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Book of Abstracts International Conference on Agriculture, Environment, and Food Security 2017 (AEFS) 2017

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Book of Abstracts

International Conference on Agriculture, Environment, and Food Security 2017 (AEFS) 2017

7th-8th November 2017

Arya Duta Hotel,

Medan, Indonesia

Committee of the AEFS 2017

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KEYNOTE SPEAKER

Prof. David Herak (Biosystem Engineering)

Czech University of Life Science, Prague

Prof. Dr. Chris Franco (Microbiology and Biotechnology)

University of Flinders, Australia

Dr. Ir. Anton Apriyantono, MS (Food Science)

Former Minister of Agriculture, Indonesia

Dr. Janice Ser Huay Lee (Environment)

Nanyang Technology University, Singapore

Mirza Hasanuzzaman, Ph.D (Agronomy)

Sher-e-Bangla Agricultural University, Bangladesh

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29. Sonia
30. Nina Unzila Angkat
31. Sylvia Bianca Sihombing

SUMMARY KEYNOTE SPEAKERS

Modern method of description of mechanical behaviour of *Jatropha curcas* L. seeds under compression loading

Prof. Ing. David Herák, Ph.D. Biosystem Engineering Czech University of Life Science, Prague.

This presentation deals with the development of long time research related to the mechanical behaviour of *Jatropha* bulk seeds carried out at Czech University of Life Sciences Prague in cooperation with several Indonesian institutions. Presentation is divided into several chapters which logically follow. At a beginning of the presentation the mechanical behaviour of bulk seeds under compression loading, creep and relaxation are described. In the next chapter different mathematical models as well as computer virtual models using finite element method are derived and presented. The connection of mathematical models with real environment of screw presses are also described in this presentation as well as their utilization in industrial engineering. Last but not least chapter is focused on the involvement of international projects and students cooperation in this research. The significant results of carried out research are an integral part of this presentation.

Endophytic Actinobacteria – Beneficial partners for Crop production

Prof Christopher Franco, Medical Biotechnology, Flinders University, Adelaide, Australia

Actinobacteria are filamentous bacteria that are prolific producers of antibiotics and other bioactive compounds. They are ubiquitous in soil but some have adapted to an endophytic life style.

The first part examines their isolation, taxonomy and their presence in the plants. This is done using a GFP-containing strain and confocal and electron microscopy (EM) to show that when added as a spore coating they can recolonise the intercellular spaces. It is also noted that they can enter the plant through crack in the roots especially at lateral root junctions. We have shown that they can be found in the leaves by scanning EM and growth using an antibiotic resistant marker.

We have found that endophytic Actinobacteria are ubiquitous in plants and some can be used to improve crop production. The next phase describes our Beneficial Microbes Program (BMP) supported by the Australian Grains Research and Development Corporation in which we have 5 streams. 1. Nodulation increasing bacteria; 2. Control of Rhizoctonia on wheat; 3. Control Pythium on wheat; 4. Control Pythium on canola; 5. Canola tolerance to moisture stress.

For the control of fungal root diseases of wheat we have utilised a unique high throughput tube assay followed by the more rigorous replicated pot assays to confirm efficacy, reliability, stability on seed and determine the optimum amount of inoculum. The effect of farm chemicals such as fungicides and insecticides was also tested for compatibility. In addition, because Rhizoctonia manifests in patches a new form of field testing was employed so that the controls and treatments fall within a disease patch. We screened over 2000 strains for Pythium and Rhizoctonia root rot to give us 2 strains for control of each of the disease.

Of relevance to Indonesia is the microbiome of rice. This was doctoral research work done by Dr Fitri Widiantini who showed that Australian rice plants harbour an abundance on *Microbispora* species even though the soils have a majority of *Streptomyces* species. A number of the isolates were found to be new on the basis of polyphasic taxonomy including DNA-DNA hybridisation. Further studies with different soil types confirmed the presence of *Microbispora* spp. as being the dominant genus in Australian rice plants.

Mechanisms of action are an important factor in progressing the use of microbial inoculants for use in agriculture. Here we report on our inoculants being able to induce systemic resistance using *Arabidopsis thaliana* as the model plant. The transcript analysis indicates that the inoculant primes the plant so that it can withstand infection either by *Fusarium oxysporum* or *Pectobacterium carotovorum*. A proteomics study showed that the priming effect is due to the inoculant being able to produce a boost of PR protein. These proteins appear to be able to counteract the ROS damage inflicted by the pathogen at levels that exceed the response to infection by the pathogen alone.

Finally we examined the association of actinobacteria with Rhizobia to increase biological N-fixation by 50-70% in legume plants grown in soils with low N content, compared to untreated controls. In crops like Lucerne the biomass yield increases by up to 50% and with grain legumes such as soya the dry bean yield increased by 20-50% when treated with specific actinobacteria.

Our work has served to illustrate that a few endophytes offer reliable sustainable solutions to modern agriculture.

*Prof Christopher Franco, Medical Biotechnology, College of Medicine and Public Health,
Flinders University, Adelaide, Australia.*

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Ecosystem Management For Improving Oil Palm Agriculture & Ensuring Food Security

Janice Ser Huay Lee

Assistant Professor at the Asian School of the Environment, Nanyang Technological University of Singapore

In this talk, I will discuss the importance of ecosystem management for oil palm agriculture and highlight the ways in which plantation agriculture rely and is shaped by its ecosystem. Oil palm plantation agriculture cannot be seen as being isolated from the ecosystem as it has large impacts on the integrity of tropical ecosystems, where they are grown, and are equally affected when the ecosystem degrades and is in poor health. Well managed ecosystems have the potential to benefit oil palm plantation agriculture in the long-run, which will in turn benefit Indonesia's rural population and national economy.

Ecosystem management is an example of a coupled human and natural system where human decisions and policies govern the landscape and shape the outcomes of components of the landscape, including oil palm plantation agriculture. Firstly, I will discuss how to implement effective ecosystem management through the lens of existing government regulations for oil palm development, certification standards to reward well managed oil palm plantations, and jurisdictional approaches to include stakeholders which have yet to be convinced of the benefits of incorporating ecosystem health in the management of their oil palm plantations. Secondly, I will highlight how environmental changes pose significant risks to oil palm plantation landscapes and the ways in which ecosystem management can mitigate these risks. These include peatland management and restoration, riparian buffer development, and a moratorium on the development of relatively intact peatswamp forests, peat domes and mangrove forests. Lastly, I will talk about the use of palm oil in our diets and highlight how there is an increasing trend in the use of palm oil for processed food or junk food, which is nutritionally poor. I will present the extent of oil palm plantations required for palm oil consumption in junk foods and elaborate on the need to link nutritional values to agricultural land use.

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Crop Responses And Adaptation To Environmental Stresses In The Era Of Climate Change

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‘How will we feed the world in the next decades?’ is one of the frequently asked questions among the agricultural scientists. The main evolution that will increase the demand for food is a continued rise in the number of people on our planet. While the world’s population consists of 7.3 billion people today, the UN projects that the number will increase by 1.2 per cent annually, amounting to 8.5 billion people in 2030 and almost 10 billion people in 2050. Unfortunately, the population growth is high in developing countries that have the least area of arable lands per capita. Although plant scientists are largely successful in enhancing crop yield due to advanced technologies there is still crisis of food. Plants are the major providers of staple foods for human. But as a sessile organism plants cannot avoid environmental adversities. Due to the climate change different adverse environmental factors like salinity, drought, extreme temperatures, toxic metals/metalloids, waterlogging/flooding, ozone etc. are reducing plant productivity significantly. The complex nature of the environment, along with its unpredictable conditions and global climate change, are increasing gradually, which is creating a more adverse situation. Abiotic stress may reduce crop yield up to 70%. The episodes of drought and heat stress is very common now-a-days. In the last couple of years we have experienced record breaking high temperature. In contrary, both chilling and freezing are common in many temperate countries and also in other part of the world during winter. Some of the toxic metals/metalloids, e.g. cadmium, lead, arsenic etc. are exceeding their allowable limits which are also major concern for crop production and human health as well. Abiotic stresses modify plant metabolism leading to harmful effects on growth, development and productivity which ultimately affect food security. Therefore, understanding the molecular and physiological mechanisms of abiotic stress tolerance and to find the ways that would increase stress tolerance in plants are crucial in agriculture. Recently, scientists have explored the underlying mechanisms of stress-induced damages and the tolerance mechanisms. They also developed various techniques in conferring environmental stress tolerance in plants. Learning from the tolerant plants and transferring these traits to sensitive plants to gain productivity is now a major concern. With the advancement of molecular tools tailoring of stress responsive genes become possible for the development of tolerant genotypes. Overexpression of combinations of target genes in transgenic plants has been shown to have synergistic effects on stress tolerance. Therefore, increased emphasis is being placed on producing transgenic plants overexpressing genes – i.e., gene stacking – associated with more than one trait in order to achieve tolerance to multiple environmental stresses. Some eco-friendly approaches like phytoremediation has also drawn attention to researchers for the mitigation of metal/metalloids-induced damages. It is possible to minimize losses in

agricultural production due to abiotic stresses by a judicious blend of knowledge in crop physiology and crop husbandry procedures. Since environmental stress is concerned with multidiscipline like agriculture, plant science, plant breeding, molecular biology, soil science, chemistry and many other field of biological science an integrated approaches with coordinated and sustainable research may attain the goal.

Opening Speech From Rector of Universitas Sumatera Utara

International Conference on Agriculture, Environment and Food Security (AEFS) 2017

07 November 2017 at Hotel Aryaduta, Medan

Assalamu'alaikum warahmatullahi wabarakatuh,

Good morning and Peace be upon you all

Excellencies, distinguished guest, Ladies and Gentlemen

It gives me great pleasure and privileged to extend to you all a very warm welcome on behalf of Universitas Sumatera Utara. We are very grateful to all our distinguished guests who accepted our invitation especially those who have travelled many hours to convene this International Conference on Agriculture, Environment and Food Security (AEFS) 2017.

AEFS 2017 is organized by The Faculty of Agriculture, Universitas Sumatera Utara as an annual event to celebrate the faculty anniversary and fully supported by other university and research institution partners. The cross cutting issue such as growing population, climate change, fair trade negotiation, food standard, environmental sustainability and globalization are putting pressure on future food security and environmental sustainability. These issues have motivated us to initiate this conference. The agricultural practices must rely on restoring the natural ecological balance by optimizing the production of food and the use of space. The challenge will be of how to produce enough food to meet all needs but still enhancing and preserving natural resources. This conference will not only give an opportunity to all of us to exchange idea and information but also to extend our corporation and discuss problems of mutual interest with academician and delegates not only from Indonesia but also from member countries of the region.

No matter how much we can do by ourselves on the local or national level, whether it is research or development action, it never enough to solve all problems in Agriculture, food security and environment. We must collaborate in an action-oriented effort to resolve the problems that trouble the agricultural development. I hope this conference can be a very fruitful first step to initiate our future collaboration. At the end of the conference, the knowledge from exchanging the information will give benefit to all of us with deeper understanding and give brighter idea of how to meet the future food need but with sustainable agricultural practice.

North Sumatera is famous known by its cultural heritage and having Danau Toba as one of the most popular tourism destination in Indonesia. Istana Maimun and Mesjid Raya are one of the famous cultural heritage which designed by Italian Architect. In addition, Danau Toba

is the largest volcanic lake in Indonesia which never fails to amaze any visitor. We hope that you may have the opportunity to visit any of these sites during your stay here.

I am looking forward to a productive discussion among all of the participants including both the speakers and the audience. I hope today's conference will be useful and interesting to all of us. With this, I proudly announce that on Tuesday, November 7th 2017, The International Conference on Agriculture, Environment and Food Security (AEFS) 2017 is officially open. Hope you have a good day and thank you very much for your attendance.

Wassalamu'alaikum warahmatullahi wabarakatuh,

Rector,

Prof. Dr. Runtung, SH, M.Hum

Conference Schedule

Activity	Time
Tuesday, 07th November 2017	
Registration of Participants	07.30 – 08.30
Welcome Address and Opening	08.30 – 09.00
Keynote Speeches and Discussion Part I	
Chris Franco	09.0 -09.30
David Herak	09.30 – 10.00
Mirza Hasanuzzaman	10.00 – 10.30
Discussion / Coffee Break	10.30 – 11.00
Keynote Speeches and Discussion Part II	
Janice Sher Huay Lee	11.00 – 11.30
Anton Apriyantono	11.30 – 12.00
Discussion	12.00 – 12.20
Lunch break	12.20 – 13.00
Parallel Session I	13.30 – 15.00
Coffee Break	15.00 – 15.15
Photo Session and Welcome Dinner at USU	16.00
Wednesday, 08th November 2017	
Paralel Session II	08.00 – 09.30
Coffee Break	09.30 – 09.45
Paralel Session III	09.45 – 11.15
Paralel Session IV	11.15 – 12.30
Lunch Break	12.30 -13.30
Paralel Session V	13.30 – 15.00
Coffee Break	15.00 – 15.15
Paralel Session VI	15.15 – 16.45
Closing Ceremony	17.00

Parallel Session Schedule

CLASS A

Session I 7/11/17

No	Paper ID	Author	Title	Time	Date	Track
A1	1515	Witono Adiyoga	Farmers's Perceptions on Climate Change in Low Land and High Land Vegetable Production Centers of South Sulawesi	13.30 – 13.45	11/07/2017	AEC
A2	1524	E.W. Riptanti, A. Qonita, Suprapti	Revitalization of Food Barns in Supporting Sustainable Food Security in Central Java	13.45 – 14.00	11/07/2017	AEC
A3	1625	Diana Chalil, Riatri Barus	Questioning the Sustainable Palm Oil Demand : Case Study from French – Indonesia Supply Chain	14.00 – 14.15	11/07/2017	AEC
A4	1793	S. Hariyanti, T. Supriana, R.S. Siregar	The Effect of Consumer Perception to the Satisfaction of Use of Traditional Drugs in Medan	14.15 – 14.30	11/07/2017	AEC
A5	1802	A.F. Siregar, T. Supriana	Factors That Influence The Interest of Farmer in Shallots Farming at Cinta Damai Village of Simanindo Sub- District of Samosir District	14.30 – 14.45	11/07/2017	AEC
A6	1803	Salsabila, T. Supriana	Strategies to increase the consumption of Traditional Medicine in Medan	14.45 – 15.00	11/07/2017	AEC

Session II 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
A13	1571	Dessy Adriani, Imron Zahri, Elisa Wildayana, Maryadi, Maryanah Hamzah, Yulius	Can tidal land prosper the farmers ? Lesson learn from migrant and local farmers in telang's integreted independent city, south sumatera	08.00 - 08.15	11/08/2017	AEC
A14	1766	T. Supriana and Farida Yani	The analysis of consumption level and preferences of fresh shallots consumers in Medan	08.15- 08.30	11/08/2017	AEC
A15	1771	M C Alam and T Supriana	Analysis of Supply Chain Management of Shallots at Medan	08.30- 08.45	11/08/2017	AEC
A16	1854	IS Rianse, U Rianse, WG Abdullah, S Hartono, A	The Income Distribution and Contribution of Palm Sugar Producer in	08.45- 09.00	11/08/2017	AEC

		Suryantini, Jamhari, Muhidin	Increasing The Household Welfare of Palm Sugar Maker in Kolaka Southeast Sulawesi Indonesia			
A17	3032	Rahmanta	Influence of Land Area and Capital Strengthening Fund of Rural Economics Enterprise toward Corn Production in North Sumatera Province	09.00-09.15	11/08/2017	AEC
A18	1832	Leni Handayani, Abdul Rauf, Rahmawaty, Tavi Supriana	The Strategy Of Sustainable Soybean Production To Increase Soybean Needs In North Sumatera	09.15-09.30	11/08/2017	AEC

Session III 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
A19	3011	Rulianda P Wibowo, Sumono, Noah Miller, Hasman Hashyim, Thompson Sebayang	Pricing behavior of USA exporter in wheat international market	09.45 - 10.00	11/08/2017	AEC
A20	1683	Lindawati, Nunung Kusnadi, Sri Utami Kuntjoro, Dewa K.S. Swastika	The Impact Of Input And Output Prices On The Household Economic Behavior Of Farmers Rice-Livestock Integrated Farming System (Rlifs) And Non Rlifs In Westjava	10.00 - 10.15	11/08/2017	AEC
A21	1580	Muhammad Buhari Sibuea, Faiz Ahmad Sibuea	Contribution of Village Cooperation Unit in Improving Farmers Incomes	10.15 - 10.30	11/08/2017	AEC
A22	1640	Rina Br Bukit, Bode Haryanto, Paham Ginting	Environmental Performance, Profitability, Asset Utilization, Debt Monitoring and Firm Value	10.30 - 10.45	11/08/2017	GP
A23	1582	Apri Heri Iswanto, Tito Sucipto, Elfrida Adlina	Passion fruit hulls particleboard: the effect of urea formaldehyde level on physical and mechanical properties	10.45 - 11.00	11/08/2017	GP
A24	1641	Mohammad Iqbal Bahua, Dewa Oka Suparwata	Local of participation the community in land rehabilitation critical in das randangan pohnuato regency	11.00 - 11.15	11/08/2017	GP

Session IV 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
A25	1831	Siti Latifah, Yunus Afifuddin, Sri Widya	Analysis of Community Income on Suren (<i>Toona sureni</i> (Blume) Merr.) and Cacao Crops (<i>Theobroma cacao</i> L.) in Simalungun, North Sumatera-Indonesia	11.15 – 11.30	11/08/2017	GP
A26	1755	Tito Sucipto, Rudi Hartono, Wahyu Dwianto	Determination of Wood Wettability Properties of Oil Palm Trunk, Shorea sp., and Paraserianthes falcataria by Contact Angle Method	11.30 - 11.45	11/08/2017	GP
A27	1643	Z Noer, Hasanuddin, Lisnawita, D Suryanto	Pathotype profile of <i>Xanthomonas oryzae</i> pv. <i>oryzae</i> isolates from North Sumatera	11.45 - 12.00	11/08/2017	GP
B49	3030	Amna Suresti ^{1*} , Uyung Gatot S. Dinata ^{2*} , Rahmi wati	Maturity Analysis of the Innovation System in the Livestock Industries of West Sumatra, Indonesia	12.00 – 12.15	11/08/2017	PS
B50	1584	Herwenita and Yanter Hutapea	Swamp Land Optimization in Supporting Food Security and Enhancing Farmers Welfare in South Sumatra Indonesia	12.15 – 12.30	11/08/2017	PS

Session V 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
D33	1510	Jessica Natalina Manurung, Hasnudi, Tavi Supriana	Income Analysis Of Goat Farmers On The Farmers Group In District Of Serdang Bedagai	13.30 - 13.45	11/08/2017	AS
D34	3027	Tafsin M, Y Khairani, ND Hanafi, Yunilas	In Vitro Digestibility Of Oil Palm Frond Treated By Local Microorganism (MOL)	13.45 - 14.00	11/08/2017	AS
D35	1631	Obed Haba Nono, Ronny Natawidjaja, Burhan Arief, Dadi Suryadi, and Maximilian M. J. Kapa	The Impact Of Sharing Arrangement Institution On Beef Cattle Breeding Performance In Kupang District, East Nusa Tenggara Province, Indonesia	14.00 - 14.15	11/08/2017	AS
D36	1368	Nevy Hanafi, Hadirin, Nini Rahmawati	Response Of Forages By Administration Of Fermented Goat Urine	14.15 - 14.30	11/08/2017	AS
D37	1477	David Yasin, Ari. Ashari Harahap, Muhammad Ary Syaputra, Randi Mulianda, Try Juli	Factors Affecting The Whole Beef Prices In Eight Provinces In Sumatera	14.30 – 14.45	11/08/2017	AS

		Adha, Ali Syahdana Harahap, Alfath Rusdhi, Musa Seno Ibarahim, Annur Rasyidah Siregar, Bobby Purwadi, Simon Petrus Ginting, Hasnudi, and Yusuf Leonard Henuk				
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Session VI 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B51	1826	Sarifuddin; Zulkifli Nasution; Abdul Rauf And Budi Mulyanto	Changing Of Sumatra Backswamp Peat Properties By Seawater And Zeolite Application	15.15 - 15.30	11/08/2017	PS
B52	3036	Virna Muhardina	Quality Evaluation Of Probiotic Capsule Prepared From Alginate, Carrageenan And Tofu Waste Flour Based On Bacterial Activity And Organoleptic Test	15.30 - 15.45	11/08/2017	PS
B53	3028	Zulkifli Nasution	Some Ecological Factors Of Pine At Lake Toba Catchment Area	15.45 - 16.00	11/08/2017	GP
B54	989	Achmad Siddik Thoha, Bambang Hero Saharjo, Rizaldi Boer, Muhammad Ardiansyah	Strengthening Community Participation In Reducing Ghg Emission From Forest And Peatland Fire	16.00 - 16.15	11/08/2017	PS
B55	3021	Eva Sartini Bayu, Anggria Lestami, E. Harso Kardhinata And Rosemary	Phylogenetic Relationship of Asam Gelugur (<i>Garcinia Atroviridis</i> Griff. Ex T. Anders) Based On Morphological Characters In Langkat And Serdang Berdagai, North Sumatra	16.15 - 16.30	11/08/2017	PS
A28	3037	T. Supriana, T. Chairuna	The Influences Of Consumer Characteristics On The Amount Of Rice Consumption	16.30 - 16.45	11/08/2017	AEC

CLASS B**Session I 7/11/17**

No	Paper ID	Author	Title	Time	Date	Track
B1	1520	Mujiyo, B.H. Sunarmingto, E. Hanudin, J. Widada, J. Syamsiah	The Effect Of Organic Paddy Field System To Soil Properties	13.30 - 13.45	11/07/2017	PS
B2	1538	Alridiwersah. E.M. Harahap, E.N.Aqoeb, Hamidah Hanum, Aisar Novita	Growth And Production Of Local Rice Varieties In The Shade Intensity	13.45 - 14.00	11/07/2017	PS
B3	3008	AM Lubis, LAM Siregar, K Lubis, Lisnawita, I Safn , AR Tantawi	Root Morphology Of Several Potato Varieties – Infected <i>Meloidogyne</i> Spp. And Addition Of Organic Matters	14.00 - 14.15	11/07/2017	PS
B4	3019	Mutia Rahmah, Diana Sofia Hanafiah, Luthfi Azis Mahmud Siregar	Selection Of Selected Individuals On Soybean Plant (<i>Glycine Max</i> L.Merrill) In Generation M ₅ Based On High Quality Production And Tolerant Stem Base Rod Disease <i>Athelia Rolfsii</i> (Curzi)	14.15 - 14.30	11/07/2017	PS
B5	1844	Yaya Hasanah, Mariani Sembiring	Effect On Foliar Application Of Chitosan And Salicylic Acid On The Growth Of Soybean (<i>Glycine Max</i> (L.).Merr.) Varieties	14.30 - 14.45	11/07/2017	PS
B6	1592	Rita Noveriza, Jumsu Trisno, Haliatur Rahma, Sri Yuliani, Reflin and Martinius	Effectiveness Of Several Dosage Formula Of Oil And Nano Emulsion Of Citronella Against Vascular Streak Dieback (Vsd) Disease On Cocoa	14.45 - 15.00	11/07/2017	PS

Session II 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B17	1808	Rahayu M , La Ode Santiaji Bande, Asmar Hasan, Agung Yuswana dan Fatma Rinambo	Contributionof Pod Borer Pests To Soybeancrop Production (Case In Pondidaha, Konawe District, Southeast Sulawesi)	08.00 - 08.15	11/08/2017	PS
B18	1843	Ratna Rosanty Lahay, Srinidiyanti Misrun, Rosita Sipayung	The Storage Capacity Of Cocoa Seeds (<i>Theobroma Cacao</i> L.) Through Giving Polyethylene Glycol (PEG) In The Various Of Storage Container	08.15 - 08.30	11/08/2017	PS
B19	1648	Nilahayati,	Genetic Variability And	08.30 -	11/08/2017	PS

		Rosmayati, Diana Sofia Hanafiah, Fauziyah Harahap	Heritability In Kipas Putih Soybean Mutant Line Using Gamma Rays Irradiation In M ₃ Generation	08.45		
B20	1677	M Basyuni, A Nuryawan, Yunasfi, and L A P Putri	Effect Of Long-Term Salinity On The Growth And Biomass Of Two Non-Secretors Mangrove Plants <i>Rhizophora Apiculata</i> And <i>Ceriops Tagal</i>	08.45 - 09.00	11/08/2017	PS
B21	1789	Sakiah, Mariani Sembiring, Jamalluddin Hasibuan	Entisol Land Characteristics With And Without Cover Crop (<i>Mucuna Bracteata</i>) On Rubber Plantation	09.00 - 09.15	11/08/2017	PS
B22	1798	M Hasibuan, I Safni, Lisnawita, K Lubis	Morphological Characterization Of Several Strains Of The Rice-Pathogenic Bacterium <i>Burkholderia Glumae</i> In North Sumatra	09.15 - 09.30	11/08/2017	PS

Session III 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B23	1842	Posma Marbun, Zulkifli Nasution, Hamidah Hanum, Abubakar Karim	Classification Of Andisol Soil On Robusta Coffee Plantation In Silima Pungga - Pungga Sub District	09.45 - 10.00	11/08/2017	PS
B24	1761	Ratna Rubiana, Araz Meilin	Effect Of Rice Husk Biochar Application To Soil Insect Diversity On Potato Cultivation	10.00 - 10.15	11/08/2017	PS
B25	1847	La Ode Santiaji Bande, Mariadi1, Gusnawaty HS, Nuriadi, Lilis Trisulpa & Rahmania	Botanical Pesticides Effect From Shells Of Bean's Cashew Nut On Biological Agents Of <i>Trichoderma Sp.</i> And <i>Gliocladium Sp.</i>	10.15 - 10.30	11/08/2017	PS
B26	1838	Rosmayati and D Bakti	Identification And Phylogenetic Analysis Of Local Yellow And Orange Sweet Potatoes Genotype In Sumatera Utara	10.30 - 10.45	11/08/2017	PS
B27	1858	N Rahmawati and R I M Damanik	Effect Of Foliar Application Of A-Tocopherol On Vegetative Growth And Some Biochemical Constituents Of Two Soybean Genotypes Under Salt Stress	10.45 - 11.00	11/08/2017	PS
B28	1605	Rini Sulistiani, Rosmayati, Luthfi	Differences In Morphology And Sugar	11.00 - 11.15	11/08/2017	PS

		A.M. Siregar and Fauziyah Harahap	Content Of Purple Sweetpotato (<i>Ipomoea Batatas</i> L.) With Potassium Treatment At Several Altitude			
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Session IV 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B29	1853	Chairani Hanum	Growth, yield and movement of phosphate nutrients in soybean on P fertilizer, straw mulch and difference of plant spacing	11.15 – 11.30	11/08/2017	PS
B30	3012	Andi Khaeruni, Eko Aprianto Johan, Teguh Wijayanto, Muhammad Taufik, Andi Abdul Rahman Syafar	Induction of Soybean Resistance to Bacterial Pustule Disease (<i>Xanthomonas axonopodis pv glycines</i>) by Rhizobacteria and Organic Material Treatment	11.30 - 11.45	11/08/2017	PS
B31	1855	L Sitinjak and E Purba	Response to Growth and Production of Green Beans (<i>Vigna radiata</i> L.) In Various Cropping Spots and Fertilizer Provision of Layer Chickens	11.45 - 12.00	11/08/2017	PS
B32	1811	Revandy Damanik	Germination Performance of Selected Local Soybean Cultivars during Drought Stress Induced by Polyethylene Glycol (PEG)	12.00 – 12.15	11/08/2017	PS
B33	1861	Yaya Hasanah, Tengku Chairun Nisa, Hapsah, Hamidah - Hanum	Physiological Characters of Soybean Cultivars with Application of Nitrogen Sources Under Dry Land Conditions	12.15 – 12.30	11/08/2017	PS
B34	1810	R I Damanik, B H Manurung and E S Bayu	Effect of Hypoxia Condition in Embryogenic Callus Growth of soybean cell culture	12.30 - 12.45	11/08/2017	PS

Session V 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B35	1647	Nasruddin, E.M. Harahap, C. Hanum, L.A.M. Siregar	Growth and Yield of Patchouli (<i>Pogostemon Cablin</i> , Benth) due to Mulching and Method of Fertilizer on Rain/Fet Land	13.30 - 13.45	11/08/2017	PS
B36	1576	Delvian Delvian, Ridahati Rambey	Decomposition Rate of <i>Rhizopora Stylosa</i> Litter in Tanjung Rejo Village, Deli Serdang Regency, North Sumatera Province	13.45 - 14.00	11/08/2017	PS
B37	1689	M Basyuni, N Sulistyono, R Wati and R Hayati	Deforestation trend in North Sumatra over 1990-2015	14.00 - 14.15	11/08/2017	PS
B38	1606	A. Susilowati, A.H. Rachmad,	Genetic Diversity of Resin Yields <i>Pinus Merkusii</i> from West Java	14.15 - 14.30	11/08/2017	PS

		I.Z. Siregar, Supriyanto	Indonesia Revealed by Microsatellites Market			
B39	1621	C.R. Kholibrina, Aswandi, A.Susilowati	Flowering and Fruiting Phenology of Kemenyan Toba (<i>Styrax Sumaterana J.J.SM</i>) in Aek Nauli Forest, North Samatera	14.30 - 14.45	11/08/2017	PS
B40	1598	Arida Susilowati, Cut Rizlani Kholibrina, Henti Hendalastuti Rahmad, muhtar Ardansah Munthe	Phylogeny of Kemenyan (<i>Styrax Sp</i>) From North Sumatra Based on Morphological Characters	14.45 - 15.00	11/08/2017	PS

Session VI 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B41	1809	Hamidah Hanum, Lisnawita, Ahmad Rafiqi Tantawi	Agronomic Effect Of Empty Fruit Bunches Compost, Anorganic Fertilizer And Endophytic Microbes In Oil Palm Main Nursery Used Ganoderma Endemic Soil	15.15 - 15.30	11/08/2017	PS
B42	1805	E Utari, Hasanuddin, Lisnawita, I Safni, K Lubis, AR Tantawi	The Potential Of Soil Fungi Associated With Potato Rhizosphere To Control Root Knot Nematode (<i>Meloidogyne Spp.</i>) On Potato".	15.30 - 15.45	11/08/2017	PS
B43	1804	Desi Indah Permatasari, Lisnawita, Syahril Oemri, Irda Safni, Khairunisa Lubis, Ahma Rafiki Tantawi	Use Of Organic Waste As Biofumigant For Controlling Root Knot Nematodes (<i>Meloidogyne Spp.</i>) On Potato	15.45 - 16.00	11/08/2017	PS
B44	3035	S.A.A.Taridala, Suaib, S. Wahyuni, W.G. Abdullah, N. I. Wianti, M. Zani, L.O. Jabuddin, Rosmawaty, Yusria, H. Batoa	Understanding The Social And Economic Aspects Of Upland Rice Farming	16.00 - 16.15	11/08/2017	PS
B45	1814	E Purba and D P Nasution	Planting Pattern And Weed Control Method Influence On Yield Production Of Corn (<i>Zea Mays L.</i>)	16.15 - 16.30	11/08/2017	PS
B46	3034	I R Manurung, Rosmayati and N Rahmawati	Physiology Response Of Fourth Generation Saline Resistant Soybean (<i>Glycine Max (L.) Merrill</i>) With Application Of Several Types Of Antioxidants	16.30 - 16.45	11/08/2017	PS

