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INDONESIAN AGRICULTURAL RESEARCH ABSTRACTS

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PREFACE

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E10 AGRICULTURAL ECONOMICS AND POLICIES

001 RUSDIANA, S.

Profile and profitability of dairy farming in Jelok Village, Cepogo District, Boyolali Regency [Indonesia]. *Profil dan profitabilitas usaha sapi perah di Desa Jelok, Kecamatan Cepogo Kabupaten Boyolali* / Rusdiana, S.; Praharani, L. (Pusat Penelitian dan Pengembangan Peternakan, Bogor (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 295-303, 6 tables; 11 ref. 338.43:316.343/SEM/p

DAIRY CATTLE; DAIRY FARMS; ECONOMIC ANALYSIS; LABOUR ALLOCATION; PROFITABILITY; FARM INCOME; AGROINDUSTRIAL SECTOR; JAVA.

The objectives of this study are to identify the profile and analysis feasibility of dairy farming in Jelok Village, Cepogo Subdistrict, Boyolali District and its eligibility analysis, as an effort to improve farmer's income. Primary data were collected through a survey using questionnaire and interviewing 40 respondents. The results showed that Jelok Village has the potency to be developed as a dairy farming centre. Age, education and experience in farming do not affected cattle ownership, but labor allocation does significantly affect ownership scale. The dairy farming net benefit is Rp 10,770,000/year of Rp 897,500/month with B/C ratio 1.5. The B/C ratio indicated that the dairy farming is feasible financially.

002 SOETRIONO

Strategy of competitiveness improvement on Robusta coffee bean agribusiness using competitiveness Tree-Five model. *Strategi peningkatan daya saing agribisnis kopi Robusta dengan model daya saing Tree Five* / Soetrio (Universitas Jember (Indonesia). Program Studi Agribisnis Pasca Sarjana). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 91-108, 4 ill., 3 tables; 11 ref. Appendices. 338.43:316.343/SEM/p

COFFEA CANEPHORA; AGRICULTURAL PRODUCTS; ECONOMIC COMPETITION; MARKET SEGMENTATION; PRODUCTION FUNCTIONS; DEMAND; AGROINDUSTRIAL SECTOR; GOVERNMENT; POLICIES.

The research aimed to study, to predict, and to formulate the competitive ability of Robusta coffee to overcome problems related to various gaps in production, input-output, demand, agro-industry, and government policies. The samples of research were taken from East Java Province (Malang and Jember District) and Lampung Province (Tanggamus District). The methods of data analysis used were risk analysis, policy analysis matrix (PAM), Tree Five Competitiveness, and policy simulation. The results showed that from the side of supply, the production of Robusta coffee bean should consider some factors, such as number of coffee bean production in Indonesia, the price of fertilizer in the country and protective government policy that were less support to the competitiveness acceleration. From the demand perspective, there was a significant opportunity in coffee postharvest processing (i.e. coffee powder) demand in the domestic and world market; while from the environment and farming business perspective, it was considered as monoculture and has not yet applied suggested

technical culture, the awareness of smallholders about genuine seed variety was low, most of coffee tree was very old/damage and infected by plant diseases. Also, coffee commodity was just processed in the primary level (i.e. dry coffee bean) meanwhile downstream product processing has not yet been conducted significantly. From the policy perspective, it was concluded that the government support in the domestic policy was lacking (shown by the coefficient of DRC was better than PCR, the coefficient of NPCO and SRP was not supporting the competitiveness acceleration if they were compared to the world price). However, the coefficient of NPCI of the government policy has contributed a significant support for the competitiveness acceleration, from the social perspective, it was shown that the smallholders was dominantly risk neutral or safety first.

E11 LAND ECONOMICS AND POLICIES

003 SUHARTA, N.

Characteristics and problems of marginal soils from acid sedimentary rocks in Kalimantan [Indonesia]. *Karakteristik dan permasalahan tanah marginal dari batuan sedimen masam di Kalimantan* / Suharta, N. (Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian, Bogor (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(4) p. 139-146, 2 ill., 7 tables; 34 ref.

KALIMANTAN; LAND SUITABILITY; MARGINAL LAND; SEDIMENT; SOIL PARENT MATERIALS; ACID SOILS; SOIL CHEMICOPHYSICAL PROPERTIES; CATIONS; ION EXCHANGE CAPACITY; SOIL IMPROVEMENT.

Marginal or suboptimal soils are potential for agricultural development such as food crops, estate crops, and industrial planted forest. These soils have low fertility status and susceptible to erosion. In Kalimantan, the marginal soils cover about 30.15 million ha or 57.22% of the total island area, with the major soils consist of Ultisols, few Oxisols, and Inceptisols. The physical properties of marginal soils from acid sedimentary rock are mostly influenced by the type of parent materials (sandstone or claystone). Meanwhile, the chemical properties showed the similar characteristics indicating acid soil reaction, vary in organic matter, and low in cation exchange capacity, exchangeable bases, base saturation, mineral reserve, as well as P and K potentials, but the Al saturation is high. Agricultural development on these soils, other than the physical and chemical properties, should consider the relief condition. The areas with flat to undulating relief are recommended for annual or food crops, while the perennial or estate crops and industrial planted forest can be developed until the hilly area. Land management such as fertilization to improve nutrient status, liming to increase soil reaction and to decrease Al reactivity, and soil conservation practice were recommended. In this time, most of the marginal soils were utilized for estate crops development, such as oil palm, rubber, pepper, and industrial planted forest, and only a limited area for food crops.

004 SUPRIYO, A.

Identification of land resources for rice development in tidal swamp: case study in Bapeang Village, East Kotawaringin District, Central Kalimantan Province [Indonesia]. *Identifikasi potensi sumber daya lahan dan arahan pengembangan pertanian tanaman padi di lahan pasang surut: studi kasus Desa Bapeang, Kabupaten Kotawaringin Timur, Kalimantan Tengah* / Supriyo, A.; Hatmoko, D. (Balai Penelitian Pertanian Lahan Rawa, Banjarbaru (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. *Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan*

pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 777-794, 6 ill., 7 tables; 9 ref.

ORYZA SATIVA; LAND EVALUATION; LAND RESOURCES; LAND SUITABILITY; LAND MANAGEMENT; LAND USE; WATER MANAGEMENT; SOIL CHEMICOPHYSICAL PROPERTIES; AGRICULTURAL DEVELOPMENT; KALIMANTAN.

Quick assessment study was conducted at tidal swamp area of Kotawaringin Timur, Central Kalimantan. The research covered compilation of land unit map, field study, soil analysis, data processing, and reporting. Compilation of land unit based on land typology and overflowing type. Research in the field included observation of soil, land and ground area, aquatic resources, and soil fertility. Field study was mainly on determining recommendation on the land use and the technology in rice cropping. Result of research indicated that (a) Bapeang Village included to agroecosystem area of tidal swamps with alluvial and peat soil groups. Its formation was affected by Mentaya River; (b) Most soils had low drainage, clay texture, and acid reaction. Soil typologies consisted of potential-1 (P1), potential-2 (P2), actual acid sulphate, shallow peat, medium peat, and deep peats. Type of the overflow were classified in B,C and D types; (c) Existing land use consisted of irrigated rice, upland rice, shrubs and shrubs forest. Planting pattern were rice-fallow in lowland and rice-food crops in upland; (d) Land use in Bapeang Village for agriculture composed with a width 6,388 ha was consisted of irrigated land (PS-1) with 708.75 ha for irrigated rice, irrigated land-2 (PS-2) with 35.90 ha for rice, maize, long bean, annual crops (AC-1) with 1,044 ha for rice, maize, long bean and cassava, perennial crops (PC) with 1,890 ha for rubber and coffee crops, and conservation area (CA) with 2,710 ha; (e) The main problem of land resources to rice development in Bapeang area were unfunctional of micro water management levels, acid soil and ferro toxicity, (f) management of land and water resources technology was conducted the micro water management levels based on overflow types and land typology. On the overflow type B area oneway flow system and "surjan system" land management was applied. On overflow type C/D areas with application of "tabat system" in tertiary canals, rain water usage and conservation of forest water was applied. Rice cultivation employing twice planting date in a year or rice food crops cropping pattern depended on availability of water supply.

E14 DEVELOPMENT ECONOMICS AND POLICIES

005 ARSANA, I G.K.D.

Transformation of rice technology innovation under ecofarming at Subak ecosystem in Bali [Indonesia]. *Transformasi inovasi teknologi tanaman padi dengan pendekatan ekofarming pada ekosistem Subak di Bali* / Arsana, I G.K.D.; Wiguna, I W.A.A. (Balai Pengkajian Teknologi Pertanian Bali, Denpasar (Indonesia)); Sembiring, H. [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdurachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 427-442, 1 ill., 7 tables; 10 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; INNOVATION; ALTERNATIVE AGRICULTURE; INTENSIFICATION; ORGANIC AGRICULTURE; IRRIGATION SYSTEMS;

INDIGENOUS KNOWLEDGE; VARIETY TRIALS; PRODUCTIVITY; TECHNOLOGY TRANSFER; FARM INCOME; BALI.

An experiment to evaluate the effect of modified System of Rice Intensification (SRI) and Good Agricultural Practice (GAP) on rice yields was carried out at Subak Wangaya Betan, Mengesta, Tabanan, Bali during January - December 2008. Results of the experiment were (1) Rice productivity of the paddy field at Subak Wangaya Betan was increased from 5.45 to 6.26 t/ha and from 5.60 to 7.10 t/ha for Mansur and Ciherang varieties, respectively, and (2) Rice grains produced by the farmers at Subak Wangaya Betan has been free from pesticide residues especially from the organochlorine groups such as α BHC, β BHC, γ BHC, δ BHC, DDD, DDE, DDT, aldrine, dieldrine, endrine, endrine aldehyde, endosulfan-1, endosulfan-2, endosulfan sulphate, hepta chlor, hepta chlor exposide, chlordane, and methoxy chlor. Impacts of the experiment were (1) increase of livestock, as the farmers need more basic materials for organic fertilizer, (2) the utilization of rice straw to feed cattle, (3) more balanced rice field ecosystem, as indicated by the increasing population of molusca, eel, etc. observed in the paddy field; and (4) the increase of job opportunities, as the new activities such as the processing of organic fertilizer, feeding the cattle, etc.

006 ASSAD, M.

Performance of technology innovations and agricultural institution on rice and maize cultivation in Sidrap District of South Sulawesi Province [Indonesia]. *Keragaan inovasi teknologi dan kelembagaan usaha tani padi dan jagung pada Prima Tani Kabupaten Sidrap, Sulawesi Selatan* / Assad, M.; Warda (Balai Pengkajian Teknologi Pertanian Sulawesi Selatan, Makassar (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 943-956, 8 tables; 8 ref. 633.18-15.2/SEM/p bk2

RICE; MAIZE; INNOVATION; FARMING SYSTEMS; FARMERS ASSOCIATIONS; EXTENSION ACTIVITIES; TRAINING PROGRAMMES; TECHNOLOGY TRANSFER; INTEGRATED PLANT PRODUCTION; AGROINDUSTRIAL SECTOR; SULAWESI.

Prima Tani is one of efforts to introduce and socialize agricultural innovation to users to accelerate technology adoption in the farmer level. The activity was conducted in Bila Village, Dua Pitue Subdistrict, Sidrap District with semi-intensive rice field agroecosystem. The activity was done by involving nine farmer groups. The main commodity in that area was rice. The activity was done in 2008 including implementation of rice and maize production technologies, development of farmer group, empowerment of farmer group capital and clinic agribusiness empowerment. Results of the activity were the existent of empowered farmer group association (*Gapoktan*), and farmer and extension trainings. The farmer capital through seed capital had increased Rp 14.2 millions and agribusiness clinic had functioned well as information and consultation sources. The yield of rice with integrated crop management (ICM) at demonstration plot increased by 5.8 t/ha in planting season of 2007/08, several farmers that implemented ICM at agribusiness laboratory obtained yield at about 7.7-9.6 t/ha, and during the rainy season of 2008 was 6.8-8.6 t/ha. The rice planted were *Inpari*, *Ciliwung*, *Cigeulis*, and *Aek Sibundong* with planting system of *tabela legowo* (1:3 and 1:4). The maize yield at demonstration plot during the planting season of 2008 ranged from 7.2-8.32 t/ha. It was observed that Prima Tani resulted in an interesting impact particularly to technology adoption and institutional innovation that indicated by the implementation of several rice technologies by the farmers outside the demonstration plot. Especially on Sabbarae Farmers Group who was about 31% of farmer

members had implemented some ICM technologies. The technology components adopted by farmers outside the agribusiness laboratory were new varieties and planting system of legowo. The Inpari variety was planted in 10 villages, covering a total area of 375 ha, while Aek Sibundong variety was planted in 2 villages, covering a total area of 4 ha. Legowo 3:1 and 4:1 using "atabela" was also has been adopted in other villages.

007 JUMAKIR

Rice cropping on semi-intensive lowland of Jambi Province in Tanjung Jabung Barat District [Indonesia]. *Ketersediaan teknologi dan peluang peningkatan produksi padi IP 300 di lahan sawah semi-intensif Kecamatan Batang Asam, Kabupaten Tanjung Jabung Barat, Jambi* / Jumakir; Bobihoe, J. (Balai Pengkajian Teknologi Pertanian Jambi (Indonesia)) [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 451-465, 1 ill., 5 tables; 31 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; INNOVATION; TECHNOLOGY; HIGH YIELDING VARIETIES; PRODUCTION INCREASE; TILLAGE; CROPPING SYSTEMS; WATER MANAGEMENT; ORGANIC FERTILIZERS; INTEGRATED CONTROL; IRRIGATED LAND.

Increasing rice production on semi-intensive lowland can be supported by the availability of natural resources, human resources, and the suitability of agroecosystem. Technology innovations that support rice production include soil tillage, new superior rice varieties, legowo planting system, young seedling, water management, pest and disease control, as well as harvest and postharvest technology. The opportunity to increase rice production could be done by practicing IP 300 and using fallow period with soybean planting with rice-soybean pattern. In this area soybean planting was only on 20-40% of the area, and 60-80% of the area could be planted with rice (IP 300). In addition, to support the implementation of rice IP 300 technologies, farm input and coordination among coordination are required.

008 PRIHTANTI, T.M.

Fruit crops potency as promotor of Merapi-Merbabu agropolitan area development at Magelang Regency [Indonesia]. *Potensi tanaman buah sebagai pendukung pengembangan kawasan agropolitan Merapi-Merbabu Kabupaten Magelang* / Prihtanti, T.M. (Universitas Kristen Satya Wacana, Salatiga (Indonesia). Fakultas Pertanian) [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 205-216, 4 tables; 9 ref. Appendix. 634.1/.7(594)/SEM/p

FRUIT CROPS; AGRICULTURAL PRODUCTS; DEVELOPMENT POLICIES; FARMING SYSTEMS; PRODUCTION POSSIBILITIES; AGROINDUSTRIAL SECTOR; RURAL AREAS; JAVA

Agropolitan area development based on vegetable commodities in Magelang Regency should be support by the development of others agricultural commodities, to integrate development. This research was mapping priority commodities in agropolitan district (8

districts ('kecamatan') and the regional development plan. Based upon LQ indicator of commodity and production trend, 5 priority commodity of 'agropolitan' District were chosen: avocado, sapodilla, banana, salacca (snake fruit), and water melon. According to LQ analysis and productivity gap of those primary commodities, Dukun, Sawangan, Tegalrejo, and Grabag were chosen as avocado development area, while Tegalrejo district was chosen as sapodilla development area. Candimulyo, Tegalrejo, Pakis, Ngablak, and Grabag were chosen as banana development area and Srumbung District was chosen as water melon development area. Determination of those commodities considers natural resources, physical infrastructures, institution, and conservation aspect as well synchronization with agricultural development program.

E16 PRODUCTION ECONOMICS

009 HARYATI, Y.

Rice production improvement through the newly released rice variety, Mekongga. *Peningkatan produksi padi melalui varietas unggul baru Mekongga* / Haryati, Y.; Nurawan, A. (Balai Pengkajian Teknologi Pertanian Jawa Barat, Lembang (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 675-682, 2 ill., 6 ref. 633.18-115.2/SEM/i bk2

ORYZA SATIVA; HIGH YIELDING VARIETIES; CULTURAL METHODS; PRODUCTION INCREASE; DISEASE RESISTANCE; FARMERS; PARTICIPATION; INTRODUCED VARIETIES; CONSUMER BEHAVIOUR.

Result of rice varieties demonstration plot, concluded that the most farmer favor was the variety of Mekongga, due to its high yield and good eating quality. Farmers were also become more confident that rice cultivation was also able to provide profit for their daily need. During the rainy season of 2007/08, Mekongga was planted by most farmer at Cirebon District through the integrated crop management model in 22.5 ha area. Other rice varieties planted were Ciherang and Cigeulis. Results indicated that Mekongga variety yielded 5.67 t/ha, Ciherang 4.94 t/ha, and Cigeulis 4.29 t/ha milled dry grain. A total of 56.25% of farmers preferred Mekongga, 42.50% Ciherang, and 1.25% Cigeulis.

E20 ORGANIZATION, ADMINISTRATION AND MANAGEMENT OF AGRICULTURAL ENTERPRISES OR FARMS

010 BURHANSYAH, R.

Perfomance of rice farming and farmer's welfare indicators in rice production center of Kubu Raya Regency [Indonesia]. *Kinerja usaha tani padi dan indikator kesejahteraan petani di sentra produksi padi Kabupaten Kubu Raya* / Burhansyah, R.; Melia, P. (Balai Pengkajian Teknologi Pertanian Kalimantan Barat, Pontianak (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 304-323, 9 tables; 27 ref. 338.43:316.343/SEM/p

RICE; FARMING SYSTEMS; ECONOMIC INDICATORS; FARM INCOME; CONSUMER EXPENDITURE; FAMILY BUDGET; EXCHANGE RATE; TERMS OF TRADE; LIVING STANDARDS; KALIMANTAN.

Agricultural sector, especially food crops (rice), in West Kalimantan economic structure is still a mainstay of farmers' income, although the agricultural sectoral role has been declining. Along with the downward trend, the income level and welfare of farmers' tends to decline. Indicators of rural economic development which are directly related to the farmers' welfare are important to be investigated. The research objectives are to analyze performance of rice farming and identify and analyze indicators of economic well-being of farmers. The method used is a survey at the household level using a structured questionnaire in two villages of Kubu Raya, which having agroecosystem of swampland, i.e. *Sungai Itik* and *Jeruju Besar* village. The results showed that rice farming in *Sungai Itik* is economically feasible to be developed, but not in *Jeruju Besar* due to its subsistence nature. Based on three indicators of farmers' welfare level of income, household expenditure, and farmer terms of trade, it can be concluded that welfare of rice farmers in the research location were still need be improved land agricultural utilization and rural industrialization need to be accelerated.

011 HAYATI

Impact of payment of environmental services towards household income and agribusiness development. *Dampak pembayaran jasa lingkungan terhadap perkembangan agribisnis dan pendapatan rumah tangga: suatu kasus di Kecamatan Ciomas, Gunung Sari Kabupaten Serang dan Kecamatan Mandalawangi Kabupaten Pandeglang Propinsi Banten* / Hayati; Gunawan, G.; Sariyoga, S. (Universitas Sultan Ageng Tirtayasa, Serang (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 340-347, 1 table; 11 ref. 338.43:316.343/SEM/p

JAVA; SOCIOECONOMIC ENVIRONMENT; ENVIRONMENTAL PROTECTION; REMUNERATION; HOUSEHOLDS; FARM INCOME; FARMERS ASSOCIATIONS; AGROINDUSTRIAL SECTOR.

The paper is aimed at investigating the impact of environmental service payment to development of agribusiness and earnings of domestic farmer. The research used survey method, by taking samples from household that receive environmental service payment in Subdistrict of Ciomas and Gunung Sari, Serang and Mandalawangi-Pandeglang, Province Banten. Stratified random sampling with ownership of trees as stratification that is above 1000 trees, 250-1000 trees, below 250 trees was used for sample collection. Data were analyzed by descriptive method and farmer's household revenues before and after environmental service payment is enacted. The result show that environmental service payment give impact to development of agribusiness system, where "on farm" subsystem, local farmer grow "*melinjo*" (*Gnetum gnemon*) and "off farm" subsystem they produce "*melinjo* chips". Environmental service payment increases earnings of domestic farmers who own >1000 trees and 250 to 1000 trees, but decreases earnings of domestic farmers who own <250 trees.

012 MASTUR, R.

Technology of production and income of durian farmer at production center Penajam Paser Utara Regency, East Kalimantan [Indonesia]. *Teknologi produksi dan pendapatan petani durian di sentra produksi Kabupaten Penajam Paser Utara, Kalimantan Timur* / Mastur, R.; Wati, S.; Rahayu, S.P. (Balai Pengkajian Teknologi Pertanian Kalimantan Timur, Samarinda (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 173-182, 1 ill., 4 tables; 8 ref. 634.1/.7(594)/SEM/p

DURIO ZIBETHINUS; CULTURAL METHODS; PRODUCTION; INNOVATION; RESOURCE MANAGEMENT; EXTENSION ACTIVITIES; FARM INPUTS; INFRASTRUCTURE; TECHNOLOGY TRANSFER; FARM INCOME; KALIMANTAN.

East Kalimantan Province has rich land and plant genetic resources to develop durio agribusiness. One of areas developed for durio is *Penajam Paser Utara* (PPU) Regency. A research was conducted to study present status and recommendation of production technology and farmer's income in PPU. The study was concentrated in centre of durio production, i.e. Suko Mulyo Village, Sepaku Subdistrict, PPU. Farmer's family and their characteristics, agronomy, input, postharvest, marketing, institution, infrastructure, and extension and information sources for farmer's were collected primarily by interviewing farmers, merchant, labour, and local government officials. The results showed that durio, with total revenue Rp24,31 million/annuum/capita, contribute to farmer's income is higher than other farming (Rp7,93 million/annuum/capita). However, increasing in income contribution has not been supported by optimal cultivation such as fertilizing, plant protection, pruning, and other plant management. Farmer human resources, institution, and infrastructure should be improved. Extension workers play important roles in improving production technology. In the long term, durio areas and technology should be increased and supported by local germplasm utilization and marketing strategy.

013 PRIYANTO, D.

Analysis of sheep farming system factors to support diversification farming system model in villages. *Analisis faktor-faktor usaha ternak domba dalam mendukung pola diversifikasi usaha tani di pedesaan* / Priyanto, D.; Adiati, U [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 565-571, 3 tables; 15 ref. 636:619/SEM/p

SHEEP; ANIMAL HUSBANDRY METHODS; FARMING SYSTEMS; DIVERSIFICATION; FARM INCOME.

Diversification of farming system is commonly applied in villages to anticipate the risk of farming system failure. The farmer choices in determining their farming commodities are affected by technical, economical, environmental, and social factors. The research on farming system diversification model was conducted in Cianjur Regency. The aim of the study was to analyze factors which influenced farming system. Structured questionnaire survey was applied in assessing factors affecting diversification in farming system on 20 sheep farmers. Two regression of production function models were used in the analysis. The result showed that horticulture farming was the main income and sheep farming was as subsistence of horticulture, which was able to contribute 17.3% from total income. Number of sheep sold, price, and scale of farming was identified as factors affecting sheep farming

income ($P < 0.01$), while other factor did not significantly affect the income. Income from sheep positively correlated with number of ewe reared by the farmers ($P < 0.05$). Income from agriculture (horticulture) was significantly higher than that from sheep farming ($P < 0.01$) and this affected total income of sheep farmer. Therefore, horticulture was still main source of sheep farmer income in the village.

014 RUSDIANA, S.

Analysis of income of traditional sheep farming in Sukabumi Regency [Indonesia]. *Analisis pendapatan usaha ternak domba tradisional di Kabupaten Sukabumi* / Rusdiana, S. (Pusat Penelitian dan Pengembangan Peternakan, Bogor (Indonesia)); Priyanto, D. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 538-544, 5 tables; 9 ref. 636:619/SEM/p

SHEEP; FARM INCOME; ECONOMIC ANALYSIS; TRADITIONAL FARMING; JAVA.

Income analyses of traditional sheep farming in Sukabumi District is very important to use bare land around rubber and coconut plantations. The study was done in Ciemas Subdistrict, Sukabumi District, West Java Province based on information from the local Livestock Services. Respondents were chosen randomly in Sukmajaya and Ciwaru Villages as the representative of bare land, both rubber and coconut plantation areas. Thirty respondents from each village were interviewed and data obtained was then analyzed descriptively and economically. The result showed that from selling sheep, farmer received Rp1,885,000 and Rp1,970,000, respectively for Sukmajaya and Ciwaru Villages. They spent Rp1,260,000 (252 men days/year) and Rp1,656,000 (331.2 men days/year) for labor. Therefore the benefit for farmer was Rp625,000/year and Rp314,000 respectively for Sukmajaya and Ciwaru. The calculated B/C ratio was 1.5% and 1.3% respectively for sheep farming in Sukmajaya and Ciwaru. Farmer in Sukmajaya received higher benefit then that in Ciwaru due to higher labor expenditure especially to supervise sheep grazing in Ciwaru (3.237 men days) compared to Sukmajaya (144 men days). The sold sheep consisted of 33.3% ram and 24.2% young ram for Sukmajaya; 38.2% ram and 20.6% young ram for Ciwaru.

015 SILALAH, M.

Economic analysis on food crop-goat integrated system in dryland of Buana Sakti Village, East Lampung [Indonesia]. *Analisa usaha pola integrasi tanaman ternak kambing di lahan kering Desa Buana Sakti Lampung Timur* / Silalahi, M.; Tambunan, R.D. (Balai Pengkajian Teknologi Pertanian Lampung, Bandar Lampung (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 529-537, 2 ill., 6 tables; 10 ref. 636:619/SEM/p

GOATS; FOOD CROPS; INTEGRATED PLANT PRODUCTION; ECONOMIC ANALYSIS; AGROPASTORAL SYSTEMS; DRY FARMING; SUMATRA.

An assessment of crops-goat integrated system was conducted in dry land of Buana Sakti Village, Batang Hari, East Lampung Regency. Ten cooperated farmers were involved as respondent in this study which was conducted to assess: (1) the utilization of legume crops such as *Gliricidia*, (2) flushing technology, (3) the introduction of superior PE bucks, and (4) periodical medical treatment for goats. The study was to assess the effect of technology applied on the goat farming to the improvement of farmers' income. The result showed that cooperated farmers had tried to plant *Gliricidia* around their lands. Eighty percent of cooperated farmers used legume crops, such as *Gliricidia*, as the main feed especially in dry season. The introduction of superior bucks and flushing technology resulted in higher birth weight and were dominant to PE which indicated with long ears, long legs, and black dots in both front legs. The food crop-goat integrated system has improved farmers' income up to 14.04%.

016 WALUYO

Rice cultivation in swamp land areas of South Sumatra [Indonesia] through integrated crop management. *Usaha tani padi di lahan rawa lebak Sumatera Selatan melalui pendekatan PTT / Waluyo; Suparwoto; Supartha, I W.* (Balai Pengkajian Teknologi Pertanian Sumatera Selatan, Palembang (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 815-823, 4 tables; 10 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; HIGH YIELDING VARIETIES; CROP MANAGEMENT; SEED; INTEGRATED PLANT PRODUCTION; PRODUCTION INCREASE; FARM INCOME; SWAMP SOILS; SUMATRA.

Integrated crop management (ICM) in swamp land areas has been practiced in Kotadaro II Village, Rantau Panjang Subdistrict, Ogan Ilir District during the DS of 2008. The location was 10 m asl, having the soil type of Inceptisols. The collaborator farmers were grouped into 6 people of the ICM participants and 6 people of the non-ICM participants, in which each farmer covered a total of 5,000 m² of areas. The technology components applied were Ciharang varieties quality seed, seedling age of less than 30 days, 4:1 legowo planting system, and 2-3 seedlings/hole. The rice crops were fertilized with P and K based on the soil analysis, N based on leaf color chart (LCC) reading, and organic manure at the rate of 500 kg/ha. Urea was applied 1/3 at the planting time together with all of the SP-36 and KCl fertilizers. The rests of urea fertilizer was applied based on LCC reading, which were done at 10 days interval. Result indicated that rice yield produced by the participant farmers of ICM was 4.0 t/ha dried milling grain with B/C ratio of 1.5, while that produced by the non-ICM participants was 2.76 t/ha dried milling grain with B/C ratio of 1.29.

017 WIDIARTA, I N.

Sustainability of system of rice intensification in Indonesia as considered through biological indicator: a case study in West Java and Bali [Indonesia]. *Keberlanjutan sistem intensifikasi padi di Indonesia ditinjau dari indikator hayati: studi kasus di Jawa Barat dan Bali / Widiarta, I N.; Manikmas, M.O.A.* (Pusat Penelitian dan Pengembangan Tanaman Pangan, Bogor (Indonesia)); Subiksa, M. [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 411-425, 10 tables; 7 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; RICE; INTENSIFICATION; INDICATOR ORGANISMS; FARM INPUTS; SOIL ORGANIC MATTER; AGRICULTURAL WASTES; ENVIRONMENTAL DEGRADATION; SOCIOECONOMIC ENVIRONMENT; SUSTAINABILITY; JAVA; BALI.

Green revolution has been practiced in Indonesia as Indonesian System of Rice Intensification. The rice intensification itself has been initiated since the launch of mass guidance (BIMAS) program. Recently, the BIMAS was improved and renamed as National Rice Improvement Program (P2BN). Through such program the country was successfully attained the rice self sufficiency state in 1984 and 2008. In order to evaluate sustainability of rice intensification in Indonesia, survey was conducted in Tabanan and Badung Districts of Bali Province and in Karawang and Cianjur Districts of West Java Province. During survey in these two provinces, four indicators were observed, i.e. (1) chemical input, (2) soil, (3) biological diversity, and (4) agricultural wastewater. Sustainability of rice intensification was evaluated on the combination of sustainability-value of these four indicators. Results of these surveys indicated that rice intensification in Tabanan was classified as adequately sustainable, in Cianjur was less sustainable, while in both Badung and Karawang were not sustainable. These results indicated that rice intensification practices in Tabanan should be maintained and while those in the other three districts, i.e. Badung, Cianjur, and Karawang should be improved to prevent further environmental deterioration.

E21 AGRO-INDUSTRY

018 PRIYANTI, A.

Impacts of decreasing milk price on small scale dairy farming. *Dampak penurunan harga susu terhadap agribisnis sapi perah rakyat* / Priyanti, A.; Mahendri, I G.A.P. (Pusat Penelitian dan Pengembangan Peternakan, Bogor (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 265-275, 6 tables; 9 ref. 338.43:316.343/SEM/p

DAIRY CATTLE; SMALL FARMS; DAIRY FARMS; MILK; PRICE POLICIES; MILK PRODUCTION; FARM INCOME; LABOUR ALLOCATION; HOUSEHOLDS; PRODUCER PRICES; AGROINDUSTRIAL SECTOR.

The decreasing milk price in the international market for during the last two years has caused a decreasing milk price at the farm level in Indonesia. This study was conducted to analyze the impacts of decreasing milk price on dairy farmer household income and their working time allocation. The primary data was collected through a survey of 177 farmers in the Province of West Java, DIY, Central Java and East Java from July to August 2008. A simultaneous equation model estimated with 2SLS method was used for the analysis. The results showed that milk price significantly affected milk production and hence income of dairy farming. The income then positively influenced the dairy farming time allocation of the household members, and negatively affected working time allocation for non-dairy farming. The simulation analysis showed that a 10% decrease in milk price will decrease the farmer households income up to 28%. This indicated that decreasing milk price at farmers level will shift the working time allocation of the farmers to non-dairy farming. It is recommended that the government have to set up a regional policy on basic milk price.

019 ZAKARIA, A.K.

Soybean agribusiness development program in increasing production and farmer's income. Program pengembangan agribisnis kedelai dalam peningkatan produksi dan pendapatan petani / Zakaria, A.K. (Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian, Bogor (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(4) p. 147-153, 3 tables; 26 ref.

SOYBEANS; DEVELOPMENT POLICIES; FARMING SYSTEMS; FARMERS; PARTICIPATION; PRODUCTION INCREASE; CAPITAL; FARM INCOME; AGROINDUSTRIAL SECTOR; SELF SUFFICIENCY.

The domestic soybean production decreased continuously in the period of 1990-2009 in line with the sharp decline in planted area. To meet the domestic demand, import soybean was conducted. From the farmers' side, the decrease in planted area shows the low participation of farmers' in soybean planting, because soybean farming is not benefited for them. Implementation of incentive policy program is one of efforts to increase soybean production towards self-sufficiency. However, increasing soybean production is not only related with the technical aspects. It also needs strategies to strengthen farmers' participation in soybean farming. Government policies are needed to increase farmers' participation in soybean farming. These include improving soybean business administration, fixing floor price, intensifying extension activities, provisioning appropriate technologies, and other stimulating incentives.

E50 RURAL SOCIOLOGY AND SOCIAL SECURITY

020 ABDULLAH, A.

Role of farmer's wife in improving family income from raising native chicken in Bulukumba District [Indonesia]. Peranan istri petani ternak ayam buras dalam upaya peningkatan pendapatan keluarga di Kabupaten Bulukumba / Abdullah, A.; Amrawati, A. (Universitas Hasanuddin, Makassar (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 711-717, 3 tables; 8 ref. 636:619/SEM/p

CHICKENS; FARMERS; FARM INCOME; FAMILIES; ROLE OF WOMEN.

The objective of this study was to evaluate the role of farmers' wives and contribution in improving family income from raising native chicken and the influencing factors in Gangkang District, Bulukumba Regency. This study was done by using a survey method in the women's groups that raise chicken, using the questionnaire (question list) include the characteristics of respondents/individual, age, education level, the amount of income, number of family members, and the flow of time in domestic poultry. Data were analyzed through qualitative and quantitative approaches. Farmer's wife contribution in family income was determined by calculating the ratio of wife's income over family income in one month that was 13.17%, where the average of family income was 148.800/month (Rp35,000 - Rp450,000/month). The factors that affected the income level of the wife in domestic poultry was analyzed using multiple linier regression model with dependent variable was the variable income, and the independent variable were age, education, number of family members, and the flow of time. Results showed that education, age, time of contribution, number of family was simultaneously gave effect to the real level of income of the wife

raising domestic poultry. Correlation coefficient values obtained on the relationship of dependent variables and independent was 0.904, so the relationship of education, age, time of contribution, and the number of members with wives income was very close (high). The amount of determinant coefficients is value 0.818, means that independent variables simultaneously contributed as much as 81.8%.

E70 TRADE, MARKETING AND DISTRIBUTION

021 ANUGRAH, I.S.

Cattle marketing partnership supports smallholder farms in Gorontalo Province [Indonesia]. *Kemitraan pemasaran komoditas sapi potong mendukung usaha peternakan rakyat di Provinsi Gorontalo* / Anugrah, I.S.; Sejati, W.K. (Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian, Bogor (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 276 - 294, 2 ill., 3 tables; 12 ref. 338.43:316.343/SEM/p

BEEF CATTLE; PARTNERSHIPS; MARKETING; ANIMAL PRODUCTION; SMALL FARMS; LIVESTOCK MANAGEMENT; FARMERS ASSOCIATIONS; PARTICIPATION; LOCAL GOVERNMENT; FARM INCOME; FINANCIAL INSTITUTIONS; SULAWESI.

Cattle farming is one of the income sources of the people in Gorontalo Province. This high value livestock is being developed to a major source of earnings after corn. The basic capital to achieve the highest economic gain target from raising the cattle is the potential quantity and technical aspect along with its management through PUTKATI program as well as the related programs of small-scale livestock development in the province. Commitment of all concerns according to their respective role and ability has been resulted in a positive impact in the making of cattle as a leading economic commodity. The cattle development is shown by the community activities in, among others, marketing partnership involving all stakeholders. This partnership activity is monitored intensively by the local government institutions from the provincial level down to the village level through appropriate implementation policies so that the activities could improve farmers income as well as wider local economic development. This paper is aimed at identifying marketing partnership forms, partnership performance of engaged institutions, and local government roles, including financial institutions directly or indirectly, dealing with marketing partnership pattern of cattle in Gorontalo Province. This paper is based on a research conducted in the province through survey method using interview technique on the cattle marketing actors at provincial level as well as those at regency and village level.

022 MAYROWANI, H.

Perspective of shallot marketing in Brebes Regency, Central Java [Indonesia]. *Perspektif pemasaran bawang merah di Kabupaten Brebes, Jawa Tengah* / Mayrowani, H.; Darwis, V. (Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian, Bogor (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfares oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.;

Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 169-185 , 1 ill., 6 tables; 15 ref. 338.43:316.343/SEM/p

SHALLOTS; MARKETING CHANNELS; PRICE STABILIZATION; TRADE POLICIES; DOMESTIC MARKETS; INFRASTRUCTURE; MARKETING MARGINS; JAVA.

Trade liberalization creating the opportunity and challenge in the development of horticultural products. Trade will give an incentive for the farmers to increase their production in term of quantity and quality, and marketing is important to distribute the products. Shallot is one of the important horticultural products in Indonesia. Brebes District is one of the famous production centers of shallot, and the farmers still have a difficulty to sell their product. The objective of this paper was to understand the shallot marketing problem in Brebes District. The results showed that the bargaining power of the farmers were still weak, long marketing channel, price fluctuated and unpredictable, farmers were not yet obtain enough benefit from the margin of market, and market infrastructures were not yet well developed. Therefore, limitation of imported shallot in the case of illegal trade, policy to secure domestic market, developing partnership between farmers and traders and industries, arranging production pattern among production center, availability of market and price information for the farmers and developing market infrastucture such as farm road were necessary in developing shallot market.

E73 CONSUMER ECONOMICS

023 BAKRIE, B.

Analysis of the preferences of consumers on animal products in Jakarta [Indonesia]. *Analisis faktor yang mempengaruhi preferensi konsumen terhadap produk peternakan di wilayah perkotaan DKI Jakarta* / Bakrie, B.; Suwandi; Setiabudi, D. (Balai Pengkajian Teknologi Pertanian Jakarta (Indonesia)); Sarjoni. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 854-861, 3 tables; 18 ref. 636:619/SEM/p

ANIMAL PRODUCTS; CONSUMER BEHAVIOUR; MEAT; MILK; EGGS; JAVA.

A study was conducted to investigate the preference of consumers in DKI Jakarta Province to animal products known as protein sources, namely meat, milk and egg. The aims of this study were a) to gather information on characteristics of people who consume these products in this area, and b) to find out several factors which influence the preference of people in buying and consuming these products. Information was collected through direct interview with respondents using a prepared questionnaire and the respondents were selected using a stratified random sampling technique. A total of 400 respondents were selected from 5 municipalities in this area. Data were analysed using descriptive analyses, cross tabulation and factor analyses. It is concluded that a) housewife in a family has an important role in deciding to purchase the protein source foods, b) eggs were consumed in a great number compared to meat and milk by people live in DKI Jakarta Province, and c) factors which influence people in buying and consuming the animal products were the experience of people in buying, quality dan the price of the products.

F01 CROP HUSBANDRY

024 BARUS, J.

Yield increase of upland superior rice varieties through the ICM adoption. *Peningkatan hasil varietas unggul padi gogo dengan teknologi PTT* / Barus, J. (Balai Pengkajian Teknologi Pertanian Lampung, Bandar Lampung (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 20. Buku 2 09 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 725-732, 6 tables; 11 ref. 633.18-115.2/SEM/p bk2

UPLAND RICE; HIGH YIELDING VARIETIES; INTRODUCED VARIETIES; CROP MANAGEMENT; INTEGRATED PLANT PRODUCTION; YIELD INCREASES; TECHNOLOGY TRANSFER; FARM INCOME.

An experiment to study the increase of upland rice yields and the income of the farmers through the adoption of integrated crop management (ICM) technologies in Abung Selatan Subdistrict, North Lampung District during the WS of 2007/08 and in the Gunung Sugih Subdistrict, Central Lampung District during the WS of 2008/09. The package of ICM technology introduced were (a) the varieties of *Limboti*, *Situ Patenggang*, and *Situ Bagendit* for ICM and local variety for non-ICM, i.e. *Sirendah* (for the WS of 2007) and *Ciherang* (for the WS of 2008), (b) the seed sowing method was buried the seed by putting the seeds into the hole, 5 grains per hole, (c) the planting distance for the WS 2007 in Abung Selatan was legowo 4:1 and for the WS 2008 in Gunung Sugih was legowo 2:1, (d) organic fertilizer was waste compost of cattle 2 t/ha, and (e) fertilizing by using urea 200 kg applied 3 times and Phonska 15:15:15 at the rate of 200 kg/ha applied once. Results indicated that through ICM management, the yield of three superior rice varieties was higher as compared to that of the local variety (non ICM) in both wet seasons. The farming net incomes by using ICM were Rp3,980,000 and Rp5,791,200, for the WS of 2007 and 2008, respectively.

025 HANAFAI, H.

Assessment of appropriate technology for chrysant cultivation in Prima Tani location in Sleman Regency, Yogyakarta [Indonesia]. *Pengkajian teknologi tepat guna budi daya krisan di lokasi Prima Tani Kabupaten Sleman Daerah Istimewa Yogyakarta* / Hanafi, H.; Martini, T. (Balai Pengkajian Teknologi Pertanian, Yogyakarta (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani, Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 147-160, 2 ill., 4 tables; 6 ref. 338.43:316.343/SEM/p

CHRYSANTHEMUM; CULTURAL METHODS; INNOVATION; APPROPRIATE TECHNOLOGY; EXTENSION ACTIVITIES; AGROINDUSTRIAL SECTOR; DIVERSIFICATION; FARM INCOME; JAVA.

Due to lowland ownership by farmers within northern part of Sleman District, it needs to find commodities alternatives having high economic value in order to increase welfare of farmer's household. *Chrysanthemum* cultivation was introduced in year 2005 by AIAT Yogyakarta in collaboration with Indonesian Ornamental Plants Research Institute Cipanas, West Java. Even though it needed more complicated handling, *Chrysanthemum* cultivation in

controlled environment could benefit community within village area with relatively high additional income. The objective of research was to assess and to collect data from several researches and technology assessment conducted by researchers team to the farmers cooperators of the government supporting the success of dissemination of innovation technology produced by the Indonesian Agency for Agricultural Research and Development five years ago (2005) until now (2009). Purposive method was used to determine the location with consideration that Hargobinangun Village, Sleman District as Prima Tani activities. The basic method of this research was descriptive analysis, of which the research based on existing actual problems solving. The result of this research showed that diversification of commodities cultivation has been created; incomes added of which indirectly increases farmers' welfare; interesting jobs for youth in village area; highly self confidence of youth and change of mindset to live as a farmer within village area; and initiated of agro-industry within village area through another farming activities as multiplier effect from *Chrysanthemum* farming activity.

026 NASUTION, F.

[Response of papaya growth and production to phosphorus application in tidal swamp land]. *Respon pertumbuhan dan produksi 5 varietas harapan pepaya Balitbu Tropika terhadap aplikasi fosfor di lahan rawa pasang surut* / Nasution, F.; Martias; Noflindawati; Budiyanti (Balai Penelitian Tanaman Buah Tropika, Solok (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghortit, 2009: p. 36-44, 3 tables; 14 ref. 634.1/.7(594)/SEM/p

CARICA PAPAYA; VARIETIES; PRODUCTION POSSIBILITIES; PHOSPHATE FERTILIZERS; FERTILIZER APPLICATION; GROWTH; CROP PERFORMANCE; AGRONOMIC CHARACTERS; APPLICATION RATES; INTERTIDAL ENVIRONMENT; SWAMP SOILS.

The research was intended to reveal the response of five papaya varieties treated with P in tidal swamp. The research was conducted at ex tidal swamp project (PLG) in Mentangai, Kapuas, Central Kalimantan, from August 2007 to April 2008. The research was arranged in a split plot design. The main plot was P application (100; 200; 300 g P/plant) and the subplot was varieties of papaya (Bt1; Bt2; Bt3; Bt4; Bt7), with 3 replications and 10 plants per unit of treatment. Parameters observed were: (1) vegetative growth (plant height, stem diameter, internodes number); (2) fruit quality (fruit number, fruit weight, fruit length, fruit circumference, flesh thickness, and total soluble solid). The result showed that four of five papaya varieties, namely Bt1, Bt2, Bt4, and Bt7 have proven possess higher growth and production response than Bt3. Therefore those four varieties have a good prospect to be developed in the tidal swamp. P application only significantly affected plant height, but did not significantly affect the other parameters. This finding could be referred as a guidance to select suitable varieties for the tidal swamp.

027 PRATIWI, G.R.

Productivity and yield components of rice as a function of plant population. *Produktivitas dan komponen hasil tanaman padi sebagai fungsi dari populasi tanaman* / Pratiwi, G.R.; Suhartatik, E.; Makarim, A.K. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20

Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 443-450, 4 ill., 2 tables; 2 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; PLANT POPULATION; SPACING; TILLERING; INFLORESCENCES; YIELD COMPONENTS; PRODUCTIVITY.

A field experiment to evaluate the relationship between plant population and the rice yields was conducted at the Muara Experimental Station, the Indonesian Center for Rice Research Institute (ICRRI), during the DS 2008/09. The trial was arranged in a randomized completely block design with three replications. The treatments were eight plant spacings, i.e. 50 cm x 50 cm up to 20-40 cm x 10 cm, in order to obtain the plant population of 4-33 hills/m². Result of the experiment indicated that the number of tiller per hill was affected by the plant density. The lower the plant densities, the lesser the number of tiller per hill as the development of tillers stopped as the rice plant reached the age of 40 days after transplanting (DAT). In contrast, the higher the plant densities, the higher the number of tiller per hill as the development of tillers was continued until the rice plants reached the age of 70 DAT. Plant densities affected the ring of the plant canopy, the number of field grain per hill, and the number of panicles per m². The ring of plant canopy, the number of filled grain per hill, and the length of panicles per hill decreased with the plant densities. The ring of plant canopy at the low plant densities (J8) reached 101 cm, and at the two high plant densities of J1 and J2 were reached 27 cm and 32 cm, respectively. The number of filled grain per hill, at the low plant densities reached 5,837 grains per hill, and at the high plant densities it reached 947 grains per hill. The length of panicles at the low density was 1,100 cm, and at the high density was 200 cm. In contrast, the number of panicles per m² increased with the plant densities. The number of panicles per m² at the low density was 175 and at the high density were 367. The yield of dried grains per hectare at high plant densities reached 7.17 tons milled dried grains, but at the low plant densities it reached 4.10 tons milled dried grains per hectare.

028 TOHA, H.M.

Effect of planting time to the growth, yield, and yield components of some medium elevation irrigated rice varieties. Pengaruh waktu tanam terhadap pertumbuhan, hasil, dan komponen hasil beberapa varietas padi sawah irigasi dataran menengah / Toha, H.M.; Daradjat, A.A. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)); Permadi, K. [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 581-599, 5 ill., 7 tables; 21 ref. 633.18-115.2/SEM/i bk2

IRRIGATED RICE; VARIETIES; PLANTING DATE; GROWTH; YIELDS; YIELD COMPONENTS.

Result of the experiment indicated that effect of planting schedule on plant growth, yield, and yield components of several rice varieties showed that grain yield in the dry season were higher than that in the wet season. The best variety in the both seasons was Memberamo, while Ciherang variety was good to grow in the dry season and Widas variety was good in both seasons. The average yield differences between that in the dry and in the wet season was about 1.57 t/ha of dried grain. The average grain yield was 7.41 t/ha and 5.84 t/ha for

dry and wet seasons, respectively. Yield and yield components relationship showed that the grain yield was determined by number of panicle per hill, number of spikelet/panicle, and filled grain. The correlation between number of panicle/hill and number of spikelet/panicle was negative. The same phenomena occurred between number of spikelet and filled grain.

029 ZARWAZI, L.M.

Performance of upland rice varieties at two different locations in Indramayu [Indonesia]. *Keragaan varietas padi gogo pada dua lokasi yang berbeda di Indramayu* / Zarwazi, L.M.; Toha, H.M. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdurachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 757-766, 4 tables; 5 ref. 633.18-115.2/SEM/p bk2

UPLAND RICE; VARIETIES; INTERCROPPING; TOPOGRAPHY; AGROFORESTRY; GROWTH; SHADE PLANTS; YIELD COMPONENTS; CROP PERFORMANCE; JAVA.

As the staple food for the most Indonesian people, adequate availability, good quality, and good accessibility of rice must be maintained. It was predicted that in the year of 2030, the country will fall into the shortage of food, since the population growth rate was 1.7%/year and a number of productive rice areas were changed into non-agricultural function. Therefore Indonesia should utilize upland areas for the production of rice in the future. By such efforts, it was expected that upland areas will contribute significantly to the availability of quality rice for the people. The technology needed to support the efforts, such as superior varieties, fertilizer application, weed management, etc. are available. Experiment was conducted at Sanca and Bantarwaru Villages at Indramayu District during the wet season of 2008/09. At Sanca Village, rice genotypes were planted under the shade of 3-year old teak plants and at Bantarwaru were under open land. Results of this experiment revealed that the rice yields were not statistically different among genotypes. At Sanca Village, rice yields were 4.70; 4.59; 4.51; 4.38 and 4.21 t/ha of milling dried grain for the variety of Selegreng, IR64, Cibogo, BP760F; and Jatiluhur, respectively. The yield at Bantarwaru Village were 4.82; 4.72; 4.63 and 4.13 t/ha of milling dried grain, for Situ Patenggang, Jatiluhur, Limboto, and Situ Bagendit, respectively.

F02 PLANT PROPAGATION

030 KOSMIATIN, M.

Micropropagation of mutant citrus rootstock Japansche citroen JC. *Mikropropagasi jeruk batang bawah Japansche citroen-JC mutant* / Kosmiatin, M.; Husni, A.; Martasari, C. (Balai Besar Penelitian dan Pengembangan Bioteknologi dan Sumberdaya Genetik Pertanian, Bogor (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009 Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 134-147, 4 ill., 6 tables; 14 ref. 634.1/.7(594)/SEM/p

CITRUS; MUTANTS; MICROPROPAGATION; ROOTSTOCKS; PLANT GROWTH SUBSTANCES; BA; ADENINE; SHOOTS; GROWTH.

Improvement of citrus rootstock has not been widely reported in Indonesia. Nonconventional breeding techniques require accomplishment on in vitro techniques before starting the process. Mastery of the technique must be done for multiplication of improved citrus

rootstock. JC mutation induction was done with gamma irradiation in PAIR Batan. Population of mutant cell was regenerated through somatic embryogenesis and it produced mutant shoots. The mutant shoots were then propagated for further testing to improve citrus rootstock. The research aimed at finding a formulation for mutant shoots propagation of JC rootstock. Research was carried out in 2 stages, i.e. clonal multiplication and root induction on shoots of JC mutant. A series clonal propagation was done using the basic medium MS and MT with the addition of growth regulator substances BA 1; 2; 3 mg/l for the first series. The second series was carried out by reducing the concentration of BA and the addition of adenin sulphate. The third series was done by reducing or eliminating the addition of BA. Root induction was performed in medium MS and 1/2 MS salt with the addition of NAA. Best bud multiplication was obtained from MS medium with slight modification without the addition of BA. The best root induction medium obtained from half strength MS with the addition of NAA 1 g/l.

031 WIDIASTOETY, D.

Effect of nonsynthetic supplement on the plantlet growth of Vanda. *Pengaruh suplemen nonsintetik terhadap pertumbuhan planlet anggrek vanda* / Widiastoety, D.; Nurmalinda (Balai Penelitian Tanaman Hias, Cianjur (Indonesia)). *Jurnal Hortikultura* (Indonesia). ISSN 0853-7097 (2010) v. 20(1) p. 60-66, 5 tables; 28 ref.

VANDA; GROWING MEDIA; SUPPLEMENTS; CASEIN; SEEDLINGS; GROWTH.

Medium is one of the important factors in determining the plantlet growth of Vanda. Nonsynthetic supplement has to be added into the medium to accelerate the growth of Vanda plantlet. The aim of this experiment was at obtaining of nonsynthetic supplement to substitute the component of Vacin and Went (VW) medium. The experiment was conducted at Tissue Culture Laboratory of Indonesian Ornamental Crops Experimental Garden, Pasarminggu-Jakarta from June to December 2007. The experiment was arranged in a randomized block design with five treatments and four replications. The treatments were: (1) medium VW without addition of organic compound; (2) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + banana 50 g/l; (3) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + cassava 50 g/l; (4) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + potato 50 g/l; and (5) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + mungbean sprout 50 g/l. The results showed that (1) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + banana 50 g/l; (2) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + cassava 50 g/l; (3) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + potato 50 g/l; and (4) KNO_3 1 g/l + casein hydrolysate 100 mg/l + yeast 1.25 g/l + mungbean sprout 50 g/l could be used as alternative media. The use of nonsynthetic supplement could reduce production cost of plantlet.

F04 FERTILIZING

032 ABDULRACHMAN, S.

Efficiency of fertilization through partitioning of fertilizer rate on rice-rice-secondary crops farming systems. *Efisiensi pemupukan melalui partisi takaran pupuk pada pola tanam padi-padi-palawija* / Abdulrachman, S. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)); Wihardjaka, A. [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung

ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 833-844, 5 ill., 8 tables; 11 ref. 633.18-115.2/SEM/i bk2

ORYZA SATIVA; FOOD CROPS; CROP MANAGEMENT; LAND PRODUCTIVITY; NPK FERTILIZERS; ORGANIC FERTILIZERS; DOSAGE EFFECTS; APPLICATION RATES; YIELD COMPONENTS.

Rainfed lowland is a suboptimal land that provides high potency in supporting national food requirement. Unfortunately up to now, the effort to optimize this suboptimal rainfed lowland was not as high as in irrigated lowland. Rainfed lowland area is generally occupied by poor farmers with limited infrastructure and adopt only traditional technology. It is understandable, therefore, that they are only able to harvest a low yield of their crops. It has been reported also that the fertility of the rainfed lowland rice has been degraded severely. By approaching partitioning fertilization, the productivity of rainfed lowland rice could be improved. For that purpose, the field experiment was conducted to increase the efficiency of fertilizer through six fertilization partition treatments. It was arranged in randomized block design with six replications. The result showed that application of NPK fertilizers either with rice straw or with farmyard manure yielded significantly higher grains of rainfed lowland rice and soybean crops with or without organic matter. Application of organic matter contributed in the increase of inorganic fertilization efficiency.

033 JAWAL, M.A.S.

Effect of drip irrigation and fertilization to control the yellow latex incidence on mangosteen fruits. *Pengaruh pemberian air dan pemupukan terhadap getah kuning pada buah manggis* / Jawal, M.A.S. (Pusat Penelitian dan Pengembangan Hortikultura, Jakarta (Indonesia)); Mansyah, E.; Martias; Purnama, T.; Fatria, D.; Usman, F. *Jurnal Hortikultura* (Indonesia). ISSN 0853-7097 (2010) v. 20(1) p. 10-17, 10 ill., 2 tables; 18 ref.

GARCINIA MANGOSTANA; TRICKLE IRRIGATION; FERTILIZER APPLICATION; NPK FERTILIZERS; CALCIUM; PLANT DISEASES; FRUITS; DAMAGE

Yellow latex is a major problem on mangosteen fruit quality, especially for export. The yellow latex occurred in the fruit flesh caused improper taste. The experiment was conducted in the mangosteen production center in Pesisir Selatan District, West Sumatra. The experiment was designed as super imposed trial. The data was analyzed using factorial randomized block design with two factors and three replications. The first factor was irrigation (no irrigation and with irrigation), and the second factor was fertilizer application (no fertilizer, NPK, NPKCa, and NPKCaMg). Drip irrigation was applied continuously on the generative phase. The objective of this experiment was to find out the control technique of the yellow latex on mangosteen fruit. The parameter observed were the percentage of yellow latex on outer and inner skin fruit of mangosteen. The results indicated that drip irrigation during the generative phase was able to decrease the yellow latex incidence on the inner fruit skin of mangosteen up to 36%, but the decreased yellow latex incidence on the outer fruit skin of mangosteen was not consistent. Fertilizer application did not significantly reduce percentage of yellow latex on mangosteen fruit.

034 NAPITUPULU, D.

Effect of N and K fertilizer on growth and yields of shallots. *Pengaruh pemberian pupuk N dan K terhadap pertumbuhan dan produksi bawang merah* / Napitupulu, D.; Winarto, I.

(Balai Pengkajian Teknologi Pertanian Sumatera Utara, Medan (Indonesia)). *Jurnal Hortikultura* (Indonesia). ISSN 0853-7097 (2010) v. 20(1) p. 27-35, 2 ill., 6 tables; 25 ref.

ALLIUM ASCALONICUM; NITROGEN FERTILIZERS; POTASH FERTILIZERS; APPLICATION RATES; GROWTH; YIELDS.

Shallots is one of the vegetables that has wide adaptation. One of shallots varieties that well adapted in the lowland is Kuning. Total shallots production in North Sumatra was still quite low and has not yet been able to meet the local needs. The low productivity in North Sumatra was due to inappropriate fertilizers application and no suitable recommendation of fertilizer application technology package for specific location. Proper recommendation of fertilizer application was expected to increase productivity which economically profitable. The objective of this study was to find out the effect of N and K fertilizers on the growth and yield of shallots. The study was conducted in the experimental garden of North Sumatra Assessment Institute of Agricultural Technology, Medan at 30 m asl, from April to June 2008 using Kuning varieties. The treatments were four levels of N (0, 150, 200, 250 kg/ha) and four levels of K (0, 75, 100, 125 kg/ha). The experiment was arranged in a factorial randomized block design with four replications. Basic fertilizers used were manure (15 t/ha) and SP-36 (300 kg/ha), applied at one week before planting. N and K were given at the age of 3, 21, and 35 days after planting, with 1/3 dose of each. The plot size was 1.5 m x 1.5 m, and 0.3 m row spacing and distance between block 0.4 m and 0.3 m, respectively. Planting distance was 25 cm x 25 cm. Pest and disease observation were done using integrated pest control methods. The research results indicated that there was interaction between nitrogen and potassium fertilizers application to the fresh weight and dry bulb per plant. Application of 250 kg N/ha and 100 kg K/ha increased shallots dry bulb yield up to 64.69 g/plant. The fertilizer application of N (250 kg/ha) and K (100 kg/ha) was recommended to increase the productivity of shallots in the area.

035 NIELDALINA

Influence of N, P and K fertilization to the growth and production of Gilirang, the new plant type rice variety. Pengaruh pemupukan N, P, dan K, terhadap pertumbuhan dan produksi padi tipe baru varietas Gilirang / Nieldalina; Yufdy, M.P. (Balai Pengkajian Teknologi Pertanian Sumatera Utara, Medan (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 869-878, 3 ill., 5 tables; 5 ref. 633.18-115.2/SEM/i bk2

ORYZA SATIVA; HIGH YIELDING VARIETIES; NPK FERTILIZERS; DOSAGE EFFECTS; FERTILIZER APPLICATION; GROWTH RATE; PRODUCTION INCREASE.

Gilirang is a high potential yield rice variety. To achieve its potential yield, its fertilizing requirements need to be evaluated. The experiment was done in a randomized block design arranged in factorial with 3 factor treatments: (1) rate of N (Supra Insus and BWD), (2) rate of P (65, 97.5, and 130 kg SP36/ha), and (3) rate of K (0, 50, and 100 kg KCl/ha). The plot size was 3 m x 5 m. The result showed that the fertilization of N based on Supra Insus, improved plant height and number of tiller at 2 month of crop age, but did not significantly affect at 1 months age and at harvesting time. The N Supra Insus significantly increased

yield of Gilirang, while the fertilizing of P, K, and interaction of the 3 fertilizing factors did not increase rice yield. The highest yield of Gilirang 6.22 t/ha harvested grain, equivalent to 5.7 t/ha dried grain, were obtained from an interaction treatment of N Supra Insus, 97.5 kg SP36/ha, and 0 kg KCl/ha. The rate of fertilizing of N, P, and K which was mention above can be recommended for rice crops grown in areas with similar condition to Bahjambi II Village, Tanah Jawa Subdistrict, Simalungun District.

036 SASTRO, Y.

Effect of liquid cattle manure on the growth and yield of chinese cabbages, lettuce and *Ipomoea aquatica*. Peran pupuk limbah cair peternakan sapi terhadap pertumbuhan dan hasil sawi, selada dan kangkung / Sastro, Y.; Lestari, I.F.; Suwandi (Balai Pengkajian Teknologi Pertanian Jakarta (Indonesia)). *Jurnal Hortikultura* (Indonesia) ISSN 0853-7097 (2010) v. 20(1) p. 45-51, 3 tables; 33 ref.

BRASSICA CHINENSIS; LACTUCA SATIVA; IPOMOEA AQUATICA; LIQUID MANURES; LIQUID FERTILIZERS; GROWTH; YIELDS

Alternative fertilizer is very important to be developed because of the high price of chemical fertilizers. One of the potential fertilizers to be developed is liquid cattle manure. This research was aimed at studying the effect of liquid cattle manure on the growth and yield of chinese cabbage, lettuce, and *Ipomoea aquatica*. The pot scale study used Ultisols as media was conducted in Glasshouse of the Jakarta Assessment Institute of Agricultural Technology, from March until October 2007. The treatments were diluted cattle manure (1:1, 1:2, no cattle manure); combination of urea, TSP, and KCl (NPK), and no fertilizer as control. The experiment was arranged in a completely randomized design with five replications. The parameters observed were plant height, leaf number, and biomass weight. The results showed that liquid cattle manure significantly increased growth and yield of chinese cabbage, lettuce, and *Ipomoea aquatica*. The application of liquid cattle manure on chinese cabbage, lettuce, and *Ipomoea aquatica* gave yield of 95, 87, and 61% compare with NPK fertilizers, respectively. The results indicated that liquid cattle manure could replace chemical fertilizers in the vegetable production, especially in chinese cabbage and lettuce.

037 SETYONO, B.

Feasibility of shallot farming in sandy beach using ameliorated technology in Bantul Regency, Yogyakarta [Indonesia]. *Kelayakan usaha tani bawang merah di lahan pasir pantai dengan teknologi ameliorasi di Kabupaten Bantul Provinsi Daerah Istimewa Yogyakarta / Setyono, B; Suradal (Balai Pengkajian Teknologi Pertanian, Yogyakarta (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastra, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 161-168, 1 ill., 1 table; 10 ref. 338.43:316.343/SEM/p*

SHALLOTS; FARMING SYSTEMS; LAND USE; LAND IMPROVEMENT; PEAT SOILS; FARMYARD MANURE; ZEOLITES; SANDY SOILS; COASTS; LAND PRODUCTIVITY; JAVA.

The agricultural development program of the Special Region Province of Yogyakarta for utilization of southern sea shore sandy land of Bantul District aimed at developing a robust agriculture supporting a strong and advanced industrial sector through promotion of agribusiness agriculture oriented. Some farmers have been able to produce 20 t/ha of shallot

by using the amelioration technology. This was a prove that by adding clays, manures and zeolit, the amelioration technology increased land productivity, transformed an unproductive sandy shore land to become a productive agricultural land. It is suggested to keep adding ameliorants for both improving soil fertility and sustaining environment quality. Financial analysis showed that shallot farming with amelioration technology in shore sandy land was feasible with B/C ratio 2.4 and R/C ratio 3.4.

038 SUSANTI, Z.

Quantification response of two types of rice to nitrogen, phosphate, and potassium fertilizers. *Kuantifikasi respons dua tipe padi terhadap pupuk nitrogen, fosfor, dan kalium* / Susanti, Z.; Abdulrachman, S.; Sembiring, H. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.) Sukamandi (Indonesia): BB Padi, 2010: p. 665-681, 5 ill., 5 tables; 12 ref. 633.18-15.2/SEM/p bk2

ORYZA SATIVA; VARIETIES; INBRED LINES; HYBRIDS; NITROGEN FERTILIZERS; PHOSPHATE FERTILIZERS; POTASH FERTILIZERS; FERTILIZER APPLICATION; DOSAGE; PLANT RESPONSE; YIELD INCREASES.

NPK balance fertilizer application is a key factor to increase fertilizer efficiency as well as yield of irrigated rice. The experiment was aimed at (1) understanding rice responses to NPK fertilizers and (2) determining the rate of fertilizer requirement for specific variety based on yield and yield components. The experiment was arranged in a split plot design with 4 replications. The main plot was 5 combinations of NPK, i.e. +PK, +N, +NP, +NK, +NPK, and no NPK as control. The subplot was two rice varieties, i.e. IR64 (representing inbred rice) and Maro (representing hybrid rice). Results of the experiment indicated that (1) rice varieties, IR64 and Maro, were significantly affected by nitrogen fertilizer. The agronomy efficiencies were 11.8 kg and 11.4 kg grain/kg urea, for IR64 and Maro, respectively, (2) under Ultisols Sukamandi soil condition, nitrogen was the most limiting factor influenced yield and rice growth, followed by phosphor and potassium, (3) application of P of 25 kg increased yield by 3% and 15%, for the variety of IR64 and Maro, respectively. The yield increase of these two rice varieties was primary due to the increase of productive tiller number, (4) the two rice varieties were not significantly affected by potassium applied at the rate of 100 kg. It was concluded that nutrient balance application was the most important factors to maintain rice production at the level of high yield, as it related highly with the availability of the nutrient in the soil, either naturally from outside sources.

039 SUSILAWATI, A.

Effect of nitrogen fertilizer on irrigated rice. *Respons tanaman padi terhadap pupuk nitrogen di lahan sawah irigasi* / Susilawati, A.; Anwar, K. (Balai Penelitian Pertanian Lahan Rawa, Banjarbaru (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.) Sukamandi (Indonesia): BB Padi, 2010: p. 605-614, 1 ill., 7 tables; 10 ref. 633.18115.2/SEM/p bk2

ORYZA SATIVA; NITROGEN FERTILIZERS; UREA; FERTILIZER APPLICATION; NUTRIENT UPTAKE; DOSAGE EFFECTS; PLANT RESPONSE; APPLICATION RATES; IRRIGATED LAND.

Nitrogen represents the main nutrient needed by rice plant and most farmers apply urea fertilizer as source of nitrogen for their crops. The efficiency of urea is very low, and therefore, it requires an appropriate rate to be applied at particular growth stages in a particular location. An experiment to evaluate the response of irrigated rice crops to urea fertilizer has been carried out in Penggalaman, Banjar District, South Kalimantan. Treatments were urea fertilizer applied at the rates of 0, 30, 60, 90, and 120 kg N/ha, arranged in a randomized block design with five replications. Results of the experiment indicated that the urea prill improved plant height, numbers of tiller/hill, numbers of panicle/hill, numbers of filled grains/panicle, 1,000 grains weight, dry matter weight, the content of N in dried biomass and grains, and soil NH_4^+ soil. Application of urea at the rate of 90 kg N/ha was appropriate to produce a total of 5.26 t/ha of rice grain.

040 WINARTI, E.

Use of manure and its economic value in horticulture plants on sandy soil in Galur Subdistrict, Kulonprogo District [Indonesia]. *Pemanfaatan limbah kandang dan nilai ekonomi dalam usaha tani hortikultura di lahan pasir Kecamatan Galur Kabupaten Kulonprogo* / Winarti, E.; Rustijarno, S. (Balai Pengkajian Teknologi Pertanian Yogyakarta (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 718-723, 5 tables; 9 ref. 636:619/SEM/p

HORTICULTURE; FARMYARD MANURE; ORGANIC WASTES; SANDY SOILS; ECONOMIC VALUE; JAVA.

As agricultural land, sandy soils is marginal land that requires conservation. One of conservation techniques for sandy soils is using manure as organic fertilizer. This study was done to assess contribution and economic value of organic waste in sandy soils at various horticulture crops. The study was undertaken from January to July 2008 in south coastal area of Galur Subdistrict, Kulonprogo District. The results indicated that quality of organic fertilizer was good and the organic fertilizer from poultry manure was sufficient (266.25 t/period or 1331.25 t/year). Requirement of organic fertilizer on sandy soils was 24 t/ha/period, while the requirement of inorganic fertilizer was 0.72 t/ha/period. Economic value of organic fertilizer was Rp 3,120,000/ha/period (66.6%), while inorganic fertilizer was Rp 1,562,000 /ha/period (33.4%). High use of organic fertilizer and low use of inorganic fertilizer enables the agricultural products of sandy soils are to be directed for organic products.

041 YURMIATI, H.

Production evaluation and compost decrease of rabbit feces at rural farm. *Evaluasi produksi dan penyusutan kompos dari feses kelinci pada peternakan rakyat* / Yurmiati, H.; Hidayati, Y.A. (Universitas Padjadjaran, Bandung (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni,

A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 730-734, 1 table; 9 ref. 636:619/SEM/p

RABBITS; FAECES; COMPOSTS; EVALUATION; PRODUCTION; SAWDUST.

Beside producing meat, wool, and fur, rabbit farming activities are also producing feces, feed remains and forage. The waste should be well managed due to negative effect to the environment. One of several ways to use the wastes is by making compost, because it is useful and has economic value. Composting is degradation process of organic matter with assistance of microorganism into compost. The objective of the study was to find out the effect of C/N ratio of compost matter if rabbit feces composted by sawdust (*Albizia falcata*) toward production and percentage of compost shrinkage, also looking for better C/N ratio in making compost from rabbit feces. This research was done based on completely randomized design and as treatment was 3 C/N ratios ($P_1 = C/N 25$, $P_2 = C/N 30$ dan $P_3 = C/N 35$) and each was repeated 6 times. The result showed that C/N ratio significantly affected compost production ($P_1 = 926.67$ g; $P_2 = 1,115.00$ g and $P_3 = 1,313.33$ g), and significantly decreased percentage of compost shrinkage ($P_1 = 51.23\%$, $P_2 = 44.25\%$ and $P_3 = 37.46\%$). The best C/N ratio was 25 with compost production of 926.67 g and shrinkage percentage of 51.23%.

F08 CROPPING PATTERNS AND SYSTEMS

042 AR-RIZA, I.

Cropping pattern of twice a year as rice production increase effort on tidal swamp land. Pola tanam dua kali setahun sebagai upaya peningkatan produksi padi di lahan pasang surut / Ar-Riza, I. (Balai Penelitian Pertanian Lahan Rawa, Banjarbaru (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 815-824, 3 ill., 1 table; 18 ref. 633.18-15.2/SEM/i bk2

ORYZA SATIVA; CROP MANAGEMENT; PLANTING DATE; PRODUCTION INCREASE; INTERTIDAL ENVIRONMENT; SWAMP SOILS; LAND SUITABILITY; LAND USE.

Food and food security in Indonesia are still priority and must be given more attention, because the increase of population growth rate is still high, around 1.6%/ year. Therefore, the increased rate of rice production must follow accordingly. The tidal swampland has a high potency with special characteristics and good agronomic support. Yet, the level of production now is not optimum, low productivity in the tidal swampland was caused by non optimum land resources management. The productivity of agriculture on the tidal swampland was still low, as well, it was caused by the improper land resources management on this area. The common cropping pattern in this tidal swampland was one harvest time per year and cultivated only local variety. The research result indicated that cropping pattern rice-rice in tidal swamp land yielded a good grain, especially on the A and B tide types. This cropping pattern of rice-rice showed increased rice production in tidal swampland.

043 MUKHLIS

Optimalization of rice based cropping pattern with rice basis in the shallow tidal swamp in South Kalimantan [Indonesia]. *Pola tanam optimal berbasis padi di lahan lebak dangkal Kalimantan Selatan* / Mukhlis; Nurtirtayani; Fauziati, N. (Balai Penelitian Pertanian Lahan Rawa, Banjarbaru (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 825-832, 1 ill., 3 tables; 7 ref. 633.18-15.2/SEM/i bk2

ORYZA SATIVA; CROP MANAGEMENT; LAND MANAGEMENT; CROPPING SYSTEMS; SWAMP SOILS; COST BENEFIT ANALYSIS; YIELDS; KALIMANTAN.

Cropping pattern and land management are needed to optimize the monotonous swampland area for agricultural development. This research was aimed at obtaining models of rice based cropping pattern in the two land management systems, suitable for the shallow swamp land character in South Kalimantan. The research was conducted in Tanggul Experimental Farm, South Kalimantan (shallow swamp). The cropping pattern treatments were rice-food crops (fallow) and vegetable + citrus (raised bed) for surjan system and rice-food crops (fallow) and citrus (tukungan) for the tukungan system. Research result showed that cropping patterns on surjan system with rice-corn (fallow) and chilly (raised bed) and cropping pattern of rice-corn on tukungan system in shallow swamp land was the highest margin benefit cost ratio (MBCR) value (3.12 and 2.88, respectively). These cropping patterns were feasible to be developed. Citrus was still three years old and unproductive, so it was not involved in the MBCR analyses.

044 SUASTIKA, I.B.K.

Role of IPM technologies to protect rice production from major pests and diseases. *Peranan teknologi PTT dalam upaya mengamankan produksi padi dari serangan OPT utama* / Suastika, I.B.K. (Balai Pengkajian Teknologi Pertanian Bali, Denpasar (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 525-537, 1 ill., 4 tables; 22 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; CROP MANAGEMENT; INTEGRATED PLANT PRODUCTION; INTEGRATED CONTROL; FARMING SYSTEMS; TECHNOLOGY TRANSFER; PRODUCTION INCREASE; PROFITABILITY.

Integrated crop management (ICM) is a model or an approach to manage soil, water, crop, pests, and diseases to keep the environment in a balanced condition. The application of ICM technology has been conducted at Subak Guama, Selanbawak Village, Marga Subdistrict, Tabanan District in 2008. The IPM components applied were superior rice variety of Ciharang, young seedlings (12-15 days of age), provision of intermittent irrigation, and in-row (legowo) planting system. The check was technology provided by farmers themselves. The objectives of the experiment were to evaluate the role of ICM in securing rice production against main pests and diseases. ICM treatments involved 20 farmers, conducted plots of 0.10-0.15 ha in size. Each treatment consisted of 3 plots as replication and was arranged in a randomized block design. Technical application of ICM technology was using 2-3 plants per hole with young seedlings of 12-15 days of age. The rice seedlings were transplanted at a planting distance of 50 cm x 25 cm x 12.5 cm. Fertilizers were applied

based on soil analysis previously done by Bali AIAT. Urea and phonska fertilizers were applied at 15-21 and 40-50 days after planting, respectively, at the rate of 200 kg. Results of this experiment indicated that ICM technology increased rice yield by 9.2%, plant height, and tiller number. ICM also reduced main pests and diseases, which might be due to the effect of legowo planting system 2:1 through the unfavorable microclimate in the plant canopies. It was observed that the occurrence of stem borer, rat and blast reached 10.5%, 15.5%, and 20%, respectively. Based on the economic analysis, it was noticed that ICM provided better profit of Rp 9,147,000 as compared to control of Rp 7,298,000.

045 SUPARWOTO

Rice production improvement through legowo planting system in swampland area of South Sumatra Province [Indonesia]. *Peningkatan produksi padi melalui sistem tanam legowo di lahan rawa lebak Provinsi Sumatera Selatan* / Suparwoto; Kadir, A.; Waluyo (Balai Pengkajian Teknologi Pertanian Sumatera Selatan, Palembang (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 841-849, 3 tables; 9 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; CROPPING SYSTEMS; SPACING; APPROPRIATE TECHNOLOGY; TECHNOLOGY TRANSFER; AGRONOMIC CHARACTERS; ECONOMIC VALUE; PRODUCTION INCREASE; SWAMP SOILS; SUMATRA.

In-row rice planting, called legowo system in Indonesia, is basically a planting system in which rice seedlings are planted in a denser distance within row and in about double distance between rows, while the rice population per hectare is maintained. Under a legowo cropping system, space becomes more available in the rice canopy as compared to that other cropping system. Such condition is expected to provide several advantages for the rice plants to grow. Among the advantages are air circulation within the rice canopy, more sun light penetrating into the canopy, more evapotranspiration, easier for the farmer to handle maintenance activities (weeding, fertilizing, spraying, etc.) in the rice field. The observation was conducted during the dry season 2008 at Sungai Dua Village, Rambutan Subdistrict, South Sumatra Province. The observation was aimed at evaluating the agronomic performance and economic value of paddy cropped in legowo system. The cropping was conducted by 3 farmer cooperators covering rice field as total of 1.5 ha. Result showed that legowo system increased rice yield by the harvest as much as 1.3 t/ha as compared to that of farmer's practice.

046 TOHA, H.M.

Implementation of ICM field school in rural areas in East Lombok [Indonesia]. *Sekolah lapangan pengelolaan tanaman terpadu padi sawah di kawasan pengairan pedesaan Lombok Timur, NTB* / Toha, H.M.; Guswara, A. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)); Widiarta, I N.; Zairin, M. [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.) Sukamandi (Indonesia): BB Padi, 2010: p. 549-567, 1 ill., 4 tables; 11 ref. 633.18-115.2/SEM/p bk2

IRRIGATED RICE; CROP MANAGEMENT; INTEGRATED PLANT PRODUCTION; HIGH YIELDING VARIETIES; INTEGRATED CONTROL; INTRODUCED VARIETIES; SOCIAL PARTICIPATION; EDUCATION; TECHNOLOGY TRANSFER; NUSA TENGGARA.

It was reported that implementation of integrated crop management (ICM) increased grain yield by 37% over those managed through the farmer's practices, in order to increase both the rice production and farmer's income. It would be necessary to bring the ICM into the farmer's fields. A demonstration plot of ICM with its component of the new HYV has been carried out in North Jenggik Village, Montong Gading Subdistrict, East Lombok District. Rice crops established through the implementation of square planting of 20 cm x 20 cm in space and in-row planting system legowo of 40 cm x 20 cm x 10 cm in space with planting young seedling of 2-3 seedlings/hole were introduced to the farmers under guidance of extension workers and researchers. Farmers' field school was conducted to train farmers on HYV, ICM, and integrated pest management. Data indicated that the average yield harvested from 10 HYVs were 7.1 t/ha, with the range of yield were of 6.7-7.4 t/ha. The yield of HYV by farmers' practice was 6.7 t/ha. Planting in-row legowo increased yield by 6%. Five HYVs, i.e. Mekongga, Cibogo, Cimelati, Tukad Unda, and Cilosari planted in legowo planting system yielded >7.5 t/ha. Mean income of planting 10 HYVs in the demonstration plot was Rp17,552,833 with the range of Rp16,670,400 to Rp18,544,900. The mean cost for rice production was Rp5,233,617, and therefore, the mean benefit obtained by the farmers was Rp12,329,217/ha/season. The highest benefit were obtained on legowo planting system, followed by square planting system and farmers' practice with values of Rp13,155,410, Rp12,213,880 and Rp11,618,360, respectively. The additional cost due to the adoption of square and legowo planting systems were Rp100,000 and Rp150,000/ha, respectively. The additional cost was considerably small as related to the overall farmers benefit obtained from adopting these planting methods.

047 WIDYANTORO

Optimizing rice farming system of walik jerami through integrated crop management model. *Optimalisasi pengelolaan tanaman padi walik jerami melalui pendekatan model pengelolaan tanaman terpadu* / Widyantoro; Rustiati, T.; Toha, H.M. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 739-751, 1 ill., 6 tables; 6 ref.

ORYZA SATIVA; CROP MANAGEMENT; CULTURAL METHODS; MINIMUM TILLAGE; INTEGRATED PLANT PRODUCTION; FARMERS; TECHNOLOGY TRANSFER; YIELDS; RAINFED FARMING.

Rainfed lowland area is the second rice granary after the irrigated lowland rice, however, the average yield was only about 2.5 to 3.5 t/ha. The main constraints in such ecosystem were unpredictable rainfall, low soil fertility, limited high yielding variety, and high weed infestation. Approach to increase rice productivity in rainfed lowland area was designed by implementing the integrated crop management (ICM) model, particularly in walik jerami. In such approach the implemented ICM by optimizing walik jerami rice farming systems through the integrated crop management model improved rice yields, proper management of fertilizer, and proper weeds managements. The objectives of the trial were to obtain information on the best production technology suitable in that ecosystem and the economic

value of ICM in walik jerami rice farming system in rainfed lowland area. Experiments were conducted at Jaken, Pati, Central Java. Results showed that increase ICM gave higher yield and benefit than farmers model. Average grain yield at demonstration plot with ICM walik jerami rice farming systems was 4.99 t/ha (legowo) and 4.47 t/ha (squared) or increased 31% (legowo) and 17% (squared), while farmers got 3.81 t/ha. ICM walik jerami rice farming system gave more net profit of 51% (legowo) and 28% (squared), respectively.

F30 PLANT GENETICS AND BREEDING

048 ABDULRACHMAN, S.

Optimalization of yield potential on several types of rice varieties through arrangement of plant population and nitrogen fertilizer. *Optimalisasi potensi hasil berbagai tipe varietas padi melalui pengaturan populasi dan pemupukan nitrogen* / Abdurachman, S.; Sembiring, H.; Agustiani, N. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdurachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 593-603, 2 ill., 3 tables; 13 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; HYBRIDS; INBRED LINES; VARIETIES; PLANT POPULATION; NITROGEN FERTILIZERS; FERTILIZER APPLICATION; GROWTH; YIELD COMPONENTS; YIELD INCREASES.

Lowland rice productivity under intensive technology has been stagnant, even declined. So that, to increase rice production, use of improved varieties and proper management are needed. To examine the interaction among rice varieties, plant population, and N fertilizer management on rice growth and yield, and also to develop "healty canopy" in order to obtain high yield and efficient input production as well, field experiments had been done at ICRR Sukamandi Field Experimental station on DS and WS 2008/09. Rice variety, plant population and N fertilizer management were used as the treatments and designed in completely randomized block design with four replications. Selection of varieties was basically based on panicle length and tiller number, V₁: long panicle and high tiller number. (hybrid Rokan), V₂: long panicle and low tiller number (PTB, BP360E-MR-9-PN-2), and V₃: short panicle and high tiller number (inbred Ciherang). Plant population consisted of P₁: recommended plant spacing 20 cm x 20 cm or 25 hills/m² and P₂: unoptimum plant spacing 25 cm x 25 cm or 16 hills/m². Nitrogen fertilizer management was applied on two different treatments, N₁: SSNM recommendation (30-45-60), and N₂: high early N dosage (60-45-30). The research results were (1) The most significant response of rice variety was observed on growth, yield component, and grain yield, followed by plant population and N fertilizer management. Having better growth performance, hybrid Rokan had also high yield (8.49 t/ha in DS 2008 and 7.10 t/ha in WS 2008/09). Meanwhile, PTB BP 360 produced 8.50 t/ha in DS 2008 and 6.46 t/ha in WS 2008/09), and inbred Ciherang 7.89 t/ha in DS 2008 and 6.48 t/ha in WS 2008/09, and (2) On unfavorable environment (high rainfall) rice was more sensitive to treatments. To obtain high yield, it needs a wider spacing 25 cm x 25 cm with high dosage of early N fertilization (60 kg/ha) in order to prevent from lodging and improving tillering ability.

049 DASMAL

Performance of local lowland rice varieties in three different environments. *Penampilan varietas lokal padi sawah pada tiga lingkungan tumbuh* / Dasmal; Azwir (Balai Pengkajian Teknologi Pertanian Sumatera Barat, Sukarami (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 787-977, 7 tables; 13 ref. 633.18-115.2/SEM/p bk2

IRRIGATED RICE; LAND VARIETIES; VARIETY TRIALS; GENOTYPE ENVIRONMENT INTERACTION; AGRONOMIC CHARACTERS; YIELD COMPONENTS; YIELDS.

Field evaluation of Ceredek local variety of lowland rice to study agronomic performance, yield components, and yield potential were conducted in Sumani (300 m asl), Katialo (600 m asl), and Rawang (900 m asl) in Solok District, during the DS of 2008. The experiment was arranged in randomized completely block design with three replications, with plot size of 4 m x 4 m. The crops were fertilized with urea, SP-36, and KCl, at the rates of 150, 100, and 50 kg/ha, respectively. Result of the assessment indicated that the best lowland rice varieties in the three testing locations were Padi Kuning and Padi Kutu in which their yield were up to 4.6 t/ha with the average plant heights were 116.6 cm and 144.4 cm, respectively. Unfortunately, the two varieties were susceptible to lodging. The other two varieties (Ceredek Putih and Ceredek Merah) reached the average yield of 3.7 and 3.3 t/ha, respectively, resistant to lodging, medium plant height (103.6 cm and 107.0 cm, respectively), and mature at 142 DAT.

050 EDISON, H.S.

Characterization and beta carotene content of banana germplasm. *Karakterisasi dan kandungan betakaroten plasma nutfah pisang* / Edison, H.S.; Sutanto, A.; Hermanto, C. (Balai Penelitian Tanaman Buah Tropika, Solok (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 92-101, 1 table; 15 ref. Appendix. 634.1/.7(594)/SEM/p

MUSA PARADISIACA; GERMPPLASM COLLECTIONS; GERMPPLASM CONSERVATION; PROXIMATE COMPOSITION; CAROTENOIDS; CHEMICOPHYSICAL PROPERTIES.

Germplasm is a substantial source of genetic diversity that can be processed to create new varieties. Preservation should be done for the raw materials of agricultural development in the future. Technology is needed to prevent germplasm prospect to improve people welfare from scarcity. Nutrients, vitamins and minerals contents of banana are very good for health. The purpose of the study was to preserve the germplasm of bananas and to identify β -carotene content of tropical banana collection owned by ITFRI in Solok, West Sumatra. Beta carotene analysis was conducted in Bioprospecting Laboratory LIPI, Bogor. The method used in evaluation of banana germplasm collection with high carotene ($>500 \mu\text{g}/100 \text{g}$) was inventory banana a fleshy fruit colored orange/pink, yellow, cream, and analyse of β -carotene with a method of Simone *et al.* (1993) with HPLC analysis tool-Water 440. The criteria used banana fruit flesh colored orange, yellow, cream, cloudy white. The experiment was conducted from March 2007 to Desember 2008. The highest content of β -carotene banana was obtained from the collection of Papua banana Sticks sky of $2,316.38 \mu\text{g}/100 \text{g}$,

followed by banana horns with comb 2-3 i.e. 1425.00 µg/100 g, namely 976.00 µg/100 g Sario banana, banana yellow namely Ambon 925 µg with orange flesh color-yellow, and the lowest was at the raja sere with white flesh color-cream of 50.15 µg/100 g. Evaluation of β-carotene content in banana cultivars can be utilized for various purposes such as health.

051 ERNAWATI, R.

Evaluation of the performance of the new improved rice varieties in Central Lampung [Indonesia]. *Evaluasi varietas unggul baru pada pengkajian budi daya beberapa varietas padi sawah di Lampung Tengah* / Ernawati, R. (Balai Pengkajian Teknologi Pertanian Lampung, Bandar Lampung (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 479-485 , 4 tables; 10 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; IRRIGATED RICE; VARIETY TRIALS; HIGH YIELDING VARIETIES; CULTIVATION; GROWTH; CROP PERFORMANCE; YIELD COMPONENTS; YIELD INCREASES.

Ciherang rice variety has been continuously and widely planted in Central Lampung. The continuous planting of a particular variety can cause yield decrease of the variety planted. The objective of the assessment was to evaluate some new improved rice varieties, in order to replace the Ciherang variety in lowland irrigated area in Central Lampung. The assessment was carried out during the dry and wet seasons of 2007. The evaluated rice varieties were planted in a row planting system of 4:1, at the planting space of 25 cm x 12.5 cm and one seedling per hole. The new improved rice varieties tested were Cigeulis, Mekongga, Batang Piaman and Ciherang. The assessment was arranged in randomized block design with five replications. Result of this study indicated that the new variety of Cigeulis was potential to be developed in Central Lampung to replace Ciherang variety.

052 KAMANDALU

Yields of some rice varieties harvested from the crops managed through ICM. *Produktivitas beberapa varietas unggul baru melalui pendekatan pengelolaan tanaman dan sumber daya terpadu* / Kamandalu; Suryawan (Balai Pengkajian Teknologi Pertanian Bali, Denpasar (Indonesia)); Toha, H.M. [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 539-548, 3 tables; 10 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; HIGH YIELDING VARIETIES; VARIETY TRIALS; CROP MANAGEMENT; INTEGRATED PLANT PRODUCTION; CULTURAL METHODS; AGRONOMIC CHARACTERS; YIELD COMPONENTS; PRODUCTIVITY.

An assessment of irrigated rice yields managed through ICM has been conducted at Subak Nyitdah III, Kediri Subdistrict, Tabanan District during the WS of 2008/09. Seven rice varieties to be tested, namely Inpari 1, Inpari 3, Inpari 6, Conde, Ciherang, Situ Bagendit, and Angke were planted and managed through ICM system. The components implemented in this assessment were certified rice seeds, young seedlings of <20 days-old, 1, 3, 5, and 7

seedling per hole, legowo 2:1 in-row planting, intermittent irrigation, proper fertilizing, and IPM. Results of the assessment indicated that average yields harvested from the crops managed through the ICM were 7.45 t/ha, with the range of 6.80-9.03 t/ha of milling dried rice grain. Planting with 1 and 3 seedlings per hole significantly produced higher yields as compared to that of planting with 5 and 7 seedlings per hole. Ciherang variety produced 7.45 and 6.50 t/ha when it was managed through ICM and non-ICM, respectively, compared to farmer practice which was 6.50 t/ha. Rice crop managed through ICM also increased farmer profit income by 18.6%.

053 KOBARSIH, M.

Evaluation on the use of new high yielding varieties of rice in Kebonagung Village, Imogiri Subdistrict, Bantul District [Indonesia]. *Studi penggunaan varietas unggul baru berdaya hasil tinggi di Desa Kebonagung, Imogiri, Bantul* / Kobarsih, M.; Mudjisihono, R.; Subowo G. (Balai Pengkajian Teknologi Pertanian Yogyakarta (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdurachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 495-505, 1 ill., 6 tables; 5 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; HIGH YIELDING VARIETIES; CROP MANAGEMENT; AGRONOMIC CHARACTERS; YIELD COMPONENTS; CROP PERFORMANCE; EVALUATION.

An experiment to evaluate the performance of four rice varieties of Ciherang, Singkil, Fatmawati, and IR64 managed in the integrated crop and resources management (ICM) was conducted in the Village of Kebonagung, Imogiri, Bantul, during the wet season of 2007/08. The experiment was arranged in a randomized block design with three replications. Results of the trials indicated that the yields reached 8.03 t, 8.67 t, and 7.2 t/ha milling dried grain for Ciherang, Singkil, and IR64, respectively. Meanwhile, under the transplanting management of in-row planting and direct seeding, yields of the variety Fatmawati reached 8.33 t and 9.12 t/ha, respectively. Urea fertilizer applied at the rate of 125-250 kg/ha improved rice yields, and therefore it was recommended to be adopted in that particular area. As a while, the fertilizers of urea, SP-36, and KCl at the rates of 250 kg, 100 kg, and 100 kg/ha, respectively, shall be adopted in this particular areas. Organic fertilizer is strongly recommended, since it maintains the soil fertility and improves grain quality.

054 KRISNAWATI, A.

Genetic diversity and development prospects of winged bean (*Psophocarpus tetragonolobus* L.) in Indonesia. *Keragaman genetik dan potensi pengembangan kecipir (*Psophocarpus tetragonolobus* L.) di Indonesia* / Krisnawati, A. (Balai Penelitian Kacangkacangan dan Umbi-umbian, Malang (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia) ISSN 0216-4418 (2010) v. 29(3) p. 113-119, 1 ill., 4 tables; 22 ref.

PSOPHOCARPUS TETRAGONOLOBUS; GENETIC VARIATION; NUTRITIVE VALUE; GERMPLASM CONSERVATION; USES; DEVELOPMENT POLICIES; INDONESIA.

Winged bean (*Psophocarpus tetragonolobus* L.) is a tropical plant with multiple uses, as a high nutritional food and cover crop. All parts of the plant are edible and rich of protein. The plant can also be used as fertilizer, cattle feed, traditional medicine, and preventing the dryland from erosion. The plant is originally from Papua New Guinea, Mauritius,

Madagascar, and India. The biggest centers of diversity now are in Papua New Guinea and Indonesia. This paper presents the genetic diversity of Indonesian winged bean, its multifunctions and development prospects in Indonesia. Winged bean varieties in Indonesia are numerous, but characterization of the winged bean germplasm has not been done. Winged bean description list has been made by IBPGR, and the guidelines can be applied to characterize winged bean germplasm in Indonesia. The prospect of winged bean development in Indonesia is very wide in terms of its utilization, nutritional aspects, as well as from the ecological aspect which is very suitable for Indonesia.

055 MAKARIM, A.K.

Response of IR64 and IR64 Sub-I rice varieties to submergence and fertilizers. *Respons varietas padi IR64 dan IR64 Sub-1 akibat pengaruh perendaman dan pemupukan* / Makarim, A.K.; Pratiwi, G.R. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)); Ikhwan. [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 701-713, 5 ill., 4 tables; 10 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; VARIETY TRIALS; WATER TOLERANCE; FERTILIZER APPLICATION; APPLICATION RATES; COMPOUND FERTILIZERS; PLANT RESPONSE; GROWTH; YIELD COMPONENTS.

A number of rice varieties were produced, introduced, and bred, either by IRRI and by NARs that were tolerant to submergence condition. Among them were IR64 Sub-1, Swarna Sub-1, Inpara 1, Inpara 2, Inpara 3, and others. However the performance of those new varieties in this particular ecosystem have not yet been widely evaluated. Experiment to evaluate the response of IR64 and IR64 Sub-1 to submergence and fertilizers was conducted in the green house of Muara Experimental Station of the Indonesian Center for Rice Research, during the dry season of 2008. The objectives of this experiment were (1) to study the effects of time of exposure to submergence and nitrogen application on plant growth and yields of IR64 and IR64 Sub-1 varieties; (2) to find out the proper nutrient management for rice varieties grown under submergence condition. The experiment was arranged in a completely randomized factorial design with three replications. The rice varieties of IR64 and IR64 Sub-1 were assigned as factor 1. Times of exposure to submergence (without submergence, submerged at 15 to 24 DAT, and submerged at 35 to 45 DAT) were as factor 2, and 5 combinations of fertilizers, namely 300 kg urea/ha with 3 applications at 7, 30, and 55 DAT; urea mudball, 300 kg/ha applied once at 7 DAT; compost; compost and urea; urea and silicate were as factor 3. Urea was applied four times, at 0 (basal), 7, 30, and 55 DAT. Results of the experiments indicated that time of exposure to submergence and different combination of fertilizers increased dry grain weight of IR64 by 35.9 g and 29.9 g at vegetative and primordial growth stages, respectively. The same effects were also occurred on the variety of IR64 Sub-1, in which its grain weight increased by 32.6 g and 30.3 g at vegetative and primordial growth stages, respectively.

056 PUSTIKA, A.B.

Performance of eight hybrid rice in Galur Subdistrict, Kulon Progo District, D.I. Yogyakarta Province during the rainy season of 2007/08. *Penampilan delapan padi hibrida di Kecamatan Galur, Kabupaten Kulon Progo, D.I. Yogyakarta, musim hujan 2007/08* / Pustika, A.B.; Rustijarno, S.; Sukar; Suradal (Balai Pengkajian Teknologi

Pertanian Yogyakarta (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.). Sukamandi (Indonesia): BB Padi, 2009: p. 723-728, 2 ill., 3 tables; 5 ref. 633.18-115.2/SEM/i bk2

ORYZA SATIVA; HYBRIDS; HIGH YIELDING VARIETIES; CROP PERFORMANCE; AGRONOMIC CHARACTERS; DISEASE SURVEILLANCE; SYMPTOMS; WET SEASON; JAVA.

Many new rice varieties including hybrid rice have been released by various research institutions, but those have been planted by farmers were still limited. In the D.I. Yogyakarta Province, IR64 was the dominant variety planted by the farmers followed by Ciherang. Therefore, some hybrid rice such as PPI, Maro, Rokan, Bernas Super, Intani, Hipa 3, Hipa 5, and Hipa 6 were planted in Galur District during the rainy season of 2007/08 and was compared with non hybrid rice (IR64 and Sintanur). The experiment were arranged in a randomized completely block design with 3 replications. The results showed that plant height was not differ among varieties, and the yields of hybrid rice were not significantly different as compared to that of non hybrid rice. There were five diseases observed at 38 and 90 days after planting.

057 SETIABUDI, D.

Relative sensitivity of the inbred and hybrid rices to the variability of water supply during vegetative and reproductive stages. *Kepekaan relatif padi inbrida dan hibrida terhadap variasi pasokan air selama fase vegetatif dan reproduktif* / Setiabudi, D.; Samaullah, Y.; Rustiati, T. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009. Buku 2 Sukamandi (Indonesia), 20 Oct 2009 / Abdurachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 683-700, 2 ill., 9 tables; 6 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; INBRED LINES; HYBRIDS; WATER SUPPLY; VEGETATIVE PERIOD; REPRODUCTION; GROWTH; PLANT WATER RELATIONS; PRODUCTIVITY.

A pot experiment to evaluate the growth and yields of rice variety as affected by water supply during the vegetative and reproductive growth stages was conducted in the screen house of the Indonesian Center for Rice Research, during the WS of 2008/09. The trial was arranged in a 4 x 5 factorial in randomized completely block design with three replications. The first factor was 3 inbred genotypes, namely Dodokan, S3382, Ciherang, and the hybrid rice, Rokan. The second factor was the water supply during the vegetative and reproductive growth stages which being varied as (a₁) continuously flooded at 3 cm of depth from the day 7 after transplanting until the day 80, (a₂) water supply which was ranged from the upper limit of field saturation (FS) to the lower limit of the soil moisture tension at -0.5 MPa from the day 7-25 and the day 45-65, (a₃) similar to the second treatment, except the duration were from the day 7-25 and the day 55-75, (a₄) same with the second treatment, but at 45-75 DAT, and (a₅) same with the second treatment but at 55-75 DAT. Results of the experiment indicated that the water supply during vegetative and reproductive plant growth stages did not significantly affect both the plant height and number of tillers per hill at harvest time. The hybrid rice Rokan was the highest plant height at havest, but the number of tillers per hill was the lowest. The plant height of Dodokan variety at harvest was the highest. The

plant height was steadily increasing started from the day 21 until the harvest time. The number of tillers per hill reached the maximum at the day of 56 and sharply decreased after approaching the harvest time. The weight of 1,000 grain and the straw biomass of the hybrid rice at harvest were the highest among the other rice genotypes tested. All inbred rices were relatively sensitive to water supply during grain filling period and affected the weight of 1,000 grain. The average grain yield significantly decreased by 14% when the water was supplied from the day 7-45 and 55-75. The grain yield of the hybrid rice was similar to that of the inbred line. Root volume at harvest time of the hybrid rice was the greatest among that of the genotypes tested, indicating that the root mass was less sensitive to water supply than the root volume. The total water consumption ranged between 35.0 l -45.8 l at the day 7-80 and the highest water productivity of 0.94 g/l was observed when the water was supplied at the day 45-75.

058 SUHENDRATA, T.

Performance of new high yielding variety of rice in rainfed lowland rice of Tulakan Village, Jepara District, Central Java [Indonesia]. *Keragaan padi varietas unggul baru pada lahan tadah hujan Desa Tulakan, Kecamatan Donorojo, Kabupaten Jepara /* Suhendrata, T. (Balai Pengkajian Teknologi Pertanian Jawa Tengah, Ungaran (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 715-723, 2 ill., 1 table ; 9 ref. 633.18-115.2/SEM/p bk2

ORYZA SATIVA; HIGH YIELDING VARIETIES; INTRODUCED VARIETIES; AGRONOMIC CHARACTERS; LAND PRODUCTIVITY; PRODUCTION INCREASE; RAINFED FARMING; JAVA.

Variety is one of the main technologies that can improve rice productivity and farmers income. Until now, rice planting area in the District of Jepara is dominated by the variety of IR64. The dominance of this variety is associated with its yield and eating quality characters. Unfortunately, the variety currently seems susceptible to a number of pests and diseases and its productivity was also started to decline. To anticipate such problem, an assessment and introduction of several lowland new high yielding variety (HYV's) of rice developed by Indonesian Center for Rice Research were carried out. This study was aimed at evaluating the performance of the HYV's Mekongga, Cibogo, Conde, and Tukad Unda and to provide alternative for farmers to select the variety that they prefer to grow to improve the productivity of rainfed lowland available in their area. The assessment was carried out in Tulakan Village, Jepara District in the wet season of 2008/09. Young seedlings grown from the stock seeds (SS) quality of 2 to 3 seedlings/hole were transplanted. The rice plants were fertilized based on the soil nutrient status in that particular area and was completed with the organic fertilizer at the rate of 2 t/ha. Results of the trials indicated that the agronomic characters directly affected higher rice grain yield of the HYV's as compared to that of IR64. The yield of tested HYV's grown through the production management of young seedlings, fertilized based on soil nutrient status completed with organic fertilizer increased from 4.9 t to 6.4 t/ha of milling dried grain, or by 19.42%. It was also observed that the intensity of bacterial leaf blight on Conde variety was lower as compared to that on Mekongga, Cibogo, Tukad Unda, and IR64 varieties.

059 TOHA, H.M.

[Performance of high yielding varieties and elite lines of upland rice in two different agro ecosystems: upland and irrigated rice ecosystem]. *Keragaan varietas unggul dan galur harapan padi pada budi daya padi gogo dan padi sawah* / Toha, H.M.; Daradjat, A.A. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Rice technology innovation to anticipate global climate change supporting food security: Proceedings of the national seminar on rice 2008. Book 2]. Inovasi teknologi padi mengantisipasi perubahan iklim global mendukung ketahanan pangan: Prosiding seminar nasional padi 2008, Sukamandi (Indonesia), 23-24 Jul 2008. Buku 2 / Gani, A.; Pirngadi, K.; Susanti, Z.; Agus S.Y. (eds.) Sukamandi (Indonesia): BB Padi, 2009: p. 645-665, 1 ill., 10 tables; 20 ref. 633.18-115.2/SEM/i bk2

ORYZA SATIVA; UPLAND RICE; IRRIGATED RICE; HIGH YIELDING VARIETIES; PROGENY; CULTIVATION; AGROECOSYSTEMS; YIELDS; YIELD COMPONENTS; CROP PERFORMANCE.

Harvested area of upland rice in Indonesia is about 1.2 million ha or about 10% of the total of national rice harvested area. In recent time, the upland rice production was 2.56 t/ha or about half of irrigated rice production which was 4.74 t of dry grains/ha. In the research level, the upland rice production reached up to 7.0 t/ha. This phenomena means that the rice production under upland condition still possible to be improved. In order to identify the best yielding lowland and upland rice and elite lines suited to upland rice ecosystem, a field study was carried out. The result showed that under irrigated rice ecosystem the production of upland rice increased, while under upland rice ecosystem, the production of irrigated rice decreased. Under upland rice ecosystem, the production of Situ Bagendit, Towuti, Batutegi, and Situ Patenggang varieties were above 4.0 t/ha. Whereas under irrigated rice ecosystem, the production of those varieties were 7.12 t/ha, 6.82 t/ha, 5.98 t/ha, and 5.20 t/ha, respectively. Under irrigated rice ecosystem, the production of upland rice elite lines such as TB490C-TB-1-2-1, B5524G-SM-61-2-1, BP606C-18-9-6, and TB396B-TB-143 reached up to >6.0 t/ha. Under upland rice ecosystem, the irrigated rice varieties such as Cigeulis, Widas, Sunggal, and Ciherang yielded >4.5 t/ha. The production of those varieties in that ecosystem were 5.47 t/ha, 5.02 t/ha, 4.99 t/ha, and 4.5 t/ha, respectively.

060 WAHYUNO, D.

Development of improved black pepper variety resistant to foot rot disease caused by *Phytophthora capsici*. *Pengembangan varietas unggul lada tahan penyakit busuk pangkal batang yang disebabkan oleh *Phytophthora capsici** / Wahyuno, D.; Manohara, D. (Balai Penelitian Tanaman Obat dan Aromatik, Bogor (Indonesia)); Ningsih, S.D.; Setijono, R.T. *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(3) p. 86-95, 7 ill., 3 tables; Bibliography: p. 94-95.

PIPER NIGRUM; HIGH YIELDING VARIETIES; DISEASE RESISTANCE; PHYTOPHTHORA CAPSICI; FUNGAL DISEASES; ROTS; INTERSPECIFIC HYBRIDIZATION; INTRASPECIFIC HYBRIDIZATION; DISEASE CONTROL.

Black pepper (*Piper nigrum*) is a spice crop that cultivated by many farmers in Indonesia. Black pepper productivity in Indonesia is low due to pepper price fluctuation in global market which causes difficulty to maintain their crops properly, and the occurrence of foot rot disease caused by a pathogenic fungus, *Phytophthora capsici*. Improvement of pepper varieties having disease resistance and high productivity accompanied by better cultivation system is considered as the best approach to reduce yield losses. However, effort to improve black pepper resistance faced problems, among other narrow genetic diversity of black

pepper population in Indonesia and widely virulence variance of *P. capsici* are major constraints in developing resistant variety. Cross pollination either inter- or intraspecies of *Piper* has been conducted, but it still needs a lot of work before obtaining progenies with promising characteristics. Widely geographic distribution of *P. capsici* and the presence of virulence variation of *P. capsici* population lead improving other component technologies for controlling foot rot disease. These efforts are important in improving the disease resistance against *Phytophthora* and supporting sustainable national pepper production.

061 WIDIASOETY, D.

Potential of *Dendrobium* in increasing variety and quality of orchids. *Potensi anggrek dendrobium dalam meningkatkan variasi dan kualitas anggrek bunga potong* / Widiastoety, D.; Solvia, N.; Soedarjo, M. (Balai Penelitian Tanaman Hias, Segunung-Cianjur (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(3) p. 101-106, 5 ill., 2 tables; 23 ref.

DENDROBIUM; GENETIC RESOURCES; HYBRIDS; HYBRIDIZATION; GENETIC VARIATION; QUALITY; CUT FLOWERS.

Dendrobium is one of the largest orchid genera from the family of *Orchidaceae*. The orchid genera is an important genetic resource which is vastly available in the eastern Indonesia, such as in Papua and Maluku. However, this genetic resource has not yet utilized optimally as parents in cross breeding to produce varieties having characteristics as needed by consumers. Out of the 20 *Dendrobium* sections, only two sections that have been used as cross breeding plants, e.g. *Phalaenanth* and *Ceratobium* or *Spatulata*. The constraints for developing orchid in Indonesia among others are limited availability of best seedlings, relatively low technology applied, and lacking supports of government policy.

062 ZARWAZI, L.M.

Performance of upland rice lines and upland rice varieties as an intercropping system at young teak forest in Blora and Indramayu [Indonesia]. *Keragaan galur dan varietas padi gogo sebagai tanaman tumpang sari hutan jati muda di Blora dan Indramayu* / Zarwazi, L.M.; Widyantoro; Supartopo; Toha, H.M. (Balai Besar Penelitian Tanaman Padi, Sukamandi (Indonesia)). [Proceedings of the national seminar on rice research results 2009. Book 2]. Prosiding seminar nasional hasil penelitian padi 2009, Sukamandi (Indonesia), 20 Oct 2009. Buku 2 / Abdulrachman, S.; Toha, H.M.; Gani, A. (eds.). Sukamandi (Indonesia): BB Padi, 2010: p. 767-778, 6 tables; 7 ref. 633.18-115.2/SEM/p bk2

UPLAND RICE; TECTONA GRANDIS; PROGENY; VARIETY TRIALS; INTERCROPPING; GROWTH; CROP PERFORMANCE; YIELD COMPONENTS; PRODUCTIVITY; HARVEST INDEX; JAVA.

There were dryland available in Indonesia which can be utilized as an alternative of improving rice production in the country. One of the dryland available was those covered with young forest plants in which rice crops still possible to be grown with considerable yield production. The experiment has been conducted at Ngliron Village, Randublatung Subdistrict, Blora District, Central Java and at Bantarwaru Village, Gantar Subdistrict, Indramayu District, West Java, during the WS of 2008/09. The rice genotypes tested in Blora were TB409B-TB-14-3, B11602E-MR-1-2, and BP1351D-1-2-PK-3-1, while in Indramayu were TB490C-TB-1-21-MR-1-1, TB490C-TB-1-2-1, and TB409B-TB-14-3. In both

locations, three rice varieties, i.e. Batutegei, Limboto, and Situ Patenggang were grown as check. The trials were arranged in a randomized completely design, with rice genotypes as the trial. Results of the trials indicated that the average yield of upland rice genotypes harvested were 4.21 t/ha of dry crop grains (DCG) or 3.94 kg/ha of dry milled grains (DMG) in Indramayu and 4.56 t/ha (DMG) in Blora. In Indramayu, the lines of TB490C-TB-1-21-MR-1-1, TB490C-TB-1-2-1, dan TB409B-TB-14-3 yielded 4.81, 4.73, and 4.62 t/ha, respectively. In Blora, the lines of TB409B-TB-14-3, B11602E-MR-1-2, and BP1351D-1-2-PK-3-1 yielded 5.32, 5.26, and 4.99 t/ha, respectively. In both locations, the check varieties yielded lower than the tested genotypes.

F60 PLANT PHYSIOLOGY AND BIOCHEMISTRY

063 WIRADIPUTRA, B.R.

Forage yield and crude protein content of solodsoya (*Portulaca oleracea* L.) and talisaid (*Commelina diffusa* Burm. F.): A preliminary study. Daya hasil hijauan dan kandungan protein kasar solodsoya (*Portulaca oleracea* L.) dan talisaid (*Commelina diffusa* Burm. F.): studi pendahuluan / Wiradiputra, B.R. (Balai Penelitian Ternak, Bogor (Indonesia)) [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 797-800, 3 tables; 5 ref. 636:619/SEM/p

PORTULACA OLERACEA; COMMELINA; FORAGE; YIELDS; CRUDE PROTEIN; PROTEIN CONTENT.

A preliminary study on two forages species, namely solodsoya (*Portulaca oleracea* L.) and talisaid (*Commelina diffusa* Burm. F.), was conducted at Indonesian Research Institute for Animal Production. The two mentioned forages have high crude protein content. The result showed that the protein content of the forages were between 9 to 21%, depend on soil moisture condition and cutting interval. The fresh weight yield of talisaid was higher than that of solodsoya. Soil moisture also influenced yield and protein content. In high moist soil condition solodsoya gave higher yield compared to talisaid but in field capacity condition talisaid gave higher yield than that of solodsoya.

F62 PLANT PHYSIOLOGY - GROWTH AND DEVELOPMENT

064 HUSNI, A.

Optimization of fusion induction using PEG on citrus protoplast. Optimasi induksi fusi menggunakan PEG pada protoplas tanaman jeruk / Husni, A.; Kosmiatin, M.; Martasari, C. (Balai Besar Penelitian dan Pengembangan Bioteknologi dan Sumberdaya Genetik Pertanian, Bogor (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 114-133, 3 ill., 7 tables; 27 ref. 634.1/.7(594)/SEM/p

CITRUS; PROTOPLAST FUSION; POLYETHYLENE; ISOLATION; ENZYMES; EMBRYONIC DEVELOPMENT; CALLUS.

Concentration and incubation period in PEG solution affect fusion inductions of plants protoplast. The higher concentration of PEG there was the higher frequency of fusion

protoplast. Results of the study showed that the combination of enzyme cellulase Onozuka (Yakult R-10) with 1% maserozim (R-10-Yakult) 1% in the CPW solution isolated 13.95×10^3 protoplast/gram of leaf mesophyll and 15.10×10^3 protoplast/gram of embriogenic callus. The longer incubation time in PEG solution, there was the more number of fusion protoplast, for either high concentrations of PEG (30%) or low concentration (4%). The higher concentration of PEG (30%) is more effective to induce the fusion than low concentration (4%). The resulting fusion types were Binner fusion (heterogenous fusion and homo genous fusion) and multifusion. The average number of heterofusion resulting from Binner fusion PEG 30% was 1.6 of incubation for 5 minutes, 3.6 of incubation for 10 minutes and 4.8 for 15 minutes incubation. The average number of hetero-fusion resulting from Binner fusion using PEG 4% was 1.2 of incubation for 5 minutes, 1.8 of incubation for 10 minutes and 3.0 for 15 minutes incubation. Frequency of fusion increased after the addition of 200 1 washing solution. The average number of induction heterofusion from PEG 30% is 7.2 and 3.6 from 4% PEG fusion.

H10 PESTS OF PLANTS

065 AFFANDI

Control of *Scirtothrips dorsalis* (Hood) and *Selenothrips rubrocintus* GIARD. pests cause scar on mangosteen fruit. *Pengendalian Scirtothrips dorsalis* (Hood) dan *Selenothrips rubrocintus* GIARD. hama penyebab burik buah manggis / Affandi; Emilda, D. (Balai Penelitian Tanaman Buah Tropika, Solok (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 74-83, 1 ill., 2 tables; 30 ref. 634.1/.7(594)/SEM/p

GARCINIA MANGOSTANA; SCIRTOTHRIPS DORSALIS; SELENOTHRIPS; FRUIT DAMAGING INSECTS; CONTROL METHODS; PEST CONTROL; MULCHING; STICKY TRAPS; CLIMATIC FACTORS.

International export standard for mangosteen requires quality of fruit that free from scar. It was the main constraint on the export of Indonesian mangosteen. Thrips are the pest causing those scars on mangosteen fruits. Hence, the thrips population must be controlled. This research is aimed at studying the effects of yellow fluorescent sticky trap (YST) application, combination treatment of sanitation (SNT + YST) and combination treatment of paddy hay mulching (MLS + YST) on the percentage and intensity of fruit scars caused by thrips. The research was conducted at a farmer polycultured mangosteen orchard in Lima Puluh Kota, West Sumatra, during three fruit seasons from September 2006 to February 2009. The results showed that all treatments gave significant differences in decreasing percentage and intensity of scars compared to the control during three-year treatment. Combination treatment of SNT + YST showed the best result in reducing percentage (41.19%, 96% and 46.9%, respectively) and intensity of scars value (32.14%, 15.81% and 49.99%, respectively) eventhough it was not significantly different with MLS + YST treatment in the first, second year as well as in the third year, respectively. Decreasing of population thrips fluctuation was caused by application of sanitation and mulching in combination with yellow fluorescent sticky trap and supported also by climatic factor especially number of rainy days.

066 ISTIANTO, M.

Use of Citronella oil as an environment friendly alternative control of pest and disease in horticultural crops. *Pemanfaatan minyak sereh wangi sebagai alternatif pengendalian ramah lingkungan terhadap organisme pengganggu tanaman hortikultura* / Istanto, M. (Balai Penelitian Tanaman Buah Tropika, Solok (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009; p. 198-204, 14 ref. 634.1/.7(594)/SEM/p

HORTICULTURE; PESTS OF PLANTS; PLANT DISEASES; BIOLOGICAL CONTROL; CYMBOPOGON; ESSENTIAL OILS; BOTANICAL PESTICIDES; APPLICATION RATES; PESTICIDAL PROPERTIES.

Pest and disease are the main problems in cultivation of horticultural crops. Until now, the main technology to control pest/disease is applying synthetic pesticide. To support environmentally friendly program, applying natural pesticide is an exact decision. In field test, citronella oil showed good effectiveness to control fruit fly, thrips, white fly, scale insect, aphid, sucking beetle, citrus fruit borer, antrachnose, and scab. Some technical requirements needed to obtain high effectiveness of citronella oil were (1) interval application was once in six days, (2) using emulsifier material, (3) spraying to every part of plant. Evaluation of economic feasibility and feasibility in wide scale is needed before this technology be disseminated to the user.

067 MOEKASAN, T.K.

Effect of insecticides combination against beat armyworm *Spodoptera exigua* Hubn. *Pengaruh campuran insektisida terhadap ulat bawang *Spodoptera exigua* Hubn.* / Moekasan, T.K.; Murtiningsih, R. (Balai Penelitian Tanaman Sayuran, Lembang (Indonesia)). *Jurnal Hortikultura* (Indonesia). ISSN 0853-7097 (2010) v. 20(1) p. 67-79, 1 ill., 10 tables; 16 ref.

ALLIUM ASCALONICUM; INSECTICIDES; SPODOPTERA EXIGUA; EGGS; POPULATION DYNAMICS; ECONOMIC ANALYSIS.

The purpose of the study was to determine the efficacy of combination of four insecticides, i.e. spinosad (Tracer), methomyl (Metindo), thiodicarb (Larvin), and chlorpyrifos (Dursban) against beat armyworm, *S. exigua* on shallots. The experiment was conducted from April until September 2007 at Kendawa Village, Jatibarang Subdistrict, Brebes District, Central Java (2 m asl). The treatments were (a) spinosad + methomyl, (b) spinosad + thiodicarb, (c) chlorpyrifos + methomyl, (d) spinosad, (e) thiodicarb, (f) chlorpyrifos, (g) methomyl, and (h) check. The treatments were arranged in a randomized block design with 4 replications. The results showed that spinosad + methomyl was the most effective insecticide combination to suppress *S. exigua*. This combination could sustain the high yield and the price of spinosad + methomyl combination was cheaper than the spinosad single price. Therefore, the application of spinosad + methomyl was more profitable compare to single spinosad.

068 YUSUF, S.

Effect of several carriers on *Beauveria bassiana* to control *Thrips parvispinus* Karny on chrysanthemum under plastichouse. *Pengaruh bahan pembawa terhadap efektivitas *Beauveria bassiana* dalam mengendalikan *Thrips parvispinus* Karny pada tanaman krisan di rumah plastik* / Yusuf, S.; Nuryani, W.; Djatnika, I. (Balai Penelitian Tanaman

Hias, Cianjur (Indonesia)). *Jurnal Hortikultura* (Indonesia). ISSN 0853-7097 (2010) v. 20(1) p. 80-85, 2 ill., 3 tables; 29 ref.

CHRYSANTHEMUM; BEAUVERIA BASSIANA; THRIPIDAE; POPULATION DYNAMICS; PEST CONTROL; CORN COB MIX; FLOURS; HUSKS; KEEPING QUALITY.

Beauveria bassiana is one of effective entomopathogenic fungi in controlling important pests on chrysanthemum production. Several constraints on its application in the field yet still become problems, including the decrease of viability and effectiveness of the fungi. The aim of this study was at determining the effect of several carriers on the application of *B. bassiana* to control thrips on chrysanthemum. The experiment was carried out in the plastichouse of Indonesian Ornamental Crop Research Institute at Segunung from April-August 2008. The experiment was arranged in a randomized block design with 6 treatments and 5 replications. The treatment was *B. bassiana* with carriers of corn cob powder, talk, husk ash, *B. bassiana* 10 g conidia/ml, *Beauveria N* (positive control), and water (negative control). The results showed that talc carrier was more effective in suppressing thrips population on chrysanthemum in the plastichouse than positive control. These results were not shown by carriers of corn cob powder and husk ash. All of the treatments did not show any significant effect on the damage percentage and vase life of flower, but there was a significant difference on the number of thrips population.

H20 PLANT DISEASES

069 MURYATI

Potency evaluation of essential oils to control anthracnose at *in vitro* scale. *Evaluasi potensi minyak atsiri sebagai pengendali penyakit antraknose pada skala in vitro* / Muryati; Istanto, M. (Balai Penelitian Tanaman Buah Tropika, Solok (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 84-91, 2 tables; 14 ref. 634.1/.7(594)/SEM/p

MANGIFERA INDICA; MANGOES; ANTHRACNOSIS; DISEASE CONTROL; ESSENTIAL OILS; CLOVES; FLOWERS; LEAVES; PLANT EXTRACTS; BIOLOGICAL CONTROL AGENTS.

Anthracnose is an important disease attacking mango fruit in storage. The aim of this research was to find out essential oils that have effectiveness to control anthracnose in *in vitro* scale. The research was conducted at Plant Protection Laboratory of Indonesian Tropical Fruit Research Institute, Solok, West Sumatra. The essential oils tested in this research were extracted from *Cymbopogon nardus*, pumello, cinnamon bark, and clove. The result showed that essential oil extracted from clove had higher inhibition effect on the mycellial growth of anthracnose. The lowest inhibition effect was showed by essential oil extracted from pumello. This result indicated that clove essential oil had good potency to be developed as an alternative technology to control anthracnose considering the consumer and environment safety.

070 SALAMIAH

Diplodia bark disease control on siam banjar citrus using basic knowledge about disease cycle of pathogen and good agricultural practices. *Pengendalian penyakit kulit diplodia pada jeruk siam banjar menggunakan pengetahuan dasar mengenai siklus penyakit dan penerapan GAP* / Salamiah (Universitas Lambung Mangkurat, Banjarbaru (Indonesia). Fakultas Pertanian). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 55-73, 4 tables; 28 ref. 634.1/.7(594)/SEM/p

CITRUS; BOTRYODIPLODIA THEOBROMAE; PATHOGENICITY; SYMPTOMS; CONTROL METHODS; LIFE CYCLE; GEOGRAPHICAL DISTRIBUTION; PLANT COMPETITION; VECTORS.

Diplodia bark disease (*Botryodiplodia theobromae*) is one of important diseases in South Kalimantan, Indonesia. Around 54% of citrus plantations in South Kalimantan are infected by the disease and caused considerable loss in yield and quality of fruit. The spread of the disease is fast and the farmer knowledge about the disease is still lacks. Up to now, effective or efficient method to overcome the problem is still lacks too. Diseases control strategy has been widely known, one of them is the use of disease resistant plants. This method is very effective and environmentally safety. However, basic knowledge about plant resistance mechanism to diseases is less. Based on the results, pathogen propagul could survive in seed, tree stump, soil and even on the alternative host. Therefore, the disease control should be directed not only to citrus but also to alternative hosts as well and destroys retention site of the pathogen. This paper discuss a research to determine the life cycle of the pathogen and application of good agricultural practices to control the disease.

071 SANTOSO, T.J.

Identities and genetic variabilities of begomoviruses associated with leaf curl disease of tomato based on the polymerase chain reaction-restriction fragment length polymorphism. *Identitas dan keragaman genetik Begomovirus yang berasosiasi dengan penyakit keriting pada tomat berdasarkan teknik Polymerase Chain Reaction (PCR)-Restriction Fragment Length Polymorphism (RFLP)* / Santoso, T.J.; Herman, M. (Balai Besar Penelitian Bioteknologi dan Sumberdaya Genetik Pertanian, Bogor (Indonesia)); Hidayat, S.H.; Aswidinnoor, H.; Sudarsono. *Indonesian Journal of Agriculture* (Indonesia) ISSN 1979-4673 2009 v. 2(2) p. 65-73, 5 ill., 4 tables; 13 ref.

LYCOPERSICON ESCULENTUM; LEAF CURLS; PLANT VIRUSES; GENETIC VARIATION; PCR; RFLP; IDENTIFICATION.

Begomoviruses, member of the Geminivirus, are considered as potentially damaging plant viruses. This is indicated by the increasing incidences and severities of the diseases due to these pathogens in a number of economically important crops, including tomato (*Lycopersicon esculentum*). Identities and genetic variabilities of eight begomovirus isolates of tomato collected from eight different tomato production areas in Indonesia were analyzed using the polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) technique. DNA fragments (1500 base pairs) from PCR amplifications using degenerate primers specific for begomovirus were digested using restriction enzymes DraI, EcoRI, RsaI, and PstI. Genetic identities and variabilities of the isolates were determined based on restriction patterns of the DNA fragments and compared to those of the predicted RFLP fragments of begomovirus isolates from the Gene Bank database. Results of the PCR amplifications indicated that the tomato plants from eight locations in Java and Sumatra

showing leaf curl symptoms were infected with at least one begomovirus isolate. There were polymorphisms among the DNA fragments of the begomovirus isolates. The begomovirus isolates from Brastagi, Bogor, Sragen, Magelang, and Boyolali were tomato leaf curl virus (ToLCV); the isolates from Malang and Blitar were Ageratum yellow vein virus (AYVV), and the isolate from Kaliurang was tomato yellow leaf curl virus (TYLCV). Phylogenetic analysis indicated the eight begomovirus isolates belong to three different groups.

072 SUMARTINI

Rust disease on soybean and its environmentally-friendly control measure. *Penyakit karat pada kedelai dan cara pengendaliannya yang ramah lingkungan* / Sumartini (Balai Penelitian Tanaman Kacang-kacangan dan Umbi-umbian, Malang (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(3) p. 107-112, 6 ill., 2 tables; 22 ref.

GLYCINE MAX; PHAKOPSORA PACHYRHIZI; DISEASE TRANSMISSION; BIOLOGICAL CONTROL AGENTS; BOTANICAL PESTICIDES; BACTERIAL PESTICIDES; MICROBIAL PESTICIDES; BACILLUS; VERTICILLIUM.

Rust disease caused by fungus *Phakopsora pachyrhizi* is an important disease on soybean. Rust disease has been spread on soybean production centers in Sumatra, Java, Bali, West Nusa Tenggara, Kalimantan, and Sulawesi. Initially, the disease was found in Asia called as the Asian soybean rust. At present, the disease has been spread in almost all parts of the world. Yield losses due to the disease reached 10-90%, depending on the varieties used and local agroclimatic conditions. The development of the disease needs high humidity (>95%) and optimal temperature for infection process, i.e. 15-28°C. This temperature range is commonly occurred in the dry season, therefore, rust disease is often attacked soybean in the dry season. The rust disease is spread by wind. The host plant of *P. pachyrhizi* plays an important role in spreading rust disease during the year around when the soybeans are not found in the field. Some leguminous weeds play as host plant for *P. pachyrhizi*. In subtropical countries, kudzu (a kind of weed) is a host plant for the fungus during the winter hence the disease is always available from season to season. Environmentally-friendly control methods of rust disease include planting soybean resistant varieties and using botanical fungicide made of clove oil, and Bacillus and Verticillium as antagonistic bacteria and fungus, respectively.

073 SUTARIATI, G.A.K.

Isolation and efficacy trial of indigenous rhizobacteria as biocontrol agents of fungal diseases of hot pepper. *Isolasi dan uji kemampuan rizobakteri indigenous sebagai agensia pengendali hayati penyakit pada tanaman cabai* / Sutariati, G.A.K. (Universitas Haluoleo, Kendari (Indonesia). Fakultas Pertanian); Wahab, A. *Jurnal Hortikultura* (Indonesia) ISSN 0853-7097 (2010) v. 20(1) p. 86-95, 1 ill., 3 tables; 24 ref.

CAPSICUM ANNUUM; COLLETOTRICHUM CAPSICI; FUSARIUM OXYSPORUM; ANTAGONISM; RHIZOBACTERIA; BIOLOGICAL CONTROL AGENTS.

A number of fungal pathogens have caused various diseases in hot pepper (*Capsicum annuum* L.). Since the utilization of chemical fungicides has negative impact to the environment, application of naturally available antagonistic microorganisms has been developed to control fungal pathogens. Rhizobacteria have been used for disease control and

plant growth enhancement. The objectives of this experiment were to isolate local rhizobacteria from surrounding hot pepper roots, explored from Southeast Sulawesi especially from Konawe, South Konawe, Kendari, Muna, and Buton Regencies, and to characterize the effectiveness of the isolates to inhibit colony growth of hot pepper fungal pathogens, namely *Colletotrichum capsici* and *Fusarium oxysporum*. In this experiment, 20 potential isolates of indigenous rhizobacteria were found, i.e. 14 isolates of *P. fluorescens*, 2 isolates of *Serratia* spp., and 4 isolates of *Bacillus* spp. All of the 20 isolates were able to inhibit colony growth of fungal pathogens and potential to be used as biocontrol agents of fungal diseases of hot pepper.

H50 MISCELLANEOUS PLANT DISORDERS

074 SUPRIYANTO, A.

[Fruit splitting phenomena on citrus var. keprok Terigas in Sambas District, West Kalimantan (Indonesia)]. *Fenomena pecah buah pada jeruk keprok Terigas di Kabupaten Sambas Kalimantan Barat* / Supriyanto, A.; Zuhran, M. (Balai Pengkajian Teknologi Pertanian Kalimantan Barat, Pontianak (Indonesia)). [Proceedings of the national seminar on Indonesian fruits]. Prosiding seminar nasional buah Nusantara 2009, Bogor (Indonesia), 28-29 Oct 2009 / Taher, R.; Dwiastuti, M.E.; Devy, N.F.; Prabawati, S.; Harlion (eds.). Jakarta (Indonesia): Puslitbanghorti, 2009: p. 155-164, 3 tables; 4 ref. Appendix 634.1/.7(594)/SEM/p

CITRUS SINENSIS; FRUIT DROP; DAMAGE; ENVIRONMENTAL FACTORS; SOIL WATER CONTENT; NUTRIENT UPTAKE; NUTRIENT DEFICIENCIES; KALIMANTAN.

Fruit splitting is the main problem in the development of mandarin cv. Terigas in Sambas District, West Kalimantan. High levels of attack that reached 30-40% in dry land and 10-20% in the tidal area were very detrimental for growers. Observations indicated that the fruit splitting of mandarin cv. Terigas is physiological changes due to changes in plant microenvironment. Fruit splitting is believed due to the extremely fluctuations in temperature, water humidity, soil moisture content and nutrient uptake rates. Fruit splitting often occurs after sudden rain fall in the long dry season. Excessive nutrient absorption or specific nutrient deficiencies also cause fruit splitting. Fruit splitting mainly occurs in young plants start producing fruit in the rapid growth phase of the fruit crops in the upper fruit size reach the size of marbles. More fruit burst occurred on fruit crops in the upper canopy of 11%, whereas in the bottom of the plant canopy was only 7%. Based on Quadrant of Plant Canopy, the fruit splitting in Sambas District was in Quadrant III (South-West) as much as 11% which was the largest compared to Quadrant I (North-East), II (East-South), and IV (West-North) which were only 9%, 9% and 6%, respectively. Approximately 60% fruit splitting occurred in the fruit located at the end of the fruit clusters. Fruit segment that was in the broken line position was generally larger than any other segment. Fruit burst pattern were various: diagonal, irregular, horizontal, and vertical which is the most common pattern. The pattern was formed from the end of the fruit into the fruit base. The broken skin could reach more than half the size of the fruit loop. From the analysis of nutrient content in leaves and fruit skins, Boron was significantly lower in the leaves of fruit with fruit splitting than that with no fruit splitting.

075 WIDIASTUTI, R.

Analysis of aflatoxins in corn which purified with SPE silica and detected with HPLC. *Analisis aflatoksin pada jagung yang dimurnikan dengan solid phase extraction silika dan*

dideteksi secara kromatografi cair kinerja tinggi / Widiastuti, R.; Indraningsih; Firmansyah, R. (Balai Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.), Bogor (Indonesia): Puslitbangnak, 2009: p. 705-710, 3 tables; 13 ref. 636:619/SEM/p

MAIZE; AFLATOXINS; ANALYTICAL METHODS; EXTRACTS; SILICA; HPLC.

Analysis of aflatoxins in corn or corn basal diet feed is necessary due to its occurrence could threat animal health. A determination of aflatoxins in corn using a solid phase extraction (SPE) silica cartridge for purifying the extract and detected with a HPLC was validated. The result showed performance characteristic meet the requirement. Meanwhile the analysis result on 16 corn showed that 15 samples were positive for aflatoxin content. However, those results showed that in general the aflatoxin contamination in corn samples were still under the maximum tolerance level for feed.

J11 HANDLING, TRANSPORT, STORAGE AND PROTECTION OF PLANT PRODUCTS

076 MISKIYAH

Mycotoxin contaminations on fresh and processed fruits and its control. Kontaminasi mikotoksin pada buah segar dan produk olahannya serta penanggulangannya / Miskiyah; Winarti, C.; Broto, W. (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(3) p. 79-85, 4 tables; 40 ref.

FRUITS; POSTHARVEST TECHNOLOGY; HANDLING; CONTAMINATION; MYCOTOXINS; FUSARIUM; ASPERGILLUS; PENICILLIUM; ALTERNARIA; HARVESTING DATE; CLEANING; FRUIT JUICES; FILTRATION.

Indonesia is a tropical country which is suitable for fruit plants to grow and produce fruits. Inadequate application of production and postharvest handling technologies resulted in inconsistency quality of fruits. Mycotoxin contamination is one of crucial problems in agricultural postharvest handling in Indonesia. Research on mycotoxin contamination on fruits has not yet conducted in Indonesia, but that information can be found in international research journals. There are some types of mycotoxins which usually exist on fruits including patulin, aflatoxin, ochratoxin, and alternariol. These mycotoxins are produced by *Fusarium* sp., *Aspergillus* sp., *Penicillium* sp., and *Alternaria* sp. Proper fruit handling such as harvesting, good handling practices, cleaning, and washing fresh fruits decrease level of mycotoxins contamination. Meanwhile, for fruit juice, decreasing mycotoxin contamination can be conducted with trimming followed by pressing using filtration, enzyme treatment, and fining (purification).

077 RACHMAT, R.

Innovation of radiation drying technology of vegetable. Inovasi pengeringan mendukung pengembangan diversifikasi produk sayuran / Rachmat, R. (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). *Buletin Teknologi*

Pasca Panen Pertanian (Indonesia). ISSN 1858-3504 (2010) v. 6(1) p. 17-25, 3 ill., 3 tables; 43 ref.

VEGETABLES; DRYING; INFRARED RADIATION; DRIED VEGETABLES; TEMPERATURE; VOLATILE COMPOUNDS; CHEMICOPHYSICAL PROPERTIES.

Development of drying technology has become more advanced, the drying is not only to reduce water content, but also safe for storage, and minimal changes in nutrition, vitamins, flavor, color and taste. Drying technology for drying vegetables with minimal changes to the Reducing Volatile Substance (VRS) is required. Far infrared radiation (FIR) technology for food drying has several advantages including efficient heat transfer in foods thereby reducing processing time and costs. The operational principle of FIR drying technology in the drying process occurs through the mechanism of termination of the water molecules (HP) by vibration or the vibration of the molecules without passing through the media (air) as well as on the process of convection and conduction. The use of FIR radiation technology has demonstrated superiority to chlorophyll and stabilization of volatile substances in the dried vegetables. Dried vegetables produced by FIR, shows a more uniform and hygienic with minimal changes in nutrition. FIR technology is very prospective to be applied in the drying of agricultural commodities to minimize changes the flavor and color as well as other bioactive compounds of dry product.

078 SUSANTO, A.

Contamination of aflatoxin and critical point analysis in corn postharvest steps at Garut Regency [Indonesia]. *Kandungan aflatoksin dan analisis titik kritis pada pengelolaan pascapanen jagung di Kabupaten Garut* / Susanto, A. (Balai Pengujian Mutu Pakan Ternak, Bekasi (Indonesia)); Laconi, E.B.; Widiastuti, R. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 696-704, 5 ill., 1 table; 19 ref. 636:619/SEM/p

MAIZE; POSTHARVEST TECHNOLOGY; AFLATOXINS; ELISA.

Corn is the major ingredient feedstuff. Feed ration in feedmill industry is based on corn-soya. Postharvested corn is susceptible to fungal invasion which able to produce fungal metabolites such as aflatoxin. The objectives of the research were (1) to get a description of aflatoxin contamination in farmer, collecting sellers and whole sellers (2) to get a description of critical points in aflatoxin contamination. A total of 57 samples of corn which collected from farmers, collecting sellers and whole sellers in Garut Regency have been investigated for the aflatoxin contamination and the critical points of its occurrence in postharvested corn. Samples were collected by purposive sampling method and aflatoxin content was detected by Enzyme Linked Immunosorbent Assay (ELISA). The results showed that the highest contamination was found in whole sellers level. The critical points at farmers stage were due to spoilage corn from improper handling in the field, shelling procedure and sun drying dependency. Critical points at collecting sellers stage were due to improper storage and sun drying dependency. Whereas critical point at whole seller stage was due to the improper mixing practice.

J13 HANDLING, TRANSPORT, STORAGE AND PROTECTION OF ANIMAL PRODUCTS

079 ABUBAKAR

Postharvest technology for improving food quality and safety, and value added of duck husbandry on supporting development of livestock subsector. *Teknologi pascapanen untuk meningkatkan mutu dan keamanan pangan serta nilai tambah ternak itik menunjang pembangunan sub sektor peternakan* / Abubakar (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). *Buletin Teknologi Pasca Panen Pertanian* (Indonesia) ISSN 1858-3504 (2010) v. 6(1) p. 26-37, 3 tables; 45 ref.

DUCKS; POSTHARVEST TECHNOLOGY; QUALITY; FOOD SAFETY; VALUE ADDED; ECONOMIC DEVELOPMENT.

Until now, utilization of livestock production is not optimal because of product loss, the variety of product quality, uneffective way of handling and processing, having a perishable nature, and weak marketing system. Good and appropriate postharvest technology of livestock produce good quality product. Appropriate postharvest activities of livestock should be conducted as early as possible at producer level, intermediaries and marketing up to consumers in a focused and sustainable ways. Duck is a potential waterfowl that can be easily developed and reared. Duck can mate naturally or through artificial insemination techniques, is easy to feed, is not require a special land and disease resistant than other poultry such as chickens. It can also be raised in a confined or intensive way or as shepherd who easily moved, especially during the rice harvesting time. Duck was originally reared only as egg producers. Nowadays, it is popular as meat sources, and other potential products such as leather, fur, and duck feet which have a high economic value. Postharvest technology to improve quality and food safety as well as value added of duck products through postharvest handling and processing of meat products, eggs, leather, fur and claw, and apply the principles of food safety since the producer level, intermediaries and then up to the level of marketing and final consumer. Research in a sustainable way and technological development of handling and processing of ducks is expected to improve product quality, as well as to increase added value to support development of livestock industry.

080 ABUSTAM, E.

Physical properties of chicken sank gelatin through acid, alkali and enzymatic denaturizing process. *Sifat fisik gelatin kulit kaki ayam melalui proses denaturasi asam, alkali dan enzim* / Abustam, E.; Ali, H.M.; Said, M.I.; Likadja, J.C. (Universitas Hasanuddin, Makassar (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 724-729, 2 tables; 10 ref. 636:619/SEM/p

CHICKENS; GELATIN; QUALITY; CHEMICOPHYSICAL PROPERTIES; ACIDS; ENZYMES.

The aim of this study was at investigating physical properties of gelatin made of chicken shank by denaturizing of collagen using acids, alkali, and enzymes during the curing process. The study used 30 kg chicken shank at the same age. Curing materials used were 1% CH₃COOH and HCl acid treatments, NaOH and Ca(OH)₂ as alkali treatments and papain and

trypsin as enzymatic treatments. Complete randomized design was employed in this study with six treatments and ten replications, whereas measurements were yield, percentage of developed shank after curing process, extracted volume ratio, gel strength and viscosity. The results showed that coefficient correlation between treatments indicated that low and too high reaction velocity produced poor characteristics of gelatin. The use of 1% acid as a curing material resulted in better characteristics of gelatin, with high yield (12.9%), high percentages of developed shank (244.96%), low extracted volume (3.55), high gel strength (261.44 g bloom) and high viscosity (5.01 cP). The use of enzyme as a curing material would produce poor quality of gelatin.

L01 ANIMAL HUSBANDRY

081 BRAHMANTIYO, B.

Performance of rabbit production at Magelang District, Central Java [Indonesia]. *Performa produksi kelinci di Kabupaten Magelang, Jawa Tengah* / Brahmantiyo, B. (Balai Penelitian Ternak, Bogor (Indonesia)); Raharjo, Y.C.; Mansjoer, S.S.; Martojo, H [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 582-587, 1 ill., 2 tables; 13 ref. 636:619/SEM/p

RABBITS; ANIMAL PERFORMANCE; PRODUCTION; JAVA.

Evaluation of rabbit production raised under local farmer can explain the opportunity and potency to be developed in the future. Reproduction and production characteristics were important information for improving its productivity. Farmers in Magelang District raised English Spot (ES), Flemish Giant (FG), New Zealand White (NZ) and Rex (RR) rabbits. There was no difference on reproduction characteristic among breed because the rabbit were raised in the same management. RR had the lowest production compared to ES, FG and NZ. Performances of ES, FG and NZ were not different because of uncontrolled mating system.

082 JUARINI, E.

Profile of meat type duck production system in northern coastal area of West and Central Java [Indonesia]. *Profil usaha itik potong di pantura Jawa Barat dan Jawa Tengah* / Juarini, E; Wibowo, B.; Sumanto (Balai Penelitian Ternak, Bogor (Indonesia)) [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 742-750, 7 tables; 6 ref. 636:619/SEM/p

DUCKS; MEAT; ECONOMIC ANALYSIS; ANIMAL HUSBANDRY; JAVA.

Recently the Research Institute for Animal Production has been started to conduct a series of research in developing meat duck type. To support those efforts, a field study was conducted in the northern coastal areas of West and Central Java in the District of Indramayu, Cirebon and Brebes, using a methodology of structured survey to see the characteristic of 3 production systems of duck farming: duck farming that produce culled duck, fattened male duck, muscovy duck and mule duck, as duck meat resources. Some farmers (3 farmers) from each production system were interviewed on management system, feed and feeding system,

marketing system, breeding practice and their knowledge on disease. Technical and economical data were collected and then to be tabulated and analyzed descriptively. The results showed that meat availability in the domestic market was mainly provided by culled duck from the disposal of layer duck farm, followed by male duckling fattening farm. Financial analysis result showed that the extensive system of fattening of male duckling was the most profitable (R/C= 2.01) followed by laying duck farming system (R/C= 1.69), then muscovy duck farming (R/C= 1.44) and followed by the intensive system of male duckling fattening farm (R/C= 1.13).

083 KOMARUDIN

Performance of duck based on small, big and mix groups of birth weight. *Performa produksi itik berdasarkan kelompok bobot tetas kecil, besar dan campuran* / Komarudin; Rukimasih; Hardjosworo, P.S. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 604-610, 2 ill., 2 tables; 12 ref. 636:619/SEM/p

DUCKS; ANIMAL PERFORMANCE; PRODUCTION; BIRTH WEIGHT; GROWTH.

This study was conducted to determine the effect of birth weight and raising method based on small, big and mix groups of birth weight on performance at six weeks of age of duck. In this study 122 female day old duck (DOD) were grouped based on birth weight. DOD with more than 42 gram was classified as a big group, less or equal to 42 gram were classified as small group. Mix group were taken from those two groups randomly. Those groups were raised for six weeks of age. Feed consumption and conversion, growth and six weeks weight ducks were measured. This research was done based on Random Group Analysis and Tukey test. The result showed significant difference ($P < 0.01$) of growth and six weeks weight. Their growth and six weeks weight of small, big and mix groups were 819.51 ± 129.02 g (857.31 ± 129.53 g), 837.21 ± 137.51 g (883.44 ± 137.51 g), and 909.88 ± 90.26 g (952.94 ± 91.17 g), respectively. Feed consumption and conversion of each groups (small, big and mix) did not show the differences ($P > 0.05$). Their feed consumption and conversion were $2,929.1 \pm 214.7$ g (3.57 ± 0.34), $2,922.4 \pm 452.3$ g (3.48 ± 0.24); $3,186.6 \pm 241.8$ g (3.59 ± 0.26), respectively. Compensatory growth was appeared on duck with small birth weight and become similar to big birth weight.

084 SURETNO, N.D.

Goat housing on two locations of Prima Tani in Lampung [Indonesia]. *Tata laksana perkandangan ternak kambing di dua lokasi Prima Tani Propinsi Lampung* / Suretno, N.D.; Basri, E. (Balai Pengkajian Teknologi Pertanian Lampung, Bandar Lampung (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 545-551, 3 tables; 7 ref. 636:619/SEM/p

GOATS; ANIMAL HOUSING; LIVESTOCK MANAGEMENT; SUMATRA.

There are three important factors in goat production including breed, feed and management. Barn is a part of management that should be taken into account. The aim of this research was at studying the management of goat housing in East Lampung and North Lampung Regency. This research was conducted in May until August 2008. The data of goat housing were analyzed descriptively. The result showed that the distance between goat's barn and farmer's house more than 5 meters, and it received adequate morning sunshine. Materials for building barn were bamboo, wood and roof tiles. These materials were available around these locations, inexpensive and strong enough for a long time. The separations in goat's barn were done based on their physiological status. The size of these partitions was following the standard, and some of them have bigger than standard's size.

085 USMIATI, S.

Performance of small ruminant carcass. *Penampilan karkas dan komponen karkas ternak ruminansia kecil* / Usmiati, S.; Setiyanto, H. (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 371-380, 4 tables; 17 ref. 636:619/SEM/p

GOATS; SHEEP; CARCASSES; ANIMAL PERFORMANCE.

Sheep and goat are small ruminants which are prospective as meat producer in Indonesia. Both of them have differences in some aspects that affect their carcass profile. The objective of this study was to obtain profile of sheep and goat carcasses. The study was designed based on randomized completely block design (RCBD) of factorial pattern 2 x 2 x 2 with three replications. Treatments were: (i) types of ruminant (A_1 = sheep and A_2 = goat); (ii) sex (B_1 = female, and B_2 = male); and (iii) age (C_1 = young/less than two years old and C_2 = old/more than two years old). Animal used in the research was male and female local sheep and goat, at the ages less and more than 2 years old. Parameters measured were live weight, carcass, meat (loin, rump, meat mix), fat, and bone (g); carcass percentage (%); redness degree (a), cooking losses (%) and tenderness point (kg). The results showed that sheep carcass has better profile than goat based on carcass weight (10.59 kg), total meat (2892.93 g), leg (1706.67 g), ribs meat (959.17 g), longissimus dorsi (327.33 g), low of bone weight (1379.50 g) and good tenderness performance. Based on fat content of carcass in young female goat, performance of goat carcass was better for people who is dieting strictly.

086 WINARSO

Prospects and constraint of sheep and goat agribusiness development in Indonesia. *Prospek dan kendala pengembangan agribisnis ternak kambing dan domba di Indonesia* / Winarso (Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian, Bogor (Indonesia)). [Proceedings of the national seminar on improving agribusiness competitiveness with farmers welfare oriented]. Prosiding seminar nasional peningkatan daya saing agribisnis berorientasi kesejahteraan petani Bogor (Indonesia), 14 Oct 2009 / Suradisastira, K.; Simatupang, P.; Hutabarat, B. (eds.). Bogor (Indonesia): PSE-KP, 2010: p. 246-264, 3 ill., 4 tables; 14 ref. 338.43:316.343/SEM/p

SHEEP; GOATS; ANIMAL HUSBANDRY; AGROINDUSTRIAL SECTOR; LIVESTOCK MANAGEMENT; PRODUCTION POSSIBILITIES; FARM INPUTS; SOCIOECONOMIC ORGANIZATION; PARTICIPATION; EXTENSION ACTIVITIES; INDONESIA.

Goat and sheep are categorized as small livestock, which are commonly grown in rural society and primarily for economic purposes that are to support and also secure of livestock household economic well-being. Although these livestock are commonly grown by in many rural areas, the fact showed that the growth of goat and sheep business is stagnant. Meanwhile, at the national scale level, the population of goat and sheep tend to increase, but the average size of business is still in small-scale and a part-time activity and apparently not quite attractive for the new investors with a large capital investment. The purpose of this paper is to evaluate potentials and constraints of development of goat and sheep farming. The paper showed that goat and sheep farming consisted of several interlinked. Some constrains were found in each subsystems, as well as some unexploited strengths and opportunities in various goat and sheep farming region.

L02 ANIMAL FEEDING

087 ANGGARAYONO

Metabolizable energy and protein digestibility of layer ration as affected by different feeding portion. *Energi metabolis dan pencernaan protein akibat perbedaan porsi pemberian ransum pada ayam petelur* / Anggarayono; Wahyuni, H.I.; Tristiarti (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 623-629, 5 tables; 12 ref. 636:619/SEM/p

LAYER CHICKENS; ANIMAL FEEDING; RATIONS; ENERGY VALUE; FEED CONSUMPTION; DIGESTIBILITY.

The research was conducted to evaluate the effect of different feeding portion on feed consumption, protein digestibility, metabolizable energy (ME) and hen day production (HDP) in layer. Two hundred fifty two layers of twelve weeks old with initial body weight of 987.5 ± 178.5 g were used. Completely randomized design was employed in this study with the following treatments: T₁ (100S) = 100% (once in the afternoon), T₂ (30P : 70S) = 30 : 70%, T₃ (40P : 60P) = 40 : 60%, T₄ (50P : 50S) = 50 : 50%, T₅ (60P : 40S) = 60 : 40%, T₆ (70P : 30S) = 70 : 30% and T₇ (100 P) = 100% (once in the morning). Each treatment was replicated four times and each replication consisted of nine layers. The result showed that different feeding portion did not affect feed consumption, ME and HDP, but significantly affected ($P < 0.05$) protein digestibility. It is concluded that high feeding portion in the morning decreases protein digestibility, but giving the same value of ME and HDP was similar compared to other treatments.

088 ASMARASARI, S.A.

Effect of turmeric (*Curcuma domestica*) in the ration on broiler performance. *Pengaruh penggunaan kunyit dalam ransum terhadap performans ayam pedaging* / Asmarasari, S.A.; Suprijatna, E. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 657-662, 2 ill., 4 tables; 7 ref. 636:619/SEM/p

BROILER CHICKENS; RATIONS; ANIMAL PERFORMANCE; CURCUMA LONGA; FEED GRASSES; WEIGHT GAIN.

The effect of turmeric (*Curcuma domestica*) in feed on performance of broiler chickens was investigated. Forty eight unsexed broiler chickens were assigned into 4 treatments with 6 replications. The treatments were four different levels (0, 3, 6 and 9%) of turmeric in the ration. Parameter observed were body weight, feed intake, feed conversion, and abdominale fat. Data were analyzed by completely randomized design (CRD). The result showed that the addition of turmeric in commercial feed gave no significant effect on all parameters measured ($P>0.05$) compared to control.

089 BESTARI, J.

Mineral content and potency of forage grown on peatland area in Central Kalimantan [Indonesia] as green feed for goat. *Kandungan nutrisi mineral dan potensi pakan hijauan lahan gambut Kalimantan Tengah sebagai pakan kambing* / Bestari, J. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 430-435, 3 tables; 15 ref. 636:619/SEM/p

GOATS; FORAGE; VEGETATION; MINERAL CONTENT; FEED CROPS; PEATLANDS; KALIMANTAN.

Central Kalimantan has peatland area which is highly acidity, high in organic matter, and low fertility for plant cultivation. Central Kalimantan is province passed by equator line. The temperature is relatively hot (32°C) and 23°C at night. The average rainfall is 2,500 mm/year. Various vegetation as sasendok, delingu, pakis, aseman, and gajihan can be used as feed for animals, but information on mineral and nutrition of forages in peatland is still limited. Five male local goats with average weight of 20 kg were used in this research. Experiment was done for 5 period with 10 days per period. Adaptation of animals was 6 day and during experiment animals were fed 3 kg forage. During 4 day, 10% of total feces and 5% of total urine were collected and prepared for analysis. Result indicated that peatland of Palangkaraya had low fertility, average dry matter intake for sasendok 3.32%, delingu 3.0%, pakis 6.2%, aseman 3.9%, and gajihan 3.5% of live body weight. Average daily gain: obtained from sasendok 90 g, delingu 50 g, pakis 60 g, aseman 30 g, and such as calcium, phosphorus, magnesium of forage in peatland was enough for local goats except zinc which is deficient. Forage of peatland at Palangkaraya, Central Kalimantan has potency as feed for goat.

090 HIDAYAT, C.

Effect of phytate fortification in diet on lead (pb) and calcium blood plasma concentration of lead impuring broiler. *Efek fortifikasi fitat dalam ransum terhadap konsentrasi pb dan Ca plasma darah ayam broiler yang tercemar timbal (Pb)* / Hidayat, C. (Balai Penelitian Ternak, Bogor (Indonesia)); Kamil, K.A.; Latifudin, D. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 663-668, 5 tables; 13 ref. 636:619/SEM/p

BROILER CHICKENS; PHYTATES; DIET; CALCIUM; FEED MEALS; BLOOD PLASMA.

This research was conducted at the Laboratory of Physiology and Biochemistry, Faculty of Animal Husbandry, and the Laboratory of Soil and Environmental Chemistry, Faculty of Mathematics and Natural Sciences, Padjadjaran University. The research was aimed to find out the effect of phytate fortification in diet on lead and calcium blood plasma concentration of lead impuring broiler. The experimental research method was based on the completely randomized design (CRD), with five treatments and five replications. The parameter were lead and calcium blood plasma concentration. The result of experiment showed that concentration level of phytate fortification until 1.33% in diet had no effect on lead and calcium blood plasma concentration of lead impuring broiler.

091 KRISNAN, R.

Physical characteristic condition of sheep diet during storage. *Perubahan karakteristik fisik konsentrat domba selama penyimpanan* / Krisnan, R. (Loka Penelitian Kambing Potong, Sungai Putih (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 491-497, 3 tables; 8 ref. 636:619/SEM/p

SHEEP; RATIONS; DIET; FORMULATIONS; STORAGE; ORGANOLEPTIC PROPERTIES.

The aim of study was at investigating the effect of storage on physical characters of sheep feed. The diet is made in a mash form by using feedstuffs consisted of 'onggok', palm kernel cake, ketchup waste, molasses, urea, CPO, vitamin/mineral. Each diet contains 18.03% crude protein and 82.61% TDN. The experiment was arranged in a completely randomized design of four treatments and three replications. The parameters observed were organoleptic test, water content, water activity, bulk density, specific gravity, particles size, angle of repose, and threshold energy. The organoleptic test was not significantly affected by storage. All parameters were statistical significantly different except for bulk density and specific gravity, but the concentrate were numerically in normal rate and appeared feasible for sheep. Furthermore, production cost was cheaper so that it is applicable for sheep concentrate.

092 MIDE, M.Z.

Daily gain, feed consumption, feed conversion, blood cholesterol and meat triacilglyceride of broiler given ration containing garlic powder (*Allium sativum* L.). *Pertambahah bobot hidup, konsumsi, konversi ransum, kadar kolesterol darah dan trigliserida daging broiler yang diberi ransum mengandung tepung bawang putih (*Allium sativum* L.)* / Mide, M.Z. (Universitas Hasanuddin, Makassar (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 630-635, 2 tables; 14 ref. 636:619/SEM/p

BROILER CHICKENS; FEED CONSUMPTION; FEED CONVERSION EFFICIENCY; CHOLESTEROL; TRIGLYCERIDES; GARLIC; WEIGHT GAIN.

The purpose of this research was to study daily gain, feed consumption, feed conversion, and concentration of blood cholesterol and triacylglyceride of broiler meat given ration containing different levels of garlic powder. Experiment was conducted based on completely randomized design consisted of 4 treatments and four replications for each treatment. The treatments were A= Based diet, B= diet A + 1% garlic powder, C= diet A + 2.5% garlic powder, D= diet A + 4% garlic powder. Analysis of variance indicated that treatment affected ($P<0.05$) daily gain, feed consumption, and level of triacylglyceride of broiler meat. Further test using LSD test indicated that feed consumption of treatment A was lower ($P<0.01$) than that of treatment C, similarly treatment B was lower ($P<0.01$) than that of D. However, between treatment A and B and between treatment B and D was similar ($P>0.05$). Analysis of variance also indicated that treatment significantly affected body gain. LSD test showed that average daily gain of treatment A and B was lower ($P<0.01$) than that of treatment C and D. However daily gain between A and B as well as between C and D was similar ($P>0.05$). Moreover, LSD test indicated that triacylglyceride of broiler meat of treatment A was higher ($P<0.01$) than that of treatment B, C, and D. But, treatment B was not different ($P>0.05$) from treatment C and D, similarly between C and D. Analysis of variance, however, indicated that treatment did not affect feed conversion and blood cholesterol of broiler.

093 PANTJAWIDJAJA, S.

Effects of diet containing seaweed on the abdominal fat and meat cholesterol of broilers. Pengaruh pemberian ransum yang mengandung rumput laut terhadap lemak abdomen dan kolesterol daging broiler / Pantjawidjaja, S. (Universitas Hasanuddin, Makassar (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 674-677, 2 tables; 12 ref. 36:619/SEM/p

BROILER CHICKENS; SEaweEDS; FEED GRASSES; DIET; FATS; MEAT; CHOLESTEROL.

The objective of this research was to investigate the effect of diet containing no seaweed (= control) and two diets containing seaweed (4.5% *Euchema cottonii* and 4.5% *Gracillaria verucosa*) on the abdominal fat and meat cholesterol of broilers. It was found that the differences among the treatment groups were not significant regarding abdominal fat. The lowest meat cholesterol in the treatment groups were observed in the group treated with 4.5% *G. verucosa* and then followed by the group treated with 4.5% *E. cottonii*.

094 PUAStUTI, W.

Effect of diet with different protein sources on growth and wool protein deposition. Pengaruh ransum dengan sumber protein berbeda terhadap pertumbuhan dan deposit protein wul / Puastuti, W. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 483-488, 1 ill., 2 tables; 16 ref. 636:619/SEM/p

SHEEP; WOOL; RATIONS; PROTEINS; GROWTH.

A study was conducted to investigate the effect of diet with different protein sources on growth and wool protein deposition. Forty young rams of 6-7 months old with an average live weight 18.63 ± 2.24 kg were used in this study. Sheep were grouped based on live weight. Eight diets were formulated in isoprotein and isoenergy (18% CP and 75% TDN) with different protein sources. The experiment was done based on randomly block design with 8 treatments and 5 replications. The treatments were R₁= basal diet with soybean meal (SBM) as the main protein source, R₂= diet with SBM + urea, R₃= diet with SBM + kapok seed meal, R₄= diet with SBM + kapok seed meal + urea, R₅= diet with SBM + fish meal, R₆= diet with SBM + fish meal + urea, R₇= diet with 50% SBM + 50% protected SBM, and R₈= diet with 100% protected SBM. The results showed that diet with different protein sources affected ($P < 0.05$) wool growth measured as weight (mg/mm^2) and ($\text{mm}/12$ weeks). The least weight of wool ($52 \text{ mg}/\text{mm}^2$) was produced by R₄, in contrast the highest weight of wool ($78 \text{ mg}/\text{mm}^2$) was produced by R₆. The shortest wool (28 mm/12 weeks) was produced by R₈, but the longest (40 mm/12 weeks) was produced by R₅. The different protein sources did not affect wool composition, but it affected ($P < 0.05$) wool protein deposition. Sheep wool consisted of $86.28 \pm 0.43\%$ DM; $78.83 \pm 0.94\%$ OM; $7.21 \pm 0.62\%$ ash; and $64.95 \pm 1.76\%$ CP. Diet R₅ and R₆ containing fish meal produced the highest wool protein deposition of 41.23 and 42.91 mg/mm^2 , respectively.

095 PUASTUTI, W.

Response of growing lambs fed on different source of protein: observation on chemical body composition and wool growth. *Respon domba yang mendapat ransum dengan sumber protein berbeda: tinjauan pada komposisi kimia tubuh dan pertumbuhan wool /* Puastuti, W.; Mathius, I W. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 409-415, 3 tables; 15 ref. 636:619/SEM/p

SHEEP; FEEDING LEVEL; PROTEINS; ANIMAL DEVELOPMENTAL STAGES; WOOL; GROWTH; CHEMICAL COMPOSITION.

Response of animal to the level of protein diet is varied depend on the sources of protein. This study was conducted to investigate the effect of feeding ration with different sources of protein on chemical body composition and wool growth in sheep. Thirty growing lambs, aged of 6-7 months with an average live weight of 16.2 ± 2.2 kg were classified into 5 groups according their live weight. The treatment were arranged in a randomized block design. The diets were formulated isonitrogen and isoenergy (16% CP and 75% TDN) with different protein characteristic. The treatment consisted of R₁= soybean meal (SBM) as main protein source; R₂= SBM + urea; R₃= SBM + kapok meal; R₄= SBM + kapok meal + urea; R₅= SBM + fish meal and R₆= SBM + fish meal + urea. The experimental diets were offered for 12 weeks. The result showed that both body composition and wool growth of the growing lambs were affected by the differences in protein sources ($P < 0.05$). Diet R₅ and R₆ resulted in more body protein deposition (25.3, 26.6 vs 18.4, 23.2, 18.2, 15.8 g/head/d) and body water deposition (95.0, 99.9 vs 69.2, 87.2, 68.4, 59.1 g/head/d), but less body fat deposition (5.8, 6.0 vs 18.1, 18.8, 15.1, 12.2 g/head/d) than other diets. Wool growth and wool protein deposition of R₅ and R₆ were higher value than that of other diets namely (71.0, 77.8 vs 58.5, 67.2, 58.2, 51.3 mg/mm^2) and (41.2, 42.9 vs 31.4, 38.2, 33.5, 28.6 mg/mm^2),

respectively. It is concluded that protein source of SBM and fish meal mixture produced the highest level of body protein deposition and wool growth.

096 PURBOWATI, E.

Characteristic of male local sheep carcass in feedlot system with different protein and energy levels. *Karakteristik karkas domba lokal jantan yang digemukkan secara feedlot dengan pakan komplit berkadar protein dan energi yang berbeda* / Purbowati, E. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan); Sutrisno, C.I.; Baliarti, E.; Budhi, S.P.S.; Lestariana, W. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 463-472, 2 ill., 4 tables; 20 ref. 636:619/SEM/p

SHEEP; FATTENING; FEEDLOTS; CARCASSES; PROTEINS; ENERGY.

The purpose of this study was to investigate the characteristic of male local sheep carcasses resulted from feedlot system with different protein and energy levels. Twenty four males of local lamb, aged around 3-5 months with body weight of 8.7-15.5 kg (CV= 15.01%) were set in a generalized randomized completely block design with 4 treatments: R₁ (CP 14.48% and TDN 50.46%), R₂ (CP 17.35% and TDN 52.61%), R₃ (CP 15.09% and TDN 58.60%), and R₄ (CP 17.42% and TDN 57.46%). The grouping of the sheep was based on body weight (light 10.73 ± 1.37 kg, average 12.76 ± 0.54 kg and heavy 14.91 ± 0.36 kg). The group of light weight was slaughtered at the slaughter weight (SW) of 15 kg, the group of average weight was slaughtered at the SW of 20 kg, and the group of heavy weight was slaughtered at the SW of 25 kg. The ANOVA test was used to analyze data and any differences among groups were further tested using Duncan Multiple Range Tests (DMRT) as necessary. The result showed that carcass weight was not significantly different (P>0.05) among feed treatments, that was 8.67-9.21 kg (43.81-45.62%), meat weight of R₃ (2722.81 g) and R₄ (2787.72 g) were higher (P<0.05) than that of R₁ (2532.70 g) and R₂ (2469.38 g), bone weight and binding tissue weight were not significantly different (P>0.05) that was 725.04-763.26 g and 119.50-134.84 g, although fat weight of R₁ (802.37 g) was higher (P<0.05) than that of R₂ (612.57 g), R₃ (564.59 g), and R₄ (563.21 g). Meat-bone ratio was not significantly different (P>0.05), that was 3.97-4.41. Carcass weight and its component increased (P<0.05) with the increase of the SW, at SW 20 kg resulted in the first class carcass fat. It is concluded that the use of complete feed with CP-TDN 17.5-50% or 15-60% or 17.50-60% and SW 20 kg resulted in the first class carcass fat.

097 SETYANINGSIH, K.

Energy conversion of indigenous rams at various body weight at 1.5 maintenance level of feeding. *Konversi energi pakan domba lokal pada bobot hidup berbeda dengan level pakan 1,5 kebutuhan hidup pokok* / Setyaningsih, K.; Mahesti, G.; Setyawan, A.R.; Rahmadi, D.; Purnomoadi, A.; Rianto, E. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 473-476, 1 table; 13 ref. 636:619/SEM/p

SHEEP; FEEDING LEVEL; BODY WEIGHT; FEED CONVERSION EFFICIENCY.

Eight rams consisting of 4 rams with 10 kg of body weight (BW), at 5-6 month olds, and 4 rams with 18 kg of BW, at 9-12 month olds were used in this experiment, which were aimed at evaluating the feed energy conversion by rams with various BWs and 1.5 maintenance level feeding. A completely randomized design with 2 treatments and 4 replications was employed. Diets were offered as complete feed at 3.6% of BW containing 92.11% DM; 12.9% CP; 1.86% EE; 22.48% EN, 42.13% NFE and 3503.35 cal/g. The result showed that energy conversion did not differ among treatment ($P>0.05$). Average daily gain (ADG) was 50 g/d for 18 kg of BW and 25 g/day for 10 kg of BW. DMI was higher at 18 kg of BW (738.94 MJ/d) than 10 kg of BW (373.75 MJ/d). DMI conversion between treatments did not differ ($P>0.05$), which was on a average of 15.76-16.85. Energy conversion did not differ between 10 kg and 18 kg of BWs ($P>0.05$), which was on average of 0.25-0.27 MJ/g. It is concluded that feed energy conversion would not differ between various BW when diets was offered in the same level of feeding.

098 SETYAWAN, A.R.

Different proportion of muscle, fat and bone in thin tailed sheep fed at maintenance and production level. *Selisih proporsi daging, lemak dan tulang domba ekor tipis yang diberi pakan untuk hidup pokok dan produksi* / Setyawan, A.R.; Setyaningsih, K.; Mahesti, G.; Rianto, E.; Sunarso; Purnomoadi, A. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 395-400, 2 tables; 12 ref. 636:619/SEM/p

SHEEP; ANIMAL FEEDING; MUSCLES; FATS; BONES; PRODUCTION.

This research was aimed at investigating the feed requirement for net production of meat, fat and bone in thin tailed sheep. Sixteen thin tailed sheep with different body weight (BW), i.e. averaged 10 ± 3.4 kg (CV= 14.74%), 5-6 months old for B10 group and 18 ± 3.8 kg (CV= 11.82%), 9-12 months old for B18 group were randomly assigned in a split plot design with 2 feeding levels. The feed was allowed to fulfill 1 x maintenance (1 M; 2.6% BW) and 1.5 x maintenance (1.5 M; 3.6% BW) requirements. The data for net production were obtained by subtracting the data from 1 M to that from 1.5 M, result from this calculation was the net production from each parameters measured. Data was then analyzed by T-student with 2 samples. The net dry matter intake was 155.80 and 250.11 g/d for B10 and B18. Slaughter weight and carcass weight were 2503.33 g; 5050 g and 1149.67 g; 2800 g for B10 and B18, respectively. Meat, fat and bone production for B10 were 829.77 g; 62.78 g; 257.12 g and 2009.94 g; 475.30 g and 314.76 g for B18. Net production for slaughter weight, carcass weight, meat weight, fat weight and bone weight per gram dry matter intake were 16.07 g; 7.38 g; 5.33 g; 0.40 g; 1.65 g on B10, while for B18 were 20.19 g; 11.20 g; 8.04 g; 1.90 g and 1.26 g. It is concluded that net production per gram dry matter intake for meat, fat and bone were 5.33 g; 0.40 g; 1.65 g on B10, while for B18 were 8.04 g; 1.90 g and 1.26 g, respectively. In the same feeding level, big sheep would have high net production of carcass, meat and fat weight than those the small one, but there were no differences on slaughter weight and bone weight.

099 SIMANIHURUK, K.

Utilization of oil palm frond silages as basal diet for kacang goats in growth phase. *Pemanfaatan silase pelepah kelapa sawit sebagai pakan basal kambing kacang fase pertumbuhan* / Simanihuruk, K.; Junjungan; Ginting, S.P. (Loka Penelitian Kambing Potong, Sungai Putih (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 446-455, 2 ill., 5 tables; 18 ref. 636:619/SEM/p

GOATS; ANIMAL FEEDING; SILAGE; OIL PALMS; AGRICULTURAL WASTES; GROWTH PERIOD.

Oil palm frond is one of oil palm by-products from palm plantation. It is potential to be used as goat basal diet. Silages technology is a microbial fermentation process to produce feed with a higher protein and energy content, also increase feed palatability. Twenty male kacang goats (average initial body weight 12.42 ± 2.06 kg) were used in this experiment to study the effect of utilization of oil palm fronds silages as basal feed as substitution of grass on their growth. The experiment was arranged in completely randomized design consisting of 4 diets and 5 replications. Animal were randomly allocated into 4 diets (ratio of concentrates, grass and oil palm fronds silages are 40:60:0%, 40:20:20%, 40:10:50%, and 40:0:60% as feed treatments of R₀, R₁, R₂, and R₃, respectively). Concentrates contains 17.1% crude protein and digestibility energy 2.8 KCal/kg. The feeding level was set at 3.8% of body weight based on dry matter. The result of the experiment showed that dry matter intake, dry matter, organic matter, ADF digestibility and average daily gain were affected by feed treatments ($P < 0.05$). Feed efficiency was not affected by feed treatments ($P > 0.05$). The highest dry matter intake, dry matter, organic matter, ADF digestibility, average daily gain and feed efficiency were found in R₀ treatment. It is concluded that oil palm fronds silages could be used up to 60% as basal feed for kacang goats. Oil palm frond silage is one of alternative basal feed to substitute grass.

100 SIRAIT, J.

Potency of *Arachis glabrata* planted at different shading level as goat feed: morphology, production, nutritive value and digestibility. *Potensi Arachis glabrata yang ditanam pada taraf naungan berbeda sebagai pakan ternak kambing: morfologi, produksi, nilai nutrisi dan pencernaan* / Sirait, J.; Hutasoit, R.; Junjungan; Simanihuruk, K. (Loka Penelitian Kambing Potong, Sungai Putih (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 436-445, 2 ill., 7 tables; 16 ref. 636:619/SEM/p

GOATS; ARACHIS GLABRATA; FEED CROPS; SHADING; PRODUCTION; NUTRITIVE VALUE; DIGESTIBILITY.

The aim of this study was at assessing morphology, production, nutritional quality and digestibility of *Arachis glabrata* that was planted on different shading levels. The experiment was conducted in lowland-wet climate agro-ecosystem at Goat Research Institute in Sungai Putih, Deli Serdang, North Sumatra. There were three levels of shading that measured by solarimeter tube, they were: 0% (N-0), 55% (N-55), and 75% (N-75). *A. glabrata* was planted on 12 m x 4 m plot in three replications. Average of fresh productions on N-0, N-55 and N-75 were 481.4 ± 46.2 ; 274.5 ± 46.2 and 222.2 ± 76.8 g/m²/cut, respectively. This

forage was fed to goats as a single feed at 3.5% of body weight based on dry matter. The digestibility experiment was arranged in a completely randomized design consisted of three treatments and four replications; each replication used one animal. The animals were put into individual metabolism cages. Twelve male goats were used in this experiment with average body weight for each treatment was: 8.4 ± 0.7 kg (N-0); 7.8 ± 0.3 kg (N-55), and 8.2 ± 0.3 kg (N-75). The animals were allocated randomly into three treatments (shading level of *A. glabrata* planting) to an adaptation period for 14 days, followed by fecal and urine collection for the next 7 days. Data were analyzed by analysis of variance, and continued with Duncan Multiple Range Test if there was a significant different among treatments. The result showed that dry matter, organic matter, crude protein, NDF, and energy were relatively equals among shading levels, but ADF content of *A. glabrata* that was planted on N-75 was lower than others. The dry matter intake tended to increase as the shading level increased, but there was no difference ($P > 0.05$) among treatments. Average dry matter intake on N-0, N-55, and N-75 were 300, 283 and 268 g/head/day, respectively. The digestibility coefficient of dry matter, organic matter, crude protein, energy and NDF were not affected by shading level ($P > 0.05$), but digestibility of ADF was significantly different ($P < 0.05$) among treatments. The lowest of ADF digestibility was found on N-75 (57.42%). It was significantly different ($P < 0.05$) from N-55 (71.86%), but relatively equals to N-0 ($P > 0.05$). The nitrogen retentions were positive in goats fed *A. glabrata* on those shading levels. N-retentions were affected ($P < 0.05$) by shading treatments, they were 1.66, 1.49 and 3.11 g/head/day on N-0, N-55 and N-75, respectively. It is concluded that *A. glabrata* can be recommended to be planted in shading area because there was no significantly different of production, nutritive value, intake, and digestibility except ADF.

101 SJOFJAN, O.

Effect of *Moringa oleifera* leaf meal in feed on broiler production performance. *Efek penggunaan tepung daun kelor (Moringa oleifera) dalam pakan terhadap penampilan produksi ayam pedaging* / Sjojfan, O. (Universitas Brawijaya, Malang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 649-656, 4 tables; 6 ref. 636:619/SEM/p

BROILER CHICKENS; FEED LEGUMES; MORINGA OLEIFERA; PRODUCTION; ANIMAL PERFORMANCE; FEED CONSUMPTION; WEIGHT GAIN.

The objective of this research was to investigate the effect of *Moringa oleifera* leaf meal in feed on broiler production performance. The materials used were *Moringa oleifera* leaf meal and 100 one-day-old Lohmann broilers chicks. This research has 5 treatments, namely P_0 = feed with no treatment *Moringa oleifera* leaf meal, P_1 = feed with 2.5% *Moringa oleifera* leaf meal, P_2 = feed with 5% *Moringa oleifera* leaf meal, P_3 = feed with 7.5% *Moringa oleifera* leaf meal and P_4 = feed with 10% *Moringa oleifera* leaf meal. Each treatment was repeated 4 times, if there was significant influence, then followed by Duncan's Multiple Range Test. The result of this research showed that *Moringa oleifera* leaf meal did not significantly influence ($P > 0.05$) feed consumption, body weight, feed conversion ratio, carcass weight, production efficiency factor and income over feed cost (IOFC). It is concluded that addition of different levels of *Moringa oleifera* leaf meal on broiler feed did not give significant effect on broiler production performance.

102 SUSILONINGSIH

Protein utilization of indigenous sheep at different ambient temperature. *Pemanfaatan protein pada domba lokal akibat perbedaan suhu lingkungan* / Susiloningsih; Megakusuma, I.; Soedarsono; Rianto, E.; Purnomoadi, A. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009; p. 477-482, 4 tables; 24 ref. 636:619/SEM/p

SHEEP; PROTEINS; FEED CONSUMPTION; USES; TEMPERATURE.

The aim of this experiment was at examining the effects of ambient temperature on protein utilization in indigenous sheep. Sixteen indigenous sheep, aged 12 months old with an average body weight of 15.24 ± 2.01 kg (CV=13.21%) were used. Sheep were penned, fed and watered individually in different temperature (24°C vs 34°C). The sheep were given a complete feed diet to fulfill the requirement of 1.5 times of maintenance feeding level (1.5 x M equal to 3.9% BW). The experimental design employed was a completely randomized design. The result showed that the CP intake was similar in 24°C and 34°C (64.43 vs 69.30 g/d, respectively). Fecal CP was similar for sheep at 24°C and 34°C. Digestible CP and metabolisable CP did not differ between temperature. The CP digestibility did not differ between temperatures. There were no significant effects of different temperature on protein utilization. The current results showed that high ambient temperature did not affect protein utilization with respected to water intake.

103 SYAMSU, J.A.

Potential of rice straw as feed resources for ruminant development in South Sulawesi [Indonesia]. *Prospektif jerami padi sebagai sumber pakan untuk pengembangan ternak ruminansia di Sulawesi Selatan* / Syamsu, J.A.; Abdullah, A. (Universitas Hasanuddin, Makassar (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009; p. 847-852, 2 tables; 17 ref. 636:619/SEM/p

RUMINANTS; RICE STRAW; FEED RESOURCES; SULAWESI.

The objective of this study was to evaluate the potency of rice straw as feed for ruminants in South Sulawesi. Survey method was used in the area which represents different climate and cultivation patterns. Two districts were chosen to meet this criterion and subsequently where the study was taking place. Primary data were obtained using latin square method (25 m²) to estimate the production of rice straw during or just before harvesting. Nutrient composition was also analyzed in order to estimate the advantage of rice straw as feed for ruminants. The result indicated that production of rice straw per annum was approximately 4.312.125 ton or equivalent to 1.839.121 ton and 200.083 ton for total digestible nutrient (TDN) and crude protein, respectively. This suggested that annually a number of 1.891.283 animal units (AU) can be accommodated by this production.

L10 ANIMAL GENETICS AND BREEDING

104 NATAAMIJAYA, A.G.

Native chickens potential development for supporting farmers' welfare improvement. *Pengembangan potensi ayam lokal untuk menunjang peningkatan kesejahteraan petani / Nataamijaya, A.G.* (Balai Besar Pengkajian dan Pengembangan Teknologi Pertanian, Bogor (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(4) p. 131-138, 1 ill., 1 table; Bibliography: p. 136-138.

CHICKENS; LAND RACES; DOMESTICATION; CROSSBREEDING; FLUSHING; NUTRITIONAL REQUIREMENTS; ANIMAL HOUSING; DISEASE CONTROL; POULTRY FARMING; FARM INCOME; GENETIC RESOURCES.

Indonesian native chickens have very good potential to be developed to create a commercial strain for supporting food security and to improve farmers' welfare. So far, at least 32 ecotypes of native chickens were documented. Each of them has special characteristics, e.g. pelung, sentul, kedu, merawang, gaok, and nusa penida. Most of the local chickens were resulted from domestication of *Gallus gallus* since hundred years ago. The chickens could be classified into several types, i.e. meat, egg layer, dual purpose, and fancy. Government attention for developing these native chickens is limited, even though native chicken keeping activity involves most of the farmers in the villages. Native chicken diseases are commonly caused by infections of viruses, bacteria, protozoa, and parasites, however native chickens have better resistance to diseases especially avian influenza (AI) because its body contains higher percentage of Mx+ gene compared with the imported hybrid chicken. Selection for resistance toward AI and newcastle disease should be implemented and supported with disease control program.

105 SOPIYANA, S.

Local chicken primordial germ cells (PGCs) purification by nicodenz density gradient centrifugation (NGC). *Pemurnian primordial germ cells (PGCs) ayam lokal dengan metode nicodenz density gradient centrifugation (NGC) / Sopiyan, S.; Kostaman, T.; Setioko, A.R.* (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 576-581, 3 ill., 2 tables; 9 ref. 636:619/SEM/p

CHICKENS; GERMLASM; GAMETES; PURIFICATION; METHODS.

Many methods have been conducted to conserve genetic material of animal, and the use of in-situ and ex-situ conservation methods had generally conducted. Primordial germ cells (PGCs) conservation is an alternative way to preserve genetic resources in both male and female chickens. The objective of this study is to test a method to purify primordial germ cells (PGCs) of local chicken by Nicodenz density gradient centrifugation (NGC). Fertilized eggs of native chicken were used for blood collection. The eggs were incubated to obtain embryos at stage 15. The stage of embryo development was determined during the period of study. The blood of the whole embryo was collected using a fine glass micropipette under the microscope. The collected blood was pooled in a 1.5 ml micro tube and suspended to 0.5 ml PBS medium. In this experiment, harvesting PGCs was conducted using standard NGC

method refers to Zhao and Kuwana. Blood from the embryo on the stage of 13-18 was able to be collected with average 15.47 ± 0.5 and with percentage of succeed $87.1 \pm 1.1\%$. The use of standard NGC to purify PGCs was successfully collected some PGCs from the blood. The number of PGCs is still relatively varied with the average of 28.60 ± 5.7 cells per embryo. It is concluded that NGC technique could be used to purify PGCs of local chicken.

106 SUSANTI, T.

Genetic parameter estimating of egg production characteristics in Alabio ducks. *Pendugaan parameter genetik sifat-sifat produksi telur itik Alabio* / Susanti, T.; Prasetyo, L.H. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 588-592, 2 tables; 12 ref. 636:619/SEM/p

DUCKS; GENETIC PARAMETERS; EGG PRODUCTION; CROSSBREEDING.

Egg production of local ducks in Indonesia is still low, and one way of improving their productivity is through genetic improvement. Estimating of genetic parameters are required before designing an appropriate genetic program for the targeted population. This study was aimed at estimating genetic parameters of a population of Alabio ducks, which includes heritability and genetic correlations between age at first laying, weight of first eggs, and egg production at 12 weeks with egg production at 24 weeks. Measurements were taken from 650 female and 100 male Alabio ducks of F1 population and 400 female of F2 population. Data were analyzed using animal model of the Restricted Maximum Likelihood (REML) with program PEST and VCE 4.2. Results showed that the heritability estimates for age at first laying, weight of first eggs, egg production at 12 weeks and egg production at 24 weeks were 0.047 ± 0.043 ; 0.160 ± 0.098 ; 0.235 ± 0.087 and 0.127 ± 0.088 , respectively. The estimating of genetic correlation coefficient between egg production at 24 weeks with age at first laying weight of first egg and egg production at 12 weeks were 0.349; 0.016 and 0.996, respectively. Based on the estimating of heritability of the egg production characteristics it seems that crossbreeding would be more suitable for improving egg production in Alabio ducks. If a selection program will be used for improving egg production, then some other characteristics should be considered, which have a higher heritability and higher genetic correlation coefficients with egg production.

L40 ANIMAL STRUCTURE

107 WAHYUNI, H.I.

Comparative study of pancreatic enzyme activity and its histology in native and broiler chicks. *Studi perbandingan aktivitas enzim dan histologi dari pankreas ayam kampung dan broiler* / Wahyuni, H.I. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan); Roxas, N.P. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 678-683, 2 ill., 1 table; 15 ref. 636:619/SEM/p

CHICKENS; PANCREAS; ANIMAL TISSUES; ENZYME ACTIVITY; ANIMAL TISSUES.

The purpose of this study was to compare the capacity of pancreas in 44 day-old native birds and 44 day-old broiler chicks in term of the relative activity of amylase and lipase as well as its histology at 1, 7, 14 and 21 days after hatching. The relative activities of pancreatic amylase and lipase increased rapidly to its maximum at day 21, both in native and broiler chicks. Both amylase and lipase of broiler showed higher relative activity than in native chicks. This finding was supported by the pancreatic histological figures. It was noted that native chicks had less dense acini and larger area of connective tissue compared to those found in broiler chicks. It is concluded that less dense of acini showed the lower capacity of native chicks' pancreas that affected relatively low activity of amylase and lipase.

L50 ANIMAL PHYSIOLOGY AND BIOCHEMISTRY

108 KAYADOE, M.

Comparison of blood variables between endemic maleo and domesticated maleo. *Perbandingan gambaran darah burung maleo gunung (Aepodius arfakianus) betina dan unggas yang telah didomestikasi* / Kayadoe, M.; Sambodo, P.; Aronggear, Y. (Universitas Papua, Manokwari (Indonesia). Fakultas Peternakan, Perikanan dan Ilmu Kelautan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 801-804, 3 tables; 4 ref. 636:619/SEM/p

BIRDS; BLOOD; HAEMOGLOBIN; ANIMAL HEALTH.

Captive breeding is one of activity to conserve wildlife but in order to do this activity support data standard are needed. Blood image is one of the data which is needed to find out animal health status in captive breeding. This is a reason that research in blood image in maleo bird which is one of endemic bird in Papua should be conducted. The approach to carry out this research was to compare blood image of this bird with other animal from the same family which was already domesticated such as chicken. Variables of blood image measured in this research were red blood cell, white blood cell, amount of haemoglobin, percentage of leukocyte differentiation, haematocrit or packed cell volume, average erythrocyte volume, average haemoglobin erithrocyte and haemoglobin erithrocyte concentration. The result showed that blood image of female mountain maleo bird were RBC 4.76×10^6 , WBC 28.9×10^3 and haemoglobin 12.4%. The percentage of leukocyte differentiation was heterophyl 23% and the eosinophyl was the same as blood image of chicken and duck.

L51 ANIMAL PHYSIOLOGY - NUTRITION

109 MANSYUR

Digestibility of signal grass (*Brachiaria decumbens*) planted under banana plantation at various maturity stages. *Kecernaan rumput signal (Brachiaria decumbens) yang ditanam di naungan perkebunan pisang pada berbagai umur pemotongan* / Mansyur; Djuned, H.; Indrani, N.P.; Tarmidi, A.R.; Dhalika, T. (Universitas Padjadjaran, Bandung (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.;

Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 783-788, 2 ill., 19 ref. 636:619/SEM/p

BRACHIARIA DECUMBENS; DIGESTIBILITY; UNDERPLANTING; BANANAS; MATURITY

The aim of this study was at investigating maturity of grass on dry and organic matter digestibility of signal grass planted under banana plantation. The study used a completely randomized design with four treatments. The treatments were harvesting time, namely 30 days, 40 days, 50 days, and 60 days after trimming. Variables were dry and organic matters digestibility of signal grass planted under banana plantation. Data were analyzed with analysis of variance. The mean was compared using Duncan Multiple Range Test. Dry matter and organic matter digestibility of signal grass forage decreased as maturity increased. Highest dry matter and organic matter digestibility resulted from forage harvested at 30 day after trimming, i.e. 44.61% and 46.01%, respectively. Higher dry matter digestibility production was from signal grass harvested at 40 day after trimming i.e. 186.62 kg/ha/harvest.

110 PRAYITNO, C.H.

Micromineral supplementation on fermented by-product of agroindustry using *Trichoderma viridae* based on *in vitro* concentration of VFA and NH₃. *Suplementasi mikromineral pada limbah agroindustri yang difermentasi *Trichoderma viridae* yang ditinjau dari konsentrasi VFA dan N-NH₃ secara *in vitro** / Prayitno, C.H. (Universitas Jenderal Soedirman, Purwokerto (Indonesia). Fakultas Peternakan) [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 761-767, 2 ill., 1 table; 13 ref. 636:619/SEM/p

FEEDS; BYPRODUCTS; AGROINDUSTRIAL SECTOR; FERMENTATION; TRICHODERMA VIRIDAE; ZINC; COPPER.

The purpose of this study is to investigate the effects of micromineral supplementation (Zn and Cu) on by-product of agroindustry (cassava shell, cacao shell and coffee shell) fermented by *Trichