cereus* LS2B, and *Bacillus cereus* TD5B were confirmed at 38%, 38%, and 19%. The amino acid profiles contained in duck feathers are aspartic acid, glutamic acid, serine, glycine, threonine, arginine, alanine, valine, phenylalanine, ileucine, leucine, and lysine. This study concludes that Indigenous strains can produce keratinase enzymes that can degrade the keratin of the duck feather substrate into amino acids.

**ID Paper: 18422**





## **Study of Broiler Chicken Performance with different Lighting Time and Vitamin B-Complex Doses in Close House**

*K S Hasibuan, M Tafsir\*, S Umar*

*Animal Husbandry Department, Faculty of Agriculture, Universitas Sumatera Utara, Prof. A. Sofyan No.3 Medan, Indonesian Republic*

Email : [maruf\\_tafsir@usu.ac.id](mailto:maruf_tafsir@usu.ac.id)

**Abstract.** This study was conducted to analyze the performance of broiler chickens after receiving different exposure times and doses of vitamin B complex injection in a close house. Broiler chickens reared from DOC will get different lighting treatment and dose of vitamin B complex injection from 15 to 31 days of age. The treatments used in this study were N1 (24 hours), N2 (22 hours) and N3 (20 hours) while the doses of vitamin B complex were given at V0 (0.0 cc), V1 (0.5 cc), V2 (1 0.0 cc), V1 (0.5 cc), and V2 (1.0 cc). cc) and V3 (1.0 + vitamin A D E, 0.2 cc). Chickens will be placed in research plots each containing 36 birds with a separate plot design method. The results obtained in the analysis of feed consumption showed a very significant effect, body weight gain showed a very significant effect, FCR and IP did not show a significant effect and with dose treatment did not show a significant interaction. The conclusion that can be obtained from this study is that to achieve maximum performance in broiler rearing, 24-hour lighting is needed, so that lighting time can affect feed consumption and body weight gain that will be achieved by chickens per day later, and the use of vitamin B complex injections is not really necessary for given into the body of the chicken.

**ID Paper: 18423**





## **Incorporation of Fenugreek (*Trigonella foenum*) seed powder on the physical quality of buffalo meat patty during frozen storage**

***P Patriani\*, T V Sari, U Hasanah***

*Department of Animal Husbandry, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia*

E-mail: [Penipatriani@usu.ac.id](mailto:Penipatriani@usu.ac.id)

**Abstract.** The development of buffalo meat products is still limited due to several reasons, namely dark colour, and hard texture. Sustainable development of innovative food products is needed to meet consumer demand. Frozen foods have a long shelf life and are popular for example patty. The addition of materials that can improve quality and add health benefits should be carried out. Fenugreek contains protein, fiber, stabilizer, and emulsifier so it can be recommended in the development of buffalo meat patty as a frozen food product. This study aims to determine the effect of Fenugreek on buffalo meat patty during frozen storage. This study used a completely randomized design with a factorial pattern. Factor I was the addition of Fenugreek powder to buffalo meat patty (F0:0%, F1:2%, F2:4%, and F3:6%) and factor II was freezing time (B1:45 days ; B2:90 days). The addition of Fenugreek powder had a significant effect on ( $P < 0.01$ ) on pH, cooking weight loss, tenderness, and ( $P < 0.05$ ) water content but had no significant effect on frozen storage ( $P > 0.05$ ). Adding Fenugreek powder up to 6% in frozen storage for 45 days resulted in the best physical quality of buffalo meat patty.

***ID Paper: 18429***





## Physical quality of beef patty with substitution mocaf flour (modified cassava flour) and bread crumbs

*P Patriani<sup>1\*</sup> and Rosadi<sup>2</sup>*

<sup>1</sup>*Department of Animal Husbandry, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia*

<sup>2</sup>*Slaughterhouse and Animal Health Center, Rimbo Bujang District, Tebo Regency, Jambi Province, Indonesia*

E-mail: [Penipatriani@usu.ac.id](mailto:Penipatriani@usu.ac.id)

**Abstract.** The development of processed meat products needs to be carried out to meet food needs in a sustainable manner. Popular processed meat products such as patty. Patty is usually made by adding a filler in the form of bread crumbs which is quite expensive. Mocaf flour is a product of modified cassava flour by fermentation. Mocaf flour is gluten-free and has almost the same characteristics as wheat flour. Mocaf flour has the potential as a substitute for foods made from bread crumbs or wheat flour. The purpose of this study was to determine the effect of mocaf flour on the physical quality of beef patty. The method used was CRD with 5 treatments and 4 replications. The treatments consisted of R0 = 100% bread crumbs + 0% mocaf; R1 = 75% bread crumbs + 25% mocaf; R2 = 50% bread crumbs + 50% mocaf; R3 = 25% bread crumbs + 75% mocaf; R4 = 0% bread crumbs + 100% mocaf. The results showed that the substitution of mocaf flour by 75% decreased the pH, cooking weight loss, water content and increased tenderness of the beef patty. Mocaf is recommended to be used as a patty filler to provide food sustainably.

**Paper ID: 18430**





## Effects of Coriander (*Coriandrum sativum* L.) Leaf and Seeds on Biochemical and Hematological feature.

*S S Khafaji\*<sup>1</sup> and R S Khafaji<sup>2</sup>*

<sup>1</sup>*Department of physiology, pharmacology and chemistry, College of Veterinary medicine, University of Al-Qasim Green, Iraq.*

<sup>2</sup>*M.B.Ch.B, Scripps Research Institute, National University, USA.*

Email : [sura.khafaji@vet.uoqasim.edu.iq](mailto:sura.khafaji@vet.uoqasim.edu.iq)

**Abstract.** The aim of current research to examine the effect of dried leaves, DL, and seeds, SE, of *Coriandrum sativum* on some biological and hematological traits. 30 male rabbits aged (93-115) days, separated randomly into 3 equal groups, treatment 1, T1, taken the basal meal during the experimental period represented as control group. T2 fed the basal nutrition mixed with 5% of DL. Treatment three ,T3, supplemented the basal nutrition mixed with 5% SE, respectively. At the termination of experiment, blood and sera samples collected and separated for estimating hematological and biochemical traits, as well as liver was collected for histological study. The statistical analysis demonstrated significant ( $P<0.05$ ) raised in hematological parameters in T3 compared with T2 and T1. Additionally, The concentration of serum globulin and protein elevated significantly ( $P<0.05$ ) in T3 and T2 when compared with control rabbit. On other hand, the values of AST, ALT and glucose showed decrement significantly ( $P<0.05$ ) in treatment two and three rabbits comparing T1. The histological studies of liver in T3 rabbits same as that of control rabbits. In conclusion, ground seeds of *Coriandrum sativum* possessed the main biological characteristic that enabled them to improve the histological, serological and biochemical features more than dried leaves.

**Paper ID: 18435**







## Level of Microorganism Contamination in Chicken Meat From Traditional Markets in Melawi Regency West Kalimantan Province

*D Heraini<sup>1</sup>, D Setiawan<sup>2\*</sup>, RP Harahap<sup>3</sup>, M Alfius<sup>4</sup>, R Puspitasari<sup>5</sup> and K Nur<sup>6</sup>*

<sup>1</sup>Study Program of Animal Science, Faculty of Agriculture, Tanjungpura University, Jl Prof. Dr. H. Hadari Nawawi, Pontianak 78124, Indonesia

<sup>2</sup>Agency for Plantation and Livestock, Kalimantan Barat 78121, Indonesia

<sup>3</sup>Indonesian Agency for Agricultural Research and Development, Bengkulu 38119, Indonesia

<sup>4</sup>Pangkajene Kepulauan State Polytechnic of Agriculture, Pangkajene Kepulauan 90655 Indonesia

E-mail: [duta.setiawan@faperta.untan.ac.id](mailto:duta.setiawan@faperta.untan.ac.id)

**Abstract.** Chicken meat is a perfect media for microorganism to grow that can cause a disease in humans. Meat must meet the requirements of being safe and fit for consumption because meat can potentially carry animal diseases to humans (*foodborne zoonoses*). This study was aimed to determine the level of microorganism contamination in chicken meat in Melawi Regency. Data's collected from several traditional markets in Melawi Regency and analysed descriptively. Total Plate Count (TPC), the numbers of *Escherichia coli*, the numbers of Coliform, the numbers of *S Aureus* and the occurrence of *Salmonella sp.* were used in this study. The conclusion of this study is the total microbial chicken meat in the traditional market of the Melawi Regency is above the Indonesian National standard (SNI 7388: 2009) for TPC and *Salmonella* is 67%, Coliform and *E. Coli* is 78%. While the *S Aureus* of chicken meat is in accordance with SNI. Total microorganism contamination in chicken meat in Melawi Regency past the maximum microorganism contamination in food in National Standard of Indonesia (SNI) 7388:2009.

**Paper ID: 18442**





## **Giving earthworm flour (*Lumbricus rubellus*) to the total population of *Salmonella sp.* in the small intestine of super native chickens infected with *Salmonella sp.***

***E Mirwandhono<sup>\*</sup>, H W Sihotang<sup>\*</sup>, N Br Ketaren<sup>\*</sup>, Hasnudi<sup>\*</sup>, T H Wahyuni<sup>\*</sup> and M I A Nasution<sup>\*</sup>***

<sup>1</sup>*Animal Production Program Study, Faculty of Agriculture, University of Sumatera Utara, Jl. Prof. A. Sofyan No. 3 Kampus USU, Medan, Indonesia 20155*

<sup>2</sup>*Department of Animal Production and Technology, Faculty of Animal Science, IPB University, Jl. Agatis Kampus IPB Dramaga, Bogor, Indonesia 16680*

E-mail: [\\*r.edhy@usu.ac.id](mailto:*r.edhy@usu.ac.id)

**Abstract.** *Salmonellosis* is a zoonotic infectious disease. Giving antibiotics to control this disease can result in residues so that microbes become resistant. This study aims to determine the ability of earthworm flour (*Lumbricus rubellus*) in controlling the growth of *Salmonella sp.* This study used a completely randomized design (CRD) with five treatments and six replications. The treatment composed of control (P<sub>0</sub>), infection without antibiotics (P<sub>1</sub>), infection + *Trimezyn-S* (P<sub>2</sub>), infection + 50 mg earthworm meal (P<sub>3</sub>), and infection + 100 mg earthworm flour (P<sub>4</sub>). The results showed that giving earthworm flour (*Lumbricus rubellus*) as much as 100 mg resulted in the growth of *Salmonella sp.* lower and can compensate for the administration of *Trimezyn-S* antibiotics in super native chickens.

**Paper ID: 18445**





## Oral Acute Toxicity Study of Nanoherbal Sikkam Leaves (*Bischofia javanica*)

**C G P Rumahorbo<sup>1</sup>, S Ilyas<sup>1</sup>, S Hutahaean<sup>1</sup>, C F Zuhra<sup>2</sup>, P C Situmorang<sup>1</sup>**

*Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Sumatera Utara*  
*Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Sumatera Utara*

E-mail: rumahorboc@gmail.com

**Abstract.** *Bischofia javanica* (Sikkam), an edible tree with potentially beneficial medicinal properties, contains important medicinal ingredients. Extracts of sikkam leaves have been used for years in traditional medicine and evaluated scientifically as well. The purpose of this study was to determine the acute toxicity (LD50 and LC50) of nanoherbal sikkam leaves and their effect on changes in hematology, biochemistry, electrolytes, and histopathology of the organ. Nanoherbal sikkam leaves were created using High Energy Milling (HEM). The Thomson Weil formula was used to calculate the LD50 over 14 days. The Brine Shrimp Lethality Test method was used to determine the LC50 at concentrations of 1, 10, 100, 1000, and 10,000 ppm. This study revealed that the LD50 value was 12.6 g/KgBW  $\pm$  0.17, the LC50 value was 3179.926 ppm and classified as mildly toxic. Nanoherbal sikkam leaves only significantly affected the weight of the lungs and heart, did not affect to the all of hematological parameters, significantly affected the creatinine and uric acid parameters in kidney biochemical. Nanoherbal sikkam leaves also affected the total protein, SGPT (Serum Glutamic Pyruvic Transaminase), SGOT (Serum Glutamic Oxaloacetic Transaminase), and alkaline phosphatase (ALP) in liver biochemical. Meanwhile, in electrolyte parameters only affected to the chloride parameters. In summary, this study provides data on the antioxidant activity and safe use of nanoherbal sikkam leaves.

**Paper ID: 18475**





## Contribution of Household's Male and Female Labor among Dairy Farmer Households

*A A P P Satiagraha, S Andarwati, A R S Putra*

*Department of Livestock Social Economics, Faculty of Animal Science, Universitas Gadjah Mada, Indonesia, 55281*

E-mail: [ahmadromadhoni@ugm.ac.id](mailto:ahmadromadhoni@ugm.ac.id)

**Abstract.** The study aimed to identify the role of male and female workers in the dairy farm households. The research was conducted in Sleman district where there are farmers who are members of a dairy cooperative, during May to June 2022. The respondents in this study amounted to 70 people who are farmers who are members of the cooperative. Data collection was carried out through observation followed by direct interviews with questionnaires. The data analyzed using the value of Level of Effort and Level of Control. The results and conclusions in this study are the contribution of husband and wife in dairy farming which is observed from various aspects that have a role in labor participation. The role of women observed from the Level of Effort and Level of Control has a role of effort and control that is not much different from the role of men. The wife's contribution to the activities of feed management and housing management is greater than the husband's contribution. The wife's contribution to the type of milking management and health management activities is smaller than the husband's contribution.

**Paper ID: 18494**





## **Effect of The Use of Fermented Chicken Feather Flour as Feed Source of Protein in Rations with Different Levels on Nutritional Digestibility and IOFC of Peranakan Landrace Pig Livestock**

***N S Dalle, E Y Nugraha, H D Tukan***

*Faculty of Agriculture and Animal Husbandry, Animal Husbandry Study Program, Indonesian Catholic University  
Santu Paulus Ruteng, Jl. Ahmad Yani, No. 10 Tel. (0385) 22305, Ruteng-Indonesia*

E-mail: [ivandalle23@gmail.com](mailto:ivandalle23@gmail.com)

**Abstract.** Chicken feather flour has the potential to be a protein source feed for pig livestock because it has a protein content of up to  $\pm 80\%$  and its abundant presence in the market or chicken management sites, but most of the protein is fiber products (keratin) so it must be fermented to reduce keratin levels. The purpose of this study was to determine the effect of the use of fermented chicken feather flour on the performance, consumption and digestibility of nutrients as well as the Income Overfeed Cost (IOFC) of pig livestock in the starter phase. The material used was 16 heads of livestock of landrace peranakan pigs aged 2-3 months with an initial body weight of 6-19 kg (an average of 13.59 kg; CV= 28.59%). The method used is a direct experimental method using a randomized group design (RAK) of 4 treatments and 4 tests. The treatment attempted was R0=Basal ration without TBAT (control); R1= Basal ration with 90% concentrate + 10% TBAT; R2= Basal ration with 80% concentrate + 20% TBAT; and P4= Basal ration with 70% concentrate + 30% TBAT. The variables studied were: consumption and digestibility of dry matter (DM), organic matter (OM), crude protein (CP), crude fat (CF), crude fiber (CFi), and IOFC. The results of the variety analysis showed an unreal influence ( $P > 0.05$ ) digestibility of DM, OM, CP, and IOFC, but had a real effect ( $P < 0.05$ ) on the digestibility of SK and LK. This means that the use of FFM in the ration gives relatively the same, digestibility of DM, OM, CP, and IOFC, but gives different results to the digestibility of CF and CFi. The conclusion of the study is that the use of fermented chicken feather flour can be used to replace concentrates as a source of energy in the feed ration of pig livestock.

**Paper ID: 18500**





## **Sperm quality of bali bull following sexing and frozen using different cryoprotectants**

***T Saili<sup>2</sup>\*, L O Nafiu<sup>1</sup>, A Bain<sup>1</sup>, F Lopulalan<sup>2</sup>, S Rahadi<sup>2</sup>, A S Aku<sup>1</sup>***

*<sup>1</sup>Faculty of Animal Science Universitas Halu Oleo*

*<sup>2</sup>UPTD Peternakan Provinsi Sulawesi Tenggara*

E-mail: \*takdir69@uho.ac.id

**Abstract.** The use of sexed semen can increase the reproductive efficiency of cattle because, through this technology, the desired sex of the calf can be produced. In our previous study, chilled sexed semen has been applied to produce calves. The shortcoming of the use of chilled sexed semen such as the relatively short shelf life (maximum 7 days stored at a temperature of 3-5°C), have inspired us to conduct research to produce frozen sexed semen. In an effort to produce frozen semen, apart from a diluent medium, a cryoprotectant is necessary. Therefore, in this study, frozen semen of Bali cattle was produced using different cryoprotectants, glycerol (GS) and ethylene glycol (EG). Both of these cryoprotectants will maintain the motility of sperm following sexing, equilibration, and freezing (post-thawing motility). This study was divided into two stages, namely, the sexing treatment stage which aims to evaluate the effect of sexing time (D-m40 = 40 min.; D-50 = 50 min.; D-60 = 60 min.) on sperm quality, and the second experiment aims to the analysis of the effect of cryoprotectants (GS and EG) on post-thawing motility (PTM) of frozen sperm resulting from sexing. The results showed that sperm motility after sexing was significantly higher in the treatment of 40 and 50 min. of sexing compared to 60 min. of sexing. The post-thawing motility value of frozen sexed sperm cryopreserved with GS was higher than sexed sperm cryopreserved with EG. Based on the results, it can be concluded that sexing times of 40 and 50 minutes were the best time to get high sperm motility and viability value compared to sexing times of 60 minutes. In addition, GS could maintain the motility of sexed sperm better than EG.

***Paper ID: 18519***





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## The Effect of Compressing Time on Quality of Jabon Wood (*Anthocephalus cadamba*)

**R Hartono<sup>1</sup>, HLY Sitompul<sup>2</sup>, J Sutiawan<sup>3</sup>, TD Cahyono<sup>4</sup>, T Priadi<sup>5</sup>, F Diba<sup>1</sup>, R. Angraini**

<sup>1</sup>Faculty of Forestry, Universitas Sumatera Utara, Jl. Kampus USU 2 Bekala, Pancur Batu, Deli Serdang 20353, Sumatera Utara, Indonesia

<sup>2</sup>Study Program of Forestry, Faculty of Agriculture, Universitas Darussalam, Jl. Raya Tulehu Km 24, Ambon 97582, Maluku, Indonesia

<sup>3</sup>Forest Product Departement, Faculty of Forestry and Enviroment, IPB University, Jl. Ulin, Kampus IPB Dramaga, Bogor 16680, Indonesia

<sup>4</sup>Faculty of Forestry, Tanjung Pura University, Jl. Daya Nasional Kota Pontianak 78124, West Kalimantan Province, Indonesia

<sup>5</sup>Forestry Department, Faculty of Agriculture, Jambi University, Jl. Raya Jambi - Muara Bulian KM. 15, Mendalo Indah. Jambi

E-mail: [rudihartono@usu.ac.id](mailto:rudihartono@usu.ac.id)

**Abstract.** Wood densification is a technique to increase the quality of low-density wood such as Jabon wood. The variation of compressing time of Jabon wood will affect the quality of the wood. This study aimed to determine the effect of compressing time on the physical and mechanical properties of Jabon wood. Jabon wood was densification using a hot press at 5, 10, 15, and 20 minutes at a temperature of 180 °C and a densification target of 20%. This densification wood will be compared with control wood. The results showed that the density value increased from 0.37 g/cm<sup>3</sup> to 0.39-0.42 g/cm<sup>3</sup>, and the moisture content value was decreased to 11.57-15.12 %. There was an increase in value modulus of elasticity, modulus of rupture, and compression parallel to the grain by 31.55-48.86%, 6.65-35.33%, and 42.68-55.26%, respectively. The optimum value of this study resulted in a compressing time of 10 minutes

**Paper ID: 18188**





## Nature conservation campaign on building a balancing ecosystem in Simeulue Island

*T Lubis<sup>1\*</sup>, A F Abus<sup>2</sup>, N Saputra<sup>3</sup>, A A Abus<sup>4</sup>, and N A A Abus<sup>5</sup>*

*<sup>1,4,5</sup>Universitas Sumatera Utara, Medan, Indonesia*

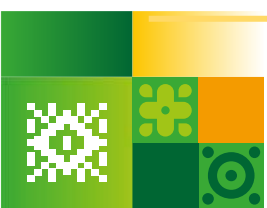
*<sup>2</sup>Aceh Landscape Development Centre, Langsa, Indonesia*

*<sup>3</sup>Sekolah Tinggi Ilmu Tarbiyah Al-Hilal Sigli, Sigli, Indonesia*

Email: [tasnimlubis@usu.ac.id](mailto:tasnimlubis@usu.ac.id)

**Abstract.** Nature conservation deals with environmental sustainability. Environmental sustainability will keep balancing the ecosystem surrounding. The role of campaign for nature conservation is important to support the atmosphere toward human welfare. This study focused on explaining the nature conservation campaign in Simeulue Island. Ethnography method was applied in this study. The study was place at Langi village on Simeulue Island in Aceh Province, Indonesia. The data consisted of recordings that described nature conservation in the past and now. Besides in-depth interviews and participant observation were also conducted to collect the data. The data were analyzed using domain analysis, taxonomy analysis and componential analysis. This study showed a change in land use from vegetation plants to new plants (ex; paddy). This situation affects the ecosystem, microclimate, and the loss of several animals in the area. It can be concluded that the nature conservation campaign is essential to maintain nature conservation as a shield for disaster in Langi village. The effort is intended to do this by involving both the chief and local governments.

**Paper ID: 18237**





## Landscape concept for outdoor recreation at Hutan Kota Langsa, Aceh, Indonesia

*A F Abus<sup>1</sup>, T Lubis<sup>2\*</sup>, N Saputra<sup>3</sup>, A A Abus<sup>4</sup> and N A A Abus<sup>5</sup>*

*<sup>1</sup>Aceh Landscape Development Centre, Langsa, Indonesia*

*<sup>2,4,5</sup>Universitas Sumatera Utara, Medan, Indonesia*

*<sup>3</sup>Sekolah Tinggi Ilmu Tarbiyah Al-Hilal Sigli, Sigli, Indonesia*

Email: [tasnimlubis@usu.ac.id](mailto:tasnimlubis@usu.ac.id)

**Abstract.** This study discusses two main points: the landscape process of outdoor recreation concept at Hutan Kota Langsa, Langsa City, Aceh, Indonesia, and visitors' activities at outdoor recreation Hutan Kota Langsa. The objectives are to investigate the background of the Hutan Kota Langsa landscape and to analyze the space used for outdoor recreation for the visitors and occupants at Hutan Kota Langsa. This study used the landscape anthropology approach as a core to explain the process of Hutan Kota Langsa in the past and present, together with the visitors' activities. The ethnography method was applied to collect data and analyze them. The data were the result of depth-interview and participant observation from the conceptor of Hutan Kota Langsa and the visitors. The results of the study showed that the formation of the Hutan Kota Langsa landscape starts from outer space itself and is used for animal habitats, such as deer, crocodiles, several species of birds, and their ecosystem. The visitors visit Hutan Kota Langsa divided into two categories; (1) For their memory of the place and the history of the previous landscape, and (2) to have fun. In addition, Hutan Kota Langsa also acts as an open space for physical health activities.

**Paper ID: 18238**





## Monitoring and identifying forest burnt area using NBR Landsat and Landuse in Central Kalimantan

*B B Pratama<sup>1</sup>, D Pratiwi<sup>2</sup> and M A Qirom<sup>2</sup>*

*1 Research Centre for Geospatial, National Research and Innovation Agency (BRIN), Jl. Raya Cibinong Km 46, Bogor- West Java*

*2 Research Centre for Ecology and Etnobiology, National Research and Innovation Agency (BRIN), Jl. Raya Cibinong Km 46, Bogor- West Java*

E-mail: [boby002@brin.go.id](mailto:boby002@brin.go.id)

**Abstract.** Forest fires are one of the phenomena that occur in peatlands in Indonesia. This incident is due to changes in landuse in peatland and occurs repeatedly over a certain period of time. This study aims to monitor and identify burnt areas and landuse changes in the Kahayan River and Sebangau Peat Hydrological Unit (KHG) Central Kalimantan. The analysis was carried out on the Landsat imagery data series and landcover data from Ministry of Environment and Forestry Indonesia from 2014-2019. Analysis conducted with identifying burnt area using the Normalized Burn Ratio (NBR) and intersected with landcover data in that areas. The results of the analysis show that forest fires affect landuse changes. Landuses that were significantly affected by forest fires notably shrub swamps, plantations, and dry land farming. Landuse decrease in shrubs swamps by 18% ( $\pm$  2000 ha) and increase in plantation land by 840% ( $\pm$  4000 ha) and dry land farming by 6357% ( $\pm$  9400 ha) prior to forest fires.

**Paper ID: 18278**





## Location of Early Residence of the Sisingamangaraja Dynasty (Resources and Environment Overview of Lake Toba)

*D E Simatupang<sup>1\*</sup>, D Hidayati<sup>1</sup>, and L R L Tobing<sup>1</sup>*

*<sup>1</sup> National Research and Innovation Agency, Medan, Indonesia*

E-mail : [defr004@brin.go.id](mailto:defr004@brin.go.id)

**Abstract.** Valleys and hills in Bakara, Humbang Hasundutan Regency are known as the origins of the Sisingamangara Dynasty (the hereditary king for most of the Toba Batak ethnic community). The purpose of this study is to describe the implementation of the early Batak ethnic dwellings that thought of defense against enemy attacks while protecting the resources and environment of the area. This study uses a qualitative approach that uses data from archaeological excavations, observations, and interviews at one of the object locations in Bakara, namely Huta Ginjang Dolok. The results of the research description indicate that the location of Huta Ginjang Dolok has indeed proven to be one of the examples of early settlements in the Lake Toba area, which has several functions, including: Social functions related to traces of former settlements in locations located on hillsides. The ecological function is related to the abundance of clean mountain springs. The cultural function is related to the finding of human and livestock bones in archaeological excavations carried out during the research, and the economic function is related to the discovery of foreign currency found also in the excavation activities during field activities.

**Paper ID: 18281**





## **Design of a Gel Spray Formulation With Extract Banana Peels (*Musa paradisiaca* L.): Antimicrobial Activity and Skin Irritation Testing in Rabbits**

***R Rizka, Yuandani\* and Sumaiyah***

*Department of Pharmaceutical, Faculty of Pharmacy, Universitas Sumatera Utara, Medan, Indonesia*

E-mail : [yuandani@usu.ac.id](mailto:yuandani@usu.ac.id)

**Abstract.** Banana peels has been considerately as waste products. However as a waste material is disposal is a major issue. The present study conducted show that banana peels have some bioactive compound. These extracts contained tannins, saponins, triterpenoids/steroids, glycosides, and flavonoids. This study also looks into a certain banana peel extract's potential as an antibacterial agent. *Musa paradisiaca* peel extract 20% against *Eschericia coli* and *Staphylococcus aureus* shown outstanding antibacterial effectiveness (12,0 and 12,3 mm of maximum zone inhibition). A formulation of a spray gel with extract banana peels for topical use was designed and characterized. The prepared spray gel was put through a variety of pharmacotechnical tests such as its physycal appearance, pH, viscosity, spraying ability, spreadability, centrifugation, and accelerated stability until 3 months. The composition of the spray gel was successfully incorporated with banana peel extract. Spray gel (F1, F2, and F3) showed good stability after three months of development. Additionally, the formulation showed no sign of skin irritation at 24, 48, or 72 hours after the test material of the rabbits. Therefore, it was concluded that the F3 could be a very potent choice for the topical or transdermal therapy.

***Paper ID: 18285***





## **An assessment of Tree Biodiversity, Forest Integrated Assessment and Carbon Stocks in Konsu Mandiri Social Forestry, Lamandau, Indonesia**

***S M Soebagiyo<sup>1\*</sup>, Martius<sup>2</sup>, Iswadi<sup>3</sup>, M A F Lubis<sup>4</sup>, A M Amin<sup>4</sup>, A Fathurrahman<sup>4</sup>, J H Samek<sup>5</sup>, B Supriyanto<sup>6</sup>***

*<sup>1</sup>Forestry Faculty, Instiper Yogyakarta, Indonesia*

*<sup>2</sup>Coord. Of Social Forestry of Konsu Mandiri, lamandau, Central Kalimantan, Indonesia*

*<sup>3</sup>Facilitator of Social Forestry in Forest Management Unit of Lamandau Central Kalimantan Indonesia*

*<sup>4</sup>Division of Sustainability and Environment PT Bumitama Gunajaya Agro*

*<sup>5</sup>Global Observatory for Ecosystem Services, Faculty of Forestry, Michigan State University, East Lansing, MI United States of America*

*<sup>6</sup>Ministry of Environment and Forestry of Indonesia*

Email: [sitimararil@gmail.com](mailto:sitimararil@gmail.com)

**Abstract.** PT. Bumitama Gunajaya Agro is an oil palm company that is committed to supporting the community through a partnership approach to social forestry management in the Konsu Mandiri Sejahtera (KMS) Forest. This is done so that managers know the potential species of biodiversity and the value of their benefits and potential alternative sources of income from non-timber forest products and environmental services. Through this activity, it is hoped that there will be a transfer of knowledge with the hope that managers will have competence in identifying and managing biodiversity. The research methodology uses a method to assess biodiversity created by USAID LESTARI in 2018. The results showed that of the 64 plots with a sampling intensity of 0.2% it is known that the average value of forest usefulness for the community is 24,47541 where the value is categorized that KMS forest is a mostly healthy forests (21 - 30). The condition of the existing forest is partly illegally cleared by the community for agriculture, which is still forested only in areas with rugged topographic conditions, with good forest conditions. The wildlife encountered is very diverse, namely haruwei, partridge, hornbill, bear, eagle, pangolin, hedgehog, deer, wild boar and mouse deer. Encounter in the form of footprints, hearing, seeing, nests and feces. KMS Forest provides 13 species of Flora and fauna that are directly beneficial to the community and 5 flora and unique habitats that are culturally beneficial and local wisdom. The carbon content of this area 114.312,68 ton carbon with 117 species of trees with Menhenick index 3,63; Margalef index 16,7; Shannon index 4,7; Simpson index 0,97 and evenness 0,85. These potentials can be developed for activities in KMS that can be done jointly with PT BGA in terms of forest conservation and improving the welfare of communities.

**Paper ID: 18289**







## Natural Operation In Removing Waste Compounds Within Cooking Oil Using Corn Cob As Adsorbent

**B Haryanto\***, A Pelawi, Octavia, S Y Sidauruk, R Tambun, E Misran

*Chemical engineering department, faculty engineering, Universitas Sumatera Utara, Jalan Almamater Kampus  
USU, Medan, 20155, Indonesia*

Email: [bode.haryanto@usu.ac.id](mailto:bode.haryanto@usu.ac.id)

**Abstract.** Cooking oil is one of the foodstuffs that people need daily, both in industry and households as a food processing tool. The high price of cooking oil in the market encourages people to use oil repeatedly. The use of used cooking oil repeatedly can cause hydrolysis and oxidation processes to produce free fatty acids which can reduce the quality of the oil and endanger health. The increasing need for cooking oil causes waste in the form of used cooking oil to increase as well. One method to improve the quality of used cooking oil is adsorption. In an effort to regenerate used cooking oil, adsorbents from natural materials are used to adsorb components in used cooking oil in order to improve the quality of cooking oil after purification and can be processed into other products such as biodiesel. In this study, the effect of mass and size of the adsorbent on the contact time was observed to reduce the turbidity of used cooking oil. The adsorption process was carried out on used cooking oil with a volume of 100 ml and variations in the mass of the adsorbent from corn cobs were 2 g, 3 g, and 4 g. The size of the adsorbent was varied at 50 mesh, 70 mesh and 100 mesh. The analysis carried out is measuring the decrease in turbidity of used cooking oil using a turbidimeter, analyzing the surface morphology characterization of the adsorbent using sem-edx and determining the adsorption kinetics model.

**PAPER ID: 18342**





## **Study on batch sorption ability of corncob naturally as adsorbent in removing waste with cooking oil base on the turbidity**

***B Haryanto\*, I T Nasution, A F Polem, O M Sitohang, R Tambun, Z Masyithah***

*Chemical Engineering Department, Faculty of Engineering, Universitas Sumatera Utara, Almamater Kampus USU, Medan, 20155, Indonesia*

Email : [bode.haryanto@usu.ac.id](mailto:bode.haryanto@usu.ac.id)

**Abstract.** Used cooking oil can be reused after the purification process is carried out by an adsorption process using an adsorbent in this case corn cob by varying the shaking speed, adsorption time, and turbidity of the used cooking oil using a turbidity meter. This research was conducted in batches to determine the effect of optimal adsorption and reactions with corn raw materials naturally on shaking speed with variations in mass and size as well as the contact time of the adsorbent for 5 hours. The data obtained from the study indicate that the activation of the adsorbent with a size of 100 mesh and a speed of 140 rpm with a mass of 4 grams, has a better surface area and adsorption capacity and affects the turbidity value of used cooking oil which increases with longer contact between the adsorbent and used cooking oil compared to adsorbents of 50 and 70 mesh sizes. The adsorption process was carried out on used cooking oil with a volume of 100 ml and variations in the mass of the adsorbent from corn cobs were 2 g, 3 g, and 4 g. In this study, a test was conducted using sem-edx to analyze the surface morphology characterization of the adsorbent by modeling of the corncob adsorbent.

**PAPER ID: 18353**





## Physical Properties of Five Species of Twigs from Mangrove Forest

*A Nuryawan\*, R S Syahputra, I Risnasari*

*Faculty of Forestry, Universitas Sumatera Utara, 2<sup>nd</sup> Campus, Kuala Bekala, Deli Serdang Regency 20355, North Sumatra, Indonesia*

\*Email: [arif5@usu.ac.id](mailto:arif5@usu.ac.id)

**Abstract.** Five species of mangrove have been investigated their twigs, particularly the physical properties, comprised of moisture content (MC), density, and specific gravity. The methods measurement using gravimetric analysis according to ASTM D4442 and ASTM D2395, respectively. Statistical analysis was conducted using analysis of variance (anova), using complete random design with two factors, namely 1) presence of bark (with and without bark) and 2) species of the mangroves, consisted of Buta-butua (*Excoeceria agallocha*), Api-api (*Avicenia marina*), Bakau hitam (*Rhizophora mucronata*), Bakau minyak (*Rhizophora apiculata*), dan Mata buaya (*Bruguera sexangula*). Further, Duncan Multiple Range Test was applied in order to evaluate the difference among the samples. Results of this study revealed that twigs have had higher MC with presence of bark and the value showed up to 86%. Density of the samples showed a same tendency with the specific gravity however the measurement values were higher than those of the literatures presumably because of the presence of water, bark, and the irregular form of the twigs. From this point, utilization of the twigs was still limited because of the variation of the properties.

**Paper ID: 18453**





## Association Of *Amorphophallus Gigas* on Rubber Land Cover In The Sabungan Village, Sungai Kanan District, South Labuhanbatu Regency, North Sumatra

**R Rambey<sup>1,2\*</sup>, Rahmawaty<sup>2,3</sup>, A Rauf<sup>3,4</sup>, E S M Nababan<sup>3,5</sup>**

<sup>1</sup>Doctoral Program in Natural Resources And Environment Management, Graduate School, Universitas Sumatera Utara. Sivas Akademika 9, Medan 20222, North Sumatra, Indonesia

<sup>2</sup>Faculty of Forestry, Universitas Sumatera Utara, 2nd Campus, Kuala Bekala, Deli Serdang Regency 20355, North Sumatra, Indonesia

<sup>3</sup>Natural Resources and Environment Management, Graduate School, Universitas Sumatera Utara, Sivas Akademika 9, Medan, Sumatera Utara 20222, Indonesia

<sup>4</sup>Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara 20155, Indonesia

<sup>5</sup>Faculty of Mathematics and Natural Sciences, Universitas Sumatera Utara, Bioteknologi 1 Kampus USU, Medan, Sumatera Utara 20155, Indonesia

\*Email: [ridahati.rambey@usu.ac.id](mailto:ridahati.rambey@usu.ac.id)

**Abstract.** *Amorphophallus gigas* is one of the tallest amorphophallus species in the world. *Amorphophallus gigas* is an understory that belongs to the Araceae family. This research was conducted on rubber land cover in the Sabungan Village, Sungai Kanan District, South Labuhanbatu Regency, North Sumatra Province. The purpose of this study was to analyze the association of *Amorphophallus gigas* with other plants around it. This research method was carried out by analysis of vegetation with a plot size of 1 ha (25 plots). The results showed that at the understory level based on the ochiai association index of amorphophallus with understory only one species had a very high association, namely *Selaginella wildenowii*, while the value of Ochiai at other understory levels was feasible and low. At the seedling level, the association of amorphophallus with plant species at the seedling level was categorized as low and medium. The association of amorphophallus at the sapling level with very high values is the species *Macaranga indica*. The association of *Amorphophallus gigas* at the pole level was *Hevea brasiliensis* with a very high category, the high category of one species was *Macaranga indica*. Association of *Amorphophallus gigas* at the tree level with a very high category, namely *Hevea brasiliensis*.

**Paper ID: 18508**





## The Relevancy-Analysis of Air Quality Index to Acute Respiratory Infection (Ari) In A Landfill Site of Medan

*T K Intan<sup>1\*</sup>, D Munir<sup>2</sup>, N N Soeroso<sup>3</sup>, M Ichwan<sup>4,5</sup>, H Khair<sup>6</sup>, I Suryati<sup>6</sup>*

*<sup>1</sup>Department of Anatomy Pathology, Faculty of Medicine, Universitas Sumatera Utara*

*<sup>2</sup>Department of Ear, Nose & Throat, Head & Neck, Faculty of Medicine, Universitas Sumatera Utara*

*<sup>3</sup>Department of Pulmonology & Respiratory Medicine, Faculty of Medicine, Universitas Sumatera Utara*

*<sup>4</sup>Department of Pharmacology & Therapeutic, Faculty of Medicine, Universitas Sumatera Utara*

*<sup>5</sup>Master Program in Biomedical Sciences, Faculty of Medicine, Universitas Sumatera Utara*

*<sup>6</sup>Department of Environmental Engineering, Universitas Sumatera Utara*

Email: [t.kemala@usu.ac.id](mailto:t.kemala@usu.ac.id)

**Abstract.** One of the negative impacts on the presence of open-dumping landfill site is a contamination in the air quality. A final site of landfill in Medan remains in open-dumping system that is located in sub-district Terjun, in district of Marelan, and it has been operated since 1993. The accumulation of litter in this site has been deteriorated surrounding air quality that has been continuously affected the local health communities. This research aims to analyse and map the distribution of ambient air concentration in Terjun landfill in term of contaminant parameter, such as PM<sub>10</sub>, PM<sub>2.5</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, O<sub>3</sub>, and HC. Moreover, the air-quality index is analysed in respective parameters to determine the prevalence of acute respiratory infection (ARI) in the nearby landfill site. The determination of ambient air-quality was carried out by manual- active and passive sampling approach. The measurements of air-quality were compared to the standard national ambient of air-quality, while the air distribution was monitored via GIS application. The conversion of ambient air-quality was converted into air-quality index based on the Indonesia regulation, which subsequently was tested in a statistical correlative method to investigate the prevalence of ARI. The results demonstrated the PM<sub>2.5</sub> concentration accounted for 38.94 – 163.1 µ/m<sup>3</sup>, while the PM<sub>10</sub> was in between 46.84 – 184.2 µ/m<sup>3</sup>; indicating an excessive level of national ambient threshold. Meanwhile, the other parameters such as CO, NO<sub>2</sub>, O<sub>3</sub> and HC remains in the threshold level. The distribution of PM<sub>2.5</sub> and PM<sub>10</sub> concentrations were observed at most in sampling site 1 that was regarded as the active zone of the landfill. The prevalence of ARI in the nearby landfill site showed strong relationship between the air-quality index to the ARI prevalence with 0.86 for PM<sub>2.5</sub> and 0.62 for PM<sub>10</sub>. These findings illustrate a poor-quality of air would increase a number of inhabitants with ARI.

**Paper ID: 18581**





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## **Development of ready-to-drink milk coffee with almond milk and isolated soy protein using kano model and quality function deployment analysis**

*Lydia and R Surya\**

*Food Technology Department, Faculty Of Engineering, Bina Nusantara University, Jakarta 11480, Indonesia*

Email : [reggie.surya@binus.edu](mailto:reggie.surya@binus.edu)

**Abstract.** Coffee is one of the popular drinks among the productive young generation. In consuming coffee, consumers often add cow's milk to reduce the bitter and sour taste that is too strong in coffee. The high use of milk from animal sources causes an increase in the livestock sector accompanied by land and water use and global warming. This study aims to develop a plant-based ready-to-drink almond soy milk coffee drink with a quantitative approach in the form of kano model, quality function deployment, and sensory test in the form of hedonic test and simple ranking test. Based on the results of the study, it was concluded that milk coffee with the use of almonds is one of the most important attributes for consumers to produce creamy milk coffee, where formula 2 with a ratio of almond paste: isolated soy protein = 70:30 is the optimal formulation and meets the acceptance consumer.

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## The shelf life of smoked catfish coated with edible coating chitosan, red ginger, and red galangal essential oil using the acceleration method

*R Efendi, N A Harahap, D F Ayu\*, E Saputra, Y Nopiani*

*Agricultural Technology Department, Universitas Riau, Kampus Bina Widya KM. 12,5, Simpang Baru, Pekanbaru, Riau 28293, Indonesia*

Email: [fortuna\\_ayu2004@yahoo.com](mailto:fortuna_ayu2004@yahoo.com)

**Abstract.** The purpose of this research was to estimate the shelf life of smoked catfish coated with edible coating chitosan, red ginger, and red galangal essential oil. Estimation of shelf life using the acceleration method by storing the smoked catfish for 30 days at three different temperatures, i.e., 30, 35, and 40°C. The parameters observed during the storage process were sensory assessments of rancidity and thiobarbituric acid (TBA) values of the smoked catfish. The obtained data were analysed using linear regression to show the relations between storage time and the measured variables. Furthermore, the Arrhenius method was used to calculate the shelf life of smoked catfish to compare the decline in the quality of the smoked catfish. The result showed that the smoked catfish coated with edible coating chitosan and red ginger had a shelf life of 32.90 days at 30°C with the regression equation  $y = 2529.6x + 4.3342$ , activation energy ( $E_a$ ) of 5023.790 cal.mol<sup>-1</sup>, and of quality degradation ( $k$ ) was 0.018 quality unit per day. Although, the self-life of smoked catfish coated with edible coating chitosan, red ginger, and red galangal essential oil was 37.10 days at 30°C with the regression equation  $y = -3085.1x + 6.039, 6127.009$  cal.mol<sup>-1</sup>  $E_a$ , and 0.016 quality unit per day  $k$  value.

**Paper ID: 18133**





## Response Surface Method to Optimize The Processing of Chinese Chestnut Stuffing

Yuhua Zhao<sup>1,2,3\*</sup>, Jie Lu<sup>3</sup>, Xueying Guo<sup>3</sup>, Xuedong Chang<sup>1,2,\*</sup>

<sup>1</sup>Engineering Research Center of Chestnut Industry Technology, Ministry of Education, Qinhuangdao 066004, Hebei, China.

<sup>2</sup>Hebei Collaborative Innovation Center of Chestnut Industry, Qinhuangdao 066004, Hebei, China.

<sup>3</sup>College of Food Science and Technology, Hebei Normal University of Science and Technology, Qinhuangdao 066004, Hebei, China.

Email: [zhyhtsh@163.com](mailto:zhyhtsh@163.com)

**Abstract.** To enrich the variety of Chinese chestnut products, promote the transformation of Chinese chestnut raw materials and improve the added value, develop Chinese chestnut stuffing and optimize the compounding process, in order to provide reference for the industrial development of Chinese chestnut stuffing. The degree of Chinese chestnut ripening, Chinese chestnut particle size, job's tear dosage, red bean dosage and date paste dosage were optimized through single-factor experiments respectively; then orthogonal experiments were conducted for the dosage of job's tear, red bean and date paste, and then the Box-Behnken experimental results were analyzed by response surface method. Firstly, it was determined that the Chinese chestnut was steamed to the fifth to seventh degree of ripeness, crushed to 4-6 mesh, the amount of job's tear 10 g/(25 g chestnut), the amount of red bean 10 g/(25 g chestnut), and the amount of date paste 6 g/(25 g chestnut) were the superior levels. The results of the orthogonal experiment showed that the compounding effect was better with the dosage of barley 9 g/(25 g chestnut), red bean 10 g/(25 g chestnut) and date paste 7 g/(25 g chestnut). Response surface analysis yielded the regression equation  $Y$  (sensory score) =  $8.2 - 0.27\chi_1 - 0.059\chi_2 + 0.26\chi_3 - 0.22\chi_1\chi_2 + 0.062\chi_1\chi_3 - 0.46\chi_2\chi_3 - 0.81\chi_{12} - 0.41\chi_{22} - 0.32\chi_{32}$ . The model had a low coefficient of variation (CV= 0.023), indicating that the equations fit well with high confidence. A better quality Chinese chestnut filling could be obtained by compounding diced chestnuts of five to seven minutes ripe and 4-6 mesh with job's tear, red beans and date paste in the ratio of 8.96 g/25 g (chestnut) for job's tear, 9.77 g/25 g (chestnut) for red beans and 7.37 g/25 g (chestnut) for red dates, and the error between the theoretical value (8.32 points) and the experimental value (8.28 points) was small (0.48%), the optimized parameters are accurate and have practical value.

**PAPER ID: 18166**





## Convective Heat Transfer Analysis in a Heat Exchanger with Two Coaxial Tubes for Aseptic Processing of Foods

*G Supriyanto<sup>1</sup>, B Rahardjo<sup>1</sup>, T Supriyanto<sup>2</sup>, A A Hidayat<sup>2</sup>, B Pardamean<sup>3</sup>*

*<sup>1</sup>Faculty of Agricultural Technology, STIPER Institute of Agriculture*

*<sup>2</sup>Bioinformatics and Data Science Research Center, Bina Nusantara University*

*<sup>3</sup>Computer Science Department, BINUS Graduate Program - Master of Computer Science Program, Bina Nusantara University*

**Abstract.** Thermal sterilization methods in food processing technique attempt to perform the heating process until the commercial-grade sterilization level of the food is achieved. Aseptic processing that employs a High Temperature Short Time system allows for a more cost-effective and time-efficient method for preserving food without reducing the food quality. In this work, we propose a heat transfer analysis of a scraped surface heat exchanger with two coaxial tubes that provides a simplified prototype of an aseptic processing system. The heat exchanger is installed with scraped blades to allow a stirring mechanism that can only oscillate back and forth at certain angles called oscillating angles. In this simulation, water and solid food particles are put in the system. Moreover, simple regression models are used to find the relation between the mechanical properties of the stirring process with the heat transfer properties. Therefore, experimental data of the temperature and heat transfer coefficient during the heating are used for model fitting. The model fit shows that the angle, frequency, and velocity of the stirring affect the temperature trend and the heat flow rate inside the system. The result of this modeling can provide a framework to build a more complex heat exchanger prototype for optimizing aseptic food processing.

**PAPER ID: 18277**





## Effect of Deodorization Temperature on Red Palm Oil in The Making of Mayonnaise

*D F Ayu\*, J P Pratama, V S Johan, Y K Dewi, F H Hamzah*

*Agricultural Technology Department, Universitas Riau, Kampus Bina Widya KM. 12,5, Simpang Baru, Pekanbaru, Riau 28293, Indonesia*

Email: [fortuna\\_ayu2004@yahoo.com](mailto:fortuna_ayu2004@yahoo.com)

**Abstract.** Deodorization is a distillation process of separating odor by using steam in a vacuum so that the odor components are easily evaporated. This study aims to determine the appropriate deodorization temperature for the chemical quality of red palm oil and the sensory of the mayonnaise. Treatments in this study were deodorization temperature of the red palm oil, namely MSD1 (120°C), MSD2 (130°C), MSD3 (140°C), and MSD4 (150°C) with a heating time of 1 hour. Data were statistically analyzed using analysis of variance (ANOVA) and then continued with Duncan's New Multiple Range Test (DNMRT) at a 5% level. The results showed that the best treatment was MSD1 with a total carotene of 909.62 mg.kg<sup>-1</sup>, 670.00 ppm total tocopherol, 0.61 mg. mal.kg<sup>-1</sup> thiobarbituric acid (TBA), and 1.05 meq.O<sub>2</sub>.kg peroxide value. The MSD1 mayonnaise on the color test had 55.54 for L value, 11.42 for a\* value, 46.15 for b\* value, and the hedonic assessment of the mayonnaise was preferred on color, aroma, and taste, but somewhat favored with a description of the color slightly red, not rancid, and tasted of red palm oil.

**PAPER ID: 18290**





## Physical and Chemical Properties of Anthocyanin Powder From Dragon Fruits (*Hylocereus Polyrhizus*) Peels as a Result of Encapsulation With Various Additional Concentrations of Maltodextrin

*H Hariadi<sup>1\*</sup>, R C Nissa<sup>2</sup>, E A Cahya<sup>2</sup>, Hidayat<sup>2</sup>, A E Ferdiansyah<sup>2</sup>, M Rifqi<sup>2</sup>*

*<sup>1</sup>National Research and Innovation Agency, Subang, Indonesia*

*<sup>2</sup>National Research and Innovation Agency, Subang, Indonesia*

*<sup>2</sup>Faculty of Halal Food Science, Djuanda University, Bogor, Indonesia*

E-mail: [raden\\_harie@yahoo.com](mailto:raden_harie@yahoo.com)

**Abstract.** One of the waste products from dragon fruit that has not been used to its full potential is red dragon fruit peels. The anthocyanin pigments that give the red dragon fruit its color are found in the peels. Maltodextrin encapsulation is one method used to preserve anthocyanin pigments. Therefore, the goal of this study was to create anthocyanin powder from red dragon fruit peels using the encapsulation method as a food coloring and to ascertain the ideal maltodextrin concentration for the physical and chemical properties of the powder. The experimental design used a one factor completely randomized design (crd) with the addition of 10%, 20%, 30%, and 40% maltodextrin concentrations. Analysis of the product involves measurements of color saturation, yield, water content, and total anthocyanin. The outcomes demonstrated that the chosen powder from the four treatments was obtained with the addition of maltodextrin at a concentration of 30% with a color intensity of 58.45 I\*, color a\* of 11.77, color b\* of 15.53, yield of 50.344%, water content of 7.847% and total anthocyanin of 148.240 ppm.

**PAPER ID: 18299**







## Effect of Sungkai Leaf Water Extract Addition to Aloe Vera Gel Edible Coating on Quality and Shelf Life of Strawberries (*Fragaria Sp.*)

*Refilda\* , M F Tanjung, Yefrida*

*Department of Chemistry, Faculty of Mathematics and Natural Sciences, Andalas University, Padang, Indonesia*

E-mail: [refilda@sci.unand.ac.id](mailto:refilda@sci.unand.ac.id)

**Abstract.** Strawberries are the most consumed fruits by people in the world. This fruit has a delicious taste and high nutritional content. But the shelf life of strawberries are very short due to their high susceptibility to tissue damage and infection from several types of phytopathogenic fungi during storage. The purpose of this study was to find out the right method to extend the shelf life of strawberries by adding sungkai leaf water extract to aloe vera gel edible coating. The study was conducted by varying the concentration of sungkai leaf extract added (0%, 30%, 50%, 70% and 90%) to aloe vera gel. Strawberries that have been coated with various compositions of coating materials were evaluated for their physicochemical properties in the range of storage time 0, 2, 4, 6 and 8 days which included fruit weight loss, percent spoilage, total dissolved solids and total antioxidant tests. The best coating results were obtained on the composition of aloe vera gel with 50% water extract of sungkai leaves. Strawberries coated with this material could be stored for 6 days longer than uncoated strawberries for 2 days with a decrease in fruit weight of 10.6%, percent spoilage of 11.1%, total dissolved solids value of 7.47°Brix, and total antioxidants of 0.28 mg AA/g FW.

**PAPER ID: 18309**





## **Application of hydroxyethyl cellulose and sodium alginate edible coating containing sungkai leaf extract (*Peronema canescens* Jack) to increase the shelf life of postharvest strawberries**

***Yefrida\*, M Fadhil, Refilda, Humaira***

*Chemistry Department, Faculty of Mathematic and Natural Sciences, Andalas University, Padang*

E-mail: [yefrida@sci.unand.ac.id](mailto:yefrida@sci.unand.ac.id)

**Abstract:** Strawberries have a high economic value, but are prone to spoilage. Edible coating is a method of combining functional compounds to maintain postharvest fruit quality parameters. This study aims to determine the effect of edible coating composite hydroxyethyl cellulose and sodium alginate with sungkai leaf extract on the shelf life and quality of postharvest strawberries and to determine the effect of variations in the concentration of sungkai leaf extract on the effectiveness of edible coating. Parameters tested were weight loss, decay index, total dissolved solids, and total antioxidant content. Edible coating HEC-SA with ethanol extract of sungkai leaf (HEC-SA/EE) showed the best effect in maintaining the freshness of strawberries during 8 days of storage based on their physicochemical properties. Variation of EE concentration 1:40; 1:30; 1:20 (w/v) did not give a significant difference in the effectiveness of edible coatings. These results indicate that the HEC-NA EE edible coating is able to maintain the quality and shelf life of postharvest strawberries.

**PAPER ID: 18350**





## Understanding The Traditional Knowledge of Picungan Bandeng, A Fermented Fish Food From Banten Province

*R O Khastini<sup>1</sup>, N Maryani<sup>1</sup>, S Haryati<sup>2</sup>, R Athifah Rahmah<sup>1</sup>, A Sa'ban<sup>1</sup>, H Aisyah<sup>1</sup>, T N Fadhilah<sup>2</sup>, S Nadia<sup>2</sup>*

<sup>1</sup>*Department of Biology Education, Faculty of Teacher Training and Education. Universitas Sultan Ageng Tirtayasa*

<sup>2</sup>*Department of Fisheries, Faculty of Agriculture, Universitas Sultan Ageng Tirtayasa*

Email: [rida.khastini@untirta.ac.id](mailto:rida.khastini@untirta.ac.id)

**Abstract.** Picungan bandeng is a traditional fermented food prepared by milkfish, mixed with salt and picung (*Pangium edule*) kernel as a primary ingredient. The food is original and popular among the traditional people from Serang, Banten Province, Indonesia, as the unique taste is produced by the fermentation process. This study aims to gain a better understanding of traditional knowledge of the picungan bandeng production process and a descriptive overview of common uses and a derivative product of picungan bandeng. According to the findings, the methods were first developed to preserve the fish for a period of time. They evolved traditional knowledge, which was transmitted orally by communities among generations. Smallholder production of picungan bandeng is observed to have socioeconomic and nutritional needs. The uses of picungan bandeng in main dishes and derivative products as side dishes are explored. This fundamental knowledge serves as a basis for additional scientific studies to further investigate picungan bandeng fermentations for commercial production on an industrial scale

**Paper ID: 18385**





## **Purification of Pecan Shell Liquid Smoke Using the Distillation Method to Separate Polycyclic Aromatic Hydrocarbons (PAHs)**

*R Hasibuan\*, F B S Pane, M A Sianipar, and R Fazillah*

*Department of Chemical Engineering, Universitas Sumatera Utara, Medan, Indonesia*

Email: Rosdanelli@usu.ac.id

**Abstract.** Pecan (*Carya illinoensis*) is one of the macadamia nuts that is used as a source of oil and spices. Its shell is an organic waste that is not utilized optimally. Pecan shells can be the raw material to produce liquid smoke to minimize waste. Liquid smoke obtained from the pyrolysis pecan shell contains antibacterial and antioxidant compounds. Liquid smoke purification is performed to remove polycyclic aromatic hydrocarbons (PAHs) and tar to obtain clear yellow liquid smoke. The purification is carried out by a distillation process with temperature variations of 150 °C, 175 °C, and 200 °C. The distillation process time is varied by 30, 60, and 90 minutes. The quality of liquid smoke is determined by the content of phenols, acids, and carbonyls. The best phenol content of 15.53% was obtained at a temperature of 175 °C for 90 minutes. The acid content was obtained by 7.65% at a temperature of 175 °C for 90 minutes. As for the carbonyl content, it produces 14.44% at a temperature of 125 °C for 60 minutes. liquid smoke at 175°C for 90 minutes produces grade 1, grade 2 at 200°C for 30 minutes, and grade 3 at 200°C for 90 minutes.

**Paper ID: 18455**





## Comparative Analysis of Volume and Growth Trends of Grain Production and World Population

**A P Darmanyan<sup>1</sup>, Sch Maignan<sup>2</sup>, S I Bogdanov<sup>1</sup>, O V Novoselova<sup>2</sup>, D E Kucher<sup>3</sup> and A. M., Abdelraouf<sup>3,4</sup>**

<sup>1</sup>Volgograd State Agrarian University, 26 University Avenue, 400002, Volgograd, Russia

<sup>2</sup>Moscow State University of Civil Engineering, 26 Yaroslavskoye Shosse, 229337, Moscow, Russia

<sup>3</sup>Department of Environmental Management, Institute of Environmental Engineering, People's Friendship University of Russia (RUDN University), 6 Miklukho-Maklaya St, Moscow, 117198, Russian Federation

<sup>4</sup>National Authority for Remote Sensing and Space Sciences, 23 Joseph Tito, El-Nozha Elgedidah, Cairo, Egypt

Email: [Schubert.maignan@gmail.com](mailto:Schubert.maignan@gmail.com)

**Abstract.** The methodology of their use in dimensionless form by means of the values  $Y = Y(t)/Y(t_0)$ , which represent the ratio of the real value of the examined value of the current year  $Y(t)$  to the value of this value in 1961  $Y(t_0)$ , was proposed for the World Bank data on the world population statistics and the volume of grain production by the world countries for the period 1961-2021. Based on the analysis of dimensionless time series  $Y$  we found mathematical models of the growth of world population and the growth of grain production. It is shown that during this period the world population growth was linear, and the world grain production growth was non-linear quadratic dependence, and the grain production growth rate for the period 1961-2020 exceeded almost 1.6 times the world population growth rate. Using the Pareto principle 13 countries of the world have been identified, which in 2020 provided 80% of the total volume of grain production in the world, and among these countries such four countries as China, United States, India and Europe gave 55% of the total volume of grain production in the world. It is concluded that if the future trend of the volume of grain production in the world exceeds the growth rate of the world population, such foodstuffs as grain and bread will be enough, provided they are distributed fairly.

**Paper ID: 18456**





## Development of Arabica Coffee Fermentation Using Yeast Starter

*D Mardhatilah<sup>1</sup>, F Padama<sup>1</sup> and Ngatirah<sup>1</sup>*

*<sup>1</sup>Department of Agricultural Product Technology, Institut Pertanian STIPER*

Email : [dina@instiperjogja.ac.id](mailto:dina@instiperjogja.ac.id)

**Abstract.** The aim of this study was to determine the effect concentration of yeast and determine the variation of fermentation time on the chemical and organoleptic green bean process using full wash method. The experiment used randomized complete block design with two factors. The first factor was the concentration of yeast in three levels, A1 (1%), A2 (3%), A3 (5%). The second factor was fermentation time, B1 (18 hours), B2 (24 hours) and B3 (30 hours). The concentration of yeast and fermentation time had significant effect on the reduce acidity, and sweetness. Fermentation time 30 hours had significant effect on reducing sugar and caffeine. Based on the organoleptic test using specialty coffee association of America (SCAA), the highest score is at a concentration 3% yeast and fermentation time 24 hours has a score of 7.18.

**Paper ID: 18460**





## Modifying the Particle Density of Cocoa Powder Using Puffing Method

**G Supriyanto<sup>1</sup>, S Achadiyah<sup>1</sup>, B Rahardjo<sup>1</sup>, T Suparyanto<sup>2</sup>, J P Trinugroho<sup>2</sup>, B Pardamean<sup>3</sup>**

<sup>1</sup>Faculty of Agricultural Technology, STIPER Institute of Agriculture Yogyakarta, Indonesia 55282

<sup>2</sup>Bioinformatics & Data Science Research Center, Bina Nusantara University Jakarta, Indonesia 11480

<sup>3</sup>Computer Science Department, BINUS Graduate Program - Master of Computer Science Program, Bina Nusantara University, Jakarta, Indonesia 11480

E-mail: [joko.trinugroho@binus.edu](mailto:joko.trinugroho@binus.edu)

**Abstract.** Cocoa consumption is often linked to the health of consumers as the flavanols contained in cocoa have several benefits for the human body. However, cocoa consumption in Indonesia is still considered low. Efforts to improve the production and quality improvements of cocoa need to be accompanied by an increase in chocolate consumption in the country. One main drawback of beverage product that contains cocoa powder is that the cocoa powder precipitates easily, which can reduce the taste and health benefits of cocoa powder. Hence, this research aims to develop a technique to increase the buoyancy of cocoa powder in beverages so that it can be evenly distributed in the liquid. This study used cocoa powder products which are available in the market (Windmolen and van Houten brands). The water content of cocoa powder was measured using the gravimetric method. The puffing chamber with pressure control was made from a cylindrical tube. Sensory test (preference test) of the cocoa powder samples were performed, based on several parameters, including colour, aroma, and taste were analysed. Furthermore, statistical analysis was performed on the data obtained from the sensory test. Our results showed that the cocoa powder which had been in the puffing chamber had a decrease in density. Furthermore, the cocoa powder samples undergoing the puffing process with higher pressure and longer time had a lower moisture content. In addition, the statistical analysis showed that the puffing process did not significantly affect the preference for the taste of cocoa powder. Overall, the puffing technique decreased the density of cocoa particles, so the particles would be distributed in the liquid evenly.

**Paper ID: 18464**





## The Effect of Immersion of Seaweed *Eucheuma Cottonii* on Physicochemical Carrageenan Flour

*I A Nur<sup>1\*</sup>, A B Tawal<sup>2</sup>, M Asfar<sup>1</sup>*

*<sup>1</sup>Department of Agricultural Technology, Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia.*

E-mail: [ismaauliah28@gmail.com](mailto:ismaauliah28@gmail.com)

**Abstract.** Carrageenan is known to have high potential in the food and non-food fields. In the food sector, carrageenan is used as a gelling agent and thickener. The most common problem faced by seaweed farmers is that they have not been able to optimize the processing of seaweed after harvesting, the seaweed tends to leave a lot of salt crystals after drying due to the absence of the immersion process before making carrageenan. The purpose of this study was to determine the physicochemistry of *Eucheuma cottonii* carrageenan in the non-immersion method and the aquadest immersion method. Before extraction, the seaweed was compared without immersion and with aquadest immersion for 24 hours. The extraction process was carried out using 8% potassium hydroxide and then observed the physicochemical properties of carrageenan. The results showed that the physicochemical properties of carrageenan were shown in the immersion method with a water content of 9.11%, yield of 41,96%, and viscosity of 157,33cP.

**Paper ID: 18466**







## **Comparison of Virgin Coconut Oil (VCO) Quality With Fermentation and Centrifugation Methods From Genjah and Hybrid Variety of Coconut Based on Indonesian Local Environment Resources**

***M Nurminah<sup>1\*</sup>, L M Lubis<sup>1</sup> dan R M Munthe<sup>1</sup>***

*<sup>1</sup>Department of Food Technology, Faculty of Agriculture, Universitas Sumatera Utara, Medan 20155, Indonesia*

E-mail: [miminurminah@usu.ac.id](mailto:miminurminah@usu.ac.id)

**Abstract.** VCO is one of the processed products made from old coconut which is obtained by extracting the flesh of the fruit. VCO has many advantages compared to other oils and has many ingredients that are beneficial for the health of the body. In this study, the manufacture of VCO using the method of fermentation and centrifugation. The raw material used is fresh old coconut which consists of 2 varieties, from Indonesian local environment resources (namely genjah coconut variety Serdang Bedagai Regency and hybrid variety from Asahan Regency). This study aims to compare the quality of VCO with fermentation and centrifugation methods of genjah and hybrid varieties of coconut through analysis of water content, free fatty acid peroxide number and iodine number. The results obtained are the manufacture of VCO by centrifugation method has a better quality than the fermentation method. Data analysis of VCO quality testing with centrifugation method has met SNI including water content, free fatty acid, peroxide number and iodine number. While the VCO with the fermentation method, in testing the water content and free fatty acids there are those that do not meet SNI but still meet APCC standards. Based on coconut varieties, hybrid VCO varieties have better quality than genjah maturing varieties

***Paper ID: 18472***





## The Effect Of Provisioning Snakehead Fish Nugget On Haemoglobin (Hb) And Albumin Levels In Breastfeeding Women In Medan

*R R Simanjuntak<sup>1</sup>, G Siahaan<sup>1\*</sup>, U Sihotang<sup>1</sup>, T L Bakara<sup>1</sup>*

*<sup>1</sup>Lectures of Health Polytechic Ministry of Medan, Departement of Nutrition*

E-mail: [ginzsiahaan@gmail.com](mailto:ginzsiahaan@gmail.com)

**Abstract.** Lack of nutrient intake in breastfeeding mothers can interfere the formation of red blood cells so the Hb and albumin levels in mother are lower than normal values. Mothers who experience a lack of red blood cells (anemia) can cause lack of nutrient intake that is channeled through breast milk. Lack of nutrition in mother will have an impact on mother and baby health. This study aims to determine the effect of giving snakehead fish nuggets on Hb and albumin levels in breastfeeding mothers in the Mandala Health Center Work Area, Medan City. Methods: This research was conducted in working area of the Mandala Public Health Center, Medan City from 03 until 29 February 2020. This type of research was a quasi-experimental design with a pre and post test one group. The population in this study were all breastfeeding mothers who had children under five years old. The sample was selected through the determination of inclusion criteria and obtained as many as 31 samples. Nugget was given for 24 days, while data on hb and blood albumin were taken before and after treatment (snakehead fish nuggets). Analysis of the data using the T dependent test after testing normality of the data with Kolmogrov Smirnov test. The results showed that there was an effect of giving snakehead fish nuggets on Hb and blood albumin levels with a value of ( $p=0.001$ ). There was an effect of giving treatment snakehead fish nugget. Meanwhile, based on the percentage, the normal Hb level before treatment was 61%, increasing to 84%, while normal albumin results were found before treatment by 71%, increasing to 93%.

**Paper ID: 18476**





## Optimization of Pectin Extraction From Cacao Pods by Microwave Assisted Extraction (MAE) Using Response Surface Methodology (RSM)

*R Wulandar<sup>1</sup>, N E Suyatma<sup>1</sup>, F S Budi<sup>1</sup>, R R Utam<sup>2</sup>*

<sup>1</sup>*Department of Food Science and Technology, IPB University, Bogor, Indonesia*

<sup>2</sup>*ATK Polytechnic, Ministry of Industry, Yogyakarta, Indonesia*

E-mail: [wulandarirahayu@apps.ipb.ac.id](mailto:wulandarirahayu@apps.ipb.ac.id)

**Abstract.** Cacao pods are the main waste of cacao processing that contains pectin. Pectin can be used as an emulsifier, elastic agent, coating agent, stabilizer, lecithin substitute, and texturizer in food products. The extraction of pectin from cacao pods was carried out by MAE method using citric acid as a solvent. This study aims to determine the most appropriate optimum conditions from determined parameters of solvent pH and solvent-to-substrate (L/S) ratio using RSM with yield as a response. There are two phases in this research, namely the preparation of cacao pod powder and pectin extraction from cacao pod powder with variations in pH and L/S ratio of each 1.0; 1.5; 2.0 and 15:1; 20:1; 25:1 (v/w). The results of this study indicate that pectin extraction optimum conditions were obtained at pH 2.0 and L/S ratio 21.57:1 (v/w) with a yield of 3.51%. Then, the extracted pectin under optimum conditions was characterized for its water content and degree of esterification, which was compared with the commercial pectin. This study also shows that the MAE technique is a potential and effective extraction method to be applied on a larger scale because it can shorten the extraction time with fewer requirements for solvent.

**Paper ID: 18477**





## Characterization of The Addition of Crude Extract of Yellow Pumpkin (*Cucurbita maschata*) as a Natural Coloring Agent in Seaweed Wet Noodles

*M B T A Bungsu<sup>1\*</sup>, M M Tahir<sup>1</sup>, Zainal<sup>1</sup>, Rahmaniar<sup>2</sup>*

<sup>1</sup>Department of Agricultural Technology, Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia.

<sup>2</sup>Departemen of Agroindustri, Pangkep State Polytechnic of Agriculture (Polipangkep), Pangkep, Indonesia.

E-mail: [musiahawangbungsu76@gmail.com](mailto:musiahawangbungsu76@gmail.com)

**Abstract.** The use of pumpkin as a food ingredient can also support government programs in an effort to diversify food consumption that is diverse, nutritious and balanced. Besides containing carbohydrates, pumpkin is also rich in vitamins, especially vitamins A and C which are antioxidants that are beneficial for health. The content of carotenoids in pumpkin such as beta-carotene reached 1187.23 g/g. The content of -carotene contained in pumpkin can also replace the use of dye (methanil yellow) in the process of making seaweed wet noodles. This research was conducted to determine the effect of solvent concentration and extraction time using the Microwave Assisted Extraction (MAE) method using ethanol with solvent concentrations of 75%, 85% and 95%. The time used is 30 minutes, 60 minutes and 90 minutes. Parameters observed were pumpkin powder moisture content, color of pumpkin extract, antioxidant activity, yield of pumpkin extract and density of pumpkin extract. This research was conducted 3 times replication. The results of the study showed that the extraction using the Microwave Assisted Extraction (MAE) method resulted in a moisture content of 11%, a pumpkin powder extract color of 65.56 (b\*), antioxidant activity of 63.45 (µg/mL), a yield of 63.58%, and a density of 48.41g./cm<sup>3</sup>

**Paper ID: 18478**





## Physical Auality Analysis and Proximate Test of Cookies With Belor Flour Substitution (EEL and Moringa leaf) as a Snack

*R Oppusunggu<sup>1</sup>, M Manalu<sup>1\*</sup>, N Suhart<sup>2</sup>, S A Aulia<sup>2</sup>*

*<sup>1</sup>Lecturer of the Health Polytechnic of the Ministry of Health of Medan*

*<sup>2</sup>Students of the Bachelor of Applied Science of Nutrition and Dietetics at the Health Polytechnic of the Ministry of Health of Medan*

*\*E-mail: [mincumanalu78@gmail.com](mailto:mincumanalu78@gmail.com)*

**Abstract.** Background :Snacks are food that are consumed between main meals. One of the foods that is very well known and has the potential to be used as a snack that is rich in nutrition is cookies. Cookies is savory food product made by a mixed roasting process made from wheat flour, fat, where generally cookies have a small size and generally have a sweet taste and crunchy texture. Destination :to determine the analysis of the physical quality and chemical quality of cookies with belor flour substitution (eel and Moringa leaves) as a snack. Method :This research is experimental by using a Completely Randomized Experimental Design (CRD), with 3 (three) treatments and 2 (two) repetitions, namely eel flour 15 g, 10 g, and 5 g and Moringa leaf flour 15 g, 10 g, and 5 grams. Results :The results of the physical quality test showed that the most preferred cookies in terms of color, aroma, texture, and taste were eel flour 5 grams and Moringa leaf flour 5 grams. And the results of chemical quality include ash content of 1.86%, water content 4.47%, carbohydrates 42.5%, total fat 23.9%, crude fiber 22.8%, and protein 4.47% and energy 402.9 kcal. Conclusion :The most preferred cookies are the addition of 5 grams of eel flour and 5 grams of Moringa leaf flour.

**Paper ID: 18482**





## **Effect of various packaging and storage time on the physicochemical characteristics of Gayo Arabica coffee processed with full-washed method**

***H Sinaga\*, T Karo-Karo, M Nurminah, A Hilman and A E Sitanggang***

*Departement of Food Science and Technology, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

\*E-mail: [\\*hotnida@usu.ac.id](mailto:hotnida@usu.ac.id)

**Abstract.** This study uses Gayo Arabica coffee which is known as one of the best quality coffee producers. This study examines the physicochemical characteristics of Gayo Arabica coffee with the fullwash processing method which is stored for 4 months in several types of packaging, namely Grain Pro, Aluminum Foil, Plastic sack, Fabric cloth sack, and Ramie sack. Green bean coffee test parameters were specific volume, color (oHue), cupping test, moisture content, ash content, fat content, protein content, caffeine content, total phenol and pH. During storage, the moisture content, pH and protein content increased in value, while the ash content, fat content, caffeine content and total phenol decreased. Coffee plantations in Indonesia are very wide, so that the plants will certainly have a positive impact on the surrounding environment and support biodiversity. Further research can be done by extending the shelf life and knowing the impact of packaging on the quality of Arabica coffee.

***Paper ID: 18503***





## **Antimicrobial Activity of Lactic Acid Bacteria From Fermented Palm Sap Against The Growth of Escherichia Coli and Staphylococcus aureus**

***R Efendi\*, Rahmayuni, E Rossi, Y Zalfiatri***

*Agricultural Technology Department, Agricultural Faculty, Universitas Riau, Jalan Bina Widya Kampus Bina Widya, Pekanbaru-Riau 28292, Indonesia*

E-mail: rahmayuni@lecturer.unri.ac.id

**Abstract.** Lactic Acid Bacteria have been isolated from fermented palm sap. The purpose of this study was to use the well diffusion and disc diffusion methods to ascertain the antibacterial activity of Lactic Acid Bacteria (LAB) from fermented palm sap against pathogenic bacteria, Escherichia coli, and Staphylococcus aureus. The study demonstrated that the LAB isolates (Lactobacillus A1, A6, B12, C1 and C4) and cell-free supernatants of Escherichia coli FNCC-19 and Staphylococcus aureus FNCC-15 had antibacterial activity. The antimicrobial activity of LAB using a cell with inhibition zone diameter against Escherichia coli FNCC-19 ranged from 8.03 to 10.58 mm and the diameter of inhibition zone Staphylococcus aureus FNCC-15 ranged from 9.13 to 11.16 mm. The antibacterial activity of LAB employing Escherichia coli FNCC-19 cell-free supernatant ranged from 4.59 to 5.01 mm, and diameter of inhibition zone against Staphylococcus aureus FNCC-15 ranged from 4.34 to 5.79 mm. From this result LAB isolates from fermented palm sap has potential as a probiotic.

***Paper ID: 18518***





## Support Vector Machine and Shapley Additive Explanations For Food-Insecure Incidence in East Java

*M D Saputra<sup>1</sup>, A F Hadi<sup>2</sup>, B Sartono<sup>3</sup>, E Ramadhan<sup>4</sup>, A F Zulva<sup>1</sup>*

*<sup>1</sup>Department of Mathematics, University of Jember, Jember, 68121, Indonesia*

*<sup>2</sup>Data Science Research Group, Department of Mathematics, University of Jember, Jember, 68121, Indonesia*

*<sup>3</sup>Department of Statistics and Data Science, IPB University, Bogor, 16680, Indonesia*

*<sup>4</sup>Department of Statistics, Syiah Kuala University, Aceh, 23111, Indonesia*

E-mail: [afhadi@unej.ac.id](mailto:afhadi@unej.ac.id)

**Abstract.** The sustainable development goals (SDGs) that have been adopted by countries in the world have a significant impact on national development planning in Indonesia until 2030. One of the goals is zero hunger. Analysis of food insecurity events has a very important contribution to achieving the goal. This study utilizes a supervised machine learning model for excellence in accuracy, namely the Support Vector Machine. However, the model made is difficult to enjoy. The Shapley Additive Explanation (SHAP) methodology is able to assist in analyzing the contribution of each complex predictor variable. the contribution of each predictor variable provides a different estimation value if the samples used are different, using a bootstrap confidence interval. This study applies the methodology to uncover 24 predictor variables that are useful for food insecure households. We use the 2021 national socio-economic survey data produced by the Central Statistics Agency. From the research that we have done, we obtained the best SVM model using the linear kernel function with parameters C 200. the model produces an AUC value of 0.78. the results of the SHAP methodology and bootstrap trust, the five most highly based on the basis of food insecure households are amount of savers, head of household education, age's head of household, cooking fuel, and floor types

**Paper ID: 18527**







## Bioactive compounds in tinuktuk, Simalungun traditional food

***N Tarigan<sup>1</sup>, E Juliant<sup>1</sup>, J Silalah<sup>2</sup>, H Sinaga<sup>1</sup>***

*<sup>1</sup>Department of Food Science and Technology, Faculty of Agriculture, University of North Sumatra, Medan, North Sumatra 20155, Indonesia*

*<sup>2</sup>Department of Pharmaceutical Chemistry, Faculty of Pharmacy, North Sumatera University, Medan 20155, Indonesia;*

*\*E-mail: [tarigannovriani@gmail.com](mailto:tarigannovriani@gmail.com)*

**Abstract.** Tinuktuk is a traditional food of the Simalungun community, usually given to mothers who have just given birth and are breastfeeding. Based on antioxidant analysis, it is known that the 3 best formulations are T3, T4 and T5 formulations. The purpose of this study was to analyze the bioactive compounds in traditional Simalungun food ingredients, namely formulations T3, T4 and T5. The materials used in the T3 formulation are 15 types, T4 are 11 types and T5 are 11 types. All ingredients were processed according to the formulation recipe in order to obtain tinuktuk T3, T4 and T5. Tinuktuk is then extracted using warm water, then analyzed for flavonoids and phenolics using the spectrophotometric method, while the levels of alkaloids and saponins using the gravimetric method. The results obtained were the highest levels of flavonoids, phenolics, alkaloids and saponins were in the T4 formulation. The difference in the number of ingredients used in the T3, T4 and T5 formulations is actually not much different, the possibility that distinguishes the results of this analysis is the processing technique. Further research needs to be done to standardize processing techniques, namely the temperature and time of roasting for the ingredients for making tinuktuk.

***Paper ID: 18528***





## Antioxidant, total phenolic content, and physicochemical properties of modified cassava flour

*Y Khasanah<sup>1,2, \*</sup>, A W Indrianingsih<sup>2</sup>, P Triwitono<sup>1\*</sup>, Agnes Murdiati<sup>1</sup>*

*<sup>1</sup>Faculty of Agricultural Technology, Universitas Gadjah Mada*

*<sup>2</sup>National Research and Innovation Agency, Research Center for Food Technology And Processing*

Email: [yuniar.khasanah@gmail.com](mailto:yuniar.khasanah@gmail.com); [triwitono@ugm.ac.id](mailto:triwitono@ugm.ac.id)

**Abstract.** This study aimed to evaluate antioxidant activity, phenolic content and nutritional properties of yellow cassava variety called Adira. Sample was freeze dried cassava (cassava); oven dried cassava (cassava flour and modified cassava flour (mocaf). Antioxidant properties of the extracts evaluated using a DPPH (2,2-diphenyl-1-picryl-hydrazyl) assay, phenolic content using the Folin-Ciocalteu method. Nutritional properties such as water, ash, protein, lipid, and carbohydrate were analyzed. Antioxidant activity ranged for for 73.69% to 74.34% at 800 ppm and in line with phenolic content mocaf had the highest of total phenolic content of 3.46 mg/g GAE. Carbohydrate was the major component (> 85%) and lower content of protein (1.44 % - 2.41 %), ash (2.21 % - 2.85 %) and lipid (0.04 % - 0.10 %). Functional groups from Fourier Transform Infrared Spectroscopy (FTIR) analysis showed the presence of OH group that was possibly generated from several bioactive compounds such as phenolic and flavonoid constituents.

**Paper ID: 18529**





## Color Stability of Anthocyanin Extract from Wastewater of Purple Sweet Potato Starch Processing

*E Julianti<sup>1,2\*</sup>, Ridwansyah<sup>1,2</sup>, and E. Yusraini<sup>1,2</sup>*

<sup>1</sup>*Department of Food Science Faculty of Agriculture Universitas Sumatera Utara, Medan, Indonesia*

<sup>2</sup>*Centre for Tuber and Root Crops Study Faculty of Agriculture, Universitas Sumatera Utara*

E-mail: [elisa1@usu.ac.id](mailto:elisa1@usu.ac.id)

**Abstract.** This research aimed to investigate the compositions and color stability of anthocyanin extract from wastewater of purple sweet potato (PSP) starch processing. The PSP starch was extracted by using sodium metabisulphite, sodium chloride and distilled water. The wastewater from PSP starch extraction was then filtered and 1 L of filtrate was concentrated to 500 mL in a rotary evaporator at 55 °C. The anthocyanin extract from wastewater of PSP starch processing were investigated in order to evaluate its utilization potential as pigment source of food products. The total anthocyanin content, antioxidant activity, and color stability as affected by storage temperature, heat, pH, concentration of sugar and salt, and light were evaluated. Results showed that the anthocyanin content, antioxidant activity and stability of wastewater of PSP starch processing were influenced by the isolation agent of starch extraction. The highest anthocyanin content, antioxidant activity and color stability were found in wastewater from starch extraction by sodium metabisulphite. The color of wastewater from PSP starch extraction by sodium metabisulphite had good stability during 15 days of storage at room temperature in dark, and kept stable at pH 3.0 – 9.0, 10-50% and 10-30% of sugar and salt concentration respectively, and heated at 100°C for 15 min.

**Paper ID: 18531**





## Physicochemical and organoleptic characterization of dried tapioca noodles with sorghum-moringa substitution

*R S Hamidah<sup>1</sup>, N F Sadek<sup>1</sup>, I A Murwan<sup>2</sup>*

<sup>1</sup>*Department of Food Technology, Bina Nusantara University*

<sup>2</sup>*BBS Master Program, Faculty of Creative Marketing, Bina Nusantara University, Jakarta, Indonesia, 11480*

Email: [nur.fathonah@binus.ac.id](mailto:nur.fathonah@binus.ac.id)

**Abstract.** Research on the formulation of functional dried tapioca noodles with sorghum and moringa leaf substitution aims to support stunting management programs. Sorghum and moringa leaf were chosen because they are rich in macro- and micronutrients, bioactive components, and have been reported to improve nutritional status. Both of these materials are also widely cultivated. In this research, four types of dry noodle formulations will be made based on the basic mixture composition, namely the ratio of tapioca flour and sorghum flour, each of 80:20 (S2T8); 70:30 (S3T7), 60:40 (S4T6), and 50:50 (S5T5). Five percent of moringa leaf flour was added into formulation. The Moringa leaf flour added is 5%. The dried noodles are then analyzed for their physical characteristics, cooking quality (water absorption, volume increase, and cooking loss), and sensory acceptance using a hedonic test. Increased sorghum proportion resulted in increased yellowness and cooking loss, as well as decreased in elongation, hardness, and overall acceptance of the product. Using de Garmo effectiveness index calculation, it is known that the S2T8 sample showed the best performance.

**Paper ID: 18534**





## The calcium oxalate levels, glucomannan levels, and the antioxidative activity of *Amorphophallus oncophyllus* in different size of particle and the maceration of *Strobilanthes crispus*

**V Aprilia<sup>1\*</sup>, N Kusumawardani<sup>2</sup>, R Fauzi<sup>2</sup>, D Estiningsih<sup>2</sup>, D Kusumawati<sup>2</sup>**

<sup>1</sup>Department of Nutrition, Universitas Alma Ata, Jl. Brawijaya 99, Yogyakarta 55183, Indonesia

<sup>2</sup>Department of Pharmacy, Universitas Alma Ata, Jl. Brawijaya 99, Yogyakarta 55183, Indonesia

Email: [verianiapriliana@almaata.ac.id](mailto:verianiapriliana@almaata.ac.id)

**Abstract.** Porang (*Amorphophallus oncophyllus*) is an Indonesian local tuber that is high in glucomannan. The use is limited because of the calcium oxalate content. However, there was found that maceration of porang with ethanolic extract of *Strobilanthes crispus* could reduce it. This study aimed to know the effect of a combination treatment of sieving and maceration of porang with ethanolic extract of SC on the calcium oxalate levels, glucomannan levels, and antioxidant activity. Calcium oxalate levels were analyzed by the atomic absorption method, whereas glucomannan levels were determined from the yield of glucomannan from the ethanolic extraction process. The selected porang was then examined for their antioxidant activity using DPPH (1,1-diphenyl-2-picrylhydrazyl). Porang was divided into 6 groups based on the size of the particle and the maceration. Those were AX (particle size of <40 mesh; maceration of X brand SC), AY (particle size of <40 mesh; maceration of Y brand SC), AN (particle size of <40 mesh; no maceration), BX (particle size of >40 mesh; maceration of X brand SC), BY (particle size of >40 mesh; maceration of Y brand SC), BN (particle size of >40 mesh; no maceration). The results showed that porang with a particle size of <40 mesh and macerated with SC had lower calcium oxalate levels, but higher glucomannan levels than that with a particle size of >40 mesh. The antioxidant activity showed a decrease in the treatment of maceration with ethanolic extract of SC.

**Paper ID: 18539**





## Characterization, Phytochemistry Screening and Acute Toxicity of *Allium cepa* fermented

**A S Rohani<sup>1\*</sup>, S N Rudang<sup>1</sup>, R N Daulay<sup>1</sup>, T I Hanum<sup>2</sup> and N A Juwita<sup>2</sup>**

<sup>1</sup>Department of Pharmacology, Faculty of Pharmacy, Universitas Sumatera Utara, Tri Dharma No. 5 Kampus USU, Medan, Indonesia Republic-20155.

<sup>2</sup>Department of Pharmaceutical Technology, Faculty of Pharmacy, Universitas Sumatera Utara, Tri Dharma No. 5 Kampus USU, Medan, Indonesia Republic-20155.

\*E-mail: [adesrirohani@usu.ac.id](mailto:adesrirohani@usu.ac.id)

**Abstract.** The health benefits of *Allium cepa* are obtained through consumption directly or as preparations from the extraction and characterization of *Allium cepa*. The benefit could be obtained through *Allium cepa* processing using fermentation technique. This study aimed to obtain standardized fermented onion extract as raw material for medicinal preparations. In addition, this study determined the different content of secondary metabolites of unfermented and fermented *Allium cepa* then the acute toxicity test was carried out to know the LD<sub>50</sub> of *Allium cepa* fermented extract. Fermentation was done by saving the *Allium cepa* in a fermentation machine for 15 days at a temperature of 50-80°C. *Allium cepa* fermented was extracted by maceration using ethanol. *Allium cepa* fermented extract was characterized and tested for phytochemical screening. The characterization results showed the total ash content of *Allium cepa* fermented extract was 3.47%; acid insoluble ash content 0.39%; water soluble extract content 15.51%; and ethanol soluble extract content of 18.14%. The phytochemical screening showed that the unfermented *Allium cepa* extract contained Alkaloids, Flavonoids, Saponins, Glycosides, and Triterpenoids while the *Allium cepa* fermented extract contained Flavonoids, Glycosides, and Triterpenoids. The LD<sub>50</sub> of *Allium cepa* fermented extract was included as the preparations with a toxicity level of 6 (non-toxic). It showed that *Allium cepa* fermented extract has a stability-tested extract and included non-toxic criteria.

**Paper ID: 18540**





## **Analysis of Antioxidant Activity of Balakka Barks And Fruits (*Phyllanthus emblica*) From South Tapanuli**

**S Addina<sup>1\*</sup>, E S Harahap<sup>1</sup>**

<sup>1</sup>*Department of Food Technology, Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia*

E-mail: [syahiraaddina@usu.ac.id](mailto:syahiraaddina@usu.ac.id)

**Abstract.** Balakka (*Phyllanthus emblica* Linn.) is a plant that is often found in the South Tapanuli area, especially in the Padangsidimpuan district. The people of South Tapanuli consume ballaka bark as an addition to the dishes called "Holat". Balakka, especially the fruit part, has been widely studied to have various kinds of bioactivity that is useful for health such as antioxidants, antidiabetic, anticancer and others. Therefore, this study was conducted to determine the difference in antioxidant activity of the fruit and bark extracts of balakka which were extracted using different solvents that are polar (ethanol) and non-polar (N-Hexane) solvents. Antioxidant activity analysis was carried out by DPPH (1,1-diphenyl-2-picrylhydrazyl) method. The results showed that the different solvents used affected the antioxidant activity of the extract of the fruit and bark of balakka. The antioxidant activity of balakka fruit extracted using ethanol was greater than that of balakka fruit extracted using N-Hexane with an IC<sub>50</sub> of  $729.66 \pm 117.03$  ppm. Likewise, the stems extracted using ethanol were larger than the stems extracted using N-Hexane with an IC<sub>50</sub> of  $1830.23 \pm 656.54$  ppm. The conclusion of this study is that the different solvents used affect the antioxidant activity produced.

**Paper ID: 18545**





## Alcohol content and chemical characteristics of fermented beverages in Aceh Province-Indonesia

**M Muzaifa<sup>\*1,3</sup>, Y Abubakar<sup>1,3</sup>, Safrida<sup>2,3</sup>, C Nilda<sup>1</sup>, M Sapitri<sup>1</sup>**

<sup>1</sup>Departement of Agricultural Product Technology, Faculty of Agriculture, Universitas Syiah Kuala, Darussalam-Banda Aceh 23111, Indonesia

<sup>2</sup>Departement of Biology Education, Faculty of Teacher Training and Education Universitas Syiah Kuala, Darussalam-Banda Aceh 23111, Indonesia

<sup>3</sup>Halal Research Center, Universitas Syiah Kuala, Darussalam-Banda Aceh 23111, Indonesia

E-mail: [murnamuzaifa@unsyiah.ac.id](mailto:murnamuzaifa@unsyiah.ac.id)

**Abstract.** Kefir and kombucha are known as healthy functional drinks, but the issue of alcohol content still needs to be a concern. Although kombucha and kefir are not categorized as *khamr* (liquor), the Indonesian Ulema Council (MUI) Fatwa No. 10 of 2018 has stipulated that the alcohol content in fermented beverages is below 0.5%. This study aims to analyze the quality and alcohol content of kefir and kombucha produced by several producers in Aceh Province. A total of 12 samples of fermented beverages were obtained from kefir and kombucha producers. Parameters analyzed were alcohol content, total phenolic compound (TPC), pH and total soluble solute (TSS). The results showed that the alcohol content of the fermented beverage obtained ranged from 0.24-4%, TPC 0.15-1.4 mg GAE/ml, pH 2.6-4.47 and TSS 3-15 brix. As much as 50% of kombucha samples and 100% of kefir samples contain alcohol above 0.5%. It is necessary to control the alcohol content of fermented beverages so that they can meet sharia and health rules.

**Paper ID: 18559**







## Rheological and functional characteristics of starch and flour of Beneng Taro on different drying methods

*Jufrinald<sup>1</sup>, A B Sitanggang<sup>1</sup>, E Y Purwan<sup>2</sup>, Slamet Budijanto<sup>1\*</sup>*

<sup>1</sup>Department of Food Science and Technology, IPB University, Bogor 16680, Indonesia

<sup>2</sup>Research Center for Agroindustry, National Research and Innovation Agency, Indonesia

E-mail: [slamet.budijanto@gmail.com](mailto:slamet.budijanto@gmail.com)

**Abstract.** Beneng Taro is a type of taro found in Banten but has not been appropriately utilized and its uses are boiled or fried. The drying process in starch extraction and flour production is critical since temperature changes will result in various properties. This study aimed to compare the rheology and functional properties of starch and flour from Beneng Taro dried in the sunlight in the greenhouse and hot air with a cabinet drier oven. This research contains the extraction of starch from Beneng Taro, the production of Beneng flour, and characterizing the starch and flour produced. The Herschel-Bulkley model is suitable for describing the rheological properties of Beneng Taro flour and starch. The flow behavior index showed that the starch and flour had non-Newtonian shear-thinning flow properties. The difference in the consistency index value of flour is significant, where flour dried with sunlight shows a higher value. Both starch and flour show a sharp decrease in viscosity at low shear rates. The value of swelling power and solubility index of starch and flour showed that drying using a cabinet dryer was higher than drying in the sunlight. In contrast to water holding capacity and oil holding capacity, sun drying shows a higher value. Knowing the characteristics of the Beneng taro starch and flour produced can be applied as a food source.

**Paper ID: 18585**





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## Marine and Fisheries Science

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## Geochemical conditions of the seas of the northwestern Pacific and their reflection on the trace element composition of Pacific salmon

**A Litvinenko<sup>1,\*</sup>, N Khristoforova<sup>2,3</sup>, D Danilin<sup>4</sup> and V Tsygankov<sup>2</sup>**

<sup>1</sup>*Sakhalin State University, Kommunistichesky Prospekt 33, 693008 Yuzhno-Sakhalinsk, Russia*

<sup>2</sup>*Far Eastern Federal University (FEFU), Mordovtseva 12, 690922 Vladivostok, Russia*

<sup>3</sup>*Pacific Institute of Geography, Far Eastern Branch, Russian Academy of Sciences, Radio, 7, 690041 Vladivostok, Russia;*

<sup>4</sup>*Pacific Institute of Geography, Far Eastern Branch, Russian Academy of Sciences, Partizanskaya, 6, 683000 Petropavlovsk-Kamchatsky, Russia*

E-mail: [litvinenko.av@bk.ru](mailto:litvinenko.av@bk.ru)

**Abstract.** The content of trace elements Cu, Pb, Cd, Ni, Zn and Fe in Pacific salmon was determined in the work: salmon from the southeast coast of Sakhalin, collected in 2017, chum salmon from the Sea of Okhotsk and the Sea of Japan, collected in 2018-2019 in cages of salmon fish hatcheries and sockeye salmon collected from two bays of the southeastern coast of Kamchatka before entering the rivers, in 2021. It was established that the concentrations of Zn, Ni, and Fe noticeably predominate in the organs and tissues of cherry salmon and chum salmon from the Sea of Japan, while Cd and Pb concentrations predominate in the organs and tissues of the Sea of Okhotsk chum salmon. The largest amount of copper was found in the liver and ovaries of sockeye salmon from Kamchatka bays. According to the content of toxic elements (Pb and Cd), all types of salmon meet the sanitary requirements of the Russian Federation for seafood. Probably, the reason for the established difference is the geochemical environmental conditions formed in the closed Sea of Japan under the influence of anthropogenic and terrigenous factors, the influence of natural factors - volcanism and upwellings - in the Sakhalin-Kuril basin of the Sea of Okhotsk, as well as the increased background copper content in the soils of Kamchatka as a result of volcanic activities.

**Paper ID: 18284**





## Diversity, Distribution, and Conservation status of the World's Smallest Fish, Cyprinidae, *Paedocypris progenetica*

**N Hussin<sup>1</sup>, I A Azmir<sup>2,3\*</sup>, Y Esa<sup>4</sup> and A Ahmad<sup>5,6</sup>**

<sup>1</sup>Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM) Shah Alam, Selangor, 40450 Shah Alam, Selangor Darul Ehsan, Malaysia.

<sup>2</sup>School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM) Shah Alam, Selangor, 40450 Shah Alam, Selangor Darul Ehsan, Malaysia.

<sup>3</sup>EmiBio Special Interest Group, Faculty of Applied Sciences, Universiti Teknologi MARA (UiTM) Negeri Sembilan, Kampus Kuala Pilah, Pekan Parit Tinggi, Negeri Sembilan, Malaysia.

<sup>4</sup>Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, 43400 Serdang, Selangor Malaysia.

<sup>5</sup>School of Marine and Environmental Sciences, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu.

<sup>6</sup>Institute of Tropical Biodiversity and Sustainable Development, Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu.

E-mail: [izzati\\_adilah@uitm.edu.my](mailto:izzati_adilah@uitm.edu.my)

**Abstract.** *Paedocypris progenetica*, the smallest fish in the world is currently listed as near threatened by the IUCN Red List due to a large decline in the population. This condition exerts pressure on the *Paedocypris* populations. Thus, this study aims to examine the diversity, distribution, and conservation status of *Paedocypris* species in the study area. A total of 66 individuals were collected from February 2019 to September 2021 from three of four sampling locations surveyed, consisting of two species namely *Paedocypris progenetica* (TL: 6.63-12.50 mm) and *Paedocypris micromegethes* (TL: 8.89-10.60 mm). The results showed that *P. progenetica* was found at two sampling locations and had the higher local distribution (LD) of 50% followed by *P. micromegethes* (25%) which had the lowest distribution and was found only in one location. Furthermore, field measurement (in situ) of water quality in the blackwater peat swamp showed temperatures ranging from 23°C to 25.3°C while pH ranged from 2.3 to 2.5. Based on the IUCN Redlist data, *P. progenetica* is categorized as being near threatened. The population trend for the genus is declining due to continuing loss and degradation of blackwater peat swamp habitat which is considered to be the greatest threat to the survival of the *Paedocypris* species.

**Paper ID: 18365**





## **Bivalvia assemblage in the estuary and mangrove of Belawan Waters, North Sumatra**

***R A Harahap, T A Barus\* and H Wahyuningsih***

*Department of Biology, Faculty of Mathematics and Natural Sciences,  
Universitas Sumatera Utara, Medan, North Sumatra 20155, Indonesia*

E-mail: ternala@usu.ac.id

**Abstract.** Marine bivalves are aquatic organisms commonly found in the intertidal zone that frequently exposed to pollution and anthropogenic activities. The study aimed to determine the bivalvian diversity and its distribution pattern in Belawan Waters as one of the most polluted estuary area in North Sumatra. The study used purposive sampling in two sites, Site-1 was located at the mangrove forest and Site-2 was located at Bagan Belawan or human-exposed waters. The study documented seven species of bivalves with *Solen* sp. as the most abundant species (3.33 ind/m<sup>2</sup>) at Site-1 and *Hiatula sinensis* (7.44 ind/m<sup>2</sup>) at Site-2. The Shannon's diversity index ( $H'$ ) of bivalves in Belawan Waters was categorized as low in both sites. The pattern of *Atrina pectinata*, *Lingula anatina*, and *Placuna* sp. was randomly distributed while *Anadara granosa*, *Solen* sp., *Hiatula sinensis* and *Tellina exerythra* was clumped in the region based on the Morisita's index. Bivalve diversity index was correlated with physical and chemical characteristics of Belawan waters, including pH, COD, TSS, and PO<sub>4</sub>, while TDS, BOD<sub>5</sub>, DO, Substrate Organic Content, salinity, and temperature were negatively correlated to the diversity.

**Paper ID: 18492**





## Phytoplankton abundance and trophic status of Belawan Waters, North Sumatra

*T A Ginting, T A Barus\* and H Wahyuningsih*

*Department of Biology, Faculty of Mathematics and Natural Sciences,  
Universitas Sumatera Utara, Medan, North Sumatra 20155, Indonesia*

E-mail: ternala@usu.ac.id

**Abstract.** Belawan is a district of Medan City and one of estuary areas in North Sumatra. The present study aimed to analyze the abundance of phytoplankton and to assess the marine trophic status of Belawan waters in the context of possible eutrophication by anthropogenic activities. This study was conducted in October 2020 through water sampling in four sites, i.e. ship dock (Site-1), fishery (Site-2), mangrove forest (Site-3), and estuarine (Site-4). The phytoplankton abundance was calculated in a light microscope while the trophic status of Belawan waters was determined based on the trophical index for marine systems (TRIX) involving the eutrophication-related parameters: chlorophyll *a* content, oxygen saturation, nitrogen and phosphorus content. The phytoplankton abundance was obtained in the range of 15,983 ind/L at ship dock (Site-1) and 24,133 ind/L at fishery (Site-2). A strong indication of high fertility (eutrophic) at  $TRIX > 6.0$  was recorded from fishery (Site-2) and mangrove forest (Site-3) of Belawan waters. Some strategies are required to mitigate the presence of eutrophication in the natural site of Belawan waters.

**Paper ID: 18496**





## **Bioeconomic Analysis of Mackerel Resources Management (*Rastrelliger spp*) Landed at Tanjung Beringin's Auction Place Serdang Bedagai, Sumatera Utara**

***J S Hasibuan\*, M R Ramadan, Desrita, V R Manurung, P S Sabila***

*Departement of Management Aquatic Resources, Agriculture of Faculty, Universitas Sumatera Utara*

E-mail: [juliasyahriani.h@usu.ac.id](mailto:juliasyahriani.h@usu.ac.id)

**Abstract.** Mackerel (*Rastrelliger spp*) is one of the main catch fishery at Tanjung Beringin's Auction Place, Serdang Bedagai, Sumatera Utara. The purpose of this research is to estimate mackerel (*Rastrelliger spp*) resources potential with bioeconomic model for the sustainability of mackerel resources landed at Tanjung Beringin. This research was conducted in July – September 2021. The method of research used purposive sampling method. The surplus production method to estimate the Maximum Sustainable Potential (MSY) and the Gordon Schaefer Bioeconomic Model. The total sample fish of indian mackerel were 272 individuals. The research showed bioeconomic analysis with Schaefer's surplus production model approach shows that optimum production rate is 359 tons and the optimum effort is 12148 trips. The Mackerel resources indicates to be biologically overfishing.

***Paper ID: 18509***







## **Length and Weight Relationship, Condition Factors, and Growth Parameters of Gulamah Fish (*Johnius trachycephalus*) Landed at Tanjung Beringin's Fish Auction Place (TPI) Serdang Bedagai District, North Sumatera Province.**

***Desrita\*, J S Hasibuan, V R Manurung and J Sinaga***

*Department of Management, Faculty of Agriculture, Universitas Sumatera Utara*

Email : [desrita@usu.ac.id](mailto:desrita@usu.ac.id)

**Abstract.** Gulamah fish (*Johnius trachycephalus*) is a by-catch that is landed daily at Tanjung Beringin TPI Serdang Bedagai. This study aimed to determine the relationship between length and weight, condition factors, and growth parameters of Gulamah fish. The method used in this research is a survey method. The research was conducted in June-August 2022 at TPI Tanjung Beringin Serdang Bedagai. The total sample was 137 fish consisting of 65 male and 72 female fish. The results showed that the total length (TL) of Gulamah fish caught with gill nets ranged from 103-214 mm, with an average length of 155,74 mm. The weight of Gulamah fish ranged between 12,77-126,02 grams, with an average of 54,95 grams. The relationship between length and weight of Gulamah fish was positive allometric with the equation  $W=0.00001L^{3,15}$  ( $R^2 = 0,89$ ) in male fish and  $W=0,00001L^{3,09}$  ( $R^2 = 0,92$ ) in female fish. The range of the condition factor of Gulamah fish is 0,43-1,12. Growth curve *Von Bertalanffy* equation shows the equation  $L_t=234,4(1-EXP_{(-0,59(t+0,063)})}$  for male Gulamah fish and  $L_t=217,8(1-EXP_{(-0,33(t+0,058)})}$  for female Gulamah fish.

**Paper ID: 18520**





## **The effect of different planting distance on the growth Sargassum plagiophyllum using longline method cultivated in Bungin Permai coastal waters, South Konawe, Indonesia**

**Hardamin, La Ode M.Aslan\*, Wa Iba, Parhan, Harmin Hari, La Ode Aslin, Manat Rahim**

*Department of Aquaculture, Faculty of Fisheries and Marine Science, Halu Oleo University, Kendari 93232,  
Indonesia*

Email: [laodemaskan@uho.ac.id](mailto:laodemaskan@uho.ac.id)

**Abstract.** Planting distance, a distance between seaweed clumps, has become an important part of to increase growth for seaweed cultivation. However, there are very few studies related to the planting distance (PD) of *Sargassum plagiophyllum* done in Indonesia. In this study, three different PDs: 10 cm, 15 cm and 20 cm as treatments with 3 replications. The results showed that 20-cm PDs showed higher Daily Growth Rate (DGR) than those of other two treatments. In addition, low DGRs found in this study could be due to the close PD between the planted *Sargassum* clumps, so that when strong wave occurs the thallus between the clumps is entangled with each other. This condition resulted in the number of clumps of seeds being planted breaking up.

**Paper ID: 18549**





## **Growth of Seaweed *Kappaphycus alvarezii* cultivated along with *Sargassum plagiophyllum* using the long line method**

***Febri Setiawan, La Ode M. Aslan\*, Wa Iba, Yusnaini, Ruslaini Ongko, Muis Balubi***

*Department of Aquaculture, Faculty of Fisheries and Marine Science, Halu Oleo University, Kendari 93232, Indonesia*

E-mail: [laodemaslan@uho.ac.id](mailto:laodemaslan@uho.ac.id)

**Abstract.** The use of smaller seedling weights < 20 g) has never been done for cultivating *S. plagiophyllum*. On the other hand, the study of cultivation of both species *S. plagiophyllum* and *K. alvarezii* simultaneously had never been done previously. This research was conducted at Bungin Permai coastal waters, Konawe Selatan regency, South East Sulawesi, Indonesia. The aim of this research was to determine the best wet initial weight (10-, -15, -20 g) on the growth of of both species seaweed. The results showed that the daily growth rate (DGR) of all treatments tended not to differ significantly. The treatment of 10-g wet weight showed higher The ratio of fresh weight (FW) and dry weight (DW) showed no significant differences among treatments. For water quality, salinity, temperature, phosphate and turbidity all in normal range for seaweed cultivation.

***Paper ID: 18550***





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## Components of genetic of coffee leaf rust symptoms in genotypes of Arabica coffee (*Coffea arabica* L.)

*S Malau and M R Sihotang*

*Faculty of Agriculture, Universitas HKBP Nommensen, Jalan Sutomo 4-A, Medan 20234, Indonesia*

Email: [sabam.malau@uhn.ac.id](mailto:sabam.malau@uhn.ac.id)

**Abstract.** Coffee is a source of income for 100 thousand coffee farmers (households) in North Sumatra Province (Indonesia). Coffee leaf rust (CLR) caused huge loss in income and jobs in coffee producing countries recently. This study aimed to study genetic components of CLR in arabica coffee (*Coffea arabica* L.) genotypes. This experimental research was conducted in the experimental garden of the Faculty of Agriculture, Nommensen HKBP University in Medan. Seven genotypes were tested for its resistance. Randomized complete blocks design was used. The result revealed that Genotype V5 from Dairi District and V7 from Toba Samosir District had moderate and high resistance against CLR, respectively. Genotypic variation, genetic advance and heritability coefficient in leaf rust severity (LRS) were high. CLR symptoms were not correlated one another. Based on the high resistance of V7, genotypes performing high resistance may be found among arabica coffee populations in North Sumatra.

**Paper ID: 17628**





## Biodiversity of Paddy Insects in Northern Sumatera

**A Z Siregar<sup>1\*</sup>, H Erwina<sup>2</sup>, I T D Tjahjaningrum<sup>3</sup>**

<sup>1</sup>Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesian

<sup>2</sup>Faculty of Agriculture, Andalas University, Medan, Indonesian

<sup>3</sup>Faculty of Biology, Institute of Technology of Surabaya, Indonesian

Email : [ameilia@usu.ac.id](mailto:ameilia@usu.ac.id)

**Abstract.** Sustainable agricultural systems are influenced by several interrelated components, especially the component of biodiversity. Biodiversity and food security are related to four dimensions, namely: availability, accessibility, utilization and stability. The aim the study to determine mapping the diversity and functional roles of local insects in paddy plantation; and to knowing the interaction of environmental variables and agro ecosystem management practices that form ecosystem services. The research was done during July-August 2022 in Sei Beraskata Villages, which insects caught at each trap sample point were determined diagonally measuring 20 x 20 m totaling 3 plots each using 5 traps (Sweep Net=SN with 10 swings; Color Pan Trap=CPT with 4 replications; Core Sampler=CR with 4 replications; Yellow Sticky Trap=YST with 5 replications; and Light Trap=LT with 1 replication) at 4 times sampling with weekly intervals. The results obtained in this study showed that the highest individual abundance and diversity of insect species were identified from the use of YST traps (479 individuals from 47 species), followed by LT trap (288 individuals, 14 species) and SN trap (236 individuals, 36 species), while the smallest was identified from the CPT traps (66 individuals, 14 species). A total of 6 types of pests dominated, consisting of: Chironomus sp (421 individuals), followed by Anopheles sp (129), Tetragnatha sp (94), Leptocorisa oratorius (73), Chilo supressalis (42) and Nilaparvata lugens (39). While the 6 smallest species, consisting of Panstenon sp, Euscyrthus concinnus, Temelucha philippinensis, Hesperia sp, Gryllotalpha orientalis and Thomisius sp. The calculation of the value of the Biology index consists of the Richness index ( $R1 = 2.70-3.25$ ), the evenness index ( $E = 0.54-0.78$ ), the diversity index ( $H' = 2.02-2.38$ ) and the dominance index ( $D = 0.60- 0.84$ ). Biodiveristy of paddy insects in Northern Sumatera is quite high and reflect to agroecosystem.

**Paper ID: 18060**





## Effect of Zeolite and Neem Oil on N-Soil Form and Efficiency of Urea Fertilization in Rice Fields

*Sarifuddin\*, Darmayanti*

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia. 20155.*

Email: [sarifuddin@usu.ac.id](mailto:sarifuddin@usu.ac.id)

**Abstract.** The high level of N loss in paddy fields makes the efficiency of urea fertilization low. Therefore, amendments are used to increase the efficiency of urea fertilization in paddy fields. This study aims to determine the effect of urea fertilizer and types of amendments on soil N form, plant growth and efficiency of urea fertilization in lowland rice. This research was conducted at the Greenhouse of the Faculty of Agriculture, Universitas Sumatra Utara. This study used a factorial randomized block design with two factors, namely, the dose of urea fertilizer 0, 100 and 200 kg N/ha and the type of amendment materials control (without amendment), neem oil, eolite mix and Zeolite coated. The results showed that the application of urea significantly increased N-NH<sub>4</sub><sup>+</sup> and N-NO<sub>3</sub><sup>-</sup>, plant height, number of tillers, shoot dry weight, root dry weight, N content, N uptake, N uptake efficiency and reduce soil pH. Zeolite and neem oil significantly increased N-NH<sub>4</sub><sup>+</sup>, decreased N-NO<sub>3</sub><sup>-</sup>, increased N uptake and raised soil pH. The interaction of Urea and the type of amendment material significantly decreased N-NO<sub>3</sub><sup>-</sup>. The application of urea at a dose of 100 kg N/ha and the application of zeolite mix can increase the efficiency of N uptake in lowland rice.

**Paper ID: 18087**





## Characteristic of Mahogany Leaves as Biochar and its effect with Urea Fertilization on Nitrogen Status and Growth of Corn in Ultisol

*U M Putri, Sarifuddin\*, Bintang*

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia. 20155.*

Email: [sarifuddin@usu.ac.id](mailto:sarifuddin@usu.ac.id)

**Abstract.** This research aims to know the characteristics of mahogany leaves as Biochar and its effect with urea fertilization on N status and growth of Corn (*Zea mays* L.) in Ultisol. Mahogany Leaves Biochar (MLB) was made using retort pyrolysis method at 409 °C for 3 hours. This research was carried out in a greenhouse used Randomized Complete Block Design (RCBD) by 2 factors and 3 repetitions. First factor are: B0 (without MLB) and B1 (40 tons MLB/ha) and second factor are doses of urea, those are N1=100, N2 =200, N3 = 300 and N4 =400 kg urea/ha. The results showed MLB has parameters that significantly influenced N plant, N uptake and N uptake efficiency, the plant height, stem diameter, root dry weight, and shoot dry weight. Urea fertilization had a significant effect on the efficiency of N uptake and the interaction of MLB and Urea had a significant effect on the efficiency of N uptake.

**Paper ID: 18088**





## Determination of Water Availability and Long Growth Periods of Maize Plant in Boalemo Regency, Indonesia

**Nurdin<sup>1\*</sup>, A Rauf<sup>2</sup>, Y Rahim<sup>1</sup>, N Musa<sup>1</sup>, S Dude<sup>1</sup>, R Rahman<sup>1</sup>, A S Malatani<sup>2</sup>, R Mooduto<sup>1</sup>, S Mobilingo<sup>1</sup>, Suryadi<sup>2</sup>**

<sup>1</sup>*Agrotechnology Department, Universitas Negeri Gorontalo, Jalan Prof. Dr. Ing. B. J. Habibie, Moutong-Bone Bolango 96114, Indonesia*

<sup>2</sup>*Agribusiness Department, Universitas Negeri Gorontalo, Jalan Prof. Dr. Ing. B. J. Habibie, Moutong-Bone Bolango 96114, Indonesia*

Email : [nurdin@ung.ac.id](mailto:nurdin@ung.ac.id)

**Abstract.** The lack of water availability and the short period of maize growth have the potential to be the main obstacles in achieving optimal maize production. We conducted research in Boalemo Regency which is included in the agroklimat zone E2 by determining the amount of water availability and the long growth period of maize plant. The materials used were rainfall and temperature data for 10 years from 2012-2022 from Saritani climate stations, Tangkobu and Bubaa climate stations in the Boalemo Regency. Then, the soil profile moisture content data using pF 2.5 (field capacity) and pF 4.2 (permanent wilting point). While the tool used the Cropwat application. Determination of available water and long growth periods (LGP) using a water balance table with the Thornwaite methods. The results showed that the highest water availability in the Boalemo Regency area was 556 mm at the Saritani climate station and at least 118 mm at the Tangkobu climate station. The long growth period of maize in the Boalemo Regency was a maximum of 242 days at the Saritani climate station and a minimum of 181 days at the Tangkobu climate station. Based on climate stations, the availability of water and the amount of LGP follow the pattern of Saritani climate station > Bubaa climate station > Tangkobu climate station.

**Paper ID: 18179**





## Results of the Study of Algae and Cyanobacteria in Various Ecotypes of Soils in Adjara, Georgia

**O Shainidze<sup>1</sup>, Z Mikeladze<sup>2</sup>, S Lominadze<sup>2</sup>, S Lamparadze<sup>2</sup>, N Beridze<sup>2</sup>, G Chkubadze<sup>1</sup> and M Turmanidze<sup>1</sup>**

<sup>1</sup>*Faculty of Technology, Department of Agroecology and Plant protection, Batumi State University Shota Rustaveli, Ninoshvili-Rustaveli Street, 35/32 Batumi, 6010 Georgia*

<sup>2</sup>*Faculty of Technology, Department of Agrotechnology, Batumi State University Shota Rustaveli, Ninoshvili-Rustaveli Street, 35/32 Batumi, 6010 Georgia*

<sup>3</sup>*Institut of Agrarian and Membran Technology of Batumi Shota Rustaveli State University, Ninoshvili-Rustaveli Street, 35/32 Batumi, 6010 Georgia*

Email : [otari.shainidze@rambler.ru](mailto:otari.shainidze@rambler.ru)

**Abstract.** The publication deals with the studies on the diversity of species composition of Algae and cyanobacteria in various layers of soils (yell, red, soilsod-podzolic, marsh, urban) of the Adjara. The aim of the study was to identify and determine the composition of Algae and cyanobacteria; Establishment of the scale of development and spread of algoflora; Assessment of the ecological state of the Algae and cyanobacteria in adverse and favorable conditions. The diversity of algae and cyanobacteria was studied in soil cultures using the method of fouling glasses. Each treatment included 5 ste-rile cover glasses for micropreparations; cultures were wetted with distilled water. The presence of algoflora was detected in various soil samples based on morphological characteristics, percentage frequency, growth rate, and colony forming units. The study has found 171 species and subspecies of soil Algae and cyanobacteria, belonging to the divisions of Ochrophyta (59 species), Chlorophyta (51 species), Xanthophyta (8 species), Eustigmatophyta (1 species) and Cyanobacteria (52 species). Classes Bacillariophyceae, Chlorophyceae, and Cyanophyceae were considered polymorphic among the leaders. 11 species of algoflora involved in algoflora of the consortium have been specified as well. The most widely distributed algoflora in soil samples were of the genera Chlamydomonas (20 species), Eunotia (17 species), Phormidium (11 species), Pinnularia (11 species), Tetracystis (10 species), Leptolyngbya (9 species), Nitzschia (9 species), Chlorococcum (8 species), Nostoc (7 species) and Oscillatoria (6 species) were dominant flora in all soil samples. Frequency percentage algoflor showed that from all of the soil, the maximum quantities of algoflora and cyanobacteria in marsh soil that was 65.49%, in sod - podzolic soil 34.51%, in yell soil 19.88, in red soil 18.71%, the lowest frequency of occurrence of algoflora and cyanobacteria was shown in urban soil 9.35%. Due to seasonal changes in soil and air temperature, there are 71 species (41.52%) in spring, 65 (38.95%) in summer, 78 (45.61%) in autumn, and 53 (30.99%) in winter. A lower level of biological activity in the urban soils was found. Morphometric trait differences in test objects activated on the soil samples have been observed. The study was found specialized species of Algal-cyanobacterial communities from each ecotype of soil. The soil samples collected from polluted sites were more affected by waste water which affected the population densities of Algal-cyanobacterial communities. Found that Adjara support a large and diverse community of Algal-cyanobacterial on soil, many species of which are previously undiscovered and







undescribed. On this basis, works of longer duration and more intensive sampling are needed to obtain data regarding Algal-cyanobacterial communities, with more attention to specific variables such as microclimate, soil moisture, soil type, soil pH and vegetation types.

***Paper ID: 18201***





## The Study of Largo Super Technology Packages in Rainfed Land

**Musfal**

*Research Center for Food Crops, Research Organization for Agriculture and Food National Research and  
Innovation Agency, Indonesia*

Email: [musfal\\_my@yahoo.co.id](mailto:musfal_my@yahoo.co.id)

**Abstract.** This study of Largo Super technology packages aimed to observe the effect of the complete and incomplete technology packages in rainfed land. This research was conducted in Desa Baru, Batang Kuis District, Deli Serdang Regency, North Sumatera from July to October 2019. The tested treatments were packages of A, B, C, D and farmer method (as comparison). The treatments were arranged according to a randomized block design with three replications on a 4x5 m<sup>2</sup> plot. From the results of this study, it can be concluded that the tested Largo Super technology packages have different effects. The more complete the components of the technology package provided, the higher the yields and the level of profit obtained. On the other hand, the less technology components provided, the lower the yields and the level of profit provided.

**Paper ID: 18212**





## Potassium and phosphorus availability due to fertilization of potassium and organic matter for rice in rainfed rice fields

*N Chairuman<sup>1</sup>\*, Rosmayati<sup>2</sup>, H Hanum<sup>2</sup>, and A Jami<sup>3</sup>*

<sup>1</sup>Indonesian Research Center for Food Crops Research, Organization for Agriculture and Food National Research and Innovation Agency of the Republic of Indonesia, Cibinong Science Center, Jl. Raya Jakarta - Bogor, Km 46 Cibinong-Bogor, West Java 16911, Indonesia

<sup>2</sup>Program Study of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, Padang Bulan, Medan 20155, Indonesia

<sup>3</sup>Directorate of Cereals Crop-Directorate General of Food Crops, Ministry of Agriculture Pasar Minggu, Jakarta Selatan 12520, Indonesia

Email : [novia.chairuman@brin.go.id](mailto:novia.chairuman@brin.go.id)

**Abstract.** Lack of potassium and phosphorus in the soil will inhibit plant productivity. Chemical fertilizers are used continuously, the cost is expensive, and they will also be harmful to the environment. Lack of potassium and phosphorus in plants causes grain yields to decrease. Therefore, the use of organic matter is an environmentally friendly approach to sustainable agriculture. This research was conducted in Serdang Village, Beringin District, Deli Serdang Regency, North Sumatra, Indonesia in May–August 2016. This study aims to determine the relationship between available potassium and phosphorus, nutrient uptake, and grain yield in rainfed rice fields due to the treatment of planting time, fertilization, and varieties. This study used a split-split plot design with two replications. Main plot (planting time): T1 = 10, T2 = 20, T3 = 30 May. Sub-plots (fertilization): K0=control; K1=50 kg ha<sup>-1</sup> KCl; K2=5 t ha<sup>-1</sup> straw compost; K3=2.5 t ha<sup>-1</sup> straw compost + 2.5 t ha<sup>-1</sup> manure; K4=50 kg ha<sup>-1</sup> KCl + 5 t ha<sup>-1</sup> straw compost; K5=50 kg ha<sup>-1</sup> KCl + 2.5 t ha<sup>-1</sup> straw compost + 2.5 t ha<sup>-1</sup> manure. Sub-plots (rice varieties): V1 = Situ Bagendit, V2 = Towuti, V3 = Batutegi, V4 = Inpago-8, V5 = Inpago-9, V6 = Inpago-10, V7 = Ciherang, V8 = Inpari 10. Data were analyzed using regression and correlation tests. The results showed that available potassium and phosphorus, potassium and phosphorus uptake, were positively correlated with grain yields in all rice varieties in rainfed rice fields.

**Paper ID: 18213**





## Identification on chemical organic compounds of pericarp nutmeg *Myristica fragrans* North Minahasa by using GC-MS

*F J Paat<sup>1,2\*</sup>, M M Toding<sup>1</sup>, S E Pakasi<sup>2</sup>, S Tumbelaka<sup>2</sup>, J B Kaligis<sup>2</sup>, D A S Turang<sup>2</sup>, J V Porong<sup>2</sup>, and R J Linggi<sup>1</sup>*

<sup>1</sup>Faculty of Agriculture, Universitas Sam Ratulangi, Phone/Fax: (0431) 862786, Manado 95115 Indonesia

<sup>2</sup>Agrotechnology Study Program, Universitas Sam Ratulangi, Phone/Fax: (0431) 862786, Manado 95115 Indonesia

Email : [frangkypaat@unsrat.ac.id](mailto:frangkypaat@unsrat.ac.id)

**Abstract.** An organic chemical compound *Myristica fragrans* in North Minahasa Regency has been identified. *Myristica fragrans* North Minahasa Regency includes species that are not yet known and there has been no release of varieties. Identification of *M. fragrans* North Minahasa Regency was investigated using Gas Chromatography-Mass Spectrometry (GC-MS) method. The sample was from the pericarp of *M. fragrans*. This study was able to identify Patchouli alcohol, 1(2H)-Naphthalenone, octahydro-4a, 8a-dimethyl-7-(1-ethylethyl)- [4aR-(4aa,7β,8aa)]-, and Neoisolongifolane, hydroxy-, 1HCyclopropa[a]naphthalene, 1a, 2, 3, 5, 6, 7, 7a, 7b-octahydro-1, 1, 7, 7a-tetramethyl, [1aR(1aa,7a,7aa,7ba)]-; 4,7-Methanoazulene, 1, 2, 3, 4, 5, 6, 7, 8-octahydro-1, 4, 9, 9-tetramethyl-, [1S-(1a,4a,7a)]-; and isodene. Further research is needed on its biological activity.

**Paper ID: 18224**





## Web-Geographic Information System for rice fields in Bungko Village, South Kotamobagu district

***S E Pakasi<sup>1,2\*</sup>, F J Paat<sup>1</sup>, D D Pioh<sup>2</sup>, S R Sentinuwo<sup>3</sup>, D A S Turang<sup>2</sup>, T B Ogie<sup>2</sup>, R Nango<sup>2</sup> and M Shofiyat<sup>1</sup>***

<sup>1</sup>Faculty of Agriculture, Universitas Sam Ratulangi, Phone/Fax: (0431) 862786, Manado 95115 Indonesia

<sup>2</sup>Agrotechnology Study Program, Universitas Sam Ratulangi, Phone/Fax: (0431) 862786, Manado 95115 Indonesia

<sup>3</sup>Informatics Engineering Study Program, Universitas Sam Ratulangi, Manado 95115 Indonesia

Email : [sandrapakasi@unsrat.ac.id](mailto:sandrapakasi@unsrat.ac.id)

**Abstract.** A WebGIS-based Geographic Information System that displays the area and data of rice field ownership in Bungko Village, South Kotamobagu District has been investigated. So far, the display of land area and rice field ownership data from the community has not been studied through a WebGIS-based Geographic Information System. Digital visual on screen classification method through digitization through GIS software by interpreting image data with WebGIS-based spatial analysis. Secondary data comes from the Department of Agriculture and Fisheries Kotamobagu in 2021. The method of implementation uses the SDLC (Systems Development Life Cycle) method with a waterfall model approach in the form of planning, analysis, design, implementation, testing and maintenance. This research has produced a Web-based application spatial information system building with a display in the form of an understanding of each WebGIS component, village profiles, digital maps of paddy fields, rice fields plots, rice fields area, rice field ownership data, rice fields photos, and contacts containing addresses, email , and social media administrator accounts that can be downloaded for free by the public by typing the URL in the address bar <http://sawahdesabungkoktgselatan.wordpress.com/>.

**Paper ID: 18230**





## **Increased production of pruned okra plant (*Abelmoschus esculentus* L. Moench) by applying IAA and Urea fertilizer**

***Meiriani\*, R R Lahay dan M R Sutra***

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Sumatera Utara, Indonesia*

Email: [meiriani@usu.ac.id](mailto:meiriani@usu.ac.id)

**Abstract.** Okra is a vegetable that has a lot of antioxidants. Increasing production of okra crops can be done by improving cultivation techniques. One alternative that can be done is shoots pruning with the aim to increase the growth of more shoots and branches. For more growth lateral shoots needed addition plant growth regulator such as IAA and sufficient nutrient availability, especially nitrogen. This research was conducted to study increasing growth and production of pruned okra plants by applying IAA and urea fertilizer, carried out on Medan Selayang District, Medan from July to October 2021, using a Randomized Block Design with 2 factors, the first factor is IAA (0, 90, 120 and 150 mg/L), the second factor is urea fertilizer (200, 250 and 300 kg/ha). Giving IAA up to 58 mg/L concentration, significantly decreasing number of leaves, number of fruits and total fruit weight per plant. The best of leaves number, fruits number and total fruit weight per plant was obtained by application 150 mg/L IAA. Giving urea fertilizer 300 kg/ha significantly increase number of fruits and total fruit weight per plant.

***Paper ID: 18263***





## Isolation of partial $\beta$ -tubulin gene from balakka (*Phyllanthus emblica* L.)

*S Hannum\**, *S Pahlevi*, *I Nurwahyuni*, *S Rahayu* and *A Hartanto*

*Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Sumatera Utara, Medan, North Sumatra 20155, Indonesia*

Email: [saleha@usu.ac.id](mailto:saleha@usu.ac.id)

**Abstract.** Balakka is one of the medicinal plant and also acts as a pioneer plant that can survive on dry land. However, the utilization of Balakka in Indonesia has not been optimum since there is a little information about this plant including the information about  $\beta$ -tubulin gene. The  $\beta$ -tubulin gene is one of the most important genes in living organisms commonly used as internal controls or one of the housekeeping genes that have stable expression level in each development. The aim of this study is to isolate and obtain  $\beta$ -tubulin gene sequence from balakka (*Phyllanthus emblica* L.). Total RNA was successfully isolated from balakka and subsequently synthesized into cDNA. cDNA was successfully amplified with  $\beta$ -tubulinG primer resulting in fragment of 252 bp. Bioinformatic analyses showed that the fragment has a 92% nucleotide similarity with  $\beta$ -tubulin gene 5 from *Ricinus communis*, furthermore this fragment called by partial  $\beta$ -tubulin gene from the *Phyllanthus emblica* (PeTUB). Phylogenetic relationship analysis based on nucleotide sequence showed that partial genes PeTUB clumped with  $\beta$ -tubulin gene 5 from another plant that has been isolated in GenBank with 0.082 genetic distance.

**Paper ID: 18273**





## Study biology of *Coccinella transversalis* Fabricius (Coleoptera: Coccinellidae) as potential predator on Aphid in Karo District, Indonesia

L Sidauruk<sup>1</sup> E Panjaitan<sup>1</sup> dan P Sipayung<sup>2</sup>

<sup>1</sup>Department of Agrotechnology, Universitas Methodist Indonesia, Jl. Harmonika Baru, Medan 20132, Indonesia

<sup>2</sup>Department of Agrotechnology, Universitas Katolik Santo Thomas, Jl. Setiabudi 479F, Medan 20132, Indonesia

E-mail: [lamriasidauruk@yahoo.com](mailto:lamriasidauruk@yahoo.com)

**Abstract.** The aim of this research was to study and describe the morphological and biological characteristics of *Coccinella transversalis* Fabricius as a potential natural enemy of aphids as vegetables main pest on Karo Highland, North Sumatera, Indonesia. The knowledge of biological aspect can be used for mass rearing on laboratory for augmentation purposes, and for conservation on field. The study was conducted at laboratory of Plant Pests and Diseases Faculty of Agriculture, Methodist University of Indonesia. Collecting samples of *C. transversalis* from potato and cabbage cultivation at Kuta Gadung, Karo District, then kept in a maintenance glass jar with artificial food and aphid as standard mass rearing technique for the coccinellid predators. The results showed that egg incubation was  $3.1 \pm 0.78$  days. The larval stage consists of 4 instars. The length of each instar is  $2.67 \pm 0.20$  days,  $2.87 \pm 0.26$  days,  $2.91 \pm 0.53$  and  $3.42 \pm 0.75$  days respectively. Prepupae and pupae stages were  $1.62 \pm 0.56$  days and  $3.11 \pm 0.81$  days. According to adult stage, there are different between female and male. Life period of female stage was  $35.05 \pm 3.80$  days and male was  $25.75 \pm 3.14$  days. Fecundity of female was  $118.4 \pm 20.14$  eggs and hatching percentage  $84.2 \pm 6.37$  percent. The survival rate of *C. transversalis* life from larva instar I until imago is  $48.8 \pm 5.84\%$ , which means that from several groups of eggs laid by female, there is about half have succeeded in becoming an imago. Predation potential for aphid at larva instar I until instar IV, female and male were  $24.55 \pm 3.28$ ,  $44.25 \pm 6.63$ ,  $89.90 \pm 13.41$ ,  $174.05 \pm 27.7$ ,  $873.67 \pm 29.21$  and  $736.11 \pm 14.77$  aphids respectively.

**Paper ID: 18282**







## The effect of various natural growth regulatory substances and the origin of stem cuttings on the vegetative growth of white jasmine (*Jasminum sambac* L.)

*Agustinur<sup>1\*</sup>, E J Harahap<sup>1</sup>, S F Lizmah<sup>1</sup>, Y Muslimah<sup>1</sup>, B Irfan<sup>2</sup>*

<sup>1</sup>*Agrotechnology Study Program, Faculty of Agriculture, Universitas Teuku Umar*

<sup>2</sup>*Alumni of Agrotechnology Study Program, Faculty of Agriculture, Universitas Teuku Umar*

Email : [evijulianita@utu.ac.id](mailto:evijulianita@utu.ac.id)

**Abstract.** Jasmine is a native plant of the archipelago in Indonesia. Jasmine (*Jasminum sambac* L.) is a plant that has many ingredients, including as an ornamental plant, the chemical content of jasmine flowers, namely indole, benzyl, livalyacetat, is believed to be able to treat diseases such as headaches, shortness of breath, fever, excess breast milk and eye pain. Shallot extract is one of the growth regulators belonging to the auxin group which contains naphthalene and indole compounds which stimulate the development of adventitious root meristems. Green bean sprouts (bean sprouts) are a type of vegetable that are commonly consumed, easy to obtain, economical, and do not produce compounds that have toxic effects. Green bean sprout extract has a concentration of auxin and cytokinin growth regulator compounds. This study aimed to determine the effect of various natural growth regulators and stem cuttings origin on the vegetative growth of white jasmine (*Jasminum sambac* L.). This research was carried out at the Experimental Garden of the Faculty of Agriculture, Teuku Umar University, West Aceh Regency from June 2020 to completion. This study used a 5 x 3 factorial randomized block design (RAK) with 3 replications. The first factor is the concentration of various natural growth regulators consisting of 5 levels, namely: Z0 : 0% (control), Z1 : 50% (shallot extract), Z2 : 100% (shallot extract), Z3 : 50% (bean sprout extract) and Z4 : 100% (Bean sprouts extract). The second factor of cutting material consisted of 3 levels, namely: B1: the top of the branch, B2: the middle of the branch and B3: the base of the branch. The variables observed were the number of shoots, shoot length, and number of leaves. The results of the F test on analysis of variance showed that the concentration of various natural growth regulators had a very significant effect on the number of shoots 20, 40 and 60 DAP, shoot length 20 and 60 DAP, and the number of leaves 20, 40 and 60 DAP. Significant effect on shoot length 40 DAP. The type of cutting material had a very significant effect on the number of shoots 20, 40 and 60 DAP, shoot length 20, 40 and 60 DAP, and the number of leaves 20, 40 and 60 DAP.

**Paper ID: 18287**





## The Effect of Dispensing Biochar of Palm Oil Empty Bunch and Palm Oil Fronds on the Population of Soil Organisms

*N A Lubis\*, B Hidayat, T Sabrina*

*Faculty of Agriculture, Universitas Sumatera Utara, Medan Jl. Prof. A. Sofyan No. 3 Kampus USU Padang Bulan, Medan 20155, Indonesia*

Email: [nrlannisalubis@gmail.com](mailto:nrlannisalubis@gmail.com)

**Abstract.** Palm oil waste can be utilized as biochar. This study aims to examine the effect of giving biochar empty palm bunches and palm fronds on soil organism populations for 2 weeks, 4 weeks, 6 weeks, and 8 weeks. This research was conducted at PT. Perkebunan Nusantara IV Bah Jambi unit plantation with inceptisol soil type. This research used a randomized design of non-factorial groups with treatment without biochar, biochar of oil palm empty bunches, and biochar of palm fronds. The results showed that the highest population of organisms was found in the treatment with biochar of palm oil fronds, followed by biochar of empty palm oil bunches and the treatment without biochar had the lowest population. The population of bacteria and macrofauna above ground level on treatment with biochar increased from the observation of 2nd week to 6th week, and fungi populations decreased on biochar treatments from 2nd week to 6th week of observations. The population of subsurface soil macrofauna increased from the 4th week to the 8th week on treatment with biochar. Meanwhile, without biochar, the growth of soil organisms didn't show significant changes. The highest soil respiration was obtained in the biochar treatment of empty bunches of palm oil, followed by biochar of palm oil fronds and subsequently without biochar treatment. Soil respiration increases every week until the 8th week.

**Paper ID: 18294**





## Oryzalin Delays germination and Induces Putative Polyploid Plants in Local North Sumatra Garlic (*Allium sativum* L.)

**A Rodiansah<sup>1</sup>, M Sinuraya<sup>2\*</sup> and D S Hanafiah<sup>2</sup>**

<sup>1</sup>Faculty of Agriculture, Universitas Medan Area, Medan Indonesia

<sup>2</sup>Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia

E-mail: [mariati@usu.ac.id](mailto:mariati@usu.ac.id) or [mariati61@yahoo.com](mailto:mariati61@yahoo.com)

**Abstract.** Oryzalin is anti-mitotic herbicide. It has been used to induce polyploid in several plants. The aim of this study was to determine the effectiveness of oryzalin in inducing polyploids and its physiological effects on North Sumatran local garlic (*Allium sativum*) germination. This study used a factorial completely randomized design (CRD), the first factor was oryzalin concentration with 5 treatment levels, namely R1 (0  $\mu$ M), R2 (100  $\mu$ M), R3(200  $\mu$ M), R4 (300  $\mu$ M) and R5 R3 (400  $\mu$ M). The second factor was soaking duration, consisting of H1 (24 hours) and H2 (48 hours). The parameters observed were percentage of germination and sprout morphology, observed at 1 and 3 weeks after treatment. The collected data were processed using ANOVA and if they were significantly different, it was continued with the DMRT test at a 5% significant level. The results showed that oryzalin suppressed garlic germination in the first week, but the effect disappeared and there was no significant difference in germination percentage at 3 weeks after soaking. Treathment with 400  $\mu$ M oryzalin induced putative poliploid garlic, the morphological shoot showed higher and thicker than control.

**Paper ID: 18295**





## Potential of Marine Organic Waste: Chemical Characteristics of Compost from Marine Organic Waste Kuala Indah Beach, North Sumatra

**B Hidayat<sup>1\*</sup>, N U W Sebayang<sup>1</sup>, Jamilah<sup>1</sup> and A M Akbar<sup>2</sup>**

<sup>1</sup>Faculty of Agriculture, Universitas Sumatera Utara, Indonesia

<sup>2</sup>Student in Department of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, Indonesia

E-mail: [bendayat@gmail.com](mailto:bendayat@gmail.com)

**Abstract.** Marine debris was a direct threat to marine habitats, human health, and navigational safety, resulting in serious socio-economic losses. Marine organic waste management can be done by turning it into compost that can be used as a nutrient addition. It can also be used as a solution to be diminished marine waste considering that the sea had many roles to support the lives of living things and maintain ecosystems. This study aimed to examined some characteristics of compost from marine organic waste and gave information on waste management for sustainable agriculture. This study was carried out at Kuala Indah Beach, Sei Suka District, Batu Bara Regency, Indonesia. The composting process was carried out at the Faculty of Agriculture, Universitas Sumatera Utara. The analysis was carried out at the Research and Technology Laboratory of the Faculty of Agriculture, Universitas Sumatera Utara. The composting process used the Berkeley method with the addition of EM4. The results showed that the chemical characteristics of marine organic waste compost by Indonesian National Standard (SNI 19-7030-2004) with a macronutrient content of 2.40% Nitrogen; Phosphorus 0.53%; and Potassium 0.45% with a pH of 6.95 (neutral) and a compost C/N ratio of 17.33.

**Paper ID: 18318**





## Soil and crop monitoring on the basis of earth remote sensing data

*D T Muhamediyeva<sup>1</sup> and N U Tukhtamuradov<sup>2</sup>*

*<sup>1</sup>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kori Niyazov Street 39, Tashkent, Uzbekistan*

*<sup>2</sup>Research Institute for the Development of Digital Technologies and Artificial Intelligence, Tashkent, Uzbekistan*

E-mail: [dilnoz134@rambler.ru](mailto:dilnoz134@rambler.ru)

**Abstract.** Remote sensing includes all types of non-contact. surveys that are carried out from various measuring platforms. The tasks in this area are the following: inventory of agricultural land, control of the state of crops, forecasting yields. The aim of the work is to classify 6 types of crop images (wheat, rice, sugarcane, corn, cotton and jute) with greater accuracy. The paper considers an algorithm for primary processing and recognition of images of agricultural crops and algorithms for constructing a neural network for initial processing and recognition of images to solve problems of noise elimination, minimization, smoothing, normalization, segmentation and image recognition.

**Paper ID: 18331**





## Seed morphology and germination of pasak bumi (*Eurycoma longifolia*)

**A Susilowati<sup>1,2</sup>, H H Rachmat<sup>3</sup>, K S Yulita<sup>3</sup>, I M Ginting<sup>1</sup>, A H Iswanto<sup>1,2</sup>, T Sucipto**

<sup>1</sup>Faculty of Forestry, Universitas Sumatera Utara. Jl. Tridharma Ujung No.1, USU Campus-Medan 20155. Indonesia

<sup>2</sup>Center of Excellence for Mangrove, Universitas Sumatera Utara, Medan 20155, Indonesia

<sup>3</sup>Research Center for Ecology and Ethnobiology, National Research and Innovation Agency, Jl. Raya Jakarta-Bogor Km 46, Cibinong-Bogor 16911

E-mail: [arida.susilowati@usu.ac.id](mailto:arida.susilowati@usu.ac.id)

**Abstract.** *Eurycoma longifolia* is a traditional medicine plant that contains a variety of bioactive components. Pasak bumi has experienced a tremendous increase in demand due to its medicinal properties, particularly its aphrodisiac properties, and is now threatened with extinction in the wild. As a consequence, species must be protected immediately through propagation techniques. This study was carried out to determine the success of pasak bumi propagation using various media combinations. This study involved sowing 360 pasak bumi seeds in four different media: pure sand (M1), mixture of soil and sand 1:1v/v (M2), mixture of sand and rice husk 1:1 v/v (M3), and mixture of sand and compost 1;1 v/v (M4). Seedlings were weaned at 8 weeks old using three different media treatments: soil and carbonized rice husk 1:1 (M1), pure carbonized rice husk (M2), and mixture of sand and soil 1:1 v/v (M3). A non-factorial completely randomized design was used to analyze the data. The results revealed that a combination of sand and soil media resulted in the highest average percentage of germination (34%). The variance results revealed that the planting medium had no significant effect on shoot growth but did affect the number and length of roots. The pure carbonized rice husk medium produces the best growth parameters.

**Paper ID: 18335**





## Distribution and association pattern of Keruing (*Dipterocarpus* sp.) in Tangkahan, Gunung Leuser National Park

**A Susilowati<sup>1,3</sup>, D Elfiati<sup>1,3</sup>, A Hidayat<sup>2</sup>, S A Rangkut<sup>1</sup>, I M Ginting<sup>1</sup>, H H Rachmat<sup>4</sup> and S H Larekeng<sup>5</sup>, T Sucipto<sup>1</sup>, AH Iswanto<sup>1,3</sup>**

<sup>1</sup>Faculty of Forestry, Universitas Sumatera Utara. Jl. Tridharma Ujung No.1, USU Campus-Medan 20155. Indonesia

<sup>2</sup>Research Center for Applied Microbiology, National Research and Innovation Agency (BRIN). Jl. Raya Jakarta-Bogor Km 46. Cibinong-Bogor 16911

<sup>3</sup>Center of Excellence for Mangrove, Universitas Sumatera Utara, Medan 20155, Indonesia

<sup>4</sup>Research Center for Ecology and Ethnobiology, National Research and Innovation Agency, Jl. Raya Jakarta-Bogor Km 46, Cibinong-Bogor 16911

<sup>5</sup>Biotechnology and Tree Breeding Lab., Faculty of Forestry, Hasanuddin University, Makassar, Indonesia

E-mail: [arida.susilowati@usu.ac.id](mailto:arida.susilowati@usu.ac.id)

**Abstract.** Keruing (*Dipterocarpus* spp.) is a commercially important timber and oil-producing species. Keruing's wood is of high quality, and its oil is widely used for medicinal purposes. Because of the high price and demand for wood and oil, keruing has become a target for exploitation and causing the population to decrease. Understanding of the keruing population in natural habitats is important for conservation efforts, one of which is in the Gunung Leuser National Park (GLNP) area. This research was conducted to analyze the pattern of distribution and association of keruing in Tangkahan, GLNP. The research was conducted using the vegetation analysis method with a plotted path that was determined intentionally based on the presence of keruing. Data analysis was performed by calculating association indices, including the Ochiai index (Oi), the Dice index (Di), and the Jackard index (Ji). The Morisita index is used to determine the form of distribution pattern. The results showed that there were 3 (three) species of keruing in the research location, namely *Dipterocarpus haseltii*, *Dipterocarpus elongatus* Korth and *Dipterocarpus constulatus*. The keruing distribution showed different patterns at different growth rates. At the seedling and keruing tree stage, the distribution pattern was clustered, while at the sapling and pole stage were uniform. The three keruing species has weak associations with various surrounding species. The species that has the highest association value is *Syzygium fastigiatum*, which is 0.22.

**Paper ID: 18336**





## Impact of Biofertilizer and Organic Fertilizer in Enhancing the Biomass of Pegagan (*Centella asiatica* L. Urb.)

*N S Vinolina\*, Meiriani, T H F Tobing*

*Department of Agrotechnology, Universitas Sumatera Utara, Jl. Prof. A. Sofyan No.3 Kampus USU, Medan,  
Indonesia Republic 2Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

E-mail: [noverita@usu.ac.id](mailto:noverita@usu.ac.id)

**Abstract.** Pegagan plant is widely used as medicine to cure various diseases. In the cultivation of Pegagan the use of organic fertilizers is better than chemical fertilizers. Thus, it is essential to study the impact of giving biological fertilizers and organic fertilizers based on the usage dose in enhancing the biomass of Pegagan. This study was done at Jalan Pasar 1 Tanjung Sari, Kecamatan Medan Selayang, Medan, from November 2021 to February 2022. It is placed at an elevation of  $\pm 25$  meters above sea level. It employed a Randomized Block Design (RBD) with 2 factors, namely biofertilizer of 0, 2, 4, and 6 mL/L and organic fertilizer of 0, 3.512, 7.032, and 10.548 ton/ha. The data were observed through the analysis of variance. If the value shows a prominent result, a test of Duncan Multiple Range Test (DMRT) with 5% level will be continued. The results revealed that biofertilizers significantly increased fresh leaves' weight per sample by 20.63% and dried leaves per sample weight by 13.69% compared to plants that were not given biofertilizers. The best treatment was obtained at the concentration of the biofertilizer at 4 mL/L. The application of organic fertilizer prominently improved the weight of fresh leaves per sample by 113.43%, the weight of root fresh per sample by 27.63%, the weight of dried leaves per sample was 145.81%, weight of dried root per sample was 102.75% compared to plants without organic fertilizer. The best treatment was obtained at 10.548 ton/ha organic fertilization. The interaction between biofertilizer and organic fertilizer did not show a significant effect on all parameters.

**Paper ID: 18347**







## **Use of Yellow Sticky Trap (YST) and Coffee Experts (Pakar Kopi) Reduces Coffee Pest Attacks in Perteguhan Hamlet, Telagah Villages, Langkat District, North Sumatra**

***A Z Siregar<sup>1\*</sup>, Tulus<sup>2</sup>, E Julianti<sup>2</sup>***

*<sup>1</sup>Faculty of Agriculture, University of Sumatera Utara, Medan, Indonesian*

*<sup>2</sup>Faculty of Mathematics and Science, University of Sumatera Utar, Indonesian*

E-mail: [ameilia@usu.ac.id](mailto:ameilia@usu.ac.id)

**Abstract.** Telagah is one of the village located in Sei Binge Subdistrict, Langkat District, North Sumatra Province with coordinate 03 18 43.26" North and latitude 98 23 47.70" East Longitude. The area of Telagah village reaches 53.38 km with a height of the place reaches 823.7m above sea level. The beauty of nature with cool air through the seasons is a magnet for nature and adventures visitors because this is the 'home' to see how the ecosystem is extraordinary. The tour starts from a phenomenal matchmaking view, Adem Peak in Perteguhan Hamlet with coffee plantations of farmers in the middle of a wild forest so exotic, stunning and challenging. Otherwise, use of Yellow Sticky Trap (YST) caught 6 pests, such as: Hypothenemus hampeii, Xylosandrus compactus, Coccus viridis, Pseudococcus citri, Zeuzera coffeae and Sanurus indecora, while used by ethanol and methanol attractant showed variances of trapped pests. The Coffee Expert (Pakar Kopi) recorded 6 pests, 5 diseases and 28 symptoms for detecting pests and diseases in agricultural and plantation crop commodities are very helpful for human work and farmers in the future.

***Paper ID: 18348***





## Liquid fertilizer formulation is based on cow urine and its concentration for maize in Indonesia

*Y Pujiharti<sup>1</sup>, S Salma<sup>2</sup>, Sarno<sup>3</sup>, J Barus<sup>2</sup> and D Meithasar<sup>2</sup>*

*<sup>1</sup>Research Center for Macroeconomics, and Finance, Research Organization for Governance Management, Economy, and Community Welfare, National Research and Innovation Agency (BRIN), Jl. Gatot Subroto, , Indonesia*

*<sup>2</sup>Research Center for Food Crops, Research Organization for Agriculture and Food, National Research and Innovation Agency (BRIN), Cibinong Science Center, Jl. Raya Jakarta-Bogor, KM. 46, Cibinong, Bogor, West Java 16911 Indonesia*

*<sup>3</sup>Departemen of soil, Faculty of Agriculture, University of Lampung, Jl. Sumantri Brojonegoro No. 1, Bandar Lampung City, Lampung Province Indonesia.*

E-mail: [yulia.r2160@gmail.com](mailto:yulia.r2160@gmail.com)

**Abstract.** This study aims to obtain liquid organic fertilizer (bio-urine) according to the Agriculture Ministry Regulation 70/2011 and determine the bio-urine concentration for maize. Research conducted was on Pesawaran Regency, in Lampung Province, Indonesia, from April 2017 to February 2018. The treatments tested were types four bio-activators and four enrichment materials. The design used was randomized blocks design in a split-plot pattern and three replications. The material above was fermented for four weeks anaerobically and analyzed in the laboratory. The value of the analysis compared with the standard and that close met the requirements, then produced in sufficient quantities for use in field research. The results showed that the bio-urine formulations tested did not meet the technical requirement yet, especially N, P, and K, so research needs to continue. Bio-urine with a C content close to the standard is fermented cow urine with bio-activator Agrodeko and added molasse and pineapple enrichment materials. For pH and harmful microbes, these formulas have met the requirements. Apart from that, bio-urine also contains growth hormones of Indole acetic acid and Gibberellin acid. The concentration of bio-urine has no significant effect on the growth and yield of maize. It needs further research with smaller than 15% and narrow interval concentrations.

**Paper ID: 18349**





## Performance of 34 shallot accessions in Lembang highland

***I R Saadah<sup>1\*</sup>, J Pinilih<sup>2</sup>, N Faoji<sup>2</sup>, C Azmi<sup>1</sup>, P Soedomo<sup>1</sup>***

*<sup>1</sup>Research Center for Horticultural and Estate Crops, Research Organization for Agriculture and Food, National Research and Innovation Agency (BRIN), Jl. Raya Jakarta – Bogor km 46, Cibinong, Bogor Regency, West Java Province, Indonesia*

*<sup>2</sup>Ministry of Agriculture, Republic of Indonesia, Jl. Tangkuban Parahu no. 517 Lembang, West Bandung Regency, West Java Province, Indonesia*

Email: [imas005@brin.go.id](mailto:imas005@brin.go.id)

**Abstract.** Identification of the appearance of shallot accession is needed in the selection of new superior varieties of shallots. Therefore, performance identification of shallot accessions from various parental backgrounds was carried out. Thirty-four shallot accessions were planted on open land in Lembang highlands (1250 m asl) from May to September 2022. The performance of shallot plants was observed starting from percentage of flowering, number of tillers, plant fresh weight, bulb dry weight, weight loss, bulb number, weight, height and diameters of bulbs and cloves. The data were analyzed descriptively. The results showed that there were 11 accessions with 100% flowering percentage, 10 accessions with more than 5 tillers per plant, 5 accessions with weight loss potential of less than 40%, 3 accessions with more than 10 bulbs per plant, 6 accessions with bulb weight more than 10 grams, 11 accessions with bulb diameter more than 2.5 cm and 6 accessions with clove diameter more than 2.5 cm. There were 2 accessions that have a combination of superior traits, namely accessions BLK and C89.

***Paper ID: 18366***





## Potential Soil Degradation of Paddy Fields Through Observation Approaches From Various Sources of Environmental Diversity

*M R Romadhon\*, M Mujiyo, O Cahyono, S Maro'ah, N M Istiqomah, and V Irmawati*

*Master of Soil Science Department, Agriculture Faculty of Universitas Sebelas Maret, Jl. Ir. Sutami No. 36,  
Surakarta 57126, Central Java, Indonesia*

Email: [rizkyrom554@student.uns.ac.id](mailto:rizkyrom554@student.uns.ac.id)

**Abstract.** Soil is classified as a vital and non-renewable natural resource for food production. We also could produce good-quality, healthy, and nutritious food through healthy soil. Good quality soil was rare to find. Commonly, land used for food crop cultivation is classified as heavily degraded soil, specifically characterized by a low percentage of soil macro primer nutrients and organic C content. This study aimed to determine the soil degradation of paddy field through environmental diversity that occur on the field. This research result showed that conventional paddy field cultivation is classified as degraded soil. Moreover, organic paddy field cultivation was classified as low degraded soil. After classifying the soil, proceed challenges of recommendations have been formulated this research aims. Monitoring the soil degradation level is necessary to set some recommendations for cultivation to prevent the ongoing degradation of rice fields and threaten food security. This research result will be a recommendation and literature that reveals the importance of evaluating soil degradation levels and determining the limiting factors so that the soil health-based paddy soil management strategy can be bought to sustain food security.

**Paper ID: 18378**





## SPAD Total Chlorophyll as an Initial Indicator of the Effect of 2,4-D Dimethyl Amine Herbicide for Lowland Rice and Barnyardgrass Weed

*Alridiwirsa<sup>1</sup>\*, K Tampubolon<sup>2</sup>, M Basyuni<sup>3</sup>, and N E Mustamu<sup>4</sup>*

<sup>1</sup>Program Study of Agrotechnology, Faculty of Agriculture, Universitas Muhammadiyah Sumatera Utara, Medan 20238, Indonesia.

<sup>2</sup>Program Study of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, Padang Bulan Medan 20155, Indonesia.

<sup>3</sup>Program Study of Forestry, Faculty of Forestry, Universitas Sumatera Utara, Medan 20155, Indonesia.

<sup>4</sup>Program Study of Agrotechnology, Faculty of Science and Technology, Universitas Labuhanbatu, Rantauprapat 21415, Sumatera Utara, Indonesia.

E-mail: [alridiwirsa@umsu.ac.id](mailto:alridiwirsa@umsu.ac.id)

**Abstract.** Barnyardgrass populations (*Echinochloa crus-galli*) can inhibit the growth and yield of lowland rice. The use of herbicides as an alternative control can affect the growth of lowland rice, such as total chlorophyll content. This study was to obtain initial information on the effect of the 2,4-D dimethyl amine herbicide by detecting the total chlorophyll of lowland rice and barnyardgrass weeds. This study was conducted in August-October 2022 using a non-factorial Randomized Block Design (40 populations of barnyardgrass from Serdang Bedagai District) sprayed with the herbicide 2,4-D dimethyl amine at a dose of 1,080 g a.i.ha<sup>-1</sup> with three replications. One population for comparison was taken from Medan City (ECG-0), Indonesia. Data were analyzed using one-way ANOVA and followed by the DMRT at  $P < 0.05$  using IBM SPSS. The findings showed that the effect of the 2,4-D dimethyl amine herbicide was safe for lowland rice (29.27% of lowland rice plants had a decrease in the total chlorophyll content up to 6 days after spraying/DAS). There was a significant decrease in the total chlorophyll content of barnyardgrass weeds exposed to the herbicide 2,4-D dimethyl amine from 2 to 6 DAS. A decrease in the total chlorophyll can be used as initial information to indicate the effect of the 2,4-D dimethyl amine herbicide on lowland rice fields.

**Paper ID: 18405**





## Approaches to solving a problem of a biological population with convective transfer

*D K Muhamediyeva<sup>1</sup> and A Kh Madrakhimov<sup>2</sup>*

*<sup>1</sup>Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Amir Temur Street 108, Tashkent, Uzbekistan*

*<sup>2</sup>Academic lyceum under the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Amir Temur Street 108, Tashkent, Uzbekistan*

**Abstract.** Population models that take into account migration are considered. The purpose of this study is to construct a system of differential equations, taking into account the peculiarities of the life of acridids. To take into account such phenomenological observations of the spatiotemporal dynamics of the population size, it is necessary to introduce migration terms that depend on the size. One way to take this into account is to introduce gradient terms into the reaction-diffusion equation. One approach to solving this problem can be the assumption that the mobility of individuals, that is, the diffusion coefficient is not a constant value, but depends on the density of the population. The paper considers the case of dependence on population density in a power-law manner.

**Paper ID: 18419**





## Pomelo (*Citrus maxima*. Merr) essential oil extraction by cold pressing and hydrodistillation methods and comparison of chemical compositions

*T H Tran<sup>1,2\*</sup>, T N T An<sup>1,2</sup>, D T Phat<sup>1,2</sup>, L T N Minh<sup>3</sup>*

<sup>1</sup>*Institute of Applied Technology and Sustainable Development, Nguyen Tat Thanh University, Ho Chi Minh City, Vietnam.*

<sup>2</sup>*Faculty of Food and Environmental Engineering, Nguyen Tat Thanh University, Ho Chi Minh City, Viet Nam*  
<sup>3</sup>*Branch of Green Power Co., LTD, Ben Tre Province, Vietnam*

Email: [hientt@ntt.edu.vn](mailto:hientt@ntt.edu.vn)

**Abstract.** Essential oils extraction from the shell bring many applications in life, as well as contribute to the development of the food flavoring and cosmetic industry. Pomelo (*Citrus maxima* Merr) essential oil (EO) was extracted by cold pressing and hydrodistillation methods. The EO content obtained was 0.067% and 0.33 mL/g, respectively. The chemical composition was determined by the GC-MS analysis method, with 4 main components being D-Limonene,  $\beta$ -Myrcene,  $\alpha$ - Pinene, and  $\alpha$ -Phellandrene which exhibited high antibacterial and antioxidant capacity). The EO obtained from pomelo peels by cold pressing conditions was limited and less effective with more natural aroma, as compared to the hydrodistillation methods. Therefore, further research on EO pressing equipment and methods that can be used for effective oil extraction and recovery are necessary.

**Paper ID: 18424**





## **Influence of silicon nano fertilizer on cucumber's productivity in greenhouses**

**S Yur<sup>1</sup>**

*<sup>1</sup>Department of Vegetable Growing and Protected Cultivated, National University of Life and Environmental Science, Kiev, Ukraine*

E-mail: [helicopter09@ukr.net](mailto:helicopter09@ukr.net)

**Abstract.** The silicon's role in mineral nutrition was studied in many scientific works in different cultures. Recently the Ukraine's company "Agroecotech" has created silicon-based fertilizer in ionic form of nanoparticles. The article presents the results of testing it in greenhouses on cucumber plants. This fertilizer was used on cucumber plants in 3 ways - by spraying with aerosols - foliar, through the drip irrigation and combined - through drip irrigation (3 times) and foliar fertilizing (3 times): after planting seedlings, during the beginning of fruiting and the period of intensive fruit-setting. Use of silicones fertilizer in the form of nanoparticles had a little effect on cucumber plants in greenhouses. The most effective is their introduction in a combined way - through the drip irrigation with aerosols folia spraying.

**Paper ID: 18431**







## Unmanned aerial vehicles (UAV) utilization for mapping the health of oil palm plants (*Elaeis guineensis* Jacq)

*Charloq<sup>1\*</sup>, AS Thoha<sup>2</sup>, DY Putra<sup>3</sup> and A Muammar<sup>4</sup>*

<sup>1,3,4</sup>*Agricultural Faculty, Universitas Sumatera Utara, Medan 20155, Indonesia..*

<sup>2</sup>*Forestry Faculty, Universitas Sumatera Utara, Medan 20155, Indonesia.*

Email: [charloqkuliah@gmail.com](mailto:charloqkuliah@gmail.com)

**Abstract.** The increasing development and expansion of oil palm plantations in Indonesia causes monitoring management to be increasingly difficult to manage a plantation and currently requires technological innovation that is faster and more accurate in providing information, one of which is using an unmanned aerial vehicle (UAV), often called a drone, a flying machine. which is controlled remotely using a remote control from outside the vehicle, this is used for monitoring and calculating the number of healthy and diseased plants in a large garden area that can be covered. The purpose of this research is to map the health of oil palm plants using drone technology. The research method is using drones and oil palm application (OPA) software to calculate the number of oil palm stands followed by plant verification with a plant census using a global positioning system (GPS) to determine the distribution of healthy and diseased oil palm plants. The result of the research is a map that displays information on plant health and the number of plants characterized by color.

**Paper ID: 18446**





## **Effect of giving biochar and chicken manure compost enriched with phosphate solubilizing fungi to the growth and production of potato (*Solanum tuberosum* L.) in Andisol soil**

***F H Hibatullah and M Sembiring\****

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia*

Email: [marianisembiring@usu.ac.id](mailto:marianisembiring@usu.ac.id) or [mariani.sembiring29@yahoo.com](mailto:mariani.sembiring29@yahoo.com)

**Abstract.** Phosphorus is considered a primary nutrient for plant growth and is needed to sustain optimum plant production and quality. This research aims to determine the effect of giving palm oil shell biochar and chicken manure compost enriched with phosphate solubilizing fungi on the growth of potato in Andisol soil. This research was conducted at the IP2TP (Agricultural Research and Technology Research Installation) Berastagi and Laboratory of Soil Biology, Agriculture Faculty, Universitas Sumatera Utara. This research used Factorial Randomized Block Design with 2 Treatment Factors and 3 replications. The first factor is oil palm shell biochar, namely; B0 (without application of biochar), B1 (210 g/plant), B2 (315 g/plant), B3 (420 g/plant). The second factor is chicken manure compost enriched with phosphate solubilizing fungi, namely; A0 (without application of compost), A1 (25 g/plant), A2 (50 g/plant), A3 (75 g/plant). The research result showed that the application of palm oil shell biochar could increase number of tubers per plant but has not been able to increase plant height, number of leaf stalks and tuber weight per plant. Applying chicken manure compost enriched with phosphate solubilizing fungi increased plant height, number of leaf stalks, number of tubers per plant, and tuber weight per plant. The interaction of oil palm shell biochar and chicken manure compost enriched with phosphate solubilizing fungi increased plant height, number of leaf stalks, number of tubers per plant, and tuber weight per plant.

***Paper ID: 18447***





## Exploration and Quantitative Character of Local Gogo Rice Padang Lawas

*H Wahyuni\*, R Alfi and J Hariani*

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

Email: [\\*hafneswahyuni@usu.ac.id](mailto:*hafneswahyuni@usu.ac.id)

**Abstract.** Exploration is one of the plant breeding activities that aims to increase genetic diversity. This exploration activity has been carried out since 2021 in Padang Lawas Regency. The purpose of this study was to find out information about genetic diversity in the quantitative character of local upland rice from Padang Lawas Regency. This research was conducted in August using the method of planting per row (head to row). The exploration results obtained 7 upland rice cultivars from Pinarik village, namely Sioppaboru, Sibayur, Sibara, Siperak, Silumutpaon, Sialim and Sibobo. Characters of plant height ranged from 113.0cm to 159.5cm, stem length ranged from 42.9cm to 59.2cm, leaf length ranged from 69.0 cm to 100.5cm, total tiller number ranged from 10 to 25 tillers, the number of productive tillers ranged from 1000 grain weight to 10 to 22 tillers. and the weight of 1000 grains ranges from 19.1 to 25.0 This research is important as preliminary information for further ex situ characterization.

**Paper ID: 18448**





## Visual Screening of Potassium Solubilizing Bacteria for Increasing Solubilization of Potassium Mineral

*W Akasah<sup>1,2</sup> and L S Chou<sup>2</sup>*

<sup>1</sup>*Faculty of Agriculture, Universitas Sumatera Utara, Medan, North Sumatra, Indonesia*

<sup>2</sup>*College of Agriculture, National Chiayi University, Chiayi City, Taiwan, ROC*

\*Email: [widaakasah@usu.ac.id](mailto:widaakasah@usu.ac.id)

**Abstract.** At present, there has been renewed interest in potassium solubilizing bacteria (abbreviated as KSB) research, but most of them were only focused on the size of halo zone or the potassium solubilization, however the information regarding long observing time during KSB growth and its potential to be used as adjunct in biofertilizers are still lacking. This research focused on the first issue, in which monitoring growth of two KSB strains, which were isolated from coffee rhizosphere for 7 days on Modified Aleksandrov Medium (MAM) plate. The difference capability of KSB to produce organic acids were used as a reference in determining the incubation time for 7 days. The purpose of this study was to provide a long observation of KSB growth data that had not been thoroughly done before, this methods were used to distinguish of KSB capability to solubilize potassium mineral and providing advanced information to the current research on KSB. In this study, we specifically designed and used MAM plate for qualitative analysis. The results indicated that isolate KSB-12 was capable of producing organic acid and thus solubilized potassium faster than isolate KSB-19 at initial 1-4 days of incubation on MAM plate. Interestingly enough, population (solubilizing zone) of isolate KSB-12 decreased after 5 days of incubation on MAM plate, while isolate KSB-19 continued to grow, maintained cell numbers, and produced organic acids, releasing potassium in a continuous fashion. According to literatures, different strains and types of organic acid (volatile *vs.* non-volatile) produced affect this phenomenon, due to non-volatile organic acid existed longer. In conclusions, we were provide a well designed time series study regarding the potassium solubilization efficiency of KSB, determining the fastest and last the longest strain of potential KSBs.

**Paper ID: 18451**





## Evaluation of yield attributing characters and grain yield in some promising lines of red rice (*Oryza sativa* L.) grown in the lowland conditions

**G R Sadimantara<sup>1\*</sup>, Muhidin<sup>1</sup> and W Nuraida**

<sup>1</sup>*Department of Agrotechnology, Faculty of Agriculture, University of Halu Oleo, Kendari, Indonesia*

E-mail: [\\*gusti5@yahoo.com](mailto:*gusti5@yahoo.com)

**Abstract.** The experiment was conducted in the paddy field of Ranomeeto village of South Konawe, Indonesia from January to May 2022 to evaluate the yield attributing characters and grain yield in some promising lines of red rice. Five rice lines, including GS12-1 (V1), GS12-2 (V2), GS16-1 (V3), GS16-2 (V4), GS44-1 (V5), and Inpari-33 variety, were laid out in a randomized complete block design (RCBD) with three replications. All red rice lines were planted at 25 x 25 cm spacing using one seedling per hill. The variables observed were plant height, number of tillers per plant, number of productive tillers per plant, days to flowering, days to harvest, panicle length, number of grains per panicle, filled grains percentage, 1000-grains weight, and grain yield. Data on various yield-attributing characters and grain yield revealed differences among promising lines of red rice. The plant height of the GS16-1 was the tallest (89.37 cm), and the GS12-2 line was the shortest (72.74 cm). The GS16-2 line produced a higher panicle length (25.96 cm) and the number of grains per panicle (146.62). The highest filled grains per panicle, 1000-grains weight, and grain yield were obtained from GS44-1 lines. The highest number of tillers per hill, number of productive tillers per plant, days to flowering, and days to harvest were recorded from G12-1 lines. There was highly positive significant correlation between the number of tillers per plant and the number of productive tillers per plant (0.908\*\*). Plant height revealed significant and highly significant negative correlations to the number of tillers per plant, number of productive tillers per hill, filled grains per panicle, 1000-grains weight, and grain yield. Further, grain yield per plant was recorded to be positively and significantly associated with the number of tillers per plant, number of productive tillers per plant, and filled grains percentage

**Paper ID: 18462**





## **Growth of arabica coffee seeds (*Coffea arabica* L.) sigarar utang variety as a response to the provision of various growth regulators and types of shade**

**L J Sembiring<sup>1</sup>, R I Damanik<sup>\*1</sup>, C Hanum<sup>1</sup>**

<sup>1</sup>*Department of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, 20155 Medan, Indonesia.*

E-mail: [revandy.iskandar@usu.ac.id](mailto:revandy.iskandar@usu.ac.id)

**Abstract.** Productivity of arabica coffee (*Coffea arabica* L.) sigarar utang variety in Indonesia is still relatively low, especially in Simalungun regency, North Sumatra province. The low productivity of coffee is partly due to the low quality of coffee seeds used by farmers in coffee cultivation. Some factors that need to be considered in nurseries are growth regulator and shade. This study aims to find out information on the type of growth regulators and the best shade density for the growth of arabica coffee seedlings. The experiment was carried out from March to June 2022 in Nagori Ujung Bawang, Simalungun regency and the central laboratory, Faculty of Agriculture, University of Sumatra Utara. The experiment used a Split Plot Design consisting of 2 factors and repeated 3 times. The first factor (main plot) consists of 4 levels, namely without shade (N0), 50% shade (N1), 70% shade (N2), and 90% shade (N3), while the second factor (sub-plot) consists of 3 levels are auxin growth regulator (Z1), cytokinin (Z2), and the combination of auxin with cytokinin (Z3). Observed parameters include: plant height, number of leaves, root canopy ratio, and total leaf chlorophyll content. The results showed that the interaction of shade treatment and growth regulators had a significant effect on root canopy ratio. The growth of root canopy ratio significantly affected the administration of the N3Z3 treatment interaction of 5.27 g. The shade treatment showed a significant effect on plant height, root canopy ratio and total leaf chlorophyll content, and treatment of growth regulators showed significant effect on root canopy ratio

**Paper ID: 18463**





## Performance of Qualitative Characters of Head and Grain of Local Gogo Rice from Padang Lawas

*H Wahyuni\*, R Alfi and M I Pakpahan*

*Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia.*

Email: [\\*hafneswahyuni@usu.ac.id](mailto:*hafneswahyuni@usu.ac.id)

**Abstract.** The performance of plant qualitative characters is a very important early stage in plant breeding programs that are influenced by simple genes. This is the basis for selecting parent sources in the assembly program for new high-yielding varieties. This research was conducted in August without a design (plant per row). The results showed that there were 6 individuals with green stems and 1 individual with yellowish green color. Based on the color character of the base of the stem, 5 individuals were found to be green, 1 individual was green with purple stripes and 1 individual was purple. In the leaf color character, there were 3 green individuals, 3 dark green individuals and 1 light green individual. There are 5 white individuals and 2 red individuals based on the character of the color of the rice. If based on the character of grain color there are 6 individuals with yellow color and 1 individual with brownish yellow color and if based on the character of the presence of grain tails there are 6 individuals who do not have grain tails and 1 individual has grain tails.

**Paper ID: 18470**





## The Role of Molybdenum in Relation to Rhizobium in Increasing Biological Nitrogen Fixation and Soybean Growth

*Y Hasanah<sup>1\*</sup>, H Hanum<sup>1</sup>, N A Harahap<sup>1</sup>, A S Harahap<sup>1</sup>*

*<sup>1</sup>Faculty of Agriculture, Universitas Sumatera Utara, Medan, Jl. Prof. A. Sofyan No. 3 Kampus USU Padang Bulan, Medan 20155, Indonesia*

Email : [yaya@usu.ac.id](mailto:yaya@usu.ac.id)

**Abstract.** Soybean is one of the legumes that can symbiotic mutualism with *Rhizobia* bacteria to bind N. In increasing the effectiveness of N fixation by rhizobia bacteria, the role of the micronutrient Molybdenum (Mo) is needed, because Mo is needed for the nitrate reductase enzyme for NO<sub>3</sub><sup>-</sup> assimilation. The objective of the research is to evaluate the role of Molybdenum in increasing the effectiveness of N fixation by the bacteria *Rhizobium* sp. and its relation to soybean growth. A factorial randomized design was established with two factors and three replications. The study used a factorial randomized block design with 2 factors and 3 replications. The first factor was application of *Rhizobium* sp (0 ; 5 and 10 ml/plant) and the second factor was application of molybdenum (0 ; 200 ; 400 and 600 g/ha). Result of the research showed that Inoculation of *Rhizobium* sp increased plant height, number of leaves and leaf area. Molybdenum application increases the number of nodules formed.

**Paper ID: 18498**







## The Content of Nitrogen, Phosphorus and Potassium of Shallot (*Allium ascalonicum* L.) Varieties with Different Cultivation Methods and Altitude

*Y Hasanah*<sup>1,2\*</sup>, *L Mawarni*<sup>2</sup>, *FR Wirawan*<sup>1</sup>, *I Kurniawan*<sup>1</sup>

<sup>1</sup>Faculty of Agriculture, Universitas Sumatera Utara, Medan, Indonesia

<sup>2</sup>Centre of Roots and Tuber Study, Universitas Sumatera Utara, Medan, Indonesia

E-mail : \*yaya@usu.ac.id

**Abstract.** Differences in altitude and plant cultivation methods greatly affect the nutrient content of shallot plants. The objective of this research is to develop differences in the nutrient content of N, P and K in two TSS shallots with different cultivation methods and altitude. The study was conducted in series in the highlands (Berastagi 1295 m asl) and in Medan (32 m asl) using a Factorial Randomized Block Design. Data analysis was carried out with combined (series) ANOVA. The first factor is the variety of shallots (Sanren F1 and Lokananta). The second factor is the cultivation method used based on the recommendation of the seed supplier, the recommendation for double production, the modification of the recommendation of the seed supplier and the modification of the recommendation for the double production). The results showed that the location, variety, cultivation and their interactions significantly affected the N, P and K content of onion plant tissues. In both Sanren F1 and Lokananta varieties, the use of M1 cultivation method in highlands resulted in the highest P and K content compared to other treatment combinations. The use of the M2 cultivation method in the lowlands in Sanren F1 and Lokananta varieties resulted in the highest N content compared to other treatment combinations.

**Paper ID: 18499**





## The effect of fertilizer on the growth of dwarf banana cavendish (*Musa acuminata* L.) seedling under the natural shade

**Muhidin<sup>1\*</sup>, G R Sadimantara<sup>1</sup>, L O M Hyudi, M Eviyani, DN Yusuf<sup>2</sup> and S Leomo<sup>2</sup>**

<sup>1</sup>Department of Agrotechnology, Faculty of Agriculture, Halu Oleo University, Kendari, Southeast Sulawesi, Indonesia

<sup>2</sup>Department of Soil Sciences, Faculty of Agriculture, Halu Oleo University, Kendari, Southeast Sulawesi, Indonesia

Email: [muhidinunhalu@gmail.com](mailto:muhidinunhalu@gmail.com)

**Abstract.** Banana is a very important fruit commodity. The demand for bananas is increasing every year but the land for banana development is increasingly limited. Therefore, it is necessary to develop banana as an insert plant. The main obstacle to banana development is the availability of banana seeds that have uniform growth. This study aims to determine the effect of various doses of NPK on the growth of banana seedlings. The research was carried out at the Experimental Garden of the Faculty of the University of Halu Oleo. The study used a Randomized Block Design (RBD) with NPK dose treatment consisting of P0 = without NPK (control), P1 = 50 kg NPK ha<sup>-1</sup>, P2 = 100 kg NPK ha<sup>-1</sup>, P3 = 150 kg NPK ha<sup>-1</sup> and P4= 200 kg NPK ha<sup>-1</sup>. The variables observed included plant height, number of leaves and leaf area. The results showed that the administration of NPK had a significant effect on the growth of banana seedlings on the parameters of plant height, number of leaves and leaf area. The growth of plant seeds is getting better with increasing the dose of NPK given.

**Paper ID: 18501**





## **Production of biomass and flavonoids in black cumin tissue culture**

***M Jannah, R I Damanik\****

*Department of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, 20155 Medan, Indonesia*

E-mail: [revandy.iskandar@usu.ac.id](mailto:revandy.iskandar@usu.ac.id)

**Abstract.** As an herbal plant, the seed part of black cumin is able to cope with various kinds of diseases including viruses. Black cumin seeds contain essential oils (psymena, thymolquinone) and fatty acids (palmitic acid, linoleic acid, oleic acid) which have various benefits, namely being able to be pain reliever (analgesic), anti-swelling (anti-inflammatory), antiallergic (antihistamine), antioxidant, antidiabetic mellitus, antitumor, and anticancer. The need to provide bioactive ingredients in that time short is not accompanied by the availability of land and nutfah plasma. With the existence of these problems, tissue culture techniques can be used to addressing the tissue. Callus culture is a heterotrophic cultivation. By paying attention to the large content of secondary metabolite compounds useful ones can be produced through callus induction techniques. Currently, the study have started using MS media, and modification of the type of tissue culture media by adding Picloramof 1 ppm combination with GA3 of 2 ppm can increased the percentage of callus growth. likewise affects the formation of phenolic and flavonoid content of black cumin callus

***Paper ID: 18516***





## **Mycorrhizal inoculation and application of chicken manure to increase sweet potato production in acidic soil**

***N Rahmawati<sup>1, 2\*</sup>, T Irmansyah<sup>1</sup> and D Yudhitama<sup>1</sup>***

*<sup>1</sup>Faculty of Agriculture, Universitas Sumatera Utara, Padang Bulan, Medan 20155, Indonesia*

*<sup>2</sup>Centre for Roots and Tuber Study Universitas Sumatera Utara*

Email: [nini@usu.ac.id](mailto:nini@usu.ac.id)

**Abstract.** Increased production of sweet potato can be done by expanding the planting in acid soil. Efforts to increase soil fertility and improve acid soil characteristics while maintaining environmental balance by inoculation of mycorrhizae and the use of chicken drum fertilizer. The purpose of this study was to evaluate the growth and production of sweet potato on the application of mycorrhizae and chicken manure in acid soil. The study was conducted in Simalingkar B, Medan Tuntungan sub-district, Medan city, North Sumatra Province, from July to November 2021, using a 2-factor randomized block design. The first factor is the inoculation of mycorrhizae with 2 levels, namely without giving mycorrhizae and giving mycorrhizae 20 g/planting hole. The second factor is the application of chicken manure with 4 levels, namely 0 tons/ha, 37 tons/ha, 42 tons/ha and 47 tons/ha. The results showed that the mycorrhizal treatment had a significant effect on the degree of mycorrhizal infection. The treatment of giving chicken manure significantly affected the degree of mycorrhizal infection, the number of tubers per sample, tuber weight per sample, and harvest index. The interaction of mycorrhizal treatment and chicken manure had a significant effect on tuber weight per sample.

***Paper ID: 18521***





## Seed biopriming using saline soil rhizobacteria from the coast of Kolaka Regency for enhancing seed viability and vigor of tomato (*Lycopersicum esculentum* L.)

*H Syaf<sup>1</sup>\*, T Sail<sup>2</sup> and A Yasin<sup>3</sup>*

<sup>1</sup>*Program Study of Soil Science, Faculty of Agriculture, Universitas Halu Oleo, Kendari 93232, Indonesia*

<sup>2</sup>*Program Study of Animal Husbandry, Faculty of Animal Husba, Universitas Halu Oleo, Kendari 93232, Indonesia*

<sup>3</sup>*Program Study of Environmental Science, Faculty of Forestry and Environmental Science, Universitas Halu Oleo, Kendari 93232, Indonesia*

E-mail: [hassyaf@yahoo.co.id](mailto:hassyaf@yahoo.co.id)

**Abstract.** The aim of the study was to obtain potential indigenous rhizobacteria as growth promoters and adaptive to saline soils. The isolate was isolated from saline soil rhizosphere on the coast in Kolaka district. The study was conducted at the Agronomy Unit Laboratory, Faculty of Agriculture, Halu Oleo University from April to September 2022. The study was arranged based on a completely randomized design (CRD), consisting of 15 test isolates. The isolates were tested for their effectiveness in increasing the viability and vigor of tomato seeds. The test was carried out using a seed biopriming technique, then the seeds were germinated using a standard germination procedure. The observed variables included maximum growth potential, seed germination, vigor index, relative growth rate and T50. The results showed that all tested rhizobacteria isolates showed the ability to increase the viability and vigor of tomato seeds. There was an increase in maximum growth potential, seed germination, vigor index, and relative growth rate of seeds with an increase in the range of 85% to 89% when compared to control. There were 3 isolates of rhizobacteria which were more capable of reducing T50 and increasing seed germination of tomato seeds, namely KL6, KL10 and KL14 isolates. Further research is still needed to test the effectiveness of this isolate in increasing the growth and yield of tomato plants under salinity stress conditions in the field.

**Paper ID: 18522**





## Assessment of Potential Soil Degradation on Various Land Uses in Keduang Watershed

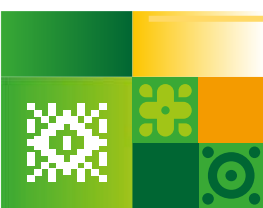
*N M Istiqomah\*, O Cahyono, M Mujiyo, D P Ariyanto, S Maro'ah, M R Romadhon, and V Irmawati*

*Master of Soil Science Department, Agriculture Faculty of Universitas Sebelas Maret, Jl. Ir. Sutami No. 36,  
Surakarta 57126, Central Java, Indonesia*

Email : [meimei2017\\_99@student.uns.ac.id](mailto:meimei2017_99@student.uns.ac.id)

**Abstract.** Keduang watershed is one of the catchment areas in the Wonogiri and Karanganyar districts, contributing 38.33% of sedimentation to the Gajah Mungkur Reservoir. The high value of population pressure on agricultural land in the Keduang watershed, triggers increasingly serious land degradation. Degradation in the upstream sub-watershed area will adversely affect the local and downstream areas. The impacts of land degradation include a decrease in land productivity and farmers' income, as well as the occurrence of critical land. Assessment of the potential for soil degradation important as an early indicator to determine the distribution of areas that have the potential for physical, chemical, and biological soil degradation. This research was conducted in Keduang watershed with the land use type consisting of paddy field, wood, moor, and plantation that overlaid trough land use, rainfall, slope, and soil type map. The method that used in this research is guided qualification. The result showed that the Keduang watershed has a soil degradation class from low to high. The medium class dominated the potential for soil degradation in Keduang watershed with the highest potential for degradation refers to moor with a slope of >40%, rainfall of 1908 mm/year, and Inceptisols soil type.

**Paper ID: 18523**





## The effect of planting material and organic fertilizer on growth of elephant foot yam (*Amorphophallus oncophyllus* Prain)

*N Rahmawati<sup>1,2\*</sup>, E H Kardhinat<sup>1,2</sup> and B D Savana<sup>1</sup>*

<sup>1</sup>Faculty of Agriculture, Universitas Sumatera Utara, Padang Bulan, Medan 20155, Indonesia

<sup>2</sup>Centre for Roots and Tuber Study Universitas Sumatera Utara

Email: [nini@usu.ac.id](mailto:nini@usu.ac.id)

**Abstract.** Elephant foot yam plants have the potential to be developed in Indonesia, planting material has an important role in the propagation and reproduction of elephant foot yam. Growth in elephant foot yam requires fertilizer which aims to maintain the balance of nutrients in the soil, and increase plant growth and production. The right type of organic fertilizer will have a good impact on the growth of elephant foot yam plants and the environment. The research was conducted on agricultural land, Faculty of Agriculture Universitas Sumatera Utara and implemented August 2021 - January 2022. The study used a randomized block design with two factors. This study aims to determine the effect of the two planting materials (bulbil and tuber) and 3 types of organic fertilizer (chicken manure, goat manure, cow manure and without organic fertilizer) on the growth of elephant foot yam. The results of this experiment showed that planting material had a significant effect on height of first shoot, number of leaves, and tuber weight but had no significant effect on number of bulbils. The application of organic fertilizer has a significant effect on all observed parameters. Tuber planting material was superior to bulbil planting material and chicken manure was the most superior in tuber weight parameter.

**Paper ID: 18524**





## Effect of mulch weight on temperature, soil moisture and vegetative growth of Sigambiri Merah in lowlands

*D Kusbiantoro<sup>1</sup>, L A M Siregar<sup>2\*</sup>, C Hanum<sup>2</sup>, L Mawarni<sup>2</sup>*

*<sup>1</sup>Doctoral Program in Agricultural Sciences, Faculty of Agriculture, Universitas Sumatera Utara, Jalan Prof. A. Sofyan No.3 Kampus USU, Medan 20155, Indonesia*

*<sup>2</sup>Program Study of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara, Jalan Prof. A. Sofyan No.3 Kampus USU, Medan 20155, Indonesia*

E-mail: [luthfi1@usu.ac.id](mailto:luthfi1@usu.ac.id)

**Abstract.** Rice is staple food source for most Indonesians. However, the development of upland rice in dry land is often ignored by policy makers due to perception that it is easier to increase paddy fields production. One of the cultivation techniques to achieve maximum production of upland rice in dry land is by modifying the microclimate in the roots zone using organic mulch. The research was carried out at the Experimental Farm of Meteorology, Climatology and Geophysics Agency, Sempali, Medan. The research method is a non-factorial randomized block design with three replications. Mulch thickness (M) used as treatment, consisted of without mulch (M0), 20 t/Ha (M1), 25 t/Ha (M2), and 30 t/Ha (M3). Observations were carried out destructively by taking two samples for each treatment at 28 days after planting (DAP). The results showed that mulch weight was effective in reducing soil temperature and increasing soil moisture compared to without mulch, but there is no improvement in the vegetative growth of Sigambiri Merah because it was still in the early stages of rice growth.

**Paper ID: 18526**







## Phytochemical Screening of *Colocasia gigantea* Ethanol Leaf Extract

***T Widyawati<sup>1,2\*</sup>, D K Sari<sup>2,3</sup>, I B Sumantri<sup>4</sup>, L F Mustanti<sup>4</sup> and N A Yusoff<sup>5</sup>***

<sup>1</sup>Pharmacology and Therapeutic Department, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

<sup>2</sup>Master Program in Tropical Medicine, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

<sup>3</sup>Nutrition Department, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

<sup>4</sup>Faculty of Pharmacy, Universitas Sumatera Utara, Medan, Indonesia <sup>5</sup>Integrative Medicine Cluster, Advanced Medical and Dental Institute, Universiti Sains Malaysia, Penang 13200, Malaysia

E-mail: [tri.widyawati@usu.ac.id](mailto:tri.widyawati@usu.ac.id) / [tw\\_rozan@yahoo.com](mailto:tw_rozan@yahoo.com)

**Abstract.** The leaf stalk of *Colocasia gigantea* is used as a vegetable in parts of Southeast Asia. The genus of *Colocasia* leaves has demonstrated the potential for antidiabetic, antihypertensive, immunoprotective, neuroprotective, and anticarcinogenic activities. This study aims to determine phytochemical screening of *Colocasia gigantea* leaf simplicial and extract. The study was carried out extraction by maceration method and phytochemical screening. Both of simplicial and extract contained alkaloids, glycoside, flavonoids, tannins, saponins, steroids/terpenoids. *Colocasia gigantea* are considered as medicinal plant that can be used in drug development.

**Paper ID: 18530**





## **Exploration of *spodoptera frugiperda* natural enemies on *zea mays* cultivation area**

***Asmanizar\**, Aldy Waridha, Fenti Maimunah Simbolon, Edy Sumantri**

*Faculty of Agriculture, Universitas Islam Sumatera Utara Jl. Karya Wisata, Gedung Johor Medan, Indonesia*

E-mail: [asmanizar\\_az@fp.uisu.ac.id](mailto:asmanizar_az@fp.uisu.ac.id)

**Abstract.** The Fall Armyworm *Spodoptera frugiperda* (Lepidoptera: Noctuidae) is a novel invasive pest in Indonesia but has established as a major pest of maize. Maize field across two ecozone (highlands and lowlands) were surveyed for natural enemies of *S. frugiperda* in North Sumatra, namely Deli Serdang District, Langkat, Karo and Dairi. Collected all insects and *S. frugiperda* eggs and larva were cultured in a laboratory for parasitoid emergence. Predator found were Coccinelidae, Dermaptera (*Euboriellia* sp) at all surveyed area, but *Sycanus* sp (Reduviidae) found at Langkat District and *Rhynocoris* sp. found at Karo and Dairi. Whilst, Tachinidae parasitoid was found at Dairi District. Further exploration and protection natural enemies is needed as the component of IPM Program of *S. frugiperda* insect pest.

***Paper ID: 18533***





## **The Effect of Biological Fertilizer and Organic Fertilizer in Growth and Biomass of Pegagan (*Centella asiatica* (L.) Urban) from Simalungun Accession**

***N S Vinolina\*, A Sidabutar***

*Department of Agrotechnology, Faculty of Agriculture, Universitas Sumatera Utara Jl. Prof. A. Sofyan No.3  
Kampus USU, Medan, Indonesia*

E-mail: [\\*noverita@usu.ac.id](mailto:*noverita@usu.ac.id)

**Abstract.** The demand for Pegagan plants to be used as medicine continues to increase yearly. One alternative to increase the productivity of Pegagan is by giving organic fertilizer. Therefore, it is essential to study the influences of giving biofertilizer and organic fertilizer based on the dose used in increasing the growth and biomass of Pegagan. Here, two treatments were applied: biofertilizer (BF): 0, 1, 2, and 3 ml/L and organic fertilizer (OF): 0, 3.650, 7.301, and 10.952 tons/ha with three replications. If the significant variance were fulfilled, Duncan's Multiple Distance Test with a level of 5% would be continued. The results demonstrated that the administration of biofertilizer revealed no notable effect on all observed parameters. The interaction between biofertilizer and organic fertilizer also had no notable impact on all parameters. In conclusion, applying organic fertilizer could notably improve the number of primary tendrils, leaf fresh weight per plot, and root fresh weight per plot.

***Paper ID: 18557***





## Identification of the distribution and characteristics of local sago from Kendari, Southeast Sulawesi

*D N Yusuf<sup>1\*</sup>, S Leomo<sup>1</sup>, T C Rakian<sup>2</sup>, G A K Sutariat<sup>2</sup>, N M Rahni<sup>2</sup> and Muhidin<sup>2</sup>*

<sup>1</sup>Department of Soil Sciences, Faculty of Agriculture, Halu Oleo University, Kendari, Southeast Sulawesi, Indonesia

<sup>2</sup>Department of Agronomi, Faculty of Agriculture, Halu Oleo University, Kendari, Southeast Sulawesi, Indonesia

E-mail: [dewi.yusuf@uho.ac.id](mailto:dewi.yusuf@uho.ac.id)

**Abstract.** Sago palm is an important commodity in Southeast Sulawesi and has high productivity as a carbohydrate-producing plant. The potential for carbohydrates produced can reach 15-24 tons ha<sup>-1</sup> yearly, which is higher than the production potential of other carbohydrate-producing plants such as rice, corn, and wheat. Before rice became the main source of carbohydrates, sago starch was the main source of food for the people who live in Southeast Sulawesi, especially in the Kendari mainland area. Like other basic starches, sago starch itself has no taste and is usually flavored with other food ingredients. Sago generally does not contain fat or protein; therefore, the consumption of sago must be supplemented with other food sources of fat or protein from the sago area. The production capacity of sago palms varies between 2-5 tons of dry sago starch per hectare in the natural sago cultivation without care and maintenance. With the density of sago 500 clumps per hectare in various ages, it is estimated that around 100 trees could be harvested annually. A well-maintained farm could produce 150 kg of starch palm and give a total yield of 15 ton ha<sup>-1</sup>. Currently, only 5,912 ha are planted with sago, from the total area in 1985 was 13,000 ha. For the development of sago, it is necessary to characterize and identify the distribution of local sago from Kendari Southeast Sulawesi. The results showed that there were three dominant types of local sago in Kendari, namely sago molat, sago tuni and sago borowila, originating from the main sago production centers in Kendari such as in Tobimeita, Abeli and Pohara.

**Paper ID: 18558**





## The Effect Of Calcium Chloride And Sodium Benzoate On Quality Of Crude Palm Oil (*Elaeisguineensis*Jacq.) As A Source Of Biofuels

***R S Handayani1\*, N Bachri2, R Rusydi1, M. Nazaruddin1, Monalisa1***

*Faculty of Agriculture, Universitas Malikussaleh, Aceh Utara Faculty of Economics and Business Universitas Malikussaleh, Aceh Utara*

E-mail: [selvy@unimal.ac.id](mailto:selvy@unimal.ac.id)

**Abstract.** One of the plantation commodities that has an important role in the Indonesian economy is palm oil. The problem that often occurs in the palm oil industry is the low quantity and quality of palm oil yield. Production quality improvement can be done by preventing damaged or defective products. Efforts that can be made to prevent fruit damage can be done by spraying a solution of calcium chloride and sodium benzoate. This research aimed to determine the effect of calcium chloride and sodium benzoate on the quality of crude palm oil. The research was done at the Fundamentals of Agricultural Science Laboratory, Faculty of Agriculture, Malikussaleh University, North Aceh Regency. The research was started from September to November 2021. The experimental design used was Factorial Completely Randomized Design consisted two factors. The first factor was the use of Calcium Chloride (C) spray with three levels, namely: C0: 0 ppm, C1: 3000 ppm, C2: 4000 ppm. The second factor was is the use of Sodium Benzoate (N) spray with three levels: N0: 0 ppm, N1: 3000 ppm, N2: 4000 ppm. The results showed that the application of calcium chloride did not significantly effect on the quantity and quality of CPO. Giving a concentration of 3000 ppm sodium benzoate spray was able to reduce the weight loss value of loose fruit and free fatty acids, as well as increase the yield of CPO. There was a very strong relationship between the value of the water content of the fruit and the level of impurities on the yield produced. The higher the water content of the fruit, the lower the yield of CPO, and the higher the level of impurities, the lower the yield of CPO produced.

**Paper ID: 18582**





## Seed biopriming using saline soil rhizobacteria from the coast of Kolaka Regency for enhancing seed viability and vigor of tomato (*Lycopersicum esculentum* L.)

**G A K Sutariati<sup>1</sup>, Muhidin<sup>1</sup>, A Bahrin<sup>1</sup>, A Khaeruni<sup>1</sup>, N M Rahn<sup>1</sup>, T C Rakian<sup>1</sup>, A Madiki<sup>1</sup>, L Mudi<sup>2</sup>, K Amartani<sup>3</sup>, and G N A Wibawa<sup>4</sup>**

<sup>1</sup>Department of Agrotechnology, Faculty of Agriculture, University of Halu Oleo, Kendari Southeast Sulawesi 93232 Indonesia

<sup>2</sup>Department of Plantation Crop Cultivation, State Agricultural Polytechnic of Samarinda 75131, Indonesia

<sup>3</sup>Doctoral Student of Agricultural Sciences, Postgraduate Program, University of Halu Oleo, Kendari Southeast Sulawesi 93232 Indonesia

<sup>4</sup>Department of Statistics, Math and Science Faculty, University of Halu Oleo, Kendari Southeast Sulawesi 93232 Indonesia

E-mail: [sutariati69@yahoo.co.id](mailto:sutariati69@yahoo.co.id)

**Abstract.** The aim of the study was to obtain potential indigenous rhizobacteria as growth promoters and adaptive to saline soils. The isolate was isolated from saline soil rhizosphere on the coast in Kolaka district. The study was conducted at the Agronomy Unit Laboratory, Faculty of Agriculture, Halu Oleo University from April to September 2022. The study was arranged based on a completely randomized design (CRD), consisting of 15 test isolates. The isolates were tested for their effectiveness in increasing the viability and vigor of tomato seeds. The test was carried out using a seed biopriming technique, then the seeds were germinated using a standard germination procedure. The observed variables included maximum growth potential, seed germination, vigor index, relative growth rate and T50. The results showed that all tested rhizobacteria isolates showed the ability to increase the viability and vigor of tomato seeds. There was an increase in maximum growth potential, seed germination, vigor index, and relative growth rate of seeds with an increase in the range of 85% to 89% when compared to control. There were 3 isolates of rhizobacteria which were more capable of reducing T50 and increasing seed germination of tomato seeds, namely KL6, KL10 and KL14 isolates. Further research is still needed to test the effectiveness of this isolate in increasing the growth and yield of tomato plants under salinity stress conditions in the field.

**Paper ID: 18589**





## **Chlorophyll and Root Nodules at Various Ages of Soybean (*Glycine max L.*) Plants in Wet Dry Season**

***M Hamawi<sup>1</sup>\*, E Rosanti<sup>2</sup> and R A A Rahma<sup>2</sup>***

*<sup>1</sup>Agrotechnology Department, University of Darussalam Gontor, Indonesia*

*<sup>2</sup>Occupational Safety and Health Department, University of Darussalam Gontor, Indonesia*

E-mail: [mahmudahhamawi@unida.gontor.ac.id](mailto:mahmudahhamawi@unida.gontor.ac.id)

**Abstract.** Effect of soybean cultivar and plant age on the number of nodules and leaf chlorophyll content planted in the wet dry season. The study was designed using a factorial randomized block design with three replications. The results showed that there was a significant difference in the number of nodules and dry weight of the nodules, while the chlorophyll content between Gepak Hijau and Gepak Kuning cultivars that were planted differently had no significant difference. The number of nodules is positively correlated with total chlorophyll. Humidity and rainfall reduce the number of nodules and the total content of chlorophyll. Solar radiation promotes the growth of the number of nodules and the total content of chlorophyll.

**Paper ID: 18637**





## The Growth and Production of Paddy Rice (*Oryza sativa* L.) through Application Combination of Various Doses of N,P,K Fertilizers With Organic Fertilizers

*Hapsoh, I R Dini\*, Wawan, M Rifa'i and F Khoiruddin*

*Department of Agrotechnology, Faculty of Agriculture, University of Riau, Pekanbaru, Indonesia.*

E-mail: [isna.rahmadini@lecturer.unri.ac.id](mailto:isna.rahmadini@lecturer.unri.ac.id)

**Abstract.** The need for rice food increases from year to year along with the increase in population. Rice production in Riau Province in 2020 reached 219,052 tons of milled dry grain with a land area of 64,733 ha producing 139,131 tons of rice, while the Riau Province's rice consumption figure in 2020 reached 571,226 thousand tons. Efforts are being made to increase rice production through intensification, namely fertilization. The use of solid and biological compost containing bacteria is expected to increase the growth and yield of lowland rice and reduce the use of inorganic fertilizers N, P, K. Therefore, this study aimed to obtain the best combination dose of inorganic fertilizers N,P,K with organic fertilizers on the growth and production of rice plants (*Oryza sativa* L.). This research was conducted experimentally using a Completely Randomized Design (CRD) consisting of 6 treatments and 4 replications in order to obtain 24 experimental units with the treatments tested were P0 = 100% inorganic fertilizer + petroganic; P1 = 100% inorganic fertilizer; P2 = 100% inorganic fertilizer + 100% solid compost; P3 = 75% inorganic fertilizer + 100% solid compost; P4 = 75% inorganic fertilizer + 100% solid compost + biological fertilizer; P5 = 50% inorganic fertilizer + 100% solid compost + biological fertilizer. The results showed that the application of a combination of inorganic fertilizers N,P,K with organic fertilizers did not affect plant height and weight of milled dry grain, but did affect the percentage of pithy grain and the weight of 1000 grains of grain. The combination of 75% inorganic fertilizer application with 4 ton.ha<sup>-1</sup> solid compost and 10 ml/l biological fertilizer was able to match the results of 100% inorganic fertilizer treatment.

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