CLASS C**Session II 8/11/17**

No	Paper ID	Author	Title	Time	Date	Track
C1	1522	Maya Sarah, Farida hanum, Mushila Rizky, M.F. Hisham	Microwave Assisted Extraction Of Pectin From Cocoa Pin	08.00 - 08.15	11/08/2017	FST
C2	1774	Zakwan, Pada Mulia Raja, Giyanto	The Combination Of Activated Natural Ziolit Bentonid To Reduce Fe, N, Cu, In Revined Bleach Palm Oil (RBPO) By Using Atomic Absorbstion Spectropotometer Method	08.15- 08.30	11/08/2017	FST
C3	1699	Ika Ucha Pradifta Rangkuti, Elisa Julianti, Jenny Elisabeth	The Tocol Content Of Crude Palm Oil Based On The Level Ripeness And Their Relationship To The Quality And Their Stability	08.30- 08.45	11/08/2017	FST
C4	3024	S Wahyuni, Holilah, Asranudin and Noviyanti	Estimation Of Shelf Life Of Wikau Maombo Brownies Cake Using Accelerated Shelf Life Testing (ASLT) Method With Arrhenius Model	08.45- 09.00	11/08/2017	FST
C5	1727	Hotnida Sinaga, Hilton Deeth, Bhesh Bhandari	Effect Of Sodium Azide Addition And Aging Storage On Casein Micelle Size	09.00- 09.15	11/08/2017	FST
C6	1728	Hotnida Sinaga, Hilton Deeth, Bhesh Bhandari	Effect Of Microfluidization On Casein Micelle Size Of Bovine Milk	09.15- 09.30	11/08/2017	FST

Session III 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
C7	1251	Irhamni, Setyati Pandia, Edison Purba, Wirsal Hasan	Heavy Metal Content in Leachate Garbage of Final Disposal Side (TPA) of Banda Aceh City	09.45 - 10.00	11/08/2017	AEN
C8	1508	Sera Pita Loka, Sumono, D.L.S. Nasution	Revamping the Physical Properties of Entisol Soil with Compost Treatment	10.00 - 10.15	11/08/2017	AEN
C9	1574	B Haryanto, M Sirait, M Azalea, Alvin, S E Cahyani	Ball Mill Tool for Crushing Coffee and Cocoa Beans Base on Fraction Size Sieving Results	10.15 - 10.30	11/08/2017	AEN
C10	1656	R. Manurung, A. Syahputra, M.A. Alhamdi, W. Satria, E.M. Barus, R. Hasibuan, M.Z. Siswarni	Delignification and Hydrolysis Lignocellulosic of Bagasse in Colinegloride System	10.30 - 10.45	11/08/2017	AEN

C11	1661	B Haryanto, R Hasibuan, Alexander, M Ashari and M Ridha	Herbal Dryer: Drying of Ginger (<i>Zingiber officinale</i>) using Tray Dryer	10.45 - 11.00	11/08/2017	AEN
C12	1717	GR Sadimantara, B Kadidaa, Suaib, LO Safuan, Muhidin	Growth Performance And Yield Stability Of Selected Local Upland Rice Genotypes In Buton Utara Of Southeast Sulawesi	11.00 - 11.15	11/08/2017	AEN

Session IV 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
C13	1768	Ulfani ikhwana, Taufik Rizaldi, Riswanti Sigalingging	The Design Of Dapog Rice Seeder Model For Laboratory Scale	11.15 – 11.30	11/08/2017	AEN
C14	3025	Erni Misran, Okta Bani, Elfrida Margaretha Situmeang, Adelina Suciiani Purba	Removal Efficiency Of Methylene Blue Using Activated Carbon From Waste Banana Stem: Study On Ph Influence	11.30 - 11.45	11/08/2017	AEN
C15	1815	Sumono, Syarah Mulkan Parinduri. Nurul Huda, Nazif Ichwan	The Utilization Of Ultisol Soil For Horticulture Crops Cultivation	11.45 - 12.00	11/08/2017	AEN
C16	1545	Kabutey	The Effects Of Heating Temperatures And Time On Deformation Energy And Oil Yield Of Sunflower Bulk Seeds In Compression Loading	12.00 – 12.15	11/08/2017	AEN
C17	2256	A Kešner, R Chotěborský, M Linda and M Hromasová	Utilization Of FEM Model For Steel Microstructure Determination	12.15 – 12.30	11/08/2017	AEN
C18	1599	R Sigalingging, Sumono and N Rahmansyah	Evapotranspiration And Crop Coefficient Of Oil Palm (<i>Elaeis Guineensis</i> Jacq.) On Main Nursery In A Greenhouse	12.30 - 12.45	11/08/2017	AEN

Session V 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
C19	1849	R Sigalingging, D Herak and A Kabutey	Mechanical Behaviour Of Arabica Coffee (<i>Coffea Arabica</i>) Beans Under Loading Compression	13.30 - 13.45	11/08/2017	AEN
C20	1859	M.S. Hutasoit, E. Julianti, and Z. Lubis	Effect of Pretreatment On Purple-Fleshed Sweet Potato Flour For Cake Making	13.45 - 14.00	11/08/2017	FST
C21	3013	Herla Rusmarilin,	Soy-Yamgurt Probiotic	14.00 -	11/08/2017	FST

		Nurhasanah,RatnaYudythia Andayani	Drink As A Natural Potential Of Antioxidant	14.15		
C22	1860	E A Zebua, J Silalahi, dan E Julianti	Hypoglicemic Activity Of Gambier Drinks (<i>Uncaria Gambir</i> Robx.) In Alloxan-Induced Mice	14.15 - 14.30	11/08/2017	FST
C23	1851	S. Alfat1 & La Ode Santiaji Bande	Numerical Analysis Heat And Mass Transfer On Drying Process Of Agricultural Product Using Finite Element Method	14.30 - 14.45	11/08/2017	FST

Session VI 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
C24	1862	Al Muzafri, E Julianti, H Rusmarilin	The Extractionof Antimicrobials Component Of Andaliman(<i>Zanthoxylu macanthopodiumdc.</i>)An dit's Application On Catfish (<i>Pangasiussutchi</i>)Fillet	15.15 - 15.30	11/08/2017	FST
C25	1389	Tri Marwati ¹ , Triahmadi Januarsyah ² , Purwoko ² and Ridwansyah	Inhibitory Activity Of Bacteriocin Produced From <i>Lactobacillus</i> SCG 1223 Toward <i>L. Monocytogenes</i> , <i>S. Thyphimurium</i> And <i>E. Coli</i>	15.30 - 15.45	11/08/2017	FST
C26	1390	Tri Marwati, Ukhdiyah Tiara Astiati, Ridwansyah, Agus Budiyanto,Wahyudiono, Abdullah Bin Arif and Nur Richana	The Effect Of Alpha Amylase Enzyme On Quality Of Sweet Sorghum Juice For Chrystal Sugar	15.45 - 16.00	11/08/2017	FST

CLASS D

Session II 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
D1	1506	H Wahyuningsih, A P Bangun, A Muhtadi	The Relation Of Sediment Texture To Macro- And Microplastic Abundance in Intertidal Zone	08.00 - 08.15	11/08/2017	MFS
D2	1087	A P Bangun, H Wahyuningsih, A Muhtadi	Impacts of Macro - and Microplastic on Macrozoobenthos Abundance in Intertidal Zone	08.15- 08.30	11/08/2017	MFS

D3	1523	Darma Bakti , Tiurmaida Manullang, Rusdi Leidonald	Structure of Gastropod Communities at Mangrove Ecosystems in Lubuk Kertang Village, West Berandan District, Langkat Regency, North Sumatera Province	08.30-08.45	11/08/2017	MFS
D4	1525	Jessica Tambun, Darma Bakti, Desrita	Growth and Exploitation Rate of Yellowstripe scad (<i>Selaroides leptolepis</i> Cuvier, 1833) In The Waters Belawan, Malacca Strait, North Sumatra	08.45-09.00	11/08/2017	MFS
D5	1527	M Fauzan, D Bakti, I E Susetya, Desrita	Growth and Exploitation Rate of <i>Anadara gubernaculum</i> (Reeve, 1844) Family Arcidae in Asahan Aquatic of North Sumatra	09.00-09.15	11/08/2017	MFS
D6	1678	M Basyuni, M S Lubis, and A Suryanti	Habitat characteristic of macrozoobenthos in Naborsahan River of Toba Lake, North Sumatra, Indonesia	09.15-09.30	11/08/2017	MFS

Session III 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
D7	1526	Muhammad Mulia Wisesa, Darma Bakti	Abundance Of Sea Cucumbers On The Ecosystem Of Seagrasses In Unggeh Island, Tapanuli Tengah Regency North Sumatera Province	09.45 - 10.00	11/08/2017	MFS
D8	1671	Nurasiah Riza, Ani Suryanti	Length-Weight Relation and Condition Factor of White Shrimp <i>Penaeus merguensis</i> Captured in Ecosystem Mangrove Waters of Bagan Asahan Village, Tanjungbalai District, Asahan Regency of North Sumatera Province	10.00 - 10.15	11/08/2017	MFS
D9	1679	M Basyuni, P Yani and K S Hartini	Evaluation of mangrove management through community-based silvofishery in	10.15 - 10.30	11/08/2017	MFS

			North Sumatra, Indonesia			
D10	1397	Rita Rosmala Dewi , Desrita & Amanatul Fadhillah	The Prevalence of parasites in Ornamental Fish from Fish Market in Medan	10.30 - 10.45	11/08/2017	MFS
D11	1710	Samadi, S. Wajijah, A.A. Munawar	Fast and Simultaneous Prediction of Animal Feed Nutritive Values Using Near Infra Red Reflectance Spectroscopie	10.45 - 11.00	11/08/2017	MFS
D12	3026	Yunilas dan Edhy Mirwandhono	The Role Of Lactic Acid Bacteria <i>(Lactobacillus sp</i> <i>YEL133)</i> From Beef In Inhibiting Of Microbial Contaminants On Various Fillers of Starter Culture	11.00 - 11.15	11/08/2017	PS

Session IV 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
D13	1409	M. Tafsir, N.D. Hanafi, E. Kejora, E. Yusraini	Nutrition Quality Of Extraction Mannan Residu From Palm Kernel Cake On Broiler Chicken	11.15 – 11.30	11/08/2017	AS
D14	1594	Nurhaita, Neli Devi Niati, Urip Santoso, Sahro Ali Akbar	The Effect of Fermented Cocoa Pod (<i>Theobroma</i> <i>Cacao</i>) Husk Supplemented with Mineral on In Vitro Digestibility Rumen Bacteria Population and Rumen Liquid Characteristic	11.30 - 11.45	11/08/2017	AS
D15	3023	J. Gloria, M. Tafsir, ND. Hanafi, AH. Daulay	The Influence Of <i>Aspergillus Niger</i> Inoculum Dosage On Nutritive Value And Metabolizable Energy Of Apu-Apu Meal (<i>Pistia Stratiotes L.</i>) On Broiler Chicken	11.45 - 12.00	11/08/2017	AS
D16	1321	E.Z.J.Nasution, M.Tafsir, N.D.Hanafi	The response of red ginger (<i>zingiber</i> <i>officinale var rubra</i>) with various processing in broilers were infected by <i>eimeria tenella</i>	12.00 – 12.15	11/08/2017	AS
D17	1339	M M J Kapa, Y L Henuk, Hasnudi, Suyadi	Contribution of local Beef Cattle Production on Farmers Income in the dryland farming of kupang regency	12.15 – 12.30	11/08/2017	AS

			Indonesia			
D18	3003	Hasnudi, Berutu I S, Dauly A H, N Ginting	Analysis of Cattle Breeder's Income in South Kualuh Sub-district of Labuhan Batu Utara Regency	12.30 - 12.45	11/08/2017	AS

Session V 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
D19	1484	Widihastuty, Maryani Cyccu Tobing, Marheni, Retna Astuti Kuswardani	Prey preference Of <i>Myopoponecastaneae</i> (Hymenoptera: Formicidae) Toward Larvae <i>Oryctes Rhinoceros</i> Linn (Coleoptera: Scarabidae)	13.30 - 13.45	11/08/2017	AS
D20	1507	St. Y.F.G. Dillak, N.G.A Mulyantini, Geertruida M. Sipahelut, and Ulrikus R. Lole	Carcass Yields Of Two Different Strains Of Ducks Raised In Different Altitude	13.45 - 14.00	11/08/2017	AS
D21	1509	S.S.A. Purba, M. Tafsir, S.P Ginting, Y. Khairani	The Utilization Of Endoparasite B In Commercial Feed Which Contains Palm Kernel Expeller On Broiler	14.00 - 14.15	11/08/2017	AS
D22	1511	Ronistra Ginting, Sayed Umar, Chairani Hanum	The Potential And Biological Test On Cloned Cassava Crop Remaining On Local Sheep	14.15 - 14.30	11/08/2017	AS
D23	1666	Andhika Putra, S.Pt, M.Pt, drh. Mudhita Zikrullah Ritonga, M. Vet,	Effectiveness Duckweed (<i>Lemna Minor</i>) As An Alternative Native Chicken Feed Native Chicken (<i>Gallus Domesticus</i>)	14.30 - 14.45	11/08/2017	AS
D24	1684	S A Sitepu, Zaituni U, Jaswandi and Hendri	Improved Quality Of Frozen Boer Goat Semen With The Addition Of Sweet Orange Essential Oil On Tris Yolk And Gentamicin Extender	14.45 - 15.00	11/08/2017	AS

Session VI 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
D25	3004	P. Siswoyo, M. Tafsir, R. Handarini	Potential Production And Response Of	15.15 - 15.30	11/08/2017	AS

			Selenium And Zinc Mineral Supplementation On Quality Of Goat Samosir Semen			
D26	3015	Mirwandono, E., S Mentari, Tri Hesti, Hasnudi, N Ginting, S Galih A	(Nutrition Quality Test Of Fermented Waste Vegetables By Bioactivator Local Microorganisms (Mol) And Effective Microorganism (Em4)	15.30 - 15.45	11/08/2017	AS
D27	1618	N Ginting, Zuhri, Hasnudi, Mirwandono, S. Iskandar, D. Armyn Hakim	Financial Analysis Of Biogas Utilization : Input Cattle, Pig Feces And Coffee Waste In Karo Indonesia	15.45 - 16.00	11/08/2017	AS
D28	1619	Tri Hesti. W, N Ginting, Yunilas, Hasnudi, Mirwandono E, Siregar GA, Sinaga IG	The Utilization Of Coconut Waste Fermented By Aspergillus Niger And Tape Yeast On Meat Quality Of Weaning Males Rex Rabbit	16.00 - 16.15	11/08/2017	AS
D29	1652	Hamdan, Mirwandono, Hasnudi, U SAYed, N Ginting, Alwiyah, Saputra	Genetic Distance Estimates And Variable Factors Distinguishing Between Goat Kacay, Muara And Samosir Through	16.15 - 16.30	11/08/2017	AS
D30	1741/3018	Nevy Diana Hanafi, Ma'ruf Tafsir, Ulina Hutasuhut, Erifson Lubis	Anyllisis Of Botanical Composition And Nutrient Content On Natural Pastures In Samosir Island Of Samosir Regency	16.30 - 16.45	11/08/2017	AS

CLASS E**Session II 8/11/17**

No	Paper ID	Author	Title	Time	Date	Track
A7	1807	W.G. Abdullah, U. Rianse, Muhidin, W. Widayati, E.S. Mihrad, S.A.A. Taridala, IS. Rianse, W.K. Baka	Farmers Motivation in Aren Sugar Processing Bussiness	08.00 - 08.15	8/11/2017	AEC
A8	3009	M. Afif Syahputra, Zahari Zein	Positive and Negative Impacts of Oil Palm Expantion in Indonesia and The Prospact to Achieve Sustainable Palm Oil	08.15- 08.30	8/11/2017	AEC
A9	3031	Idriya Adhany, Diana Chalil, Rahmanta Ginting	Strategy to Incerase Barangan Banana Production in Kabupaten	08.30- 08.45	8/11/2017	AEC

			Deli Serdang			
A10	1519	Surya Abadi Sembiring	Analysis of Rice Policy Based on Presidential Instruction on Household Food Security	08.45-09.00	8/11/2017	AEC
A11	1642	Sastro M Wantu, Usman Moonti and Asmun Wantu	Policy In Management Based On Corruption Growth Of Resources Agropolitan In The Gorontalo Province	09.00-09.15	8/11/2017	AEC
A12	3010	Rulianda P Wibowo, Sumono, Yahayu Iddrisu, Mozart Darus, Luhut P Sihombing, Jufri	The Pricing Behavior Comparison Of Canada And Australia Exporter In Wheat International Market Using Pricing To Market (PTM) And Residual Demand Elasticity (RDE)	09.15-09.30	8/11/2017	AEC

Session III 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B7	1657	Fachrina Wibowo, Armaniar	Physiological performance of the soybean (<i>glycine max</i> (L.) Merr.) Crosses in salinity stress	09.45 - 10.00	8/11/2017	PS
B8	1659	Muhidin, Elkawakib Syam'un, Kaimuddin, Yunus Musa, Gusti Ray Sadimantara, Usman, Sitti Leomo and Tresjia C. Rakian	The Effect of Shade on Chlorophyll and Anthocyanin Content of Upland Red Rice	10.00 - 10.15	8/11/2017	PS
B9	1662	Gusti Ayu Kade Sutariati, La Ode Santiaji Bande, Andi Khaeruni, Muhidin, La Mudi, Rian Maya Savitri	The Effectiveness of Preplant Seed Bio-Invigoration Techniques Using <i>Bacillus</i> sp. CKD061 to Improving Seed Viability and Vigor of Several Local Upland Rice Cultivars of Southeast Sulawesi	10.15 - 10.30	8/11/2017	PS
B10	1664	Tresjia C. Rakian, La Karimuna, Muhammad Taufik, Gusti Ayu Kade Sutariati, Uli Fermin and Muhidin	The Effectiveness of Various Rhizobacteria Carriers to Improve the Shelf Life and the Stability of Rhizobacteria as Bioherbicide	10.30 - 10.45	8/11/2017	PS
B11	1665	Ni Wayan Sri Suliartini, Teguh Wijayanto, Abdul Madiki, Dirvamena Boer, Muhidin dan Juniawan	Relationship of Some Upland Rice Genotype After Gamma Irradiation	10.45 - 11.00	8/11/2017	PS
B12	1669	Sitti Leomo, Sahta Ginting, Laode Sabaruddin, M.	The Land Use Patterns for Soil Organic Carbon Conservation At Endanga	11.00 - 11.15	8/11/2017	PS

		Tufaila and Muhidin	Watershed Southeast Sulawesi Indonesia			
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Session IV 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B13	3007	Bintang, Supriadi, Eko Tampubolon	Evaluation Of Land Suitability For Onion (<i>Allium Ascalonicuml.</i>) And Lemon (Citrus Sp.) At Harian District Of Samosir Regency	11.15 – 11.30	8/11/2017	PS
B14	1667	Aswandi Aswandi, Cut Rizlani Kholibrina	Growth And Yield Model For Non-Timber Forest Product Of Kemenyan Toba (Styrax Sumatrana J.J. Sm) In Tapanuli, North Sumatra	11.30 - 11.45	8/11/2017	PS
B15	3017	Yudi Sudarno S., Asmarlaili Sahar Hanafiah and Mariani Sembiring	Study On Changes Of Soil Sulfuric Acidity And Plant Growth With Different Soil Water Condition Byapplication Of Sulphate Reducing Bacteria (SRB)	11.45 – 12.00	8/11/2017	PS
B16	3020	Eva Sartini Bayu, Revandy I. M Damanik, Widia Febrianti	Flower Morphology Diversity In Some Accessions Of Asam Gelugur (<i>Garcinia Atroviridis</i> Griff, Ex T. Anders) In Several Districts Of Sumatera Utara	12.00 – 12.15	8/11/2017	PS
B47	1813	Suprianto Sidik, Edison Purba, and Erwin Nyak Akub	Population Dynamics Of Weeds In Oil Palm (<i>Elaeisguineensis</i> jacq.) Circle Weeding Area Affected By Herbicide Application	12.15 – 12.30	11/08/2017	PS

Session V 8/11/17

No	Paper ID	Author	Title	Time	Date	Track
B48	3029	Mariati Sinuraya, Diana Sofia Hanafiah, and Andreas Romulo, Asil Barus	Determination Quercetin Content, Antioxidant And Antimicrobial Activity Of Genotip Mutant Samosir Shallots Irradiated By Gamma Rays	13.30 - 13.45	11/08/2017	PS
D31	3006	Angelia Utari Harahap	Effects Of Wheat Leaf Noni (<i>Morinda Citrifolia</i>) On Carcass And Production Quail Eggs (<i>Coturnix Coturnix Javonica</i>)In The Different Level Concentrate	13.45 – 14.00	8/11/2017	AS

D32	1624	Sukawaty Fattah, Yohanis Umbu Laiya Sobang, Fredeicus Dedy Samba, Erna Hartati, Maximilian Marthen J. Kapa, Yusuf Leonard Henuk	The Effect Of Feeding Bull Bali Cattle Kept In Extensive Husbandry System With Concentrates Contained Gliricidia Sepium Leaf Meal And Banana Starch Tuber Meal On Their Feed Consumption And Dried Organic Matter Digestibility	14.00 – 14.15	8/11/2017	AS
D38	3038	Lollie Agustina P Putri, I E Setyo, M Basyuni, E S Bayu , H Setiado, N F Reynaldi, FATT Puteri D Arifiyanto, and I Syahputra	Molecular Performance of Commercial MTG Variety Oil Palm Based on RAPD Markers	14.15- 14.30	8/11/2017	PS
D39	3039	Jonatan Ginting and Carolina Permata Sari Simanjuntak	Application of Some Rice Varieties and Fertilizing NPK Against Increased Production	14.30 – 14.45	8/11/17	PS

TABLE OF CONTENTS

No	Paper ID	Author	Title	Track	Page
A1	1515	Witono Adiyoga	Farmers's Perceptions On Climate Change In Low Land And High Land Vegetable Production Centers Of South Sulawesi	AEC	1
A2	1524	E.W. Riptanti, A. Qonita, Suprapti	Revitalization Of Food Barns In Supporting Sustainable Food Security In Central Java	AEC	2
A3	1625	Diana Chalil, Riatri Barus	Questioning The Sustainable Palm Oil Demand : Case Study From French - Indonesia Supply Chain	AEC	3
A4	1793	S. Hariyanti, T. Supriana, R.S. Siregar	The Effect Of Consumer Perception To The Satisfaction Of Use Of Traditional Medicine In Medan	AEC	4
A5	1802	A.F. Siregar, T. Supriana	Factors That Influence The Interest Of Farmer In Shallots Farming At Cinta Damai Village Of Simanindo Sub- District Of Samosir District	AEC	5
A6	1803	Salsabila, T. Supriana	Strategies To Increase The Consumption Of Traditional Medicine In Medan	AEC	6
A7	1807	W.G. Abdullah, U. Rianse, Muhidin, W. Widayati, E.S. Mihrad, S.A.A. Taridala, IS. Rianse, W.K. Baka	Farmers Motivation In Aren Sugar Processing Bussiness	AEC	7
A8	3009	M. Afif Syahputra, Zahari Zein	Positive And Negative Impacts Of Oil Palm Expantion In Indonesia And The Prospect To Achieve Sustainable Palm Oil	AEC	8
A9	3031	Idriya Adhany, Diana Chalil, Rahmanta Ginting	Strategy To Incerase Barangan Banana Production In Kabupaten Deli Serdang	AEC	9
A10	1519	Surya Abadi Sembiring	Analysis Of Rice Policy Based On Presidential Instruction On Household Food Security	AEC	10
A11	1642	Sastro M Wantu, Usman Moonti and Asmun Wantu	Policy In Management Based On Corruption Growth Of Resources Agropolitan In The Gorontalo Province	AEC	11
A12	3010	Rulianda P Wibowo, Sumono, Yahayu Iddrisu, Mozart Darus, Luhut P Sihombing, Jufri	The Pricing Behavior Comparison Of Canada And Australia Exporter In Wheat International Market Using Pricing To Market (PTM) And Residual Demand Elasticity (RDE)	AEC	12
A13	1571	Dessy Adriani, Imron Zahri, Elisa Wildayana, Maryadi, Maryanah Hamzah, Yulius	Can Tidal Land Prosper The Farmers ? Lesson Learn From Migrant And Local Farmers In Telang's Integreted Independent City, South Sumatera	AEC	13
A14	1766	Tavi Supriana and Farida Yani	The Analysis Of Consumption Level And Preferences Of Fresh Shallots Consumers In Medan	AEC	14
A15	1771	Mega Citra Alam and Tavi Supriana	Analysis Of Supply Chain Management Of Shallots At Medan	AEC	15
A16	1854	IS Rianse, U Rianse, WG Abdullah, S Hartono, A Suryantini, Jamhari, Muhidin	The Income Distribution And Contribution Of Palm Sugar Producer In Increasing The Household Welfare Of Palm Sugar Maker In Kolaka Southeast Sulawesi Indonesia	AEC	16
A17	3032	Rahmanta	Influence Of Land Area And Capital Strenghtening Fund Of Rural Economics Enterprise Toward Corn Production In North Sumatera Province	AEC	17
A18	1832	Leni Handayani, Abdul Rauf, Rahmawaty, Tavi	The Strategy Of Sustainable Soybean Development To Increase Soybean Needs In North Sumatera	AEC	18

		Supriana			
A19	3011	Rulianda P Wibowo, Sumono, Noah Miller, Hasman Hashyim, Thompson Sebayang	Pricing Behavior Of USA Exporter In Wheat International Market	AEC	19
A20	1683	Lindawati, Nunung Kusnadi, Sri Utami Kuntjoro, Dewa K.S. Swastika	The Impact Of Input And Output Prices On The Household Economic Behavior Of Farmers Rice-Livestock Integrated Farming System (Rlifs) And Non Rlifs In Westjava	AEC	20
A21	1580	Muhammad Buhari Sibuea, Faiz Ahmad Sibuea	Contribution Of Village Cooperation Unit In Improving Farmers Incomes	AEC	21
A22	1640	Rina Br Bukit, Bode Haryanto, Paham Ginting	Environmental Performance, Profitability, Asset Utilization, Debt Monitoring And Firm Value	GP	22
A23	1582	apri heri iswanto, Tito Sucipto, Elfrida Adlina	Passion Fruit Hulls Particleboard: The Effect Of Urea Formaldehyde Level On Physical And Mechanical Properties	GP	23
A24	1641	Mohammad Ikbal Bahua, Dewa Oka Suparwata	Local Of Participation The Community In Land Rehabilitation Critical In Das Randangan Pohuwato Regency	GP	24
A25	1831	Siti Latifah, Yunus Afifuddin, Sri Widya	Analysis Of Community Income On Suren (<i>Toona Suren</i> (Blume) Merr.) And Cacao Crops (<i>Theobroma Cacao</i> L.) In Simalungun, North Sumatera- Indonesia	GP	25
A26	1755	Tito Sucipto, Rudi Hartono, Wahyu Dwianto	Determination Of Wood Wettability Properties Of Oil Palm Trunk, Shorea Sp., And Paraserianthes Falcataria By Contact Angle Method	GP	26
A27	1643	Z Noer, Hasanuddin, Lisnawita, D Suryanto	Pathotype Profile Of <i>Xanthomonas Oryzae</i> Pv. <i>Oryzae</i> Isolates From North Sumatera	GP	27
A28	3037	T. Supriana, T. Chairuna	The Influences Of Consumer Characteristics On The Amount Of Rice Consumption	AEC	28
B1	1520	Mujiyo, B.H. Sunarmingto, E. Hanudin, J. Widada, J. Syamsiah	The Effect Of Organic Paddy Field System To Soil Properties	PS	29
B2	1538	Alridiwersah. E.M. Harahap, E.N.Aqoeb, Hamidah Hanum, Aisar Novita	Growth And Production Of Local Rice Varieties In The Shade Intensity	PS	30
B3	3008	AM Lubis, LAM Siregar, K Lubis, Lisnawita, I Safn , AR Tantawi	Root Morphology Of Several Potato Varieties – Infected <i>Meloidogyne</i> Spp. And Addition Of Organic Matters	PS	31
B4	3019	Mutia Rahmah, Diana Sofia Hanafiah, Luthfi Azis Mahmud Siregar	Selection Of Selected Individuals On Soybean Plant (<i>Glycine Max</i> L.Merrill) In Generation M ₅ Based On High Quality Production And Tolerant Stem Base Rod Disease <i>Athelia Rolfsii</i> (Curzi)	PS	32
B5	1844	Yaya Hasanah, Mariani Sembiring	Effect On Foliar Application Of Chitosan And Salicylic Acid On The Growth Of Soybean (<i>Glycine Max</i> (L.).Merr.) Varieties	PS	33
B6	1592	Rita Noveriza, Jumsu Trisno, Haliatur Rahma, Sri Yuliani, Reflin and Martinius	Effectiveness Of Several Dosage Formula Of Oil And Nano Emulsion Of Citronella Against Vascular Streak Dieback (Vsd) Disease On Cocoa	PS	34
B7	1657	Fachrina Wibowo, Armaniar	Physiological Performance Of The Soybean (<i>Glycine Max</i> (L.) Merr.) Crosses In Salinity Stress	PS	35

B8	1659	Muhidin, Elkawakib Syam'un, Kaimuddin, Yunus Musa, Gusti Ray Sadimantara, Usman, Sitti Leomo and Tresjia C. Rakian	The Effect Of Shade On Chlorophyl And Anthocyanin Content Of Upland Red Rice	PS	36
B9	1662	Gusti Ayu Kade Sutariati, La Ode Santiaji Bande, Andi Khaeruni, Muhidin, La Mudi, Rian Maya Savitri	The Effectiveness Of Preplant Seed Bio-Invigoration Techniques Using <i>Bacillus</i> Sp. CKD061 To Improving Seed Viability And Vigor Of Several Local Upland Rice Cultivars Of Southeast Sulawesi	PS	37
B10	1664	Tresjia C. Rakian, La Karimuna, Muhammad Taufik, Gusti Ayu Kade Sutariati, Uli Fermin and Muhidin	The Effectiveness Of Various Rhizobacteria Carriers To Improve The Shelf Life And The Stability Of Rhizobacteria As Bioherbicide	PS	38
B11	1665	Ni Wayan Sri Suliartini, Teguh Wijayanto, Abdul Madiki, Dirvamena Boer, Muhidin dan Juniawan	Relationship Of Some Upland Rice Genotype After Gamma Irradiation	PS	39
B12	1669	Sitti Leomo, Sahta Ginting, Laode Sabaruddin, M. Tufaila and Muhidin	The Land Use Patterns For Soil Organic Carbon Conservation At Endanga Watershed Southeast Sulawesi Indonesia	PS	40
B13	3007	Bintang, Supriadi, Eko Tampubolon	Evaluation Of Land Suitability For Onion (<i>Allium Ascalonicum</i> L.) And Lemon (<i>Citrus</i> Sp.) At Harian District Of Samosir Regency	PS	41
B14	1667	Aswandi Aswandi, Cut Rizlani Kholibrina	Growth And Yield Model For Non-Timber Forest Product Of Kemenyan Toba (<i>Styrax Sumatrana</i> J.J. Sm) In Tapanuli, North Sumatra	PS	42
B15	3017	Yudi Sudarno S., Asmarlaili Sahar Hanafiah and Mariani Sembiring	Study On Changes Of Soil Sulfuric Acidity And Plant Growth With Different Soil Water Condition Byapplication Of Sulphate Reducing Bacteria (SRB)	PS	43
B16	3020	Eva Sartini Bayu, Revandy I. M Damanik, Widia Febrianti	Flower Morphology Diversity In Some Accessions Of Asam Gelugur (<i>Garcinia Atroviridis</i> Griff, Ex T. Anders) In Several Districts Of Sumatera Utara	PS	44
B17	1808	Rahayu M , La Ode Santiaji Bande, Asmar Hasan, Agung Yuswana dan Fatma Rinambo	Contributionof Pod Borer Pests To Soybeancrop Production (Case In Pondidaha, Konawe District, Southeast Sulawesi)	PS	45
B18	1843	Ratna Rosanty Lahay, Srinidiyanti Misrun, Rosita Sipayung	The Storage Capacity Of Cocoa Seeds (<i>Theobroma Cacao</i> L.) Through Giving Polyethylene Glycol (PEG) In The Various Of Storage Container	PS	46
B19	1648	Nilahayati, Rosmayati, Diana Sofia Hanafiah, Fauziyah Harahap	Genetic Variability And Heritability In Kipas Putih Soybean Mutant Line Using Gamma Rays Irradiation In M ₃ Generation	PS	47
B20	1677	M Basyuni, A Nuryawan, Yunasfi, and L A P Putri	Effect Of Long-Term Salinity On The Growth And Biomass Of Two Non-Secretors Mangrove Plants <i>Rhizophora Apiculata</i> And <i>Ceriops Tagal</i>	PS	48
B21	1789	Sakiah, Mariani Sembiring, Jamalluddin Hasibuan	Entisol Land Characteristics With And Without Cover Crop (<i>Mucuna Bracteata</i>) On Rubber Plantation	PS	49
B22	1798	M Hasibuan, I Safni,	Morphological Characterization Of Several	PS	50

		Lisnawita, K Lubis	Strains Of The Rice-Pathogenic Bacterium <i>Burkholderia Glumae</i> In North Sumatra		
B23	1842	Posma Marbun, Zulkifli Nasution, Hamidah Hanum, Abubakar Karim	Classification Of Andisol Soil On Robusta Coffee Plantation In Silima Pungga - Pungga Sub District	PS	51
B24	1761	Ratna Rubiana, Araz Meilin	Effect Of Rice Husk Biochar Application To Soil Insect Diversity On Potato Cultivation	PS	52
B25	1847	La Ode Santiaji Bande, Mariadi1, Gusnawaty HS, Nuriadi, Lilis Trisulpa & Rahmania	Botanical Pesticides Effect From Shells Of Bean's Cashew Nut On Biological Agents Of <i>Trichoderma Sp.</i> And <i>Gliocladium Sp.</i>	PS	53
B26	1838	Rosmayati and D Bakti	Identification And Phylogenetic Analysis Of Local Yellow And Orange Sweet Potatoes Genotype In Sumatera Utara	PS	54
B27	1858	N Rahmawati and R I M Damanik	Effect Of Foliar Application Of A-Tocopherol On Vegetative Growth And Some Biochemical Constituents Of Two Soybean Genotypes Under Salt Stress	PS	55
B28	1605	Rini Sulistiani, Rosmayati, Luthfi A.M. Siregar and Fauziyah Harahap	Differences In Morphology And Sugar Content Of Purple Sweetpotato (<i>Ipomoea Batatas</i> L.) With Potassium Treatment At Several Altitude	PS	56
B29	1853	Chairani Hanum	Growth, Yield And Movement Of Phosphate Nutrients In Soybean On P Fertilizer, Straw Mulch And Difference Of Plant Spacing	PS	57
B30	3012	Andi Khaeruni, Eko Aprianto Johan, Teguh Wijayanto, Muhammad Taufik, Andi Abdul Rahman Syafar	Induction Of Soybean Resistance To Bacterial Pustule Disease (<i>Xanthomonas axonopodis pv glycines</i>) By Rhizobacteria and Organic Material Treatment	PS	58
B31	1855	L Sitinjak and E Purba	Response To Growth And Production Of Green Beans (<i>Vigna Radiata</i> L.) In Various Cropping Spots And Fertilizer Provision Of Layer Chickens	PS	59
B32	1811	Revandy Damanik	Germination Performance Of Selected Local Soybean Cultivars During Drought Stress Induced By Polyethylene Glycol (PEG)	PS	60
B33	1861	yaya - hasanah, Tengku Chairun Nisa, Hapsah - Hapsah, Hamidah - Hanum	Physiological Characters Of Soybean Cultivars With Application Of Nitrogen Sources Under Dry Land Conditions	PS	61
B34	1810	R I Damanik, B H Manurung and E S Bayu	Effect Of Hypoxia Condition In Embryogenic Callus Growth Of Soybean Cell Culture	PS	62
B35	1647	Nasruddin, E.M. Harahap, C. Hanum, L.A.M. Siregar	Growth And Yield Of Patchouli (<i>Pogostemon Cablin</i> , Benth) Due To Mulching And Method Of Fertilizer On Rain/Fet Land	PS	63
B36	1576	Delvian Delvian, Ridahati Rambey	Decomposition Rate Of <i>Rhizopora Stylosa</i> Litter In Tanjung Rejo Village, Deli Serdang Regency, North Sumatera Province	PS	64
B37	1689	M Basyuni, N Sulistyono, R Wati and R Hayati	Deforestation Trend In North Sumatra Over 1990-2015	PS	65
B38	1606	A. Susilowati, A.H. Rachmad, I.Z. Siregar, Supriyanto	Genetic Diversity Of Resin Yields Pinus Merkusii From West Java Indonesia Revealed By Microsatellites Marker	PS	66
B39	1621	C.R. Kholibrina, Aswandi, A. Susilowati	Flowering And Fruiting Phenology Of Kemanyan Toba (<i>Styrax Sumatranus</i> J.J.S.M) In Aek Nauli Forest, North Sumatera	PS	67

B40	1598	Arida Susilowati, Cut Rizlani Kholibrina, Henti Hendalastuti Rahmad, muhtar Ardansah Munthe	Phylogeny Of Kemenyan (<i>Styrax Sp</i>) From North Sumatra Based On Morphological Characters	PS	68
B41	1809	Hamidah Hanuma, Lisnawitaa, Ahmad Rafiqi Tantawib	Agronomic Effect Of Empty Fruit Bunches Compost, Anorganic Fertilizer And Endophytic Microbes In Oil Palm Main Nursery Used Ganoderma Endemic Soil	PS	69
B42	1805	E Utari, Hasanuddin, Lisnawita, I Safni, K Lubis, AR Tantawi	The Potential Of Soil Fungi Associated With Potato Rhizosphere To Control Root Knot Nematode (<i>Meloidogyne Spp.</i>) On Potato".	PS	70
B43	1804	Desi indah permatasari, Lisnawita, syahril oemri, irda safni, khairunisa lubis, ahmad rafiki tantowi	Use Of Organic Waste As Biofumigant For Controlling Root Knot Nematodes (<i>Meloidogyne Spp.</i>) On Potato	PS	71
B44	3035	S.A.A.Taridala, Suaib, S. Wahyuni, W.G. Abdullah, N. I. Wianti, M. Zani, L.O. Jabuddin, Rosmawaty, Yusria, H. Batoa	Understanding The Social And Economic Aspects Of Upland Rice Farming	PS	72
B45	1814	E Purba and D P Nasution	Planting Pattern And Weed Control Method Influence On Yield Production Of Corn (<i>Zea Mays L.</i>)	PS	73
B46	3034	I R Manurung, Rosmayati and N Rahmawati	Physiology Response Of Fourth Generation Saline Resistant Soybean (<i>Glycine Max (L.) Merrill</i>) With Application Of Several Types Of Antioxidants	PS	74
B47	1813	Suprianto Sidik, Edison Purba, and Erwin Nyak Yakub	Population Dynamics Of Weeds In Oil Palm (<i>Elaeisguineensisjacq.</i>) Circle Weeding Area Affected By Herbicide Application	PS	75
B48	3029	Mariati Sinuraya, Diana Sofia Hanafiah, and Andreas Romulo, Asil Barus	Determination Quercetin Content, Antioxidant And Antimicrobial Activity Of Genotip Mutant Samosir Shallots Irradiated By Gamma Rays	PS	76
B49	3030	Amna Suresti ^{1*} , Uyung Gatot S. Dinata ^{2*} , Rahmi wati	Maturity Analysis Of The Innovation System In The Livestock Industries Of West Sumatra, Indonesia	PS	77
B50	1584	Herwenita and Yanter Hutapea	Swamp Land Optimization In Supporting Food Security And Enhancing Farmers Welfare In South Sumatra Indonesia	PS	78
B51	1826	Sarifuddin; Zulkifli Nasution; Abdul Rauf and Budi Mulyanto	Changing Of Sumatra Backswamp Peat Properties By Seawater And Zeolite Application	PS	79
B52	3036	Virna Muhardina	Quality Evaluation Of Probiotic Capsule Prepared From Alginate, Carrageenan And Tofu Waste Flour Based On Bacterial Activity And Organoleptic Test	PS	80
B53	3028	Zulkifli	Some Ecological Factors Of Pine At Lake Toba Catchment Area	GP	81
B54	989	Achmad Siddik Thoha, Bambang Hero Saharjo, Rizaldi Boer, Muhammad Ardiansyah	Strengthening Community Participation In Reducing GHG Emission From Forest And Peatland Fire	PS	82
B55	3021	Eva Sartini Bayu, Anggria Lestami, E. Harso Kardhinata and Rosemary	Phylogenetic Relationship of Asam Gelugur (<i>Garcinia Atroviridis</i> Griff. Ex T. Anders) Based On Morphological Characters In Langkat And	PS	83

			Serdang Berdagai, North Sumatra		
C1	1522	Maya Sharah, Farida hanum, Mushila Rizky, M.F. Hisham	Microwave Assisted Extraction Of Pectin From Cocoa Pin	FST	84
C2	1774	Zakwan, Pada Mulia Raja, Giyanto,	The Combination Of Activated Natural Ziolit Bentonid To Reduce Fe, N, Cu, In Revined Bleach Palm Oil (RBPO) By Using Atomic Absorbstion Spectropotometer Method	FST	85
C3	1699	Ika Ucha Pradifita Rangkuti, Elisa Julianti, Jenny Elisabeth	The Tocol Content Of Crude Palm Oil Based On The Level Ripeness And Their Relationship To The Quality And Their Stability	FST	86
C4	3024	S Wahyuni, Holilah, Asranudin and Noviyanti	Estimation Of Shelf Life Of Wikau Maombo Brownies Cake Using Accelerated Shelf Life Testing (ASLT) Method With Arrhenius Model	FST	87
C5	1727	Hotnida Sinaga, Hilton Deeth, Bhesh Bhandari	Effect Of Sodium Azide Addition And Aging Storage On Casein Micelle Size	FST	88
C6	1728	Hotnida Sinaga, Hilton Deeth, Bhesh Bhandari	Effect Of Microfluidization On Casein Micelle Size Of Bovine Milk	FST	89
C7	1251	Irhamni, Setyati Pandia, Edison Purba, Wirsal Hasan	Heavy Metal Content In Leachate Garbage Of Final Disposal Side (TPA) Of Banda Aceh City	AEN	90
C8	1508	Sera Pita Loka, Sumono, D.L.S. Nasution	Revamping The Physical Properties Of Entisol Soil With Compost Treatment	AEN	91
C9	1574	B Haryanto, M Sirait, M Azalea, Alvin, S E Cahyani	Ball Mill Tool For Crushing Coffee And Cocoa Beans Base On Fraction Size Sieving Results	AEN	92
C10	1656	R. Manurung, A. Syahputra, M.A. Alhamdi, W. Satria, E.M. Barus, R. Hasibuan, M.Z. Siswarni	Delignification And Hydrolisis Lignocellulosic Of Bagasse In Colinegloride System	AEN	93
C11	1661	B Haryanto, R Hasibuan, Alexander, M Ashari and M Ridha	Herbal Dryer: Drying Of Ginger (<i>Zingiber Officinale</i>) Using Tray Dryer	AEN	94
C12	1717	GR Sadimantara, B Kadidaa, Suaib, LO Safuan, Muhidin	Growth Performance And Yield Stability Of Selected Local Upland Rice Genotypes In Buton Utara Of Southeast Sulawesi	AEN	95
C13	1768	Ulfani ikhwana, Taufik Rizaldi, Riswanti Sigalingging	The Design Of Dapog Rice Seeder Model For Laboratory Scale	AEN	96
C14	3025	Erni Misran, Okta Bani, Elfrida Margaretha Situmeang, Adelina Suciani Purba	Removal Efficiency Of Methylene Blue Using Activated Carbon From Waste Banana Stem: Study On Ph Influence	AEN	97
C15	1815	Sumono, Syarah Mulkan Parinduri. Nurul Huda, Nazif Ichwan	The Utilization Of Ultisol Soil For Horticulture Crops Cultivation	AEN	98
C16	1545	Kabutey	The Effects Of Heating Temperatures And Time On Deformation Energy And Oil Yield Of Sunflower Bulk Seeds In Compression Loading	AEN	99
C17	2256	A Kešner, R Chotěborský, M Linda and M Hromasová	Utilization Of FEM Model For Steel Microstructure Determination	AEN	100
C18	1599	R Sigalingging, Sumono and N Rahmansyah	Evapotranspiration And Crop Coefficient Of Oil Palm (<i>Elaeis Guineensis</i> Jacq.) On Main Nursery In A Greenhouse	AEN	101
C19	1849	R Sigalingging, D Herak	Mechanical Behaviour Of Arabica Coffee (<i>Coffea</i>	AEN	102

		and A Kabutey	<i>Arabica</i>) Beans Under Loading Compression		
C20	1859	M.S. Hutasoit, E. Julianti, and Z. Lubis	Effect of Pretreatment On Purple-Fleshed Sweet Potato Flour For Cake Making	FST	103
C21	3013	Herla Rusmarilin, Nurhasanah, Ratna Yudythia Andayani	Soy-Yamgurt Probiotic Drink As A Natural Potential Of Antioxidant	FST	104
C22	1860	E A Zebua, J Silalahi, dan E Julianti	Hypoglycemic Activity Of Gambier Drinks (<i>Uncaria Gambir</i> Robx.) In Alloxan-Induced Mice	FST	105
C23	1851	S. Alfat1 & La Ode Santiaji Bande	Numerical Analysis Heat And Mass Transfer On Drying Process Of Agricultural Product Using Finite Element Method	FST	106
C24	1862	Al Muzafri, E Julianti, H Rusmarilin	The Extraction of Antimicrobials Component Of Andaliman (<i>Zanthoxylum acanthopodium</i> dc.) And its Application On Catfish (<i>Pangasius sutchi</i>) Fillet	FST	107
C25	1389	Tri Marwati ¹ , Triahmadi Januarsyah ² , Purwoko ² and Ridwansyah	Inhibitory Activity Of Bacteriocin Produced From <i>Lactobacillus</i> SCG 1223 Toward <i>L. Monocytogenes</i> , <i>S. Thypimurium</i> And <i>E. Coli</i>	FST	108
C26	1390	Tri Marwati, Ukhdiah Tiara Astiati, Ridwansyah, Agus Budiyanto, Wahyudiono, Abdullah Bin Arif and Nur Richana	The Effect Of Alpha Amylase Enzyme On Quality Of Sweet Sorghum Juice For Chrystal Sugar	FST	109
D1	1506	H Wahyuningsih, A P Bangun, A Muhtadi	The Relation Of Sediment Texture To Macro- And Microplastic Abundance In Intertidal Zone	MFS	110
D2	1087	A P Bangun, H Wahyuningsih, A Muhtadi	Impacts Of Macro - And Microplastic On Macrozoobenthos Abundance In Intertidal Zone	MFS	111
D3	1523	Darma Bakti , Tiurmaida Manullang, Rusdi Leidonald	Structure Of Gastropod Communities At Mangrove Ecosystems In Lubuk Kertang Village, West Berandan District, Langkat Regency, North Sumatera Province	MFS	112
D4	1525	Jessica Tambun, Darma Bakti, Desrita	Growth And Exploitation Rate Of Yellowstripe Scad (<i>Selaroides leptolepis</i> Cuvier, 1833) In The Waters Belawan, Malacca Strait, North Sumatra	MFS	113
D5	1527	M Fauzan, D Bakti, I E Susetya, Desrita	Growth And Exploitation Rate Of <i>Anadara gubernaculum</i> (Reeve, 1844) Family Arcidae In Asahan Aquatic Of North Sumatra	MFS	114
D6	1678	M Basyuni, M S Lubis, and A Suryanti	Habitat Characteristic Of Macrozoobenthos In Naborsahan River Of Toba Lake, North Sumatra, Indonesia	MFS	115
D7	1526	Muhammad Mulia Wisesa, Darma Bakti	Abundance Of Sea Cucumbers On The Ecosystem Of Seagrasses In Unggeh Island, Tapanuli Tengah Regency North Sumatera Province	MFS	116
D8	1671	Nurasiah Riza, Ani Suryanti	Length-Weight Relation And Condition Factor Of White Shrimp <i>Penaeus merguensis</i> Captured In Ecosystem Mangrove Waters Of Bagan Asahan Village, Tanjungbalai District, Asahan Regency Of North Sumatera Province	MFS	117
D9	1679	M Basyuni, P Yani and K S Hartini	Evaluation Of Mangrove Management Through Community-Based Silvofishery In North Sumatra, Indonesia	MFS	118
D10	1397	Rita Rosmala Dewi , Desrita & Amanatul Fadhillah	The Prevalence Of Parasites In Ornamental Fish From Fish Market In Medan	MFS	119
D11	1710	Samadi, S. Wajijah, A.A.	Fast And Simultaneous Prediction Of Animal Feed	MFS	120

		Munawar	Nutritive Values Using Near Infra Red Reflectance Spectroscopie		
D12	3026	Yunilas dan Edhy Mirwandhono	The Role Of Lactic Acid Bacteria (<i>Lactobacillus Sp YEL133</i>)From Beef In Inhibiting Of Microbial Contaminants On Various Fillers Of Starter Culture	PS	121
D13	1409	M. Tafsin, N.D. Hanafi, E. Kejora, E. Yusraini	Nutrition Quality Of Extraction Mannan Residu From Palm Kernel Cake On Broiler Chicken	AS	122
D14	1594	Nurhaita, Neli Devi Niati, Urip Santoso, Sahro Ali Akbar	The Effect Of Fermented Cocoa Pod (Theobroma Cacao) Husk Supplemented With Mineral On In Vitro Digestibility Rumen Bacteria Population And Rumen Liquid Characteristic	AS	123
D15	3023	J. Gloria, M. Tafsin, ND. Hanafi, AH. Daulay	The Influence Of Aspergillus Niger Inoculum Dosage On Nutritive Value And Metabolizable Energy Of Apu-Apu Meal (<i>Pistia Stratiotes L.</i>) On Broiler Chicken	AS	124
D16	1321	E.Z.J.Nasution, M.Tafsin, N.D.Hanafi	The Response Of Red Ginger (<i>Zingiber Officinale Var Rubra</i>) With Various Processing In Broilers Were Infected By <i>Eimeria Tenella</i>	AS	125
D17	1339	M M J Kapa, Y L Henuk, Hasnudi, Suyadi	Contribution Of Local Beef Cattle Production On Farmers Income In The Dryland Farming Of Kupang Regency Indonesia	AS	126
D18	3003	Hasnudi, Berutu I S, Daulay A H, N Ginting	Analysis Of Cattle Breeder's Income In South Kualuh Sub-District Of Labuhan Batu Utara Regency	AS	127
D19	1484	Widihastuty, Maryani Cyccu Tobing, Marheni, Retna Astuti Kuswardani	Prey preference Of <i>Myopoponecastaneae</i> (Hymenoptera: Formicidae) Toward Larvae <i>Oryctes Rhinoceros</i> Linn (Coleoptera: Scarabidae)	AS	128
D20	1507	St. Y.F.G. Dillak, N.G.A Mulyantini, Geertruida M. Sipahelut, and Ulrikus R. Lole	Carcass Yields Of Two Different Strains Of Ducks Raised In Different Altitude	AS	129
D21	1509	S.S.A.Purba, M.Tafsin, S.P Ginting, Y.Khairani	The Utilization Of Endopower B In Commercial Feed Which Contains Palm Kernel Expeller On Broiler	AS	130
D22	1511	Ronistra Ginting, Sayed Umar, Chairani Hanum	The Potential And Biological Test On Cloned Cassava Crop Remaining On Local Sheep	AS	131
D23	1666	Andhika Putra, S.Pt, M.Pt, drh.Mudhita Zikrullah Ritonga, M.Vet,	Effectiveness Duckweed (<i>Lemna Minor</i>) As An Alternative Native Chicken Feed Native Chicken (<i>Gallus Domesticus</i>)	AS	132
D24	1684	S A Sitepu, Zaituni U, Jaswandi and Hendri	Improved Quality Of Frozen Boer Goat Semen With The Addition Of Sweet Orange Essential Oil On Tris Yolk And Gentamicin Extender	AS	133
D25	3004	P. Siswoyo, M. Tafsin, R. Handarini	Potential Production And Response Of Selenium And Zinc Mineral Supplementation On Quality Of Goat Samosir Semen	AS	134
D26	3015	Mirwandono, E., S Mentari, Tri Hesti, Hasnudi, N Ginting, S Galih A	(Nutrition Quality Test Of Fermented Waste Vegetables By Bioactivator Local Microorganisms (Mol) And Effective Microorganism (Em4)	AS	135
D27	1618	N Ginting, Zuhri, Hasnudi, Mirwandono, S. Iskandar, D. Armyn Hakim	Financial Analysis Of Biogas Utilization : Input Cattle, Pig Feces And Coffee Waste In Karo Indonesia	AS	136

D28	1619	Tri Hesti, W, N Ginting, Yunilas, Hasnudi, Mirwandono E, Siregar GA, Sinaga IG	The Utilization Of Coconut Waste Fermentated By Aspergillus Niger And Tape Yeast On Meat Quality Of Weaning Males Rex Rabbit	AS	137
D29	1652	Hamdan, Mirwandono, Hasnudi, U SAYed, N Ginting, Alwiyah, Saputra	Genetic Distance Estimates And Variable Factors Distinguishing Between Goat Kacay, Muara And Samosir Through	AS	138
D30	1741/3018	Nevy Diana Hanafi, Ma'ruf Tafsir, Ulina Hutasuhut, Erifson Lubis	Analisis Of Botanical Composition And Nutrient Content On Natural Pastures In Samosir Island Of Samosir Regency	AS	139
D31	1624	SukawatyFattah, Yohanis Umbu Laiya Sobang, Fredeicus Dedy Samba, Erna Hartati, Maximilian Marthen J. Kapa, Yusuf Leonard Henuk	The Effect Of Feeding Bull Bali Cattle Kept In Extensive Husbandry System With Concentrates Contained Gliricidia Sepium Leaf Meal And Banana Starch Tuber Meal On Their Feed Consumption And Dried Organic Matter Digestibility	AS	140
D32	3006	A U Harahap	Effects Of Wheat Leaf Noni (Morinda Citrifolia) On Carcass And Production Quail Eggs (Coturnix Coturnix Javonica) In The Differentlevel Concentrate	AS	141
D33	1510	Jessica Natalina Manurung, Hasnudi, Tavi Supriana	Income Analysis Of Goat Farmers On The Farmers Group In District Of Serdang Bedagai	AS	142
D34	3027	Tafsir M, Y Khairani, ND Hanafi, Yunilas	In Vitro Digestibility Of Oil Palm Frond Treated By Local Microorganism (MOL)	AS	143
D35	1631	Obed Haba Nono, Ronny Natawidjaja, Burhan Arief, Dadi Suryadi, and Maximilian M. J. Kapa	The Impact Of Sharing Arrangement Institution On Beef Cattle Breeding Performance In Kupang District, East Nusa Tenggara Province, Indonesia	AS	144
D36	1368	Nevy Hanafi, Hadirin, Nini Rahmawati	Response Of Forages By Administration Of Fermented Goat Urine	AS	145
D37	1477	David Yasin, Ari. Ashari Harahap, Muhammad Ary Syaputra, Randi Mulianda, Try Juli Adha, Ali Syahdana Harahap, Alfath Rusdhi, Musa Seno Ibarahim, Annur Rasyidah Siregar, Bobby Purwadi, Simon Petrus Ginting, Hasnudi, and Yusuf Leonard Henuk	Factors Affecting The Whole Beef Prices In Eight Provinces In Sumatera	AS	146
D38	3038	Lollie Agustina P Putri, I E Setyo, M Basyuni, E S Bayu, H Setiada, N F Reynaldi, SAK Puteri D Arifiyanto, and I Syahputra	Molecular Performance of Commercial MTG Variety Oil Palm Based on RAPD Markers	PS	147
D39	3039	Jonatan Ginting and Carolina Permata Sari Simanjuntak	Application of Some Rice Varieties and Fertilizing NPK Against Increased Production	PS	148

ORAL PRESENTATION

Farmers Perceptions on Climate Change in Lowland and Highland Vegetable Production Centers of South Sulawesi, Indonesia

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Abstract. A survey was carried out in South Sulawesi, Indonesia interviewing 220 vegetable farmers. It was aimed at examining the vegetable farmers' perception of climate change and assessing the consistency of farmers' perception with available time series meteorological data. Results suggest that meteorological data analysis is in agreement with farmers' perception regarding faster start, longer ending, and longer duration of rainy season. Further data analysis supports the claim of most farmers who perceive the occurrence of increasing air temperature, changing or shifting of the hottest and coldest month. Most respondents also suggest that climate change has affected vegetable farm yield and profitability. Other respondents even predict that climate change may affect the quality of life of their future descendants. Meanwhile, significant number of farmers is quite optimistic that they can cope with climate change problems through adaptation strategy. However, the attitude of farmers towards climate change is mostly negative as compared to positive or neutral feeling. Informative and educational campaign should be continuously carried out to encourage farmers in developing positive attitude or positive thinking towards climate change. Positive attitude may eventually lead to constructive behavior in selecting and implementing adaptation options.(1515)

Revitalization of Food Barns in Supporting Sustainable Food Security in Central Java

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Abstract. Rice barns have been developed in some areas in Central Java, but several problems seem to appear, leading to nonoptimal functions of nonactive food barns. The present article aims to examine revitalization of food barns through systematic, integrated, and sustainable empowerment. The research design is exploratory research to generate data that are in-depth qualitative and quantitative. Survey was applied in four regencies including Wonogiri, Purworejo, Temanggung, and Batang. Key informants comprise caretakers of food barns, village apparatus, public figures, and Food Security Office apparatus. The research results revealed that the food barns have not been managed in professional manners. Active roles of all members and caretakers, village government, and Food Security Agency are, therefore, required in revitalizing the food barns. In order to perform social functions well, the food barns should be profit-oriented to achieve sustainability. **(1524)**

Questioning the Sustainable Palm Oil Demand: Case Study from French-Indonesia Supply Chain

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Abstract. Sustainable palm oil has been widely debated. Consuming countries insist certified sustainable produces palm oil, but in fact the absorption of the certified palm oil is still less than 60%. This raise questions about the sustainable palm oil demand. In this study, such a condition will be analysed in French-Indonesia supply chain case. Using monthly and quarterly data from 2010 to 2016 with Autoregressive Distributed Lag (ARDL) approach and Error Correction Model, demand influencing factors and price integration in each market of the supply chain is estimated. Two scenarios namely re-export and direct export models are considered in the Error Correction Model. The results show that France Gross Domestic Product, prices of France palm oil import from Indonesia, Malaysia, and Germany, and price of France groundnut import significantly influence the France palm oil import volume from Indonesia. Prices in each market along palm oil re-export France-Indonesia supply chain are co-integrated and converge towards long-run equilibrium, but not in the direct export supply chain. This leads to a conclusion that France market preferences in specific and EU market preferences in general need to be considered by Indonesian palm oil decision makers.(1625)

The Effect Of Consumers's Perception To The Satisfaction Of Use Of Traditional Drugs In Medan

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Abstract. Consumption of chemical drugs fluctuated in 2009-2014, whereas the consumption of solid traditional drug increased in 2009-2014. Based on that fact, a study to determine the causes of traditional drug consumption is needed. The purpose of this study is to analyse the influence of consumers's perception and their characteristics on the consumption of traditional medicinal plants. The data was analysed by using a binomial logit regression analysis. It is found that the consumers's perceptions affect customer satisfaction simultaneously; also, the health benefits and quality of drugs affects customers's satisfaction partially. Health benefit and quality of drugs is found to have a marginal effect of 7% and 4%, respectively. (1793)

Factors that Influence the Interests of Farmer In Shallots Farming at Cinta Dame Village of Simanindo Sub District of Samosir District

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Abstract. Shallots contains a lot of usefull ingredients for human life, especially as flavor to dishes by Indonesian.The need for shallots was increasing as increasing population. The increased demand of shallots caused the price to increase due to production in North Sumatera was low. The objective of this study is to analyze interest and factors that affect the interest of farmers in shallots farming and analyze the responses from each factors to the interest of farmers in shallots farming. The samples were 85 farmers in shallots farming. Binomial logit was used as data analysis method. The result of the study showed that the factors that influence the interest of farmers in shallots farming consist of land area, experiance, income, supporting and trauma.. The opportunity of farmers in shallots farming increased 22% if the area of land increased by one acre. The probability variable with the supporting is higher 0.3 % compared without the supporting. While the probability variable without the trauma is higher 0.014 % compared with the trauma.(1802)

Strategies to Increase the Consumption of Traditonal Medicine in Medan

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Abstract. As people improving their knowledge and increasing their income, it improves their awareness about healthy life. It affects of demanding of medicine highly including traditional medicine because of its using more safety and hereditary. The consumption of traditional medicine in Medan was still low comparing with modern medically. The objective of the study was to analyze the strategy of increasing traditional medicine consumption in Medan. The samples are the business actors of traditional medicine, the consumer of traditional medicine, the leader of Jamu's entrepreneur Association, and the supervisor of food and medicine in The National Agency of Drug and Food Control (NA-DFC). The analysis SWOT was used in this study. The Result of the study showed that the position of the strategy of increasing the using of herbal in Medan was in the first quadran. Commonly, it means that the strategy was in agresif level which showed the maximal probability. Therefore, jamu's entrepreneurs should implement the strategy of product development to increase the number and variation of types of traditional medicine which has a good taste and high quality and provide education to consumers about utility and how to use traditional medicine.(1803)

Farmer's Motivation in Aren Sugar Processing Business

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Abstract: The objective of the research were to analyze socio-economic characteristics and motivation of farmers in aren sugar processing business in Kolaka District, Southeast Sulawesi, Indonesia. The analysis used in this research was quantitative descriptive analysis. The results showed that average state of socio-economic characteristics of aren sugar farmer that were in the category of productive age, which was 46.12 years old, has fulfill basic education category (9 years education), low category of dependents as many as three people, the Average experience of aren sugar processing business during 18 years, and the Average aren trees were tapped as much as seven trees, every day, (b) farmer's motivation in aren sugar processing business in low category, with the indicator is the motive of imitation, economic, security, affiliations, awards, and self-actualization.(1807)

Positive and Negative Impacts of Oil Palm Expansion in Indonesia and the Prospect to Achieve Sustainable Palm Oil

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Abstract. The aim of the study is to deepen understanding the role of palm oil on Indonesian economy, poverty elevation and to investigate the positive and negative impacts of oil palm expansion, due to the burden of GHG emissions; and prospect to be more sustainable palm oil industry. The statistics show that average rural poverty tends to be lower and Gross Regional Product tends to be higher in provinces which have greater levels of oil palm cultivation. Indonesian oil palm will grow from 10.6 in 2013 to 13.7 million ha by 2020. This will release 135.59 million tons of CO₂ if nothing is done to mitigate BAU emissions. Unless there are sustained efforts to redirect development and expansion of oil palm, plantation growth will continue to encroach on intact forest and peat land.. In fact Indonesia has large areas of degraded land, an estimated total 19,144,000 ha is available for planting oil palm and other crops. A large-scale expansion program driven by estate companies needs to be accompanied by effective smallholder development program in order to achieve the best outcome for local farmers and avoid the conflicts.(3009)

Strategy to Increase Barangan Banana Production in Kabupaten Deli Serdang

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Abstract. This study was conducted to analyze internal and external factors in increasing Barangan Banana production in Kabupaten Deli Serdang. Samples were determined by snowball sampling technique and purposive sampling method. Using SWOT analysis method, this study found that there were 6 internal strategic factors and 9 external strategic factors. Among that strategic factors, support for production facilities appears as the most important internal strategic factor, while the demand for Barangan Banana as the most important external strategic factor. Based on the importance and existing condition of these strategic factors, using support for production facilities and realization of supporting facilities with farming experience are the strategies covering strength-opportunity (SO), organizing mentoring to meet the demand for Barangan Banana are the strategies covering weakness-opportunity (WO), making use of funding support and subsidies to widen the land, using tissue culture seeds and facilities and infrastructures are the strategies covering strength-threat (ST), increase the funding support to widen the land, the use of tissue culture seeds and facilities and infrastructures are the strategies covering weakness-threat (WT) are discussed and proposed to increase Barangan Banana productivity in Kabupaten Deli Serdang. **(3031)**

Analysis of Rice Policy Based on Presidential Instruction on Household Food Security

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Abstract. The objectives of this research is to analyze the impacts of rice policy on the household food security. The research used cross section data collected from respondent of 74 farmers determined by purposive sampling. Rice policy model specification uses the simultaneous equations consisting of 6 structural equations and 6 identity equations which was estimated using Two Stages Least Squares (2SLS) method. The results show that: (1) the effectiveness of government purchase price of dried harvest paddy gave a positive impact on paddy planted area, paddy production and rice production, (2) an increase of the rice production gave a positive impact on household rice availability and household rice surplus, and the increase of household rice surplus gave the quantity of Raskin decrease, (3). an increase of price of Urea and SP-36 fertilizers has a negative impact on the paddy planted area, and a decrease of the paddy planted area and decrease of paddy production and rice production, (4). the decrease in rice production was followed by a decrease in household rice availability and household rice surplus, and the decrease of household rice surplus gave the quantity of Raskin increase. **(1519)**

Policy in Management Based on Corruption Growth of Resources Agropolitan in The Gorontalo Province

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Abstract. Gorontalo was formed as a new province in Indonesia as a producer of national maize, but until now the agropolitan-based agricultural development condition is still inadequate and needs to be developed well. Thus, it is necessary to conduct a governance-related study on empowering farmers in order to increase their capacity in exploring the agricultural sector. This study aims to see the need for local government policies in managing human resources in the agricultural sector in this case the potential and contribution of farmers in creating new jobs in rural areas. This study uses a qualitative approach to the use of secondary data and primary data as a basis for tracing or researching local government management policies in empowering farmers to improve their welfare and also how this policy is expected to organize effective market mechanisms for farmers. **(1642)**

The Pricing Behavior Comparison of Canada and Australia Exporter in Wheat International Market Using Pricing to Market (PTM) And Residual Demand Elasticity (RDE)

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Abstract. This paper try to identify and examined the degree of market power on wheat international market by 2 major exporting countries comprising Canada and Australia by using the Pricing to Market (PTM) method and Residual Demand Elasticity (RDE) method. The PTM method found that Canada impose noncompetitive strategy by applying price discrimination and apply market power to their importing. Different results come from Australian exporter as they are not using their market power to the importing. Conflicting result arise from estimation using RDE and PTM method suggest that the need to extend the theoretical model of both model by expand its economic and econometric model to have consistent expected result theoretically and empirically.(3010)

Farmer's Welfare in Telang's Integrated Independent City: Lesson Learned from Migrant and Local Farmers in Tidal land, South Sumatera

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Abstract: Telang's Independent Integrated City development is a model of tidal agricultural development through technological innovation to improve farmers' welfare. In this area, the diversity of origin of population is also suspected to have an impact on the achievement of success. The purpose of this study is to analyze and prove the hypothesis that farmers are able to prosper in tidal land by Telang's Independent Integrated City Program based on migrant and local farmers disaggregation. The research was conducted at Tanjung Lago District Banyuasin Regency, South Sumatra. The research method is survey with stratified simple random sampling. Data is processed by mathematics and statistics. Telang's Independent Integrated City is an area of rice production center development and rice industry. Since 2008, farmers have implemented rice cultivation innovations by the twice-cropping index. This program by utilization of tidal land proved that farmers have a great chance of success. Farmers have succeeded in breaking the myth that has been growing in the food agriculture sector, that farmers cannot prosper only with food crops. Both Farmer's income has been above the necessities of life. Judging by the diversity of origin of population, the income of migrant is higher than local farmers. (1571)

The Analysis of Consumption Level and Preferences of Fresh Shallots Consumers in Medan

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Abstract. Comprehension about consumer preferences gives a very important contribution to the consumer's decision making process, which eventually affects the level of consumer consumption. This study aims to analyze the level of consumer consumption, consumer preferences, as well as the combination of the most preferred attributes by the fresh shallots consumers in Medan. The number of respondents in this study is 100 households. Consumer preferences were identified using conjoint analysis. Attributes of the product that were observed are the size of the root, aroma, price, and dryness. The result of this study shows that the average level of fresh shallots consumption in Medan is 11.67 grams/capita/day, which is higher compared to the 7 grams/capita/day average of national consumption. Consumers assume that the dryness is a very high importance value in judging and deciding whether to buy the fresh shallots, followed by the attribute of aroma, price, and size of the root. Meanwhile, the combination of attributes that is most preferred are fresh shallots with bulb diameter of 2.5 cm, strong aroma, low price ranging below Rp 35000/kg and dryness level in medium category which means the products are in a rather moist/dry condition, and has a little skin waste.(1766)

Analysis of Supply Chain Management of Shallots at Medan

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Abstract. Supply chain is important for business. One of supply chain that needs to be studied is the shallots supply chain. Medan have high demand while the supply of shallots is limited. This study aims to analyze the flow of shallots supply chain distribution in Medan. The method used was survey by using questionnaires to shallots producers, collecting traders, distributors, traders as well as government involved in shallots supply chain. Descriptive analysis was used to explain the shallots supply chain distribution flow. The results showed that there are two shallots supply chain model in Medan that was local shallots model and imported shallots model. Local shallots model could be distinguished based on three-producerarea; those were models of Medan Marelan, Samosir, and Simalungun. Medan Marelan and Simalungun models have seven supply chains, while the Samosir Model has eight supply chains. This condition indicates that the local shallots supply chain management in Medan was not efficient because of the length of the distribution channel. Supply chain imported shallots was more efficient because it had a shorter distribution flow with five supply chains.(1771)

The Income Distribution and Contribution of Palm Sugar Producer in Increasing The Household Welfare of Palm Sugar Maker in Kolaka Southeast Sulawesi Indonesia

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Abstract. One of household agroindustry that has been run for long time by the people in South East Sulawesi is aren sugar agroindustry. The development of small industries is expected to reduce unemployment, income inequality, the decline in the number of poor and rural-urban migration. Objectives of this research were to study (1) income distribution of aren sugar producer in household industry scale, (2) income contribution of aren sugar household industry to the total income of aren sugar producer household, and (3) the role of aren sugar household industry to the welfare level of sugar producer in Kolaka District. The research was done in Wolo Sub District of Kolaka District. Data analytical method in this research were Gini index, income contribution calculation, good service ratio and one sample t-test. Income distribution of aren sugar producers in household industry scale were in low imbalance category. Concluded that (1) The income of arensugar household industry made the income distribution of aren sugar producer more balance, (2) income contribution of aren sugar household industry to the total income of aren sugar producer household, (3) The aren sugar household industry have important role to the welfare level of aren sugar producer in Kolaka District.(1854)

Influence Of Land Area And Capital Strengthening Fund Of Rural Economic Enterprises Toward Corn Production In North Sumatera Province

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Abstract. Corn is one of the staple food crops. Corn can also be processed into various foods and also as animal feed. The need for corn will continue to increase from year to year so it is necessary to increase production. The government has targeted corn crop self-sufficiency to achieve the corn production standards required by the animal feed industry. The purpose of this study is to analyze the effect of land area and capital strengthening funds to rural economic enterprises on corn production. This study uses secondary data obtained from the Central Statistical Agency of North Sumatera Province. The research method used is panel regression method. The result shows that the area of land has a significant effect on corn production and the capital strengthening fund to the rural economy institution has an insignificant effect on corn production in North Sumatera Province. **(3032)**

The Strategy of Sustainable Soybean Development to Increase Soybean Needs in North Sumatera

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Abstract: The objective of the research was to analyze both internal and external factors influencing the strategy of sustainable soybean production to increase soybean needs in North Sumatera. SWOT analysis was used as the method to crafting the strategy. Data collected in this research consist of primary and secondary data. Primary data is in the form of questionnaires obtained from the interviews as many as 120 soybean farmers consisting of 4 districts in North Sumatra namely Langkat, Deli Serdang, Serdang Bedagai and Simalungun. The results showed that the strategy to increase soybean production in research area is aggressive strategy or strategy of SO (Strengths - Oppurtunities) that is using force to exploit existing opportunity with activities as follows: (1). Use certified seeds in accordance with government regulations and policies. (2). Utilizing the level of soil fertility and cropping patterns to be able to meet the demand for soybeans. (3). Utilizing human resources by becoming a member of farmer groups.(1832)

Pricing Behavior of USA Exporter in Wheat International Market

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Abstract. The number of wheat producing countries is changing over time. It is expected the change in wheat supply will lead world wheat market become more competitive and reduce market power of major exporter country. This paper tries to identify and examined the degree of market power on wheat international market for USA by using the Pricing to Market (PTM) method. USA is the biggest producer and exporter in wheat market. The PTM method found that USA impose noncompetitive strategy by applying price discrimination and apply market power to their importer country. (3011)

The Impact of Input and Output Prices on the Household Economic Behavior of Farmers Rice-Livestock Integrated Farming System (Rlifs) and Non Rlifs in West Java

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Abstract. Integrated farming system is a system that emphasized linkages and synergism of farming units waste utilization. The objective of the study was to analyze the impact of input and output prices on both Rice Livestock Integrated Farming System (RLIFS) and non RLIFS farmers. The study used econometric model in the form of a simultaneous equations system consisted of 36 equations (18 behavior and 18 identity equations). The impact of changes in some variables was obtained through simulation of input and output prices on simultaneous equations. The results showed that the price increasing of the seed, SP-36, urea, medication/vitamins, manure, bran, straw had negative impact on production of the rice, cow, manure, bran, straw and household income. The decrease in the rice and cow production, production input usage, allocation of family labor, rice and cow business income was greater in non RLIFS than non RLIFS farmers. The impact of rising rice and cow cattle prices in the two groups of farmers was not too much different because (1) farming waste wasn't used effectively (2) manure and straw had small proportion of production costs. The increase of input and output price didn't have impact on production costs and household expenditures on RLIFS. **(1683)**

Contribution of Village Cooperation Unit in Improving Farmers Incomes

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Abstract. One of the government and private efforts to improve people's welfare particularly to improve farmer's income is to activate the Village Cooperation Unit (KUD). The objective of research was to know the efficiency level of farming organized by farmers together with cooperative. Theoretically some social economic variables have been known influences the rate of farmer's income, therefore three social variables, such as the level of cooperation services, members participation and friendship among farmers with cooperation were studied. List of questions divided into forty family's leader members of KUD which become samples. Analysis models were used production function of Cob-Dougllass and Output Input Ratio models. It was concluded that level of participation and friendship partially were significantly to the income's rate meanwhile variable of cooperation services level were not significant. Simultaneously, three factors gave very significant contribution, where R-square was 0.97 so that very significant. It's also concluded that the biggest contribution given by the friendship level. Efficiency level or farming efforts of the farmers is very well and feasible with the average of OIR rate 19.23. This research recommended that this effort could be improved from friendship process among institution since the contribution was significantly improving the farmer's income.(1580)

Environmental Performance, Profitability, Asset Utilization, Debt Monitoring and Firm Value

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Abstract. The growing issue on firm value shows that firm value is not only determined by the firm ability to increase financial profit, but also by the company's concern in maintaining the environmental condition. The industrial development produces waste that pollutes the environment that has potential to serious impact on the next life. In addition to provide financial benefits, companies are increasingly facing pressure to be socially responsible for the survival of the company. However, past findings demonstrate that the effect of environmental performance, profitability, and asset utilization to the firm's value are still unclear. This study aims to test whether environmental performance, firm profitability and asset utilization can effectively enhance firm value in two different conditions: intensive debt monitoring and less intensive debt monitoring. Sample of companies is taken from the list of Indonesia Stock Exchange during the period 2013 to 2015. Using multiple regression analysis, discloses that: in intensive monitoring, managers tend to have high firm value when company has high environmental performance and or high profitability and high asset utilization. Monitoring system needs to be intensified especially for companies with the above characteristics. **(1640)**

Passion Fruit Hulls Particleboard: The Effect of Urea Formaldehyde Level on Physical and Mechanical Properties

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Abstract. The purpose of this research was to explore the suitability of Passion Fruit Hulls (PFH) as a raw material particleboard with variants of urea formaldehyde adhesive content (UF). In this research, PFH particles filtered by sieve insize of 10 mesh to throw dust particles. Furthermore, the particles dried until reaches of 5% moisture content. Levels of UF adhesive was using comprise of 10%, 12% and 14%. Hot pressing conducted at 120°C temperature for 10 minutes at a pressure of 30 kg/cm². The results showed that in moisture content for 10% adhesive level, almost all the parameters such as thickness swelling, modulus of elasticity (MOE) and modulus of rupture (MOR) that produced did not fulfil the standard. The 14% adhesive level produced of the best of PFH particleboard.(1582)

The Level of Society's Participation in Critical Land Rehabilitation in DAS Randangan Pohuwato Regency

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Abstract. The aim of this study is to analyze the level of participation of the society and analyze the correlation of internal and external factor with the level of participation from the society. This research was done in Randangan watershed in Pohuwato district, Gorontalo Province from Februari to April 2017. The population of the research is 150 people with 60 respondents that is chosen through random sampling. The data were collected through structured interview with questionnaire. The data were analyzed with class interval analysis (low, average, high), with sperman rank correlatioon analysis, and with descriptive analysis. The result of the research showed that the participation of the society is in low category in terms of determining the rehabilitation location (65.0% is not participated) and evaluation for planting monitoring (68.3% does not participate), and average participation on implementing seeding (55,0% participated), seeding (58.3% participating). Among the internal and external factors of the society, the one that has a significant relation is $\alpha = 0.05$ is the level of program socialization is in implementing seeding (0.299). This indicates that the better the socialization the better the knowledge of the society in participating in implementing seeding.(1641)

Analysis of Community Income on Suren (*Toona sureni* (Blume) Merr.) and Cacao Crops (*Theobroma cacao* L.) in Simalungun, North Sumatera- Indonesia

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Abstract. Agroforestry is the management and integration of trees, crops and or livestock on the same plot of land and can be an integral component of productive agriculture. It may include existing native forests and forests established by landholders. The study was conducted in Mekar Sari Raya village, Panei sub, Simalungun regency, North Sumatera. This study aims to gain the ability to use agroforestry in suren crops and cocoa that provides benefits to farmers and the feasibility of the model farm. The study site has Net Present Value (NPV) is 2.670.306.905 (IDR) for 15 of year , Gross B/C Ratio (BCR) is 2,3; Internal Rate of Return (IRR) is 28 %; and Payback Period (PP) for 5 years 4 months 24 days. Agroforestry using commodities cacao and suren crops are financially feasible to be cultivated and developed.(1831)

Determination of Wood Wettability Properties of Oil Palm Trunk, Shorea sp., and Paraserianthes falcatariaby Contact Angle Method

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Abstract. The aim of this study was to analyze the wettability of the inner part of oil palm trunk (OPT), the outer part of OPT, OPT that densified 50%, Shorea sp. and Paraserianthes falcataria wood, as raw material for laminated beams. The wettability of the wood was measured by using cosine-contact angle (CCA) method, which is measuring the angle between dripped resin liquid and the wood surface. The resins that used in this study is phenol formaldehyde (PF) and urea formaldehyde (UF). The results showed that the Shorea sp. and P. falcataria woods have the smallest contact angle or the best wettability properties than OPT. Shorea sp. has the best wettability on PF resin (83.00°), while P. falcataria on UF resin (90.89°), this is due to the levels of starch and extractive substances in Shorea sp. and P. falcataria wood are smaller than OPT. Furthermore, Shorea sp. and P. falcataria wood surfaces are flatter and smoother than OPT, so that the resin will flow easier and wetting the wood surface. In this condition, the liquid resin will flow easier and formed a smaller contact angle. The good wettability of wood will enhance the adhesion properties of laminated beams.(1755)

Pathotype profile of *Xanthomonas oryzae* pv. *oryzae* isolates from North Sumatera

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Abstract. The Bacterial blight disease caused by *Xanthomonas oryzae* pv. *oryzae* (Xoo) is one of the most important diseases and has caused crop failure in rice crops. This pathogen infects the leaves in all plant growth phases. The purpose of this study is to investigation 10 Xoo isolates pathotype obtained from North Sumatera based on their interactions with 10 near-isogenic rice lines (NIL) of IRRI. The results showed that there are 6 pathotypes of virulence in North Sumatera, they are; pathotype I with incompatible interaction to all Xa genes, pathotype II with compatible interaction to *Xa1* and *Xa3* genes, while it has incompatible interaction to other genes, pathotype III with compatible interaction to *Xa1*, *Xa5*, *Xa7*, *Xa8*, *Xa10* and *Xa11* genes, but it has incompatible interaction to other genes, pathotype IV with compatible interaction to all Xa genes, pathotype V with compatible interaction to *Xa1* gene and incompatible interaction to other genes, and pathotype VI with compatible interaction to *Xa3* gene and incompatible interaction to other genes. Based on the resistant genes in each individual *Xa2*, *Xa4*, and *Xa21* genes are the combination of Xa genes which are most suitable for use in the development of rice cultivars in North Sumatera. **(1643)**

The Influences of Consumer Characteristics on the Amount of Rice Consumption

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Abstract. This study aims to analyze the characteristics of rice consumers and the influences of consumer characteristics on the amount of rice consumption. The research areas are determined purposively in the sub-districts in Medan. The analytical methods used are descriptive and multiple linear regression analysis. The results show that consumers in the study areas have various characteristics, concerning age, income, family size, health, and education. Simultaneously, characteristics of rice consumers have the significant effect on the amount of rice consumed. Partially, age and the number of family members have the significant effect on the amount of rice consumed. The implications of this research are, need different policies toward consumers of rice based on their income strata. Rice policies cannot be generalized.(3037)

The Effect of Organic Paddy Field System to Soil Properties

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Abstract. This study aims to compare the soil properties among organic paddy field and other cultivation systems. Soil profile description was done to determine the soil horizons. The characteristics of organic paddy soil were better than others as it has C-organic in horizons I and II which were 2.09% and 2.00%, respectively; black soil color in horizon I (10 YR 2/1); microbial biomass C in horizon I and II which were 98.39 $\mu\text{g C/g}$ soil and 418.01 $\mu\text{g C/g}$ soil respectively; and microbial biomass N in horizon I and II which were 72.59 $\mu\text{g N/g}$ soil and 59.11 $\mu\text{g N/g}$ soil respectively. However, the unfavorable qualities of organic paddy soil including the clay leaching from horizon I (clay 24.56%) to horizon II (clay 40.16%) and high production potential of methane (CH_4) (1.81 $\mu\text{g CH}_4/\text{kg soil/day}$ and 1.67 $\mu\text{g CH}_4/\text{kg soil/day}$, respectively in horizon I and II) need to be anticipated. The high amount of C-organic in organic paddy field affects the soil color was darker, and the increasing of clay leaching, microbial biomass C and N, and potential of CH_4 production. **(1520)**

Growth and Production of Local Rice Varieties in The Shade Intensity

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Abstract. Shade intensity is one of the most important requirements for plant growth, affecting growth, development, survival, and crop productivity. This study aims to evaluate the growth and production of Local Rice Varieties In The shade Intensity. This study was conducted in Balai Pengkajian Teknologi Pertanian, Pagar Merbau, Deli Serdang, North Sumatra. The research used completely randomized design with twofactors. The shade intensity (N) were 25%, 50% and no shade intensity as a control. Whereas Local Rice Varieties were V₁: Inpara 2, V₂: Suluttan Unsrat 2, V₃: Inpari Mugibat, V₄: Inpari Sidenuk, V₅: Mekongga, V₆: Ciherang, V₇:Inpari 10, V₈: Inpari 3, V₉: Inpari 4, V₁₀: Inpari 30, dan V₁₁: Cibogo. The result indicated that local rice varieties showed significant effect on the growth and production variable such as leaf area, where Inpari Sidenuk variety was the highest among the varieties. Total chlorophyll, the highest was found on Inpari variety. Number of tillers and plant height where the highest was found on Ciherang variety. The shade intensity showed significant effect on leaf area, where 25% shade intensity was the highest. Total chlorophyll, the highest was found on 50% shade intensity, number of tillers, the highest was found on no shade intensity.(1538)

Root Morphology Of Several Potato Varieties – Infected *Meloidogyne* Spp. And Addition Of Organic Matters

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Abstract. This research was aimed to determine root morphology of several potato varieties which were applied by organic materials into the planting medium inoculated nematodes. The research was conducted at Research Station of Horticulture in Berastagi, Sumatera Utara on May to November 2016. The randomized block design was used with two factors ; the first factor was organic materials (mucuna and peanut compost) and the second factor was potato varieties (Tenggo, Maglia, and Margahayu). The results showed that organic matters increased the shoot fresh weight, the root fresh weight, the tubers weight and the number of tubers, root diameter, root lenght. However, organic matters also increased the number of nematodes. Varieties of Tenggo and Maglia showed significant affect to all observed characters. The interaction of the two treatments had significant affect to the shoot fresh weight, the number of root-knot, and the number of tubers, root lenght. However, no significant affect was observed in root wet weight, and tuber weight. **(3008)**

Selection of Selected Individuals on Soybean Plant (*Glycine Max*.Merrill) in Generation M₅ Based on High Quality Production and Tolerant Stem Base Rod Disease *Athelia Rolfii* (Curzi)

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Abstract.This study was aimed to obtain selected individuals on soybean plant *Glycine max* L. (Merrill) in M₅ generation based on high production character and tolerance of stem rot disease *Athelia rolfsii* (Curzi). This research was conducted in Plant Disease Laboratory and experimental field Faculty of Agriculture Universitas Sumatera Utara Medan, Indonesia. This research was conducted from December to June 2017. The treatments were 15 mutant genotypes, Anjasmoro, Agromulyo, and Kipas Putih varieties. The results showed that the appearance of agronomic characters observed in inoculation treatment of stem rot disease was lower than treatment without inoculation of stem rot disease. Selection performed on population M₅ resulted 62 selected individuals with tolerance of stem base rod disease character. **(3019)**

Effect of Foliar Application of Chitosan And Salicylic Acid on The Growth of Soybean (*Glycine Max* (L.) Merr.) Varieties

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Abstract. Elicitors such as chitosan and salicylic acid could be used not only to increase isoflavone concentration of soybean seeds, but also to increase the growth and seed yield. The objective of the present study was to determine the effect of foliar application of elicitor compounds (i.e. chitosan, and salicylic acid) on the growth of two soybean varieties under dry land conditions. Experimental design was a randomized block design with 2 factors and 3 replications. The first factor was soybean varieties (Wilis and Devon). The second factor was foliar application of elicitors consisted of without elicitor ; chitosan at V4 (four trifoliolate leaves are fully developed) ; chitosan at R3 (early podding) ; chitosan at V4 and R3 ; salicylic acid at V4 ; salicylic acid at R3 and salicylic acid at V4 and R3. Parameters observed was plant height at 2-7 week after planting (WAP), shoot dry weight and root dry weight. The results suggest that the Wilis variety had higher plant height 7 WAP than Devon. The foliar application of chitosan increased the plant height at 7 WAP, shoot dry weight and root dry weight. The foliar application of chitosan at V4 and R3 on Devon variety increased shoot dry weight. **(1844)**

Effectiveness of Several Dosage Formula of Oil and Nano Emulsion of Citronella Against Vascular Streak Dieback (Vsd) Disease on Cocoa

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Abstract. The disease of *Vascular streak dieback* (VSD) is a deadly disease of cocoa plants, because it attacks the vascular tissue of cocoa at growing point of the plant. In West Sumatra the disease was first reported in 2015 with an incidence of disease range 58.82% - 100% and an intensity of disease range 24.29% - 44.7%. The purpose of this study was to examine the effectiveness of dosage application of oil formula and nano emulsion of citronella formula against *Vascular streak dieback* (VSD) disease on cocoa plants in West Sumatra (in Padang Pariaman District and Limapuluh Kota District). The results showed that the percentage of VSD disease attacks in both testing sites was 100% .The oil and nano emulsion of citronella formulas can reduce the intensity of VSD disease on cocoa plants in West Sumatra, particularly in Padang Pariaman District and Limapuluh Kota District. The reduction of VSD intensity in Padang Pariaman district ranged from 8.32 to 21.13%; while in Limapuluh Kota district ranged from 4.33 to 11.80%. The nano emulsion of citronella formulation is effective to suppress the intensity of VSD disease on cocoa plants at doses 0.1% ($\geq 30\%$ of effectiveness level).(1592)

Physiological Performance of the Soybean Crosses in Salinity Stress

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Abstract. Plants grown in saline soils will experience salinity stress. Salinity stresses, one of which causes oxidative stress, that cause an imbalance in the production ROS compounds (Reactive Oxygen Species), antioxidants and chlorophyll. Where the reaction of this compound can affect plant growth and plant production. This study aims to inform performance and action gene to soybean physiological character that potential to tolerant from salinity soil that characterized by the presence of SOD and POD antioxidant compounds and chlorophyll. This research used a destructive analysis from crossbred (AxN) and (GxN). A = Anjasmoro varieties and G = Grobogan varieties as female elders and N = Grobogan varieties as male elders (N₁, N₂, N₃, N₄, N₅) that have been through the stage of saline soil selection. Research result can be concluded that GxN cross is more potential for Inheritance of the offspring. This can be seen from the observed skewness of character SOD, POD, Chlorophyll a and chlorophyl b. **(1657)**

The Effect of Shade on Chlorophyll and Anthocyanin Content of Upland Red Rice

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Abstract. Upland red rice (*Oryza sativa*) is a staple food and contains anthocyanin, which can act as antioxidants, plays an important role both for the plant itself and for human health. Levels of antioxidants in rice can be affected by the availability of light. The results showed that the difference of shade, cultivar, and interaction both significantly affect the content of chlorophyll *a*, chlorophyll *b* and total chlorophyll. The results also showed that shade could increase chlorophyll in all cultivars tested. The highest levels of chlorophyll *a* were present in the moderate shade level (n₂), then decreased at the shelter level (n₃) and increased again at high levels (n₄). While on chlorophyll content *b*, it appears that shade increased chlorophyll *b* in all cultivars tested and this increase was linear to the increase of shade. The shade treatment may increase the anthocyanin content and the increase depending on the type of cultivar. Increased levels of anthocyanin highest due to shade occurred on Jangkobembe cultivar. The original level of anthocyanin on Jangkobembe cultivar averaged 0.096 mg g⁻¹ increased to 2.487 mg g⁻¹ or increased 26 fold. It is concluded that the shade had a significant effect on the chlorophyll and anthocyanin content.(1659)

The Effectiveness of Preplant Seed Bio-Invigation Techniques Using *Bacillus* sp. CKD061 to Improving Seed Viability and Vigor of Several Local Upland Rice Cultivars of Southeast Sulawesi

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Abstract. The research was aimed to evaluate the bio-invigation technique using *Bacillus* sp. CKD061 in improving seed viability and vigor of local upland rice. The research is arranged in factorial with completely randomized design (CRD). The different upland rice cultivars as first factor that consisted of 11 cultivars, namely: *Pae Tinangge*, *Pae Rowu*, *Pae Uwa*, *Pae Tanta*, *Pae Waburi-Buri*, *Pae Mornene*, *Pae Indalibana*, *Pae Lawarangka*, *Pae Huko*, *Pae Wagamba* and *Pae Momea*. The second factor is the seed bio-invigation technique, consists of 5 treatments, namely: Without seed bio-invigation (B₀), NaCl + *Bacillus* sp. CKD061 (B₁), KNO₃ + *Bacillus* sp. CKD061 (B₂), Ground burned-rice husk + *Bacillus* sp. CKD061 (B₃), and Ground brick + *Bacillus* sp. CKD061 (B₄). The results showed that seed bio-invigation using *Bacillus* sp. CKD061 gave effect on the seed viability and vigor. Interaction of the seed bio-invigation and upland rice cultivars were able to improve seed viability and vigor. Seed bio-invigation treatment using ground brick + *Bacillus* sp. CKD061 was the best treatment, which could improve the viability and vigor of *Pae Waburi-Buri*, *Pae Mornene* and *Pae Indalibana*. The treatment increased vigor index by 133% in *Pae Waburi-Buri* and 127% in *Pae Mornene*, and *Pae Indalibana* compared with control. **(1662)**

The Effectiveness of Various Rhizobacteria Carriers to Improve the Shelf Life and the Stability of Rhizobacteria as Bioherbicide

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Abstract : Deleterious Rhizobacteria (DRB) have a potential to control of weed and act as a bioherbicide. Developing a method to weed control that environmentally sound friendly has been increasingly studied. Rhizobacteria can form colonies on weed rooting and synthesize the secondary metabolite compounds. The effectiveness of rhizobacteria as bioherbicide is determined by its survival to be stored for a long time. The objective of this study is to obtain the type of carrier which effectively maintains the life and stability of DRB. Therefore it is necessary to do in vivo and in-vitro research. This study consists of two stages of testing the effectiveness of the carrier in increasing the shelf life of rhizobacteria and testing the effectiveness stability as a bioherbicide on *Ageratum conyzoides* weed after storage for 20 weeks. Research was conducted in Agronomy Lab, Agriculture Faculty, Halu Oleo University Kendari, Since August to December 2016. Research found that the talc powder and chaff charcoal powder were effective as a carrier of rhizobacteria and able to maintain the viability of rhizobacteria *Bacillus lentus* A05 and *Pseudomonas aeruginosa* A08 for five months and also able to maintain the stability of rhizobacteria as bioherbicide.(1664)

Relationship of Some Upland Rice Genotype After Gamma Irradiation

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Abstract. The objective of the research was to group local upland rice genotypes after being treated with gamma irradiation. The research materials were upland rice genotypes resulted from mutation of the second generation and two parents: Pae Loilo (K3D0) and Pae Pongasi (K2D0) Cultivars. The research was conducted at the Indonesian Sweetener and Fiber Crops Research Institute, Malang Regency, and used the augmented design method. Research data were analysed with R Program. Eight hundred and seventy one genotypes were selected with the selection criteria were based on yields on the average parents added 1.5 standard deviation. Based on the selection, eighty genotypes were analysed with cluster analyses. Nine observation variables were used to develop cluster dendrogram using average linked method. Genetic distance was measured by euclidean distance. The results of cluster dendrogram showed that tested genotypes were divided into eight groups. Group 1, 2, 7, and 8 each had 1 genotype, group 3 and 6 each had 2 genotypes, group 4 had 25 genotypes, and group 5 had 51 genotypes. Check genotypes formed a separate group. Group 6 had the highest yield per plant of 126.11 gram, followed by groups 5 and 4 of 97.63 and 94.08 gram, respectively. **(1665)**

The Land Use Patterns for Soil Organic Carbon Conservation At Endanga Watershed Southeast Sulawesi Indonesia

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Abstract. The Endanga basin is one part of the Konawehea watershed located in South Konawe, Southeast Sulawesi Province, covering an area of 1,353.67 hectares. The land use patterns in Endanga Basin contained forests, shrubs, oil palm plantations, pepper fields, and cultivated fields of field rice, corn monoculture and intercropping of groundnut and corn. This watershed needs serious attention because most of its territory is on slope of 15-40%, with erosion hazard levels (EHL) varying from mild erosion to severe erosion. The loss of organic carbon (C-organic) soil is measured from the soil carried along with the surface stream and into the reservoir on various land uses. The result measurement of C-organic soil loss on forest land use is 14.02 kg.ha⁻¹, scrubland 22.71 kg.ha⁻¹, oil palm 151.32 kg.ha⁻¹, pepper garden 93.69 kg.ha⁻¹, field rice 313.80 kg.ha⁻¹, monoculture of maize 142.44 kg.ha⁻¹, intercropped maize and corn 51.10 kg.ha⁻¹ and open land 1,909.16 kg.ha⁻¹. The forest land and shrubs is best in conserving soil C-organic, but economically unfavorable for the community, so land use pattern for intercropping and pepper plantation can be used for soil C-organic conservation. **(1669)**

Evaluation of Land Suitability for Onion (*Allium ascalonicum* L.) and Lemon (*Citrus sp.*) at Harian District of Samosir Regency

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Abstract. Evaluation of land suitability for onion and lemon aimed to determine the level of suitability to the plants that would be cultivated. at Harian, Samosir. Operation of soil type, altitude map and slope maps with scale of 1:50000 obtained nine Land Map Units namely LMU1 and 2 – SampurToba; LMU3 - JanjiMartahan; LMU4 - Turpuk Limbong; LMU5 - SohorDolok; LMU6,7,8 and 9 in Partungko NaGinjang. Land suitability assessment criteria based on Bogor Soil Research Center Staff 1983 and the limit method by Djaenuddin 2011. The results showed that the onion crop was only on the LMU2- and had a barrier that can be overcome. Actual class S3 (n, r) S2(eh) had inhibiting factors those are pH and slope can be solved with liming and terracing so that its potential can be upgraded to class S1. All other LMUs have severe inhibitors that do not fit (actual class S3 to N) that is texture which is very difficult to change. Oranges has the smallest obstacle in the LMU1-, S3(nr); its limiting factor could be addressed with organic matter to increase the potential grade. LMU3-S2 (er); obstacles can be overcome by terracing slopes; LMU8 inhibition are pH and slope S2(nr,eh) can be managed by liming and terracing. At LMU4,5,6,7 and 9 the land should not be cultivated with lemon because it possesses barriers (class N) on properties of texture and slope. (3007)

Growth and Yield Model for Non-Timber Forest Product of Kemenyan (*Styraxsumatrana*J.J. Sm)in Tapanuli, North Sumatra

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Abstract. Kemenyan is resin from *Styrax* trees, the main of non-timber forest product commodity in Lake Toba catchment area, North Sumatra since hundreds years ago. However, there are lack of information about the growth and yield prediction for the trees that most communities cultivated in this region. The objective of study is to construct the growth and yield models for *Styraxsumatrana* in Tapanuli, North Sumatra. Measurement data from 20 temporary plots were used to formulate the stand diameter and height equations, and projection of incense production. The highest Current Annual Increment (CAI) of diameter occurs in the stand's age 21 to 25 years (1.00 cm/year). The growth of diameter declines significantly to 0.48 cm/year in age 46 to 50 years, and decrease to 0.26 cm/year at the age 50 years up. The intersection of CAI and MAI curves occur in stand age 31 to 35 years. This shows that the optimal diameter growth occurs in that time. Consequently, the older trees should be replanted. The average of incenses production is 318.59 g/tree/year. The optimum incense production was achieved when the diameter growth was maximal and minimal tapping scars accumulation.(1621)

Selection Individual on Mutant Genotype of Soybean (*Glycine Max*l.Merrill) In M₅ Generation Based on Resistance of Stem Rot Disease *Athelia Rolfsii* (Curzi)

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Abstract. This study was aimed to obtain selected individuals on soybean plant *Glycine max* L. (Merrill) in M₅ generation based on high production character and tolerance of stem rot disease *Athelia rolfsii* (Curzi). This research was conducted in Plant Disease Laboratory and experimental field Faculty of Agriculture Universitas Sumatera Utara Medan, Indonesia. This research was conducted from December 2016 to June 2017. The treatments were 15mutant lines genotypes and Anjasmoro variety. The results showed that some lines mutant genotypes can give the good agronomic appearance character than Anjasmoro variety on inoculation treatment of stem rot disease. Selection performed on population M₅ producesslected individuals with tolerance of stem rot disease from 100 and 200 Gy population. **(3017)**

Flower Morphology Diversity in some Accessions of Asam Gelugur (*Garcinia atroviridis* Griff, ex T. Anders) in Several Districts of Sumatera Utara

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Abstract. The research aims to study of flower morphology of Asam Gelugur plants in several Districts of Sumatera Utara. This study was conducted in Asahan, Batubara and Serdang Berdagai districts in February to April 2017, exploration using survey method with IPGRI descriptors guide, and accidental sampling. The research results showed that in three Districts of Sumatera Utara, there are 26 accessions of Asam Gelugur characterized based on morphology of flowers. Based on clustering analysis using the NTSYS-pc Program, all flower morphology data resulted in dendrogram with similar coefficient range from 0.34 to 0.75 into four groups. The first group (I) consists of 16 accessions i.e Asahan, Batubara and Serdang Bedagai districts. The second group (II) in Asahan, Batubara and Serdang Bedagai districts there are 7 accessions. The third group (III) consists of two accessions, i.e. Asahan and Batubara Districts. The fourth group (IV) consists of one accession in Serdang Bedagai District is the only outgroup access. **(3020)**

Contribution of Pod Borer Pests to Soybean Crop Production (Case in Pondidaha, Konawe District, Southeast Sulawesi)

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Abstract. Soybean (*Glycine max* L.) is one of the most important crops whose production continues to be improved in all areas of soybean cultivation centers in an effort to maintain the availability of soybean foods, including Southeast Sulawesi. The purpose is to analyze the contribution of pod borer pests to soybean crop production. The study was conducted from October to December 2016, at the soybean farmer's field, Belatu Village, Pondidaha Sub-districts, Konawe Districts and Plant Protection Laboratory, Faculty of Agriculture, University of Halu Oleo Kendari. Methods of direct observation were made on observed variables, including species and population of pest pod borer, intensity, and crop production. The result, found four types of pod borer pests are *Nezara viridula*, *Rhiptortus linearis*, *Etiella zinckenella*, and *Leptocorisa acuta*, each with a different population and contribution to the intensity of pod damage. The result of path analysis showed that directly population of *N. viridula* (61.14) and *E. zinckenella* (66.44) gave positive contribution in increasing pod damage, respectively by 0.332 and 0.502, while the negative contribution was shown by population of *R. linearis* and *L. acuta*. Damage of the pod causes increased production of low soybean is only about 0.202, therefore required appropriate control techniques to control pod borer pests populations in soybean crops. **(1808)**

The Storage Capacity of Cocoa Seeds (*Theobroma cacao* L.) Through Giving Polyethylene Glycol (PEG) in The Various of Storage Container

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Abstract. Cocoa is plant which it's seed character is recalcitrant. By giving PEG and using various of storage containers was hope to increase storage capacity of cocoa seeds as long as period of saving. The reseach was aimed to identify the storage capacity of cocoa seeds through giving PEG in the various of storage containers. The Research took place in Hataram Jawa II, Kabupaten Simalungun, Propinsi Sumatera Utara, Indonesia. The method of this research is spit-split plot design with 3 replications. Storage period was put on main plot which was consisted of 4 level, PEG concentration was put on sub plot, consisted of 4 level and storage container was put on the sub sub plot consisted of 3 types. The results showed that until 4 days at storage with 45 % PEG concentration at all storage container, percentage of seed germination at storage can be decreased 2.90 %, and can be defensed until 16 days with 45 % PEG concentration at perforated plastic storage container. Percentage of molded seeds and seed moisture content were increased with added period of storage but seed moisture content was increased until 12 days at storage and was decreased at 16 days in storage. **(1843)**

Genetic Variability and Heritability on Kipas Putih Soybean Mutant Lines Using Gamma Rays Irradiation (M3 Generation)

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Abstract. One of the most important component to the success of selection in plant breeding programs is information about genetic variability and heritability. The objective of the research was to determine the selection criteria in Kipas Putih Soybean with gamma rays irradiation in M3 generation. In this study there are four populations namely population 0 Gray (control), 100 Gray, 200 Gray and 300 Gray. The results showed that high genotypic coefficient of variation (GCV) was obtained on the number of pods and seed weight per plant in population 200 Gy, number of branches on 100 Gy and 300 Gy, number of pods and seed weight per plants 100 and 200 Gy, moderate GCV in number of branches on 100 and 300 Gy while other characters such as plant height, numbers of branches on 200 Gy, flowering and harvest age have narrow GCV criteria. High heritability values are found in 300 Gy on plant height, number of branches 300 Gy, number of pods and seed weight per plant 200 Gy, days to flower 200 Gy and 300 Gy and days to harvest of all doses. Based on the genetic variability and heritability, characters that can be used as selection criteria in this study is number of pods and seeds weight per plant, days to flower and days to harvest. **(1648)**

Effect of Long-Term Salinity on the Growth and Biomass of Two Non-Secretors Mangrove Plants *Rhizophora Apiculata* And *Ceriops Tagal*

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Abstract. The present study describes the effect of long-term salinity on morphological character and biomass content of two non-secretors mangrove plants *Rhizophora apiculata* and *Ceriops tagal*. Two mangrove seedlings were grown for six months in 0%, 0.5%, 1.5%, 2.0% and 3.0% salt concentration. The growth of *R. apiculata* was significantly enhanced by salt with maximal stimulus at 1.5% (equal to 50% natural seawater), and this increase appeared to be attenuated by increasing the salinity concentration above 1.5%. By contrast, the growth of *C. tagal* thrived up to 0.5% salt concentration. Our findings, therefore, suggested that within the range of treatments used, 1.5% and 0.5%, respectively were the optimal salinity of *R. apiculata* and *C. tagal* for growth. The highest leaf area of *C. tagal* was obtained at 1.5% salinity concentrations and, on the other hand, *R. apiculata* showed much greater extent. The wet and dry weight of the two seedlings was changed in the same manner as the height of plants upon salt treatment. Our results indicated that *R. apiculata* was more salt tolerant than *C. tagal*, which may provide valuable information for mangrove rehabilitation in North Sumatra, Indonesia. (1677)

Entisol Land Characteristics With and Without Cover Crop (*Mucunabracteata*) on Rubber Plantation

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Abstract. Optimal nutrient delivery is one way to improve the quality and quantity of crop production. This is because the crops needs for nutrient is quite high, while the soil capacity in providing nutrients is limited. In addition to fertilization, nutrients can be given in the form of added organic material or planted as cover crop. The research took place from April to August 2016 in Bandar Pinang, Bandar Sumatera Indonesia Ltd. (SIPEF Group) plantation, with survey method. Soil samples were taken based on: Topography (flat and slope 15-30%), cover crop (with or without *Mucunabracteata*) and plant age (seedling periods 1, 2 and 3). The soil sample is taken composite by zigzag method. The observed parameters were organic matter, N total, soil texture, bulk density and infiltration rate. *Mucunabracteata* planting increased the contain of soil organic matter by 30.43% in flat area and 53.33% in hilly area, amount of N total soil by 27.27% in flat area and 7.69% at hilly area, bulk density 3.73 % In flat area and 0.41% in hilly area, soil infiltration by 48.88% with sandy clay dominant soil texture.(1789)

Morphological Characterization of Several Strains of the Rice-Pathogenic Bacterium *Burkholderia Glumae* in North Sumatra

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Abstract. *Burkholderia glumae* is a quarantine seed-borne bacterial pathogen causing panicle blight disease on rice. This pathogen has been detected in some locations in Java, and recently, farmers in North Sumatra have reported rice yield loss with symptoms similar with those on rice infeced by the rice-pathogenic bacterium *B. glumae*. This research was aimed to isolate several bacterial strains from several rice varieties in various locations in North Sumatra and characterize the morphology of the strains to detect and identify the unknown bacterial strains presumably *B. glumae*. Several rice seed varieties were collected from Medan and Deli Serdang Districts. The seed samples were extracted, isolated and purified, then grown in semi-selective media PPGA. The morphological characteristics of the bacterial strains were determined including Gram staining, bacterial colony's and bacterial cell's morphology. The results showed that of eleven strains isolated, two strains were Gram negative and nine strains were Gram positive. On the basis of colony morphology, all strains had circular form, flat elevation and cream colour while the colony margin varied, i.e.entire and undulate. Most strains had bacillus/rod shape (8 strains) and only 3 strains were coccus. (1798)

Classification of Andisol Soil on Robusta Coffee Plantation in Silima Pungga – Pungga Sub District

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Abstract. The survey study aims to classify the Inceptisol soil on Robusta coffee plantation in Silima Pungga-Pungga Sub district, from Order level to Sub Group level. The study was conducted on location of sample soil profiles which were determined based on Soil Map Unit (SMU) with the main Andisol Order, i.e. SMU 12, SMU 15 and SMU 17 of 18 existing SMU. The soil profiles were described to determine the morphological characteristics of the soil, while the physical and chemical properties were done by laboratory analysis. The soil samples were taken from each horizon in each profile and analyzed in the laboratory in the form of soil texture, bulk density, pH H₂O, pH KCl, pH NaF, C-organic, exchangeable bases (Ca²⁺, Mg²⁺, K⁺, Na⁺), ZPC (*zero point charge*), base saturation, cation exchange capacity (CEC), P-retention, Al-Oxalate (Al-O) and Si-Oxalate (Si-O). The results showed that the classification of Andisol soil based on Soil Taxonomy [8] only has one Sub Group namely *Typic Hapludand*. It is expected that the results of this study can provide information for more appropriate land management in order to increase the production of Robusta coffee plant in Silima Pungga-Pungga Sub district. (1842)

Effect of Rice Husk Biochar Application to Soil Insect Diversity on Potato Cultivation

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Abstract. High intensity of disease infection and the intensive use of fertilizers and pesticides cause saturated fertilizer and pesticide to the land. Remediation using biochar rice husk is one of the technology to decrease fertilizer and pesticide residue. The diversity of soil insects can be used as bioindicators because of their existence depends on soil structure and condition. This study was aimed to study the diversity and structure communities of soil insect in potatoes on difference husk rice biochar application. The sampling of soil insects was done on potato farmer's land with four treatments i.e control (farmers' technique), trichokompos without biochar, trichokompos + biochar with dose 1 ton/ha, and trichokompos + biochar with dose 2 ton / ha. At each point a single pitfall trap was installed for two nights and then it was taken for identification. The results showed that biochar application had significant effect on the number of soil insect species ($P = 0.037$). The soil insect species composition pattern also showed significant differences between the four treatments ($R: 0.2306$, P value = 0.001). This mean that the application of biochar affects the number of insects species and plays a role in the formation of soil insect diversity beta patterns. **(1761)**

Botanical Pesticides Effect From Shells of Bean's Cashew Nut on Biological Agents of *Trichoderma sp.* and *Gliocladium sp.*

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Abstract. A shell of cashew nut (*Anacardium occidentale*) has contained Cashew Nut Shell Liquid that is used as botanical pesticides. CNSL oil consists of active substance such as *anacardium* acid, *cardol* and *cardanol*. Utilization of the pesticides from shells of cashew nut to control pests and diseases of plants would be affected on biological agents. The objective of this research was to investigate pesticides inhibition on the increase of mycelium *Trichoderma sp.* and *Gliocladium sp.* by *in vitro* method. The tested concentration sample consisted of 0% (control), 2.5%, 7.5% and 10% in PDA media. The results of this research showed that 2.5% botanical pesticides concentration could minimize mycelium of *Trichoderma sp.* and *Gliocladium sp.* 22.73% and 21.04% respectively and also the increase shells of cashew extract could be affected the increase of mycelium inhibition. The extract with 2.5% concentration was the recommended concentration to control of fruit rot diseases and if concentration was 10% then its inhibition become 54.98% and 49.35%, respectively. The results proved that uncontrolled utilization of the pesticides could be affected on decrease of *Trichoderma sp.* and *Gliocladium sp.* Growth. **(1847)**

Identification and Phylogenetic Analysis of Local Yellow and Orange Sweet Potatoes Genotype in Sumatera Utara

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Abstract. The objectives of this research was to identify and create database about the diversity of local yellow and orange sweet potatoes accessions in Sumatera Utara, have diversity accession local sweet potatoes genotype in Sumatera Utara selection for classifying populations get high production and good fruit quality. The experiment was conducted in centers sweet potatoes plants with the exploration survey methods in 2 districts in Sumatera Utara, Kabupaten Simalungun and Dairi. The study took place in Juni 2017 until July 2017. The Observations were made based on the identification and characterization Description List of International Board for Plant Genetic Resources standard and purposive random sampling technique. The result of this research indicated there were 15 genotype of sweet potato yellow and orange in Kabupaten Simalungun consists of Kecamatan Purba (G3, G4 and G7), Silimakuta (G5, G6 and G14), and Pamatang Silimahuta (G15) in Kabupaten Dairi consists of Kecamatan Parbuluan (G1, G2, G8 and G9), Sidikalang (G10 and G13), Sumbul (G11), and Sitinjo (G12) with closest relationship is G13 and G15 with a coefficient similarity 23,908 and farthest relationship is G2 and G7 with a coefficient similarity 140,029.(1838)

Effect of Foliar Application of α -Tocopherol on Vegetative Growth and Some Biochemical Constituents of Two Soybean Genotypes Under Salt Stress

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Abstract. Foliar spray of plant growth regulating compounds including antioxidants is an effective strategy to overcome the adverse effects of environmental constraints on different plants. A field experiment was conducted on May – July 2017 at the experimental farm in Paluh Merbau Village Deli Serdang (EC 6 – 7 dS/m). The aim was to study the effects of foliar spray of α -tocopherol (0, 250, 500, 500 ppm) on vegetative growth and some chemical constituents of 2 soybean genotypes (Grobogan x Grobogan and Grobogan x Anjasmoro) under salt stress (EC 6 – 7 dS/m). Most of morphological and biochemical parameters were significantly affected by application of α -tocopherol. The α -tocopherol at 500 ppm recorded the best value of root fresh weight, shoot and root dry weight, number of leaves, chlorophyll b, and soluble protein content. There was significant difference found between plants treated with α -tocopherol in terms of number of branch, shoot fresh weight, and chlorophyll a. Soybean genotypes showed diverse morphology and physiological responses to salt stress. Grobogan x Anjasmoro genotype was salt-sensitive based on all variable, while Grobogan x Grobogan genotype was more tolerant based on morphological and biochemical characters.(1858)

Differences in Morphology and Sugar Content of Purple Sweetpotato (*Ipomoea batatas* L.) with Potassium Treatment at Several Altitude

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Abstract. Research on the difference of morphology of local sweetpotato crops has done at three locations in low, medium and high plains. This study aims to determine the morphological changes and sugar content of sweetpotato caused by potassium dose treatment and climate change. Data analyzed by factorial randomized block design in time series with two factors. First factor Altitude: A₁(50 meter above sea level (MASL)), A₂ (750 MASL) and A₃ (1450 MASL). Second factor Potassium: K₀ (0 kg/ha), K₁ (50 kg/ha), K₂ (100 kg/ha) and K₃ (150 kg/ha). The data of plant morphology change and sugar content were descriptively, while agronomy and harvest component data analysis by F test and continued with Duncan Multiple Range Test. The results of morphological observations showed different types of plant growth, where in the lowlands and medium plant growth types spread, twisted, more branches, wider leaf area. However, the plateau of plant growth was relatively dwarf, erect, no twist, huddled and short rods and small leaf area. The tuber weight per plant, number of tuber yield and tuber weight per plot in high altitude significantly higher than lowland and medium. Similarly for sugar content, increased altitude will be increased the sugar content significantly. (1605)

Growth, Yield and Movement of Phosphate Nutrients in Soybean on P Fertilizer, Straw Mulch and Difference of Plant Spacing

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Abstract. Soybean is one of the plants that require much amounts of phosphate. P nutrient, microclimate modification and plant spacing arrangement is the efforts to improve grain yield. The objective of the research was to study the effect of P fertilization, mulching straw and plant spacing on growth, yield and movement of P nutrient on soybean. The study was conducted at CengkehTuriBinjai using factorial randomized block design with 3 factors. The first factors was P fertilizer 0, 100, and 200kg/ha, the second factor was thickness of rice straw mulch 0 and 5 cm, and third factors was plant spacing 30 cm x 15 cm, 40 cm x 20 cm, and 50 cm x 25 cm. The results of the research showed that phosphate fertilizer (200kg/ha) significantly increased levels of phosphate in the shoot. Plant spacing (50 cm x 25 cm) increased root volume. The interaction of phosphate fertilizer (200kg/ha) and spacing (50 cm x 25 cm) increased the phosphate level by 93.33% in shoot. Plant spacing (50 cm x 25 cm) produced the largest of 100 grains weight as compared to other plant spacing. **(1853)**

Induction of Soybean Resistance to Bacterial Pustule Disease (*Xanthomonas axonopodis* pv *glycines*) by Rhizobacteria and Organic Material Treatment

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Abstract. The use of rhizobacteria as a biological control agent has been reported to be effective in controlling bacterial diseases in food crops. This study aimed to evaluate the role of different formulations and types of organic matter in improving yield and resistance of soybean plants to bacterial pustule disease. The study was prepared based on a randomized block design with a factorial pattern. The first factor was the application of rhizobacterial formulation (biofresh), ie F0 = without the application of rhizobacteria, F1 = application of biofresh in solid formulation, and F2 = application of biofresh in liquid formulation. The second factor was the application of organic materials, namely B1 = compost of soybean litter + cow dung, B2 = compost of rice straw + cow dung, B3 = compost of soybean litter + rice straw + cow dung. Observation of disease severity and soybean yield was conducted on five sample plants in each treatment. The results showed that the treatment of biological agent biofresh in solid formulation combined with compost of soybean litter, was the best treatment in increasing plant resistance to bacterial pustule disease and seed weight. Plant resistance induction occurred systemically characterized by salicylic acid increase of 0.3 mg and peroxidase increase of 0.07 unit / mL in the sample plants.(3012)

Response to Growth and Production of Green Beans (*Vigna Radiata* L.) In Various Cropping Spots and Fertilizer Provision of Layer Chickens.

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Abstract. Agroecology affecting plant growth can be influenced by factors such as plant spacing and growing media. This study aims to determine the effect of plant spacing and chicken manure on the growth and production of green beans. Plants were planted at three spacing plants (20cm x 20cm, 20cm x 30cm, and 20cm x 40cm) while manure was applied at 3.75, 7.50 and 11.25 ton/ha and without manure as a comparison. The treatments were arranged in a randomized complete block design with three replicates. The result showed that the highest diameter of stem was resulted from the application of 11.25 ton/ha of manure combined with the planting space of 20cm x 40 cm. Similarly, the highest number of branch of stem we found at the plot where chicken manure of 11.25 ton/ha with planting space of 20cm x 30cm. The highest production (4,944.4 kg/ha) was resulted from 7.50 ton/ha manure with combined with planting space of 20cm x 40cm. There was an interaction between the treatment of manure and the planting space of soybean. The production of green bean was 24% higher in 7.50 ton/ha manure combined with 20cm x 40cm planting space compared to no manure (control).**(1855)**

Germinaton Performance of Selected Local Soybean (*Glycine max* (L.) Merrills) Cultivars during Drought Stress Induced by Polyethylene Glycol (PEG)

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Abstract. Drought stress is one of the factors that can decreased growth and production, so that required a variety that has the ability to sustain cellular metabolism, and growth during the stress. This research was aimed to investigated the involvement of germination performance *in vitro* of five local soybean cultivars, Grobogan, Kaba, Anjasmoro, Argomulyo, and Dering to drought stress induced by polyethylene glycol (PEG) 6000 (0%, 2%, 4%, and 6%). The measurable seedling traits as the day appearance of shoots and roots, total of leaves, shoot length, root length, fresh plant weight, dry plant weight, fresh root weight, and dry root weight under control as well as water stress condition were recorded. The experiment units were arranged in factorial completely randomized design with four replications. The result showed that the value for most parameters was recorded highest for Argomulyo cultivar compared with Dering cultivar which is known to be tolerant to drought. In terms of roots performance, Grobogan and Argomulyo cultivars produced the longest and heaviest of roots, while Grobogan cultivar had no significant different for root length compared with control. In conclusion, the root length and fresh weight root parameters can be used as quick criteria for drought tolerance. **(1811)**

Physiological Characters of Soybean Cultivars with Application of Nitrogen Sources Under Dry Land Conditions

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Abstract. The objective of this study was to evaluate the influence of nutrient N management on physiological characteristics of three different soybean cultivars under dryland conditions. The research was conducted at dryland Sambirejo Village, Sumatera Utara and used a randomized block design with 2 factors and 3 replications. The first factor was soybean cultivars (Anjasmoro, Wilis, Sinabung). The second factor was N source, with Urea (50 kg/ha), *Bradyrhizobium* sp., farmyard manure (10 tons/ha), a combination of *Bradyrhizobium* sp. + farmyard manure (5 tons/ha) and a control with no N. The variable observed was the content of root N, shoot Nitrogen, shoot Phosphor, shoot Potassium and total of chlorophyll content. The results suggested that Anjasmoro and Sinabung cultivars had higher root N, shoot P and shoot K compared to Wilis. Nitrogen source of Urea gave a higher physiological characteristics (content of root N, shoot Phosphor and shoot Potassium) compared to different treatment of N source. The interaction between Anjasmoro cultivar and Urea gave the highest of content of shoot Phosphor and shoot Potassium, otherwise the interaction between Sinabung cultivar and *Bradyrhizobium* sp. gave the highest of content of shoot Nitrogen. (1861)

Effect of Hypoxia Condition in Embryogenic Callus Growth of Soybean Cell Culture

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Abstract. The study was performed at Tissue Culture Laboratory, Agrotechnology Department, Universitas Sumatera Utara, to investigate the effect of plant growth regulator (PGR) and embryogenic callus performance soybean cultivars on hypoxia condition. This research had two stages, induction of embryogenic callus and analysis metabolism of callus after hypoxic condition with T-test. The analysis was used factorial Completely Randomized Design with two factors. The first factors were cultivars of soybean (Baluran, Gepak Kuning, and Grobogan) and the second factors were combinations of PGR (5 mg/l 2,4-D + 1 mg/l BAP, 10 mg/l 2,4-D + 1,5 mg/l BAP, and 15 mg/l 2,4-D + 2 mg/l BAP). The result showed the cultivars, combination of PGR, and interaction between cultivars and PGR gave significant effect to weight callus. The result of T-test showed that in hypoxic condition, POD enzyme exercise on Gepak Kuning's callus in 5 mg/l 2,4-D + 1 mg/l BAP was different before and after hypoxic condition. **(1810)**

Growth and Yield of Patchouli (*Pogostemon Cablin*, Benth) Due to Mulching and Method of Fertilizer on Rain-Fed Land

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Abstract. The drought stress that occurs during growth results in a drastic reduction in growth and yield. This study was aimed to study the effect of mulching and method of fertilizer application in reducing the impact of drought stress on patchouli plants. The experiment was conducted from July to December 2016 using a split plot design into three replications with two treatment factors. The first factor was mulch factor with three levels, i.e. M₀ (without mulch), M₁ (rice straw mulch) and M₂ (silver black plastic mulch). The second factor was the method of fertilizer application consisting of three stages: C₁ (once), C₂ (twice), C₃ (three times). The parameters included plant height, number of branches, number of leaves, root length, wet weight of plant, root canopy ratio, total of chlorophyll, soil temperature and soil moisture content. The results showed the use of straw mulch reduce the impact of drought stress on patchouli plants. Two times fertilizer application gave better growth and yield. The use of straw mulch produced lower temperature degrees and maintained soil moisture content. **(1647)**

Decomposition Rate of *Rhizopora Stylosa* Litter in Tanjung Rejo Village, Deli Serdang Regency, North Sumatera Province

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Abstract. Research on the Decomposition Rate of *Rhizopora Stylosa* Litter in Tanjung Rejo Village, Deli Serdang Regency, North Sumatera Province was conducted from September 2016 until May 2017. The objectives of this research were (1) to measure the decomposition rate of *stylosa* litter and (2) to determine the type of functional fungi In decomposition of litter. *Rhizophora stylosa* litter decomposition is characterized by a reduction in litter weight per observation period. Decomposition rate tended to increase every week, which was from 0.238 in the 7th day and reached 0.302 on the 56th day. The decomposition rate of *R. stylosa* litter of leaf was high with the value of k per day > 0.01 caused by macrobentos and fungi, and also the decomposition of *R. stylosa* litter was conducted in the pond area which is classified far from the coast. The types of fungi decomposers were: *Aspergillus* sp 1, *Aspergillus* sp 2, *Aspergillus* sp 3, *Rhizophus* sp 1., *Rhizophus* sp 2, *Penicillium* sp, *Syncephalastrum* sp and *Fusarium* sp. **(1576)**

Deforestation Trend in North Sumatra Over 1990 - 2015

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Abstract. Deforestation and forest degradation have been previously reported to contributing greenhouse gas emission, the primary driver of global warming. The present paper studies deforestation and reforestation trend in North Sumatra, Indonesia using land-use/land-cover change from 1990-2015. The land-use consists of three classes derived from forest land (primary and secondary dry land forest, primary and secondary swamp forest, primary and secondary mangrove forest). Non-Forest (shrub, oil palm plantation, forest plantation, settlement, barren land, swamp shrub, dry land farming, mixed dry land farming, paddy field, aquaculture, airport, transmigration, and mining), and water body (water and swamp). Results showed that from 33 regencies/city in North Sumatra, among them, 25 districts deforested, which was the highest deforestation rate in Labuhanbatu and South Labuhanbatu (2,238.08 and 1,652.55 ha/year, respectively), only one area reforested, and seven districts showed no deforestation or reforestation. During 25 years observed, the forest has been deforested 22.92%, while nonforest has been increased 11.33% of land-use. The significant increasing loss of North Sumatran forest implies conservation efforts and developing sustainable forest management. **(1689)**

Genetic Diversity of Resin Yielder *Pinus merkusii* from West Java - Indonesia Revealed by Microsatellites Marker

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Abstract. Phenotypic observation of resin yielder *Pinus merkusii* showed higher value of genetic variation and narrow sense heritability values for resin production trait. This result indicated that genetic factor played as dominant aspect. However, further observation using molecular marker would still be needed to overcome the weakness of phenotypic observation. This study was carried out in order to characterize the genetic diversity and genetic differentiation of resin yielder genotype candidate *P. merkusii* using microsatellite markers and to characterize the genetic structure in the resin yielder populations. Seventy needle and inner bark samples were collected from resin yielder in Cijambu Seedling Seed Orchard (SSO) Sumedang, West Java and further divided into two genotype candidates (lower and high resin yielder). Seven microsatellites loci (pm01, pm04, pm05, pm07, pm08, pm09a, pm12, pde5 and SPAC 11.6) were used for detection of genetic diversity. Results showed that genetic diversity in higher resin candidates was (0.551), slightly different compared lower candidates (0.545). However, cluster analysis determined that higher resin yielder grouped with lower one. Molecular variation was found to be low among populations (21%) and high among individuals within the populations (79%). Private alleles were detected both in higher yielder and also normal population. (1606)

Flowering and Fruiting Phenology of Kemenyan Toba (*Styrax sumatrana* J.J.Sm.) in Aek Nauli Forest, North Sumatera

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Abstract. The observation on flowering, fruiting phenology and germination of Kemenyan toba (*Styrax sumatrana*) have not been widely reported. It is required to support the breeding activities for this tree improvement, the most Non-Timber Forest Product commodity in Lake Toba Catchment Area, North Sumatra. The objectives of the research are to identify the development of flowering, fruiting and to calculate the number of fruits that germinate for *S. sumatrana* in certain cycle periode. The flowering and fruiting observation were conducted on ten sample trees in Aek Nauli forest from July 2012 to February 2013. The seeds viability were observed during January until November 2014 in the greenhouse. The study showed that the flowering development occurred for 30 to 152 days, began from the growing of generative buds, the flower's shoots and bursts were developed, and young fruits were matured. All of processes proceeded for 30 to 152 days. The average percentage of flowering is 53.5%, and 72.8% for flowering to fruiting, and 47.3% for young to mature fruit. The percentage of mature fruit to germinate was 89.3%. **(1621)**

Phylogeny of Kemenyan (*Styrax* Sp) From North Sumatera Based on Morphological Characters

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Abstract. Kemenyan was the most famous local tree species from North Sumatera. Kemenyan is known as rosin producer that very valuable for pharmaceutical, cosmetic, food preservatives and vernis. Based on its history, there were only two species of kemenyan those were kemenyandurame and toba, but in its the natural distribution we also found others species showing different characteristics with previously known ones. The objectives of this research were: The objectives of this research were: (1). To determine the morphological diversity of kemenyan in North Sumatera and (2). To determine phylogeny clustering based on the morphological characters. Data was collected from direct observation and morphological characterization, based on purposive sampling technique to those samples trees at Pakpak Bharat, North Sumatera. Morphological characters were examined using descriptive analysis, phenotypic variability using standard deviation, and cluster analysis. The result showed that there was a difference between 4 species kemenyan (batak, minyak, durame and toba) according to 75 observed characters including flower, fruits, leaf, stem, bark, crown type, wood and the resin. Analysis and both quantitative and qualitative characters kemenyan clustered into two groups. In which, Kemenyan Toba separated with other clusters. **(1598)**

Agronomic Effect of Empty Fruit Bunches Compost, Anorganic Fertilizer and Endophytic Microbes in Oil Palm Main Nursery Used Ganoderma Endemic Soil

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Abstract. Using of ganoderma endemic soil in oil palm main nursery is not recommended because produce bad quality seedling. The application of organic and anorganic fertilizer and endophytic microbes are the alternative for solving the problem. The objective of this research is to evaluate the effect of empty fruit bunches compost, anorganic fertilizer and endophytic microbes on growth of oil palm seedling in main nursery. This research used factorial randomized block design. The first factor is combine of empty fruit bunches compost and anorganic fertilizer, The second factor is endophytic microbes consist of *Trichoderma* and *Aspergillus*. The result showed that interaction effect of the both treatment factor used increased growth of seedling in third and fourth month after application. The best growth of seedling is on the treatment of empty fruit bunches compost combined anorganic fertilizer 150% recommended dosage and *Trichoderma viride*. **(1809)**

The Potential of Soil Fungi Associated with Potato Rhizosphere to Control Root Knot Nematode (*Meloidogyne* spp.) on Potato

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Abstract. The root knot nematode (*Meloidogyne* spp.) is one of important pathogens on potato crops in North Sumatra, Indonesia. This nematode causes significant crop losses on potatoes directly and indirectly. Effect of fungal isolates (*Trichoderma* sp. 1, *Mucor* sp.1, *Aspergillus* sp. 2, *Mucor* sp. 2) were isolated from rhizosphere of potato in North Sumatra were studied in glasshouse experiments on the growth of potato and on the reproduction of the nematode *Meloidogyne* spp. The results showed that *Trichoderma* sp. 1 caused a significant reduced galling, while *Mucor* sp.1 and *Mucor* sp.2 can improved the growth of potato. **(1805)**

Use of Organic Waste as Biofumigant For Controlling Root Knot Nematodes (*Meloidogyne Spp.*) on Potato

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Abstract. Root knot nematode (*Meloidogyne spp.*) is one of the important pathogens that causes big impact on potato crop yields. One of the control strategies for controlling this nematode is the use of biofumigants. Biofumigants are *volatile toxic compound* derived from plants, and have biocide properties against insects and plant pathogens. Organic waste such as *Brassicaceae*, *Leguminoceae*, and *Solanaceae* can be used as biofumigant sources. This research was conducted to determine the effectiveness of *Brassicaceae*, *Leguminoceae*, and *Solanaceae* as biofumigants against *Meloidogyne spp.* The experiment was set in a *completely randomized design* (CRD) with the treatments were organic wastes including *Brassicaceae*, *Leguminoceae*, and *Solanaceae*, both single and combinations, and 2 controls (positive and negative controls) with 3 replications. Each of the biofumigant treatments was prepared and stored for 2 weeks. Potato tubers were transplanted 15 days after germination into polybag inoculated with 1,000 *Meloidogyne spp.*J2s. The results showed that *Brassicaceae* + *Solanaceae* were effective in decreasing the number of galls in potato plants, however only *Solanaceae* improved plant growth.(1804)

Understanding the Social and Economic Aspects of Upland Rice Farming

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Abstract. The objective of this study is to analyze (1) the social characteristics of upland rice farmers, (2) the characteristics of farming, and (3) the feasibility of dry land rice farming in South Konawe Regency of Southeast Sulawesi Province, Indonesia. The sample selected for this study consists of 81 farmers. The data collected from survey is analyzed using combined economic research through the use of qualitative and quantitative methods. The results show that (1) farmers are generally in productive age and are dominated by men with low formal education level and moderate family members, (2) upland rice farming is cultivated in medium land area with fixed costs higher than variable cost, of which the productivity had been increased but still lower than rice paddy; and that the price of rice production is relatively higher than rice paddy production price, and (3) cultivation of dryland rice is feasible and has a high efficiency value. **(3035)**

Planting Pattern and Weed Control Method Influence on Yield Production of Corn (*Zea mays* L.)

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Abstract. Field experiment was carried out to evaluate the influence of planting patterns and weed control methods on the growth and yield of corn. The effect of the planting pattern and weed control method was studied in a split plot design. The main plots were that of planting pattern single row (25cm x 60cm), double row (25cm x 25cm x 60cm) and triangle row (25cm x 25cm x 25cm). Subplot was that of weed control method consisted five methods namely weed free throughout the growing season, hand weeding, sprayed with glyphosate, sprayed with paraquat, and no weeding.. Result showed that both planting pattern and weed control method did not affect the growth of corn. However, planting pattern and weed control method significantly affected yield production. Yield resulted from double row and triangle planting pattern was 14% and 41% higher, consecutively, than that of single row pattern. The triangle planting pattern combined with any weed control method produced the highest yield production of corn. **(1814)**

Physiology Response of Fourth Generation Saline Resistant Soybean (*Glycine max* (L.) Merrill) with Application of Several Types of Antioxidants

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Abstract. Antioxidant applications are expected to reduce the adverse effects of soil saline. This research was conducted in plastic house, Plant Tissue Laboratory Faculty of Agriculture, Universitas Sumatera Utara and Plant Physiology Laboratory Faculty of Mathematic and Natural Science, Universitas Sumatera Utara, Medan also in Research Centers and Industry Standardization, Medan from July-December 2016. The objective of the research was to know the effect of various antioxidant treatments with different concentrations (control, ascorbic acid 250, 500 and 750 ppm; salicylic acid 250, 500 and 750 ppm; α -tocopherol 250, 500 and 750 ppm) on fourth generation soybean physiology in saline condition (EC 5-6 dS/m). The results of this research showed that the treatment of antioxidant type and concentration affected not significantly to physiology of fourth generation soybean. Descriptively the highest average of superoxide dismutase and peroxide dismutase was showed on ascorbic acid 250 ppm (A₁). The highest average of ascorbate peroxidase was showed on α -tocopherol 750 ppm (A₉). The highest average of carotenoid content was showed on ascorbic acid 500 ppm (A₂). The highest average of chlorophyll content was showed on α -tocopherol 250 ppm (A₇). The highest average of ratio of K/Na was showed on salicylic acid 250 ppm (A₄). **(3034)**

Population Dynamics of Weeds in Oil Palm (*Elaeis guineensis* Jacq.) Circle Weeding Area Affected by Herbicide Application

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Abstract. Weed problems in oil palm field were mainly overcome by herbicide application. The application certain herbicides may lead to rapid population dynamic of certain species due to their different response to herbicides. Some species may less susceptible to certain herbicide whereas other species more susceptible. The objective of this study was to determine the population dynamic of weed species in circle weeding of oil palm in Serdang Bedagai, North Sumatra. Six treatments using glyphosate singly and mixture compared with manual weeding were evaluated for weed control. The treatments were arranged in a randomized block design with four replicates. Each treatment consisted of four circle weeding of oil palm. The results showed that glyphosate 720 g a.i/ha + indaziflam 50 g a.i/ha affected seed bank suppression and regrowth of weeds. Up to 12 WAA (weeks after application) glyphosate 720 g a.i/ha + Indaziflam 50 g a.i/ha (H4) is 29.46 % total weeds dry weight compared manual weeding (H0) is 100.45 % total weeds dry weight. The effect of herbicide application on changes in the composition of weeds and weed seed bank are affected by the characteristic of herbicides and weed resistance to herbicide application. **(1813)**

Determination Quercetin Content, Antioxidant and Antimicrobial Activity of Genotip Mutant Samosir Shallots Irradiated by Gamma Rays

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Abstract. The aim of the research was to study the variation in antioxidant and antimicrobial activity as well as the total quercetin content of the fifth generation genotip mutant Samosir shallot irradiated by gamma rays. The studies conducted included the assessment of quercetin content, antioxidant and antimicrobial activity in shallot bulbs after long-term storage (6 months in the room temperature). Quercetin content of 20 selected genotip mutants of irradiated shallot bulbs along with untreated populations were calculated using quercetin (QU) as a standard. Antioxidant activities of 8 genotip mutant were determined using DPPH. Antimicrobial activity of bulb extracts were tested against six bacteria including *Staphylococcus aureus*, *Enterococcus faecalis*, *Bacillus subtilis*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae* and one yeast *Candida albicans*. The results showed that population of genotype mutants irradiated with dosage 2 Gy, 4 Gy, 5 Gy and 6 Gy have higher quercetin content than control samples. None of the genotype mutants exhibited anti bacterial inhibitory against all microorganism tested except for the sample number 2 and 6 bulb generated from the plants irradiated by gamma rays with dosage at 2 and 6 Gy. There was also none of the genotips observed exhibited significant antioxidant efficacy.(3029)

Flower Morphology Diversity of Asam Gelugur (*Garcinia atroviridis* Griff, Ex T. Anders) Accessions in Several Districts Of Sumatera Utara

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Abstract. The research aims to study of flower morphology of Asam Gelugur plants in several Districts of Sumatera Utara. This study was conducted in Asahan, Batubara and Serdang Berdagai districts in February to April 2017, exploration using survey method with IPGRI descriptors guide, and accidental sampling. The research results showed that in three Districts of Sumatera Utara, there are 26 accessions of Asam Gelugur characterized based on morphology of flowers. Based on clustering analysis using the NTSYS-pc Program, all flower morphology data resulted in dendrogram with similar coefficient range from 0.34 to 0.75 into four groups. The first group (I) consists of 16 accessions i.e Asahan, Batubara and Serdang Bedagai districts. The second group (II) in Asahan, Batubara and Serdang Bedagai districts there are 7 accessions. The third group (III) consists of two accessions, i.e. Asahan and Batubara Districts. The fourth group (IV) consists of one accession in Serdang Bedagai District is the only outgroup access. **(3030)**

Swamp Land Optimization in Supporting Food Security and Enhancing Farmers Welfare in South Sumatra Indonesia

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Abstract. Swamp land in Indonesia spread in Sumatra, Kalimantan and West Papua. In Sumatra the largest swamp land area is located in South Sumatera Province. Unfortunately only few of the areas have been utilized due to its fragility, in which farmers could only cultivate rice on it once a year. The purpose of this paper is to develop a feasible farming pattern in swamp land to help farmers and practitioners in optimizing it by managing its water level. Shallow and mid swamp land can be cultivated using rotation model of crops (rice, corn, cassava), horticulture (cucumber, long beans, watermelon etc), fish farming (catfish, snake head fish, tilapia), and duck farming, whereas submergence tolerant rice varieties can be cultivated alternating with fish farming in deep swamp land. This study shows that such swamp land management is financially feasible showing by its positive NPV value, BCR value is above 1.00, and IRR value is greater than the interest rate. Therefore, implementation of this farming pattern is expected to increase farmers' income and household food supply as well as village food supply. **(1584)**

Changing of Sumatra Backswamp Peat Properties by Seawate and Zeolite Application

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Abstract. This research attempts to improve the properties of backswamp peat soil originated from Asahan District, North Sumatra Indonesia by adding sea water and zeolite using factorial randomized block design with volume of sea water as first factor, consisting of A0 = without seawater, A1 = 500 ml, A2 = 1000 ml and A3 = 1500 ml and second factor are dosages of zeolite consisting of Z0 = without zeolite, Z1 = 100 g, Z2 = 200 g each 10 kgs of wet peat soil at glass house in faculty of Agriculture University of Sumatra Utara (USU) Medan, Indonesia. The result showed that the application of sea water decreased pH, C/N and CEC and increased of base saturation of peat soil. Adding of zeolite minerals can buffer the increasing of acidity and EC caused by sea water application. Interaction seawater + zeolite decreased of C/N and increased of percent of base saturation. (1826)

Quality Evaluation of Probiotic Capsule Prepared From Alginate, Carrageenan and Tofu Waste Flour Based on Bacterial Activity and Organoleptic Test

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Abstract. Probiotic capsule is an innovation in functional food sector. It is used to preserve the living cells of probiotic bacteria during processing and storage. In this research, the improvement of probiotic viability is studied by using two kinds of encapsulating biomaterials and different concentration of tofu waste flour. Extrusion is selected method for encapsulation process. The purpose of this study is to examine the quality of probiotic capsule by evaluating the lactic acid bacteria performance and its physical characteristic. The article provides the data of probiotic bacteria activity related to their living cells present in capsule, activity in fermentation media compare to unencapsulated bacteria, and panelists' preferences of capsule's physical properties. The data is analyzed statistically by using ANOVA. The result shows that variables in this study affect the number of bacteria, their metabolic activity in producing acid during fermentation, and physical appearance of the capsule. Combination of alginate and tofu waste flour allows the multiplication of bacteria to a high number, and forms elastic, yellow and cloudy capsule, while with carrageenan, it causes the growth of a few numbers of bacteria which affects to a moderate pH and produces elastic, creamy and transparent capsule.(3036)

Some Ecological Factors Of Pine At Lake Toba Catchment Area

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Abstract. The article deals with ecology of Pine in the Lake Toba Catchment Area, *Pinu merkusii* is a plant endemic in Sumatra. A central population of Pine in North Sumatra is located in the Tapanuli region to south of Lake Toba. Junghuhn discovered the species in the mountains range of Sipirok. It provisionally named the species as *Pinus sumatrana*. The variability of rainfall in Lake Toba Catchment area is almost the same through out the year. Temperature and relative humidity are the important components in the climate. These components influence the evaporation process and rainfall in the catchment. The relationship between interception and stem flow to precipitation is varied; even with the same species of plant in the same location the value may be different, due to a lot of influencing factors like rainfall characteristic, variety, age and density of plant, also growth period. *Pinus merkusii* has the big crown interception. Interception and stem flow have an opposite relation. Increasing of interception capacity will decrease stemflow. *Pinus merkusii* has rough bark however significant channels so that, it flows water even during the wet season and caused the stem flow in *Pinus merkusii* relatively bigger. (3028)

Strengthening Community Participation in Reducing GHG Emission from Forest and Peatland Fire

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Abstract. Strengthening community participation is needed to find solutions to encourage community more participate in reducing Green House Gas (GHG) from forest and peatland fire. This research aimed to identify stakeholders that have the role in forest and peatland fire control and to formulate strengthening model of community participation through community-based early warning fire. Stakeholder mapping and action research were used to determine stakeholders that had potential influence and interest and to formulate strengthening model of community participation in reducing GHG from forest and peatland fire. There was found that position of key players in the mapping of stakeholders came from the government institution. The existence of community-based fire control group can strengthen government institution through collaborating with stakeholders having strong interest and influence. Moreover, it was found several local knowledge in Kapuas District about how communities predict drought that have potential value for developing the community-based early warning fire system. Formulated institutional model in this research also can be further developed as a model institution in the preservation of natural resources based on local knowledge. In conclusion, local knowledge and community-based fire groups can be integrated within strengthening model of community participation in reducing GHG from forest and peatland fire.(989)

Phylogenetic Relationship of Asam Gelugur (*Garcinia atroviridis* Griff. ex T. Anders) Based on Morphological Characters in Langkat and Serdang Berdagai, Sumatera Utara

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Abstract. *Garcinia atroviridis* plant is a commodity that has the potential to become an export commodity in Sumatera Utara. Characterization is an activity in germplasm to determine the morphological properties that can be utilized in differentiating between accessions and assessing the magnitude of genetic diversity. The magnitude of genetic diversity based on morphological properties can support breeding programs. The research was conducted in several areas of *G. atroviridis* plant, i.e. Gebang, Bahorok, Padang Tualang, Pegajahan, Sei Rampah, Pantai Cermin, and Perbaungan sub-districts in September 2016 with direct observation method. The aim of this research is to explore and characterization between *G. atroviridis* plant in Langkat and Serdang Berdagai. Parameters morphology characters were observed based on IPGRI, and observation data were analyzed by using SPSS version 21 to obtain the dendrogram. The dendrogram results showed that there are four groups of kinship relationships on the scale of the spacing (euclidean distance scale) 17. The lowest unequal value (closest kinship) in accessions G3(Bahorok) and G7(Sei Rampah) is 16.328 while the highest value of inequality (farthest kinship) in G5(Padang Tualang) and G6 (Pegajahan) is equal to 54.187. It needs the conservation of *G. atroviridis* although must be done next observation. **(3021)**

Microwave-Assisted Extraction of Pectin From Cocoa Peel

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Abstract. Pectin is a polymer of d-galacturonate acids that be linked by β -1,4 glycosidic bond. This study isolates pectin from cocoa peel (*Theobroma cacao*) using citric acid as solvent by microwave-assisted extraction method. Cocoa peels (moisture content of 10%) with citric acid solution (pH of 1.5) irradiated by microwave energy at various microwave power (180, 300, 450 and 600 W) for 10, 15, 20, 25 and 30 minutes respectively. Pectin who have been obtained from this study was collected and filtrated by adding 96% ethanol to precipitate the pectin. The best results obtained from extraction process using microwave power of 180 Watt for 30 minutes. This combination of power and time yielded 42.3% pectin with specifications of moisture content, ash content, weight equivalent, methoxyl content and galacturonate level were 8.08%, 5%, 833.33 mg, 6.51%, and 58,08% respectively. Overall, microwave-assisted extraction method shows the potency on the commercial pectin production.(1522)

The Combination of Activated Natural Zeolite-Bentonite to Reduce Fe And Cu in Refined Bleached Palm Oil (Rbpo) by Using Atomic Absorption Spectrophotometer Method

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Abstract. Indonesia is one of the crude palm oil (CPO) production country in the world. As many products are derivated from the CPO, the quality must be increased continuously. One of the things that influence the quality of palm oil is the Fe and Cu content. The objective of this research was to reduce Fe and Cu content in Refined Bleached Palm Oil (RBPO). In processing CPO or Refined Bleached Palm Oil (RBPO) may be contaminated by Fe and Cu from metal tank and pipe in the factory. The zeolite and bentonite was activated by maceration method using hydrochloric acid (0,1 N). Four batch reactions consisting of refined palm oil (RPO), activated natural zeolite-bentonite (ANZB) was bleached by heating and stirring them at about 105°C and 1200 rpm for 30 minutes. The results showed that all combinations of ANZB can reduce the Fe content. Thereafter, the optimal combination of ANZB was obtained in K1, K2 and K4 with Cu content 0.02 ppm. In the future, it is needed to study on the reduction of the Fe and Cu content in palm oil with the other adsorbent.(1774)

The Tocol Content of Crude Palm Oil Based on The Level Ripeness and Their Relationship to the Quality and Their Stability

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Abstract. Palm oil contain tocol and betacarotene which has an antioxidant function to protect the oil from oxidation process Palm oil comes from different maturity have not been specifically determined their tocol and betacarotene content, and their relation to quality and stability. The purpose of this research was to find the content of tokol and betacarotene in palm oil which comes from different maturity and to determine its stability of quality. The level of maturity was fraction 1 (unripe), fraction 2 and fraction 3 (ripe), fraction 4 (over-ripe).The result showed that palm oil which comes from different level of maturity from fraction 1, 2, 3 and 4 contained different amount of tocol and betacarotene. The quality of crude palm oil which were analysed by the value deteoriation of bleachability index (DOBI) had closed relationship to the number of beta-carotene in the palm oil. The color stability and oxidation were different in every level of maturity. The level of maturity which had the best quality and its stability was fraction 3. The tokol and betacarotene compound were 346 ppm and 727 ppm respectively, while the DOBI value was 2.75.(1699)

Shelf Life Estimation of Wikau Maombo Brownies Cake by Using Accelerated Shelf Life Testing (ASLT) Method with Arrhenius Model

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Abstract. The shelf life of brownies cake made from wikau mambo flour was predicted by ASLT method through the Arrhenius model. The aim of this study was to estimate the shelf life of brownies cake made from wikau maombo flour. The storage temperature of brownies cake was carried out at 20°C, 30°C and 40°C. The results showed that TBA (*Thio Barbuturic Acid*) number of brownies cake decreased as the storage temperature increase. Brownies stored at 20°C and 30°C were overgrown with mold on the storage time of six days. Brownies product made from wikau maombo flour of 100% and 75% had shelf life at 40°C approximately six and fourteen days, respectively. Brownies made from wikau maombo and wheat flour (75%:25%) was the best product with had the longest of shelf life about fourteen days. **(3024)**

Effect of Sodium Azide Addition and Aging Storage on Casein Micelle Size

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Abstract. Casein micelles (CMs) affected most of milk properties, therefore the use sodium azide as milk preservation is not expected to alter milk properties during storage, including the casein micelle size. The aim of this study was to analyse casein micelle size after the addition of sodium azide during storage. The experiment was performed as a complete block randomised design with three replications. The addition of 0.02-0.10% Na-azide do not lead to any noticeable differences in average casein size at the same day and show similar trend after 14 day-storage. At concentration of 0.02% sodium azide (Na-azide), the size of pasteurised milk did not change up to 12 days, while the size of raw skim milk slightly increased by ageing time at day 5. The treated concentration did not affect the size distribution, except for milk with 0.02% Na-azide which had narrower distribution compared to other treated and control milk. The finding from this study suggests that the role of Na-azide in this experiments during storage at 4°C is only for preventing the microbial growth.(1727)

Effect of Microfluidization on Casein Micelle Size of Bovine Milk

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Abstract. The properties of milk are likely to be dependent on the casein micelle size, and various processing technologies produce particular change in the average size of casein micelles. The main objective of this study was to manipulate casein micelle size by subjecting milk to microfluidizer. The experiment was performed as a complete block randomised design with three replications. The sample was passed through the microfluidizer at the set pressure of 83, 97, 112 and 126 MPa for one, two, three, four, five and six cycles, except for the 112 MPa. The results showed that microfluidized milk has smaller size by 3% with pressure up to 126 MPa. However, at each pressure, no further reduction was observed after increasing the passed up to 6 cycles. Although the average casein micelle size was similar, elevating pressure resulted in narrower size distribution. In contrast, increasing the number of cycles had little effect on casein micelle distribution. The finding from this study can be applied for future work to characterize the fundamental and functional properties of the treated milk. **(1728)**

Heavy Metal Content in Leachate Garbage of Final Disposal Site (TPA) of Banda Aceh City

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Abstract. The process of continuous landfill in the area of final disposal (landfill) of waste produces pollutants such as leachate (*leachate*). It is a liquid containing dissolved substances and suspended very fine as a result of waste decomposition by microbes. Leachate water contains decomposing organic materials and heavy metal materials. Heavy metals (Cr, Hg, Pb, Cu, Fe, Mn, Zl, Cl) present in leachate water are from waste that has been disposed to TPA Keudah Kota Banda Aceh. The author would like to do research on the adsorption of heavy metals by using *Atomic Absorption Spectrophotometer in landfill leachate* Banda Aceh. The purpose of this research is to get the absorption of some heavy metals in the landfill leachate by using AAS analysis method. The analysis in landfill leachate solution Banda Aceh by using *Atomic Adsorption Spectrophotometer* results in the highest uptake Iron (Fe) by 10.9191 ppm, and is followed by (Ni) 0.9820 ppm, (Zn) 0.4188 ppm, (Co) 0.1698, (Cu) 0.1198 ppm, (Pb) 0.0602 ppm, (Cr) 0.0502 ppm. Hg, Cu, and Cd results are not detected (ND). Considering that Indonesia, in the future, is still facing environmental pollution problems as a result of development, restoration and rehabilitation of contaminated land needs to get mutual attention, such as by using dilution method, stabilization, and phytoremediation technique.(1251)

Revamping of Entisol Soil Physical Properties by Composting Treatment

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Abstract. Physical characteristic of Entisol soil is an important factor for the growth of plant. The aim of this research was to know the effect of compost application on physical characteristics of Entisol soil. The design used was completely randomized design consist of 6 (six) treatments and 3 replications that is K1= 10 kg Entisol soil without compost, K2 = 9 Kg Entisol soil with 1 kg compost, K3= 8 kg Entisol soil with 2 kg compost, K4 = 7 kg Entisol soil with 3 kg compost, K5 = 6 kg Entisol soil with 4 kg compost and K6 = 5 kg Entisol soil with 5 kg compost. The observed parameters were soil texture, soil organic matter, soil thickness, porosity, soil pore size, soil permeability and water availability. The results showed that the Entisol soil texture was loamy sand texture, the value of soil organic matter range was from 0.74% to 4.69%, soil thickness range was from 13.83 to 20.16 cm, porosity range was from 16% to 37 % , soil pore size range was from 2.859 to 5.493 μm , permeability range was from 1.24 to 5.64 cm/hour and water availability range was from 6.67% to 9.12% by each treatment. **(1508)**

Ball Mill Tool for Crushing Coffee and Cocoa Beans Base on Fraction Size Sieving Results

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Abstract. Crushing is one of the operation units that aimed to convert the size of solid material to be smoother particle's size. The operation unit that can be used in this crushing is ball mill. The purpose of this study is to foresee the effect of raw material mass, grinding time, and the number of balls that are used in the ball mill tool related to the amount of raw material of coffee and cocoa beans. Solid material that has become smooth is then sieved with sieve mesh with size number: 50, 70, 100, and 140. It is in order to obtain the mass fraction that escaped from each sieve mesh. From the experiment, it can be concluded that mass percentage fraction of coffee powder is bigger than cocoa powder that escaped from the mesh. Hardness and humidity of coffee beans and cocoa beans have been the important factors that made coffee beans is easier to be crushed than cocoa beans.(1574)

Delignification and Hydrolysis Lignocellulosic of Bagasse in Choline Chloride System

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Abstract. Bagasse was the waste which has a fairly high content of lignocelluloses and has not been utilize optimally. With a cellulose content of up to 40%, bagasse then potentially be used as raw material for bioethanol. In this research, delignification process was carried out using sodium hydroxide (NaOH) in the ionic liquid system and without ionic liquids. The purpose of this research was to find out the highest content of cellulose which contained in the bagasse and the best hydrolysis conditions was obtained at the hydrolysis process in the choline chloride (ChCl) system. The hydrolysis stage in this research was carried out at temperature 105 °C, catalyst (H₂SO₄) 10% (w/w) cellulose, ChCl 10%, 15%, and 20% (w/w) cellulose and it was stirred at constant speed 120 rpm with reaction time of 30, 60 and 90 minutes. Delignification research results used ChCl obtained highest content of cellulose was 39.8%, hemicellulose 18.59%, and lignin 3.62% in cooking treatment 90 minutes and 20% ChCl. While delignification without ChCl obtained highest content of cellulose is 24.98%, hemicellulose 8.25%, and lignin 18.99% in cooking treatment 90 minutes. The maximum glucose yield of 39.4% was obtained at reaction time 90 minutes and 15% of ChCl. **(1656)**

Herbal Dryer: Drying of Ginger (*Zingiber officinale*) Using Tray Dryer

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Abstract. Drying is widely used as a method to preserve food because of its convenience and affordability. Drying of ginger using tray dryer were carried out at various drying conditions, such as air-drying flow, air-drying temperature, and sample dimensions, to achieve the highest drying rate. Samples with various dimensions were placed in the tray dryer and dried using various air-drying flow and temperatures. The weights of samples were observed every 3 minutes interval. Drying was stopped after three times of constant weighing. Data of drying was collected to make the drying curves. Drying curves show that the highest drying rate is achieved using highest air flow and temperature. **(1661)**

Growth Performance and Yield Stability of Selected Local Upland Rice Genotypes in Buton Utara of Southeast Sulawesi

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Abstract. Rice is major cereal crop of Buton Utara and Indonesia as well. To evaluate the growth performance and yield stability of seven selected local upland rice genotypes, field experiment was conducted in Buton Utara during rainy season 2015 and 2016. Seven selected upland rice genotypes were grown in six different locations and evaluated in a randomized complete block design (RCBD) with three replications. The variables observed were plant height, leaf area, number of tillers, number of productive tillers, panicle length, number of grains per panicle, number of filled grain per panicle, percentage of unfilled grain, 1000 grain weight, grain dry weight, and grain yield (t/ha). The results were analyzed using analysis of variance and combined analysis of variance for the interaction of environment x cultivars. Data on various growth characters and yield stability indicated different among genotypes and significant effect followed by the DMRT test at the significant level $\alpha = 0.05$. The genotypes of *Wakawondu*, *Wabalongka*, and *Mantebeka* have high yield stability, while the genotypes of *Waapolo*, *Warangka*, *Wabila Lambale*, and *Warara* have low yield stability. Hence, *Wakawondu*, *Wabalongka*, and *Mantebeka* could be recommended for cultivation by the farmers in Buton Utara and these cultivars should be popularized in larger scale to make use of its superiority. **(1717)**

The Design Of Dapog Rice Seeder Model For Laboratory Scale

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Abstract. The dapog system is seeding rice seeds using a special nursery box / tray. Rice seedings with dapog systems can produce seedlings in the form of higher quality and uniform seed rolls. This study aims to reduce the cost of making large-scale apparatus by designing models for small-scale and can be used for learning in the laboratory. Parameters observed were soil uniformity, seeds and fertilizers, soil looses, seeds and fertilizers, effective capacity of apparatus, and power requirements. The results showed a high uniformity in soil, seed and fertilizer respectively 92.8%, 3-4 seeds / cm² and 82%. The scattered materials for soil, seed and fertilizer are respectively 6.23%, 2.7% and 2.23%. The effective capacity of apparatus is 360 boxes / hour with 237.5 kWh of required power.(1768)

Removal Efficiency of Methylene Blue Using Activated Carbon From Waste Banana Stem: Study on Ph Influence

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Abstract. The effort to remove methylene blue in artificial solution had been conducted using adsorption process. The abundant banana stem waste was utilized as activated carbon precursor. This study aimed to analyse the influence of solution pH to removal efficiency of methylene blue using activated carbon from banana stem as adsorbent. Activated carbon from banana stem was obtained by chemical activation using H_3PO_4 solution. Proximate analysis result showed that the activated carbon has 47.22% of fixed carbon. This value exhibited that banana stem was a potential adsorbent precursor. Methylene blue solutions were prepared at initial concentration of 50 ppm. The influence of solution pH was investigated with the use of 0.2 g adsorbent for 100 mL dye solution. The adsorption was conducted using shaker with at a constant rate of 100 rpm at room temperature for 90 minutes. The results showed that solution pH influenced the adsorption. The activated carbon from banana stem demonstrated satisfying performance since removal efficiencies of methylene blue were higher than 99%. **(3025)**

The Utilization of Ultisol Soil for Horticulture Crops Cultivation

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Abstract. Ultisol soil is a marginal soil commonly used for palm oil cultivation in Indonesia, its very potential for cultivation of horticulture crops. The utilization of ultisol soil can be done with adding compost with certain proportions. The research aimed to know best proportion of ultisol soil and compost, and proportion of water concentration, and its relationship with fresh and dry weight of horticulture crops . The research was divided 3 steps. The first, mixed ultisol soil and compost with certain proportion and flooding until steady. The second, watering with different concentration to soil mixture. The last, studied its relationship with fresh and dry weight of crops. The result show that physical properties and nutrient content of ultisol soil was increasing with adding compost. SC4 (70% soil and 30% compost) is the best composition to soil mixture. Watering with different concentration show that trend decreased from reference and the bulk density and porosity decreased not significantly at the significant level $\alpha = 0.05$. Watering affect mass of pakcoy not significantly at the significant level $\alpha = 0.05$. Hence, ultisol soil was a potential marginal soil to utilizing as a media for cultivating horticulture crops(1815)

The Effects of Heating Temperatures and Time on Deformation Energy and Oil Yield of Sunflower Bulk Seeds in Compression Loading

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Abstract.The deformation energy (J) and percentage oil yield (%) of sunflower bulk seeds under the influence of heat treatment temperatures and heating time were examined in compression test using the universal compression testing machine and vessel diameter of 60 mm with a plunger. The heat treatment temperatures were between 40 and 100 °C and the heating time at specific temperatures of 40 and 100 °C ranged from 15 to 75 minutes. The bulk sunflowerseeds were measured at a pressing height of 60 mm and pressed at a maximum force of 100 kN and speed of 5 mm/min. Based on the compression results, the deformation energy and oil yield increased along with increasing heat treatment temperatures. The results were statistically significant ($p < 0.05$). At a 40 °C heat treatment temperature in relation to varying heating time, deformation energy increased while the percentage oil yield decreased. However, at a 100 °C, the deformation energy almost showed no correlation but the oil yield similarly decreased. From the ANOVA statistical analysis, the effect of heating time at 40 and 100 °C heat treatment temperatures on deformation energy and oil yield was not significant ($p > 0.05$). (1545)

Utilization of Fem Model for Steel Microstructure Determination

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Abstract. Agricultural tools which are used in soil processing, they are worn by abrasive wear mechanism cases by hard minerals particles in the soil. The wear rate is influenced by mechanical characterization of tools material and wear rate is influenced also by soil mineral particle contents. Mechanical properties of steel can be affected by a technology of heat treatment that it leads to a different microstructures. Experimental work how to do it is very expensive and thanks to numerical methods like FEM we can assumed microstructure at low cost but each of numerical model is necessary to verified. The aim of this work has shown a procedure of prediction microstructure of steel for agricultural tools. The material characterizations of 51CrV4 grade steel were used for numerical simulation like TTT diagram, heat capacity, heat conduction and other physical properties of material. A relationship between predicted microstructure by FEM and real microstructure after heat treatment shows a good correlation.(2256)

Evapotranspiration and Crop Coefficient of Oil Palm (*Elaeisguineensisjacq.*) on Main Nursery in A Greenhouse

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Abstract. The estimation of crop water requirement is an important part of oil palm plantation because fruit yield of oil palm can be affected by water stress. Evapotranspiration and crop coefficient of oil palm using Tenera variety at 7-12 months old was determined. Soil texture was sandy loam with 73.8 % sand, 10.8 % silt, 15.77 % clay and 1.41 % organic matter. The results showed that the oil palm getting older decreased significantly in bulk density, particle density and porosity of soil caused the root of oil palm enlarged (19.42 g to 53.37 g). This was indicated by increased the dry root weight. On the other hand, the value of evapotranspiration and crop coefficient increased significantly, that was 1.85 to 2.00 mm/day and 0.8 to 0.87 respectively. **(1599)**

Mechanical Behaviour of Arabica Coffee (*Coffea arabica*) Beans Under Loading Compression

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Abstract. The uniformity of the product of the grinding process depends on various factors including the brittleness of the roasted coffee bean and it affects the extraction of soluble solids to obtain the coffee brew. Therefore, the reaching of a certain degree of brittleness is very important for the grinding to which coffee beans have to be subjected to before brewing. The aims of this study to show the mechanical behaviour of Arabica coffee beans from Tobasa (Indonesia) with roasted using different roasting time (40, 60 and 80 minutes at temperature 174 °C) under loading compression 225 kN. Universal compression testing machine was used with pressing vessel diameter 60 mm and compression speed 10 mm min⁻¹ with different initial pressing height ranging from 20 to 60 mm. The results showed that significant correlation between roasting time and the brittleness. **(1849)**

Effect of Pretreatment on Purple-Fleshed Sweet Potato Flour for Cake Making

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Abstract. The purple-fleshed sweet-potato (PFSP) flour was produced by varying pretreatment of washed chips: dipping in 0.5 and 1.0% (w/v) citric acid solution for 30 min, dipping in 0.5 and 1.0% (w/v) citric acid solution for 30 min and followed by steam blanching for 5 min. The pretreatment effect on cake quality was investigated. The results showed that PFSP flour produced from pretreatment with dipping in 0.5% citric acid for 30 min followed by steam blanching for 5 min had higher lightness (L^*) value and lower browning index, higher hedonic value of color and aroma and baking expansion. The specific volume of cake from pretreated flour, untreated flour and wheat flour were 44.87, 43.83, and 50.43 cm³/g, respectively. The sensory evaluation of cake indicated that cake from pretreated PFSP flour was acceptable compare to those of cake from wheat flour. **(1859)**

Soy-Yamgurt Probiotic Drink as A Natural Potential of Antioxidant

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Abstract. Yogurt is a popular healthy food, consumed by many people. Probiotic are used for better growth and survival of probiotic bacteria as well as to improve organoleptic, rheological and technological properties of probiotic soy-yamgurt. The aims of this study were to determine physicochemical changes and survival of probiotic bacteria due to the effect of bengkoang and soy-bean extract addition to the quality of probiotic soy-yamgurt drink. The quality examined were total bacteria, antioxidant activity, lactic acid content, and acceptability including colour, texture, flavour, and overall acceptance. The experiment was set up in a Completely Randomized Design with five levels of bengkoang and soy-bean extract addition (100:0; 75:25; 50:50; 25:75; 0:100 with three replications. The results showed that the addition of 50:50% of bengkoang and soy-bean extract and 6 hours incubation resulted in acceptable probiotic drink containing of 1.44×10^9 CFU/mL lactic acidbacteria, IC₅₀ of soy-yamgurt in the attenuation of free radical DPPH ranged from 58.718-18.112 mg/L in 5 minutes incubation and 39.7204-11.9925 mg/L in 60 minutes, and 0.48% lactic acid. This appearance of soy-yamgurt had yellow greenish colour, desired texture and flavor, and received the highest score of over all acceptance. **(3013)**

Hypoglycemic Activity of Gambier Drinks (*Uncaria gambir* robx.) in Alloxan-induced Mice

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Abstract. Diabetes can causes complications in various parts of the body and increase the risk of early death. Gambier have bioactive compounds and can be used as raw material in making gambier drinks. The purpose of this study was to find out the best extraction method of gambier, to determine the hypoglycemic activity of gambier drinks and the best dose to improve the pancreatic conditions of alloxan-induced mice. In this study, gambier were extracted by 3 types of solvents ie. distiled water, ethyl acetate, and ethanol. The best gambier drinks would be tested on 5 treatment groups wich consisting of 5 male mice. Group 1 was given 0,5% CMC 1%/bw, group 2 was given metformin 65 mg/kg bw, groups 3, 4 and 5 were given gambier drinks with dosage 100, 200, and 300 mg/kg bw. The results showed that extraction using distiled water produced the best gambier drinks. Gambier drinks with dosage 100, 200 and 300 mg/kg bb given for 15 days decreased the blood glucose level 27.69%, 38.75%, and 50.62% respectively, and increased the body weight 13.14%, 10, 91%, and 10.18% respectively. Treatment with gambier drinks was proved able to improve the condition of pancreatic langerhans island of alloxan-induced mice.(1860)

Numerical Analysis Heat and Mass Transfer on Drying Process of Agricultural Product Using Finite Element Method

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Abstract. A 2D modeling of heat and mass transfer on drying process phenomena has been simulated very well. The model based on Luikov couple equation on axisymmetry coordinate and the rule of finite element method. There were assumption in this research, such as; (1) the temperature and moisture content of agricultural product was not uniform at initial condition, (2) there was not heat generation inside the product, (3) all boundaries were contact with the surrounding hot air, (4) water diffusion (moisture diffusion) outward toward the surface of product, and (5) the physical properties of products were function of temperature and moisture. This research have some objectives and divided on two sections, first, setup of computation domain on two sub-domains, and second, investigation of heat and mass transfer on agricultural product. The result of this study show that increasing of temperature in the surface is very fast than in the center of cocoa bean. Future work, we will investigate drying process phenomena by heat transfer radiation. **(1851)**

The Extraction of Antimicrobials Component of Andaliman (*Zanthoxylum acanthopodium* DC.) and It's Application on Catfish (*Pangasius sutchi*) Fillet

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Abstract. Andaliman (*Zanthoxylum acanthopodium* DC.) is a well known wild species in North Sumatera and used for seasoning in Batak's traditional cuisine. This study was aimed to examine the phytochemical constituents of andaliman fruit extracts after simple macerated in water, methanol, ethyl acetate and hexana using qualitative phytochemical analysis, and to determine its potential antimicrobial activity against *Staphylococcus aureus*, *Escherichia coli* and *Salmonella* sp by using agar well diffusion method and minimum inhibitory concentration (MIC). Phytochemicals such as alkaloids, flavonoid, glycosides, saponins, tannins, triterpene/steroid and glycoside anthraquinones were detected in the methanol extracts, but steroids and glycoside anthraquinones were absent in the ethyl acetate extract. The ethyl acetate extracts showed maximum zone of inhibition and minimum inhibitory concentration against all the experimental microorganisms. The minimum zone of inhibition was determined in hexane extracts showing less antimicrobial activity against all the experimental microorganisms. The MIC of the ethyl acetate extracts was 0,5% w/v for all tested bacteria. Application of ethyl acetate extracts of andaliman fruits showed effective for catfish (*Pangasius Sutchi*) fillet stored in refrigerator (5 °C) for 3 days. (1862)

Inhibitory Activity of Bacteriocin Produced from *Lactobacillus* SCG 1223 Toward *L. monocytogenes*, *S. thypimurium* and *E. coli*

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Abstract. Bacteriocin is a protein compound which has bactericidal ability toward pathogen bacteria. The aim of this research was study the inhibitory activity of bacteriocin produced from *Lactobacillus* SCG 1223 toward *Listeria monocytogenes*, *Salmonella thypimuruim* and *Escherchia coli*. The bacteriocin produce from *Lactobacillus* SCG 1223 in the MRS Broth media with initial pH 4 and 6, incubation temperature 27°C dan 40°C, incubation time 4, 10 and 14 hours, and inoculum 5% and 10%. Result showed that bacteriocin from *Lactobacillus* SCG 1223 had wide spectrum toward gram positive bacteria (*L. monocytogenes*) and gram negative bacteria (*S. thypimuruim* and *E. coli*). The highest bacteriocin activity toward *L. monocytogenes* was 1178.13 AU/ml produce by *Lactobacillus* SCG 1223 in media with initial pH 6, incubation temperature 40°C for 14 hour, toward *S. thypimurium* was 816.40 AU/ml which produce by *Lactobacillus* SCG 1223 in media with initial pH 6, incubation temperature 27°C for 14 hour, and toward *E. coli* was 1085.81 AU/ml, produce by *Lactobacillus* SCG 1223 in MRS broth with initial pH 4, incubation temperature 40°C for 14 hour. This study is expected to create a new food preservative that can inhibit the growth of pathogenic bacteria and extend the shelf life of food. **(1389)**

The Effect of Alpha Amylase Enzyme on Quality of Sweet Sorghum Juice for Chrystal Sugar

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Abstract. Sweet sorghum juice (*Sorghum bicolor* L. Moench) has characteristics similar to sugar cane juice and potentially used for sugar substitutes that can support food security. Nevertheless the sweet sorghum juice contain starch which impede sorghum sugar crystallization. Therefore, research on the enzymatic process is needed to convert starch into reducing sugar. The experimental design used was the Factorial Randomized Design with the first factor was alpha amylase enzyme concentration (0, 20, 40, 60, 80, 100, 120 $\mu\text{L}/100\text{ mL}$) and second factor was incubation time (0, 30, 60, 90 minute) at temperature 100°C . The experiment was conducted on fresh sweet sorghum juice that has been stored for 2 weeks. The results showed that the addition of the alpha amylase enzyme increased the content of reducing sugar and decreased levels of starch. Elevating concentration of alpha amylase enzyme will increase the reducing sugar content in sweet sorghum juice. The optimum alpha amylase enzyme concentration to produce the highest total sugar was 80 $\mu\text{L}/100\text{ mL}$ of sweet sorghum juice with the optimum incubation time was 90 minutes. The results of this study are expected to create a new sweetener for sugar substitution.(1390)

The Relation of Sediment Texture to Macro- and Microplastic Abundance in Intertidal Zone

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Abstract. The intertidal zone is a waters area directly affected by the contamination of plastic debris from land and sea. The aim of this research were to analyze the relation of sediment texture to macro- and micro plastic abundance and also to determine appropriate management strategy. This research was conducted in intertidal zone Jaring Halus Village Langkat Regency North Sumatera Province on February-April 2017. Plastic debris was collected using quadrat transect. Sediment was collected with correct, up to a depth of least 30 cm. Abundance of micro plastic in Station 1 were positively tolerated with clay (0.509), and silt (0.787) and negatively correlations with sand (0.709) Station 2 were positively correlations with sand (0.645) and negatively correlations with clay (0.575), and silt (0.626) Station 3 were positively correlations with clay (0.435), and silt (0.466) and negatively correlations with sand (0.599). The abundance of microplastic was positively correlations with the abundance of microplastic (0.765). Microplastic density is directly proportional to the content of clay and dust. The higher the clay and dust content the higher the micro plastic density. **(1506)**

Impacts of Macro - and Microplastic on Macrozoobenthos Abundance in Intertidal Zone

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Abstract. Plastics pollution in coastal areas is one of the topics that have received more attention over the past few years. The intertidal zone is a waters area that is directly affected by contamination of plastic waste from land and sea. The purpose of this study was to analyze the types and abundance of plastic waste in the intertidal zone and its impact on macrozoobenthos abundance. This research was conducted at Pesisir Desa Jaring Halus in February-April 2017. Macrozoobenthos and macro - micro plastic were collected by using quadratic transect. Sediments were collected with a core, to a depth of 30 cm. Microplastic and macroplastic abundances were analyzed using separation of sediment density and hand sorting. The dominant micro plastic types were film (52.30%), fiber (24.88%), fragments (22,74%), followed by pellets (0.1%). The total number of microplastics were 326.33 items and macro plastic were 308 items. Macroplastic abundance is positively correlated with microplastic (0.765). The abundance of macrozoobenthos is negatively correlated with microplastic abundance (-0.368) and with macro plastic abundance (-0.633). The management strategies were suggested clean up marine debris, decrease plastic using and built up the station of debris processing.(1087)

Structure of Gastropod Communities at Mangrove Ecosystems in Lubuk Kertang Village, West Berandan District, Langkat Regency, North Sumatera Province

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Abstract. Gastropod was one of the class from mollusca in mangrove ecosystem. Lubuk Kertang Village's mangrove forest was been converted into tourist areas, agricultural land and settlements. The purpose of this study was to analyze the structure of gastropods at *Avicennia lanata*, *Rhizophora apiculata* and *Sonneratia alba*. This research was conducted at Lubuk Kertang Village in February-March 2017. Gastropod were collected in 1 m × 1 m transect in mangrove. Examples of biota were taken by using shovel, then the biota was inserted into a plastic bag sample, wrote date of sampling and identified. The results showed there were 15 species Gastropods, namely *Achatina fulica*, *Cerithidea alata*, *Cerithidea cingulata*, *Cerithidea obtusa*, *Chicoreus capucinus*, *Cymatium pileare*, *Ellobium aurimisdæ*, *Ellobium aurisjudæ*, *Littoraria melanostoma*, *Littoraria scabra*, *Murex tribulus*, *Nerita balteata*, *Nerita planospira*, *Pugilina cochlidium*, *Stramonita gradata*, *Telescopium telescopium* and *Terebralia sulcata*. Diversity index ranged 1.702 to 2.165 was in medium category, Similarity index ranged 0.676 to 0.799 was in low category and Dominance index ranged 0.142 to 0.282 that categorized was low. The highest gastropod density was 31 individuals/m² in the *Sonneratia alba*. The conclusion of the research is the existing mangrove ecosystem in Lubuk Kertang Village in a stable state. **(1523)**

Growth and Exploitation Rate of Yellowstripe scad (*Selaroides leptolepis* Cuvier, 1833) In The Waters Belawan, Malacca Strait, North Sumatra

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Abstract. Yellowstripe scad included the one of commodity that has an important economic value in the Malacca Strait. Fish were found mostly in Indonesian of waters made this fish as one of the main target catch. But, it can had negative impact on the population of the fish. The study is done at Belawan Waters on March until May 2017 that which is purposed to study about the frequency distribution of length, determine the parameters of growth and, determine mortality rate and the rate of exploitation in order to provide appropriate management model for the fish resource. Yellowstripe scad was observed around 360 samples with the length range between 110 - 175 mm. The fish separated by bhattacarya method used the aid software FISAT II. A pattern of growth Yellowstripe scad alometrik negative with growth coefisien (K) 1.1 with length asimtotic (L_{∞}) 181.65. The rate of mortality total (Z) yellowstripe scad 4.34 per year at the rate of mortality natural (M) 1.204 per year and rate mortality by fishing (F) 3.136 per year in order to obtain the rate of exploitation 0.722. The value of this exploitation rate has exceeded the value of the optimum exploitation of 0.5. **(1525)**

Growth and Exploitation Rate of *Anadara gubernaculum* (Reeve, 1844) Family Arcidae in Asahan Aquatic of North Sumatera

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Abstract. High market demand for *A. gubernaculum*, tends to the increase to the greater catching capacity in decreasing population. The aims of this study were to determine the growth and rate of exploitation of *A. gubernaculum* in Asahan aquatic. It was conducted for 1 Month 14 Days from October to November 2016. Data analyzed by (Electronic Length Frequency Assessment Tool) ELEFAN I method by using (FAO-ICLARM Fish Stock Assessment Tool) on FiSAT II software. Shellfish obtained 855 individual. The growth pattern of shells is negative allometric. The range of condition factor was 0.81 – 2.15. The frequency distribution of the *A. gubernaculum* ranges from 14 to 43 mm, the dominant size group was 20 - 22 mm. The prediction of growth parameter Von Bertalanfy showed that the asymptotic length (L_{∞}) is 43.05 mm, the growth coefficient (K) is 1.2 / year and the theoretical life (t_0) of the *A. gubernaculum* is -0.12. The total Mortality (Z) of *Anadara gubernaculum* was 2.121 per year. Natural mortality estimation rate (M) was 1.9 per year. The exploitation rate of *Anadara gubernaculum* is 0.1 per year. **(1527)**

Habitat Characteristic of Macrozoobenthos In Naborsahan River of Toba Lake, North Sumatra, Indonesia

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Abstract. This research described the relative abundance, dominance index, and index of macrozoobenthos equitability in Naborsahan River of Toba Lake, North Sumatra, Indonesia. The purposive random sampling at three stations was used to characterize the biological, chemical, and physical parameters of macrozoobenthos. The highest relative abundance of macrozoobenthos found at station 2 (99.96%). By contrast, the highest dominance index was at station 3 (0.31), and the maximum equitability index found at station 1 (0.94). The present results showed diversity parameters among the stations. A principal component analysis (PCA) was used to determine the habitat characteristics of macrozoobenthos. PCA analysis depicted that six parameters studied, brightness, turbidity, depth, temperature, dissolved oxygen (DO) and biochemical oxygen demand (BOD₅) play a significant role on the relative abundance, dominance index, and equitability index. PCA analysis suggested that station 3 was suitable habitat characteristic for the life of macrozoobenthos indicating of the negative axis. The present study demonstrated the six parameters should be conserved to support the survival of macrozoobenthos. **(1678)**

Abundance of Sea Cucumbers on The Ecosystem of Seagrasses in Unggeh Island, Tapanuli Tengah Regency North Sumatera Province

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Abstract. Unggeh Island is one area that has the potential of Sea Cucumber in the North Sumatra. Sea cucumbers have an important role in ecosystem waters, namely as a deposit feeder. Sea cucumbers can live in shallow waters, such as seagrass ecosystems. The purpose of this study is to knowing the abundance of sea cucumbers in the seagrass ecosystems on the island of Unggeh and to knowing the type of Sea Cucumber. The method used is a transect quadrant method with a size of 5x5 meters, on a transect line with a length of 100 meters. Sampling was done at three points observations, station 1 was at coordinate point 01°34'26,88 "LU and 098°45'40,25" BT, station 2 was at coordinate point 01°34'32,71 "LU and 098°45'37, 58 "BT, station 3 is at the coordinate point 01°34'24,22" LU and 098°45'38,06 "BT. The type of sea cucumber found in the seagrass ecosystem on theUnggeh island*Actinopyga ecinites*, *A. Miliaris*, *Holothuria scabra*. The density at station 1 was 0.16 ind / m², at station II a density was 0.12 ind / m², at station III a density was 0.08 ind / m², and the total density at the research location was 0.32 ind / m².(1526)

Length-Weight Relationship and Condition Factor of White Shrimp *Penaeus Merguensis* Captured in Ecosystem Mangrove of Bagan Asahan, Tanjungbalai, Asahan, North Sumatra, Indonesia

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Abstract. White Shrimp *Penaeus merguensis* was commonly found in Mangrove Ecosystem of Bagan Asahan Village. The purpose of this research are to determine length-weight relationship and condition factor of white shrimp *Penaeus merguensis* around ecosystem mangrove waters in Bagan Asahan Village. This research was conducted for 3 month in Maret until Mei 2017 with determination of research station used purposive sampling method. The shrimp samples were taken by shrimp trawl. The result showed that 98 shrimp which consists of 58 males and 40 female. The carapace length of female shrimp between 6.05 – 22,125 mm and total weight ranged from 0.12 – 6.95 g. Male shrimp had carapace length between 7.125 – 18.25 mm and total weigth ranged from 0.14 – 3.82 g. Female and male white shrimp had different growth pattern. Female shrimp had $b = 2.984$ included in and male shrimps with $b = 3.187$ included in positive allometric and. The value of correlation coefficients was more than 90% for both male and female showed very strong relation between length carapace and body weight. The value of shrimp condition factor ranged from 0.570 – 1.773 and included to flat (thin) body shrimp (1671)

Evaluation of Mangrove Management Through Community-Based Silvofishery in North Sumatra, Indonesia

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Abstract. Aquaculture expansion has been reported as the primary driver of mangrove loss and a significant cause of mangrove deforestation in North Sumatra, Indonesia. Development of silvofishery based on creating balance condition between conserving mangrove forest and offering better livelihood for local communities surrounding mangrove. The present study evaluates of mangrove management through community-based silvofishery in three villages, namely Paluh Manan, Paluh Kurau, and Lama, Hampan Perak of Deli Serdang Regency, North Sumatra, Indonesia. Three communities used the same ecological type-silvofishery, characterized by planted mangrove surrounded aquaculture. Results showed that in the Paluh Manan village, planted mangrove and aquaculture in the ratio of 75:25 with planting distance of mangrove 50x50 cm, containing 2500 trees/ha, resulted in US\$ 36.2/month/ha of fish and shrimp farming. In the Paluh Kurau village, a mixture mangrove and aquaculture in an 84:16 ratio, planting distance of 1x1 m, consists of 1600 trees/ha, US\$ 35.5 of generating revenue from crab farming. Furthermore, in the third village, Lama village, consists of mangrove and aquaculture in the proportions 90:10, with planting spacing 2x2 m, composing 1000 trees/ha, led to US\$ 68.6/month/ha from fish, shrimp and crab farming. The present study suggested the mangrove management through community-based mangrove-friendly aquaculture. **(1679)**

The Prevalence of parasites in Ornamental Fish from Fish Market in Medan

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Abstract. Parasites still become the major problem in ornamental fish as the fast grown of its trading in Indonesia. In this study, the prevalence of parasites in 100 apparently healthy ornamental fishes namely Guppy (*Poecilia reticulata*) and Goldfish (*Carrasius auratus*) were determined. The method of this research used was survey in local fish market in Medan from March to May 2017. The aim of this study was to determine the prevalence parasite that infects aquarium fishes. For this purpose, ornamental fishes were examined for parasites from their body using wet mount method. The survey result showed that parasites that infect Guppy and Goldfish were Monogenea (*Dactylogyrus* sp and *Gyrodactylus* sp), Protozoa (*piscinodinium* sp) and Nematoda (*Capillaria* sp. Parasites prevalence rate that attack Guppy in Medan is *Dactylogyrus* sp (8%), *Gyrodactylus* sp (14%), *Piscinodinium* sp (6%) and *Capillaria* sp (8%). Then, prevalence rate of *Capilaria* sp that attack Goldfish is 4%. The conclusion of this work revealed that the prevalence rate of parasites in ornamental fishes in Medan had the low rate. However, these parasites could be a harmful parasitic diseases in case there is the changes in aquarium environment. Key word : Parasites, prevalence, ornamental fish .(1397)

Fast And Simultaneous Prediction of Animal Feed Nutritive Values Using Near Infrared Reflectance Spectroscopy

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Abstract. Feed plays an important factor in animal production. The purpose of this study is to apply NIRS method in determining feed values. NIRS spectra data were acquired for feed samples in wavelength range of 1000 – 2500 nm with 32 scans and 0.2 nm wavelength. Spectral data were corrected by detrending (DT) and standard normal variate (SNV) methods. Prediction of in vitro dry matter digestibility (IVDMD) and in vitro organic matter digestibility (IVOMD) were established as model by using principal component regression (PCR) and validated using leave one out cross validation (LOOCV). Prediction performance was quantified using coefficient correlation (r) and residual predictive deviation (RPD) index. The results showed that IVDMD and IVOMD can be predicted by using SNV spectra data with r and RPD index: 0.93 and 2.78 for IVDMD ; 0.90 and 2.35 for IVOMD respectively. In conclusion, NIRS technique appears feasible to predict animal feed nutritive values. (1710)

The Role of Lactic Acid Bacteria (*Lactobacillus* sp YEL133) from Beef in Inhibiting of Microbial Contaminants on Various Fillers of Starter Culture

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Abstract. The role of Lactic Acid Bacteria (LAB) on the starter culture can be seen from the ability to grow and suppress the growth of microbial contaminants (fungi). The research aimed to investigate the role of LAB (*Lactobacillus* sp YEL133) in inhibiting microbial contaminants (fungi) on starter cultures of various fillers. The materials used in this research was *Lactobacillus* sp YEL133 from beef and various fillers (rice flour, corn starch and wheat flour). The research methods used completely randomized design (CRD) with 3 treatments and 4 replications. The treatments of this research was P1 (rice flour), P2 (corn starch) and P3 (wheat flour) that inoculated with *Lactobacillus* sp YEL133. Parameters which is observed such as: growth of lactic acid bacteria, total microbes and total fungi as microbial contaminants. The results showed that the starter culture with a filler material of rice flour produce lactic acid bacteria and microbes were highly significant ($P < 0.01$) for corn starch and wheat flour, as well as able to suppress the growth of microbial contaminants (fungi). The conclusion of the research is the use *Lactobacillus* sp YEL133 can suppress the growth of fungi on the starter culture using rice flour. **(3026)**

Nutrition Quality of Extraction Mannan Residue From Palm Kernel Cake on Broiler Chicken

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Abstract. This study aims to find out the nutrient residue of palm kernel cake from mannan extraction on broiler chicken by evaluating physical quality (specific gravity, bulk density and compacted bulk density), chemical quality (proximate analysis and Van Soest Test) and biological test (metabolizable energy). Treatment composed of T0 : palm kernel cake extracted aquadest (control), T1 : palm kernel cake extracted acetic acid (CH_3COOH) 1%, T2 : palm kernel cake extracted aquadest + mannanase enzyme 100 u/l and T3 : palm kernel cake extracted acetic acid (CH_3COOH) 1% + enzyme mannanase 100 u/l. The results showed that mannan extraction had significant effect ($P < 0.05$) in improving the quality of physical and numerically increase the value of crude protein and decrease the value of NDF (Neutral Detergent Fiber). Treatments had highly significant influence ($P < 0.01$) on the metabolizable energy value of palm kernel cake residue in broiler chickens. It can be concluded that extraction with aquadest + enzyme mannanase 100 u/l yields the best nutrient quality of palm kernel cake residue for broiler chicken. (1409)

The Effect of Fermented Cocoa Pod (*Theobroma Cacao*) Husk Supplemented With Mineral on In Vitro Digestibility, Rumen Bacteria Population And Rumen Liquid Characteristics

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Abstract. This study aimed to determine the effect of mineral supplementation, such as S, P and Zn on the nutrients digestibility of fermented cocoa pod husk, the population of rumen bacteria and rumen liquid characteristics in vitro. The study used a randomized block design with 5 treatments and 4 replicates. The treatments tested were: T0 = without minerals; T1 = 0.2% S mineral; T2 = 0.27% P mineral; T3 = S and P; and T4 = S, P and Zn at 50 ppm. Parameters measured were: (1) digestibility of dry matter and organic matter; (2) rumen bacterial and cellulolytic bacterial populations; (3) characteristics of rumen liquid in vitro. The results of the study showed that mineral supplementation significantly ($P < 0.05$) improved dry matter and organic matter digestibility. Mineral supplementation had no effect on the total population of rumen bacteria and cellulolytic rumen bacterial populations. The characteristics of rumen liquid such pH, VFA and NH_3 were in optimal condition. In conclusion supplementation of S, P and Zn simultaneously gave the best results to improve the digestibility of dry matter and organic matter and to maintain rumen liquid characteristics under optimal conditions for growth and microbial activity. **(1594)**

The Influence of *Aspergillus niger* Inoculum Dosage on Nutritive Value And Metabolizable Energy of Apu-Apu Meal (*Pistia stratiotes* L.) on Broiler Chicken

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Abstract. Apu-apu lives at tropical and subtropical fresh waterways. The apu-apu meals utilization as feed still limited. The problem of utilization apu-apu meals as ingredients is a high crude fiber and need a treatment to decrease crude fiber. This study aim to find out the influence of *Aspergillus niger* inoculum dosage on apu-apu meal (*Pistia stratiotes* L.) on metabolizable energy on broiler chicken. This research used completely randomized design (CRD). The treatments consists of *Aspergillus niger* inoculum dosage (CFU/g) such as P0 (0), P1 (10^4 CFU/g), P2 (10^6 CFU/g), and P3 (10^8 CFU/g). The variables were observed : apparent metabolizable energy (AME), true metabolizable energy (TME), apparent metabolizable energy nitrogen corrected (AMEn) and true metabolizable energy nitrogen corrected (TMEn). The results showed that the dosage of *Aspergillus niger* increase nutritive value of *Aspergillus niger*. Dosage of *Aspergillus niger* also influence ($P < 0.05$) metabolizable energy of apu-apu meals. Dosage 10^8 CFU/g had metabolizable energy significantly higher than other treatments. Conclusion of this research is the *Aspergillus niger* at the dosage 10^8 CFU/g increased nutritive value and metabolizable energy of apu-apu meal. (3023)

The Response of Red Ginger (*Zingiber officinale* Var *Rubra*) With Various Processing in Broilers were Infected by *Eimeria Tenella*

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Abstract. Red ginger contains high antioxidants and have anti-inflammatory properties. Ginger also has the ability to treat kimatif, antiemetic, antinausea, and antiparasitik. The aim of this experiment was identified the response of red ginger in broilers were infected by *Eimeria tenella*. This research used Completely Randomized Design (CRD) with 5 treatments and 4 replications. *Eimeria tenella* were infected by 10,000oocysts/ head and red ginger solution were aplicated with 1% concentration. The treatments consist of KP (positive control), KO (coccidiostat), K1 (red ginger powder), K2 (extracted red ginger by ethanol) and K3 (extracted red ginger by water) . The results showed that the treatment of red ginger was significant effect ($P < 0.05$) to lower oocyst production in broilers were infected by *Eimeria tenella*. The comparison between extracted red ginger by ethanol is better than by water or in powder form to decreased. The utilization of red ginger showed the percentage of heterophile and eosinophile close to normal when compared with positive control. Assesment of caecum lesion score was not significant ($P > 0.05$) different effect between all the treatments. It is concluded that the treatment by red ginger better than coccidiostat and positive control.(1321)

Contribution of Local Beef Cattle Production on Farmer's Income in the Dryland Farming of Kupang Regency, Indonesia

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Abstract. Study on contribution of local beef cattle enterprise on income of dryland farmers in Kupang Regency was conducted from September to December 2016. The study aimed to: (1) determine composition of farm household income in the dry land area of Kupang Regency, Indonesia, (2) analyze contribution of income from local beef cattle enterprise to farm household income. A survey was done on 56 beef cattle farmers who were purposively selected as respondents. All respondents were interviewed using structured questioners with focus on farm household activities and their income. The results showed that total net income of farm household was Rp 14,854,550 per year, out of this Rp3,246,550 to Rp 5,404,750 equals to 21.85 to 36.38% was from local beef cattle enterprise. To enhance the role of beef cattle enterprise, the owner should improve cattle husbandry management through providing good quality and quantity of feed continuously, as well as empowering livestock extension workers to deliver proper information and technology on beef cattle husbandry to the farmer. **(1339)**

Analysis of Cattle Breeder's Income in South Kualuh Sub-district of Labuhan Batu Utara Regency

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Abstract. Beef cattle breeding is a business of the majority people in South Kualuh Subdistrict among others business. Therefore it is necessary to know the people income of beef cattle farms in the district. This research was conducted in South Kualuh Subdistrict of Labuhan Batu Utara Regency of North Sumatera Province from October to December 2016. This research used survey method with family respondent unit that raising beef cattle. The sample was obtained through Proportional Stratified Random Sampling method and obtained by 97 farmers such as, from Tanjung Pasir village, 64 respondents, Simangalam village was 24 respondents and Lobu Huala village was 9 respondents. Data was analysed by multiple linear regression analysis. The results showed that scale of business, education of farmers positively affect the income of beef cattle farms while the age, breeding experience and the number of family dependents negatively affect to the income of beef cattle farms. **(3003)**

Prey Preference of Myopoponecastaneae (Hymenoptera: Formicidae) toward Larvae *Oryctes rhinoceros* Linn (Coleoptera: Scarabidae)

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Abstract. Myopoponecastanea (Hymenoptera: Formicidae) ant is a predator for larvae *Oryctes rhinoceros* (Coleoptera: Scarabidae) which is a pest on oil palm. These ants are able to prey on all stadia of *O. rhinoceros* larvae. This study was conducted to determine prey preference of *M. castaneae* toward its prey *O. rhinoceros* larvae. The study was conducted using a Factorial Complete Random Design with two factors (using log and no log) and five replications. Preference test was done by choice test and no choice test. The results of no choice preference test on the log treatment, *M. castaneae* preferred preyed on first instar larvae of *O. rhinoceros* ($\bar{X} = 2.6$ individual) with a preference index was 0.194 and on no log treatment, *M. castaneae* preferred for both first instar larvae and second instar larvae ($\bar{X} = 4.6$ individual) with a preference index 0.197. The results of the choice preference test using logs, showed that *M. castaneae* preferred the first instar larvae of *O. rhinoceros* ($\bar{X} = 2.6$ individual), with a preference index (0.35), and on no log treatment, *M. castaneae* preferred the second instar larvae ($\bar{X} = 1.4$ individual) with a preference index 0.189. Both first and second instar larvae of *O. rhinoceros* were preferred by predator *M. castaneae*. (1484)

Carcass Yields of Two Different Strains of Ducks Raised in Different Altitude

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Abstract. The objective of this research was to determine if there is a difference in performance and carcass yield between ducks of two different strains raised in different altitude. Ducks of different strains (Muscovy vs Pekin ducks) and they raised either in high or low altitude (high altitude which was between 500 and 1000m vs low altitude which was below 500m). All ducks were given one of two different diets and provided water ad libitum. The diets were: 1) commercial diet, and 2) local diet. There were three replicates per treatment and there were 5 ducks per replication. At 34 days of age, all ducks were processed on the same day. Ducks from each strain were standardized to a similar weight. The results show that Pekin ducks carcass performance were significantly better than Muscovy ducks. Ducks given diet 2 had significantly ($P < 0.001$) lower carcass percentage than those given diet 1. Pekin ducks had greater genetic potential for carcass performance in high altitude environment. However, abdominal fat percentage in Pekin ducks is significantly ($P < 0.01$) higher than abdominal fat percentage in Muscovy ducks. **(1507)**

The Utilization of Endopower B in Commercial Feed Which Contains Palm Kernel Cake on Performance of Broiler Chicken

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Abstract. Palm kernel cake is an agricultural waste that can be used as raw material in the preparation of poultry rations. The design used was Completely Randomized Design (RAL) with 5 treatments and 4 replications. Level endopower β used 0 % (R0), 0.02% (R1), 0.04% (R2) and 0.06% (R3). The results showed that R0a and R0b were significantly different from R3 in terms of diet consumption, body weight gain and the conversion ratio. The utilization of β endopower in commercial rations containing palm kernel cake in broilers can increase body weight gain, feed consumption, improve feed use efficiency and even energy. It is concluded that utilization endopower β improve performances of broiler chicken fed by diet containing palm kernel cake. **(1509)**

The Potential and Biological Test on Cloned Cassava Crop Remaining on Local sheep

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Abstract This research aims at knowing the potential of cloned cassava crop remaining dry matter and the impact of the feeding of the cloned cassava crop remaining based complete feed on the consumption, the body weight gain, and the feed conversion of the local male sheep with the average of initial body weight of 7.75 ± 1.75 kg. The design applied in the first stage research was random sampling method with two frames of tile and the second stage research applied Completely Randomized Design (CRD) with three (3) treatments and four (4) replicates. These treatments consisted of P1 (100% grass); P2 (50% grass, 50% complete feed pellet); P3 (100% complete feed from the raw material of cloned cassava crop remaining). Statistical tests showed that the feeding of complete feed whose raw material was from cloned cassava crop remaining gave a highly significant impact on decreasing feed consumption, increasing body weight, lowering feed conversion, and increasing crude protein digestibility. The conclusion is that the cloned cassava crop remaining can be used as complete sheep feed to replace green grass and can give the best result. (1511)

Effectiveness Duckweed (*Lemna Minor*) as An Alternative Native Chicken Feednative Chicken (*Gallus Domesticus*)

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Abstract. This study aims to know the effectiveness duckweed as feed as native chicken (*Gallus domesticus*) during growth (weight gain, feed intake and feed conversion). This research was conducted in Desa Telaga Jernih Kabupaten Langkat. The study was conducted in February 2017 until May 2017. This study uses a completely randomized design (CRD) with 4 treatments and 5 Replication, where each treatment consisting of 5 Native chickens unsexing. The treatment was used P0 = control (feed manufacturing), P1 = ration conventional with 10% duckweed, P2 = ration conventional with 20% duckweed, P3 = ration conventional with 30% duckweed. The parameters observed were weight gain, feed consumption and feed conversion. The results showed significantly effect in body weight gain, feed consumption and feed conversion ($P \geq 0.05$). Where the average of best weight gain on treatment P0 (control), P2 (20% duckweed), P3 (30% duckweed) and P1 (10% duckweed), average of best ration consumption in P0 (control), P2 (20% duckweed) Of P1 (10% duckweed) and P3 (30% duckweed), P1 (10% duckweed) and P3 (30% duckweed), average of best ration conversion rate in P0 (control), P2 (20% duckweed) P1 (10% duckweed) and P3 (30% duckweed). **(1666)**

Improved Quality of Frozen Boer Goat Semen with The Addition of Sweet Orange Essential Oil on Tris Yolk And Gentamicin Extender

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Abstract. This research aimed to determine the extent of frozen semen quality Boer Goat by essential oils of sweet orange peel in tris yolk and gentamicin extender. Research has been conducted at the Laboratory LokaPenelitianKambingPotongSeiPutih, Deli Serdang, North Sumatra in February 2017. This study used a completely randomized design with 4 treatments and 5 replications. Treatments are 0.25; 0.5; 0.75 and 1% essential oils as additional diluent. The parameters were measured percentage Motility, membrane integrity, acrosome integrity and viability Boer Goat frozen semen. The results showed that the addition of essential oils as diluent semen was significant ($P < 0.01$) in the percentage motility, Viability, membrane integrity and acrosome integrity Boer Goat frozen semen. Motility, membrane integrity, acrosome integrity and viability was significantly higher in all treated groups than the control group. The best results of all treatments In the study was the addition of essential oil as much as 1%. **(1684)**

Potential Reproduction and Response of Selenium And Zinc Mineral Supplementation on Quality of Goat Samosir Semen

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Abstract. The present study was conducted to investigate the effect of supplementation of selenium and zinc on semen quality and growth of Samosir goat. The experimental design used was latin square design (4x4). The mineral supplementation treatment on multi nutrient block (MNB) were without supplementation (p0), +10ppm selenium (p1), +10ppm zinc (p2), +10ppm selenium and +10ppm zinc (p3). The results showed that mineral supplementation consisting selenium and zinc increased average daily growth and feed consumption significantly ($p < 0.05$), however, the supplement lowered the feed conversion ratio. Semen quality of goat were supplemented by selenium and zinc influenced motility, viability, volume concentration, and responding hypo osmotic swelling (HOS). Combination supplementation selenium and zinc significantly had higher semen quality than other treatment. It is concluded that supplementation selenium and zinc improve growth and semen quality of samosir goat. (3004)

Nutrition Quality Test of Fermented Waste Vegetables by Local Microorganisms Bioactivator (Mol) and Effective Microorganism (EM4)

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Abstract. Livestock feed mostly used waste which has low nutrition content and one way to improve feed content by fermentation. The objective of this study was to evaluate the effect of bioactivator types on fermented vegetables waste for animal feed. The research was conducted in Nutrition and Animal Feed Laboratory, Universitas Sumatera Utara from May until July 2016. The research was factorial completely randomized design of 3 x 3 with 3 replications. Factor I were bioactivator types which were control, local bioactivator and EM4 (Effective Microorganisms 4). Factor II were time of incubation 3, 5 and 7 days. Parameters were moisture content, ash, Nitrogen Free Extract (NFE) and Total Digestible Nutrient (TDN). The results showed that bioactivator types either local activator or EM4 has highly significantly different effect ($P < 0,01$) on water content, NFE and TDN on vegetables waste while there was no different between local bioactivator with EM4 on all parameters. Time of incubation 7 days has highly significantly different effect ($P < 0,01$) on NFE, TDN and significant different ($P < 0,05$) on water content and ash. In conclusion local bioactivators could improve animal feed by fermenting vegetables waste and it is more available for livestock. (3015)

Financial Analysis of Biogas Utilization : Input Cattle, Pig Feces And Coffee Waste in Karo, Indonesia

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Abstract. The community's need for renewable energy was very urgent. In addition, efforts to preserve the environment from waste caused biogas technology feasible to apply. This study aims to provide biogas technology with minimal cost and utilize agricultural waste that were coffee and livestock waste. The study was conducted from July to October 2016. The theoretical and empirical methods used in this study were included data from officials resources, field survey on 16 biogas locations, focus group discussion and interview with stake holders. Data were tabulated by Excel Program which then were analysed by SAS. Parameters were included Production Cost, Production Result, Profit Loss Analysis, Revenue Cost Ratio (R/C Ratio), Return On Investment (ROI), Net B/C, and IRR. The result of this research showed that the application of bioplastic gas with cow dung and coffee waste as bioplasticgas input cause the best results. **(1618)**

The Utilization of Coconut Waste Fermentated By *Aspergillus niger* and Tape Yeast on Meat Quality of Weaning Males Rex Rabbit

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Abstract. Coconut waste (CW) could be applied for animal feed while its nutrition quality were low. This study aims to investigate fermented CW effect on meat quality of Rex rabbit which feed by fermented CW either by *Aspergillus niger* or Tape Yeast. This research was conducted in rabbit farm Brastagi, using 24 male Rex rabbits with initial weight 1012 ± 126.67 gram in July-October 2016. The design used was complete randomized design : 6 treatment 4 replications. Treatment were T1 (unfermented 10%); T2 (unfermented 20%); T3 (a.niger fermentation 10%); T4 (a niger fermentation 20%); T5 (tape yeast fermentation 10%) and T6 (tape yeast fermentation 20%). The parameters were pH, meat texture either raw or cooked, water content, fat content, protein content of meat and cooking loss. The results showed that the effect of treatment was not significantly different ($P > 0.05$) on pH and raw meat texture, but significantly different ($P < 0.05$) on the texture of meat cooked and meat fat content and very significantly different effect ($P > 0,01$) on cooking loss, water content and protein content of meat. The conclusion of this research was that the utilization of fermented CW by *Aspergillus niger* and Tape Yeast improved the quality of Rex rabbit meat. (1619)

Genetic Distance Estimation and Variable Factors Distinguishing Among Kacang, Muara and Samosir Goats

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Abstract. The purpose of this research was to look on the genetic distance and factors distinguishing variabel between types of goats in North Sumatera, Indonesia. This research have been conducted in PayaBakung, Hamparan Perak and Klambir Lima village, Deli Serdang district, BatuBinumbun, Aritonang, HutaGinjang village, Muara subdistrict, North Tapanuli district and Parbaba Dolok, Siopat Sosor, Sinabulan village, Ronggur Nihuta Pangururan village, Sitonggi-tonggi village in the subdistrict Ronggur Nihuta, Samosir district of the month of July 2016. The data was analyzed using Descriptive, Discriminants, Canonical, Principal Component Analysis, Distance genetic and Tree Phylogenetic. The result showed that the nearest genetic distance goat found in Kacang and Samosir (1.973), and the farthest genetic distnace find in Samosir and Muara (8.671). The variables made it difference was goat race Base Rim Horn (0.856) and Long Horn (0.878). Genetic distance values most far between Muara goat with Samosir goat was (8.671). The conclusion that the crossing superior result, must be cross between two goat types with value genetics most distance. It will have a better chance heterosis in cross result. **(1652)**

Anylisis of botanical composition and nutrient content on natural pastures in Samosir island of Samosir regency

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Abstract. Samosir regency is one of the areas that have large grazing area. The potential of grazing production in the area plays an important role for the development of livestock, especially on ruminant livestock. The study aims to know the botanical composition and the nutritional content of forage on natural pasture at the Samosir Island. Animal feed assessment method on natural pastures in Samosir regency includes the determination of research location points based on the altitude through the survey method. Location of the study amounted to 15 locations. The results showed that at an altitude of 905–1200 meters above sea level had a botanical composition were 31 species with ratio 80.58 % grass, 9.14 % legume and 9.63 % weeds and is the most dominant forage *Imperata cylindrica* L, and the botanical composition at an altitude of more than 1205 meters above sea level is 15 species with ratio 92.72 % grass, 2.87 % legume and 4.39 % weeds and the most dominant forage is *Axonopus compressus*. The forage which has the highest crude protein is *Starkuak* 15.13 %. The conclusion of this study is the altitude in pastures give effect on the botanical composition of forages. **(1741/3018)**

The Effect of Feeding Bull Bali Cattle Kept in Extensive Husbandry System with Concentrates Contained *Gliricidia Sepium* Leaf Meal and Banana Starch Tuber Meal on Their Feed Consumption and Dried Organic Matter Digestibility

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Abstract. This study aimed to evaluate the effect of feeding bull Bali Cattle kept in extensive husbandry system with concentrates contained *gliricidia sepium* leaf meal and banana starch tuber meal in their feed consumptions and dried organic matter digestibility. Three bull Bali cattle aged 1 – 2 years old with an initial body weight of 135.5 kg – 168 kg were used in this study. The three treatments used were T₀ = local feeds (consisted of *Leucaena leucocephala*, *Acacia leochophloea*, and *Ficus sp.* leaves as commonly used by local farmers); T₁ = T₀ + 1 kg concentrate (contained banana starch tuber meal + *gliricidia sepium* leaf meal); T₂ = T₁ + 2 kg concentrate (contained banana starch tuber meal + *gliricidia sepium* leaf meal). The results showed that the dry matter intake were: 2.40, 3.52, and 4.14; organic matter intake were: 2.17, 3.32, and 3.62; dry matter digestible was 64.63%, 72.45%, 77.28% and organic matter digestible was 66.79%, 74.66%, 79.33% for T₀, T₁, and T₂, respectively. There was no effect (P>0.05) of treatments on the three parameters observed on bull Bali cattle kept in extensive husbandry system and fed with concentrates contained leaf *gliricidia sepium* meal and banana starch tuber meal. (1624)

Effects of Wheat Leaf Noni (*Morinda Citrifolia*) on Carcass and Production Quail Eggs (*Coturnix Coturnix Javonica*) in The Differentlevel Concentrate

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Abstract. This study aimed to determine the effect of leaf meal noni (*Morinda citrifolia*) at different levels in the ration of the carcass quail (*Coturnix Coturnix Javonica*) and quail egg production. Implemented September - October 2015 in the stable, a variety of farm Mix Farming Experience (MFE) Padangsidempuan for 6 weeks. The design used was completely randomized design (CRD). In the study sample used was quail aged 3 days DOQ (Day Old Quail) of 120 males. The treatments were attempted is A0 (feed without the addition of flour noni leaf 0%), A1 (ration with the addition of flour noni leaf as much as 3%), A2 (ration with the addition of flour noni leaf as much as 6%), and A3 (ration with the addition of leaf meal noni as much as 9%). Parameters measured were carcass weight, carcass percentage, abdominal fat (%), egg production was calculated based on the hen day, egg weight and feed conversion and Income Over Feed Cost (IOFC). Results of analysis of variance showed that 73.33 g A0, A1 78.33 grams, 71.67 grams A2, and A3 72.50 gr, provides no real effect on carcass weight of quail. Treatment 65.71% A0, A1 60.23%, 65.02% A2, and A3 62.98%, giving the effect was not significant on carcass percentage quail. Results were significantly different in the treatment of 0.84% A0, A1 0.73%, 1.36% A2 and A3 0.74% against abdominal fat. Treatment of 9.46% A0, A1 6.92%, 8.38% and A3 5.40% showed results significantly different to the weight of quail eggs. Treatment A0 145 gr, 155 gr A1, A2 151.67 grams and 147.5 grams A3 shows the results significantly different to the weight of the mother quail when first laying. The results of feed conversion analysis to egg production showed significantly different in the treatment A0=11.26, A1=14.89, A2=12.34 dan A3=17.59. Value Analysis IOFC Rp.112,473.53 A0, -, A1 Rp 122,424.80, -, A2 Rp 21,713.99, -, and A3 range Rp 110,341.11. The conclusion that the administration of noni leaf meal in the ration significantly different to the carcass and quail egg production. (3006)

Income Analysis of Goat Farmerson The Farmers Group in District of Serdang Bedagai

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Abstract. The farmers group are expected to reduce the production cost of goat breeding and improve the income of farmers which impact on the welfare of goat farmers. This research aim to analyze the factors that influence the income of farmers group, in sub-district Dolok Masihul Pegajahan, and Dolok Merawan, Serdang Bedagai. The method used is survey method with 90 respondents. Data was analysed by multiple linear regression. The result showed, simultaneously goat cost, sale price of goat, fixed cost and variable cost had significant effect on income of goat farmers. Partially, goat cost and sale price of goat had significant effect on income of goat farmers, while fixed cost and variable cost had no significant effect. **(1510)**

In Vitro Digestibility of Oil Palm Frond Treated by Local Microorganism (MOL)

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Abstract. This research aims to examine the ability of local microorganisms and buffalo rumen isolates in improving the digestibility of dry matter and digestibility of organic matter in vitro of oil palm barks. The research used experimental method with four treatments and three replications. The treatments were given: Oil palms without treatment (P0); Use of Starbio (P2); *Aspergillus niger* + *Saccharomyces cerevisiae* (P3); *Aspergillus niger* + *Saccharomyces cerevisiae* + Isolate of buffalo rumen bacteria (P4). The results showed that the fermented Oil Palm Frond using *Aspergillus niger* and *Saccharomyces cerevisiae* had higher DMD and OMD than fermentation without 46.01% and 65.10%. However, fermentation with the addition of *Aspergillus niger* and *Saccharomyces cerevisiae* plus buffalo rumen bacterial isolates had higher DMD and OMD than other treatments. It can be concluded that the utilisation of MOL can improve the digestibility of oil palm frond in vitro. **(3027)**

The Impact of Sharing Arrangement Institution On Beef Cattle Breeding Performance in Kupang District, East Nusa Tenggara Province, Indonesia

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Abstract. The aim of this study was to analyse the impact of sharing arrangement systems to performance of beef cattle breeding. This research was conducted in Kupang Regency – East Nusa Tenggara Province. The study used multi stage cluster random sampling method to determine the sample area and respondents. The sample areas consisted of 2 sub-districts and 6 villages, while the total respondents were 117 people comprised 74 Participant Farmers (PF) of sharing arrangement systems (SAS) and 43 non-participant farmers (NPF). 23 investors were selected for the survey. The result of the study indicated that the performance of NPF in terms of revenue, net profit, and return on investment (ROI) was better than PF respondents. The value of ROI was between 16.69 to 32.23 percent, this indicated that utilization of farm asset was not optimum yet. It was found that Farm efficiency was 1.73 which indicated that SAS does not increase farm productivity. **(1631)**

Response of Forages by Administration of Fermented Goat Urine

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Abstract. Urine goat fermentend can be used as organic fertilizers element hara on the ground For the agricultural crops and forage. Theof this study todetermine dosage of fermented goat urine onnumber of tillers,plant heightproduction of fresh dry matter,content of Phosphor and potassium on different forages (Pennisetum purpureum schumach), (Setaria sphacelata)and (Brachiaria brizantha). Experimental design usedfactorial with two factors, the first factor wasdose of fermented goat urine (liters /ha) composed of $P_0 = 0/ha$, $P_1 = 10/ha$, $P_2 = 15/ha$ and $P_3 = 20/ha$ and the second factor was forages composed of R_1 Pennisetum purpureum schumach, R_2 Setaria sphacelataand R_3 Brachiaria brizanta. The results showed that dosage of fermented goat urine and species of forage and interaction had significant effect ($P < 0.05$) on number of tillers, plant height, fresh and dry weight production, phosphorus and potassium of plant.Increasing dosage dosage fermented goat urine.Increase plantheight, fresh weight, dry weight production while, growth of Pennisetum purpureum schumach was higher than Brachiaria brizantha and Setaria sphacelata. The optimum dosage fermented goat urine on Pennisetum purpureum schumach was 20 liters /ha while on Brachiaria brizantha and Setaria sphacelata was 15 liters/ha. It is concluded that usage increase growth of forages and the best combination show on Pennisetum purpureum schumach with dosage at 20 liters /ha. **(1368)**

Factors Affecting the Whole Beef Prices in Eight Provinces in Sumatera

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Abstract. A survey has been conducted to study the fluctuation of whole beef prices in eight provinces in Sumatera, namely Lampung, South Sumatera, Jambi, Bengkulu, West Sumatera, Riau, North Sumatera, and NAD with the average cattle weight were 486kg, 492kg, 448kg, 464kg, 500kg, 480kg, 500kg, and 480kg, respectively. Their average prices and total price in these cities were Rp.4,1000 & Rp.19,926,000; Rp.41,500 & Rp.20,418,000; Rp.43,000 & 19,264,000; Rp.42,500 & Rp.19,720,000; Rp.43,000 & Rp.21,500,000; Rp.43,000 & Rp.20,640,000; Rp.42,500 & Rp.21,250,000; Rp.44,000 & Rp.21,120,000, respectively. People West Sumatera, Riau and North Sumatra provinces prefer the final results of processed byproducts of beef which caused the high price of processed byproducts from cattle. Whereas, in NAD province, the meat selling price is very high compared to other provinces, while the selling price of processed beef by-products is much cheaper than the people outside NAD province, so the selling price of processed beef by-product can not help to reduce the selling price of meat in the area. Average carcass in eight provinces in Sumatera ranged from 49.00% (North Sumatera) – 51.00% (Jambi). In conclusion, among the eighth provinces, the price of beef in Aceh is more expensive than other provinces not only in Sumatera, but also other provinces in Indonesia. (1477)

Molecular Performance of Commercial MTG Variety Oil Palm Based on RAPD Markers

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Abstract. The oil palm, an economically important tree in Indonesia, has been one of the world's major sources of edible oil and a significant precursor of biodiesel fuel. This research is conducted by taking individual tree sample of commercial MTG variety germplasm oil palm one years old. The purpose of this research is to molecular performance analysis of some oil palm MTG variety based on RAPD markers. In this experiment, the DNA profile diversity was assessed using markers of oil palm's random RAPD markers (OPD-20, SB-19, OPM-01 and OPO-11). A total of 15 trees commercial MTG oil palm variety were used for analysis. The results of the experiment indicated out of 4 RAPD markers (OPD-20, SB-19, OPM-01 and OPO-11) showed polymorphic of PCR product. These preliminary results demonstrated RAPD marker can be used to evaluate genetic relatedness among trees of commercial MTG variety oil palm and detecting either genetic variants or mislabelled. **(3038)**

Application of Some Rice Varieties and Fertilizing NPK Against Increased Production

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Abstract. This research was conducted at Balai Benih Induk Padi Murni / Pure Rice Millen Seed Center, Tanjung Morawa, Deli Serdang Regency, North Sumatera Province in year 2015. Aiming to get high yielding adaptive rice varieties and appropriate NPK fertilization doses. This study used a Randomized Block Design with two treatment factors and three replications / blocks. The first factor treatment was varieties consisting of Ciherang, Mekongga and Inpari 4 varieties. The second factor treatment was NPK fertilization with four fertilizer doses : 0 kg / ha, 100 kg / ha, 200 kg / ha, 300 kg / ha and 400 kg / ha. The results showed the highest yielding varieties among the three varieties tested were inpari 4 varieties (5.8 tons / ha) and Ciherang (5.7 tons / ha) with the number of panicles per plant of 10.69 and 10.87 panicles respectively. While the NPK fertilization response from the three varieties tested against the various doses applied relatively same to the level of production obtained is ranging from 5.6 to 5.9 tons / ha. **(3039)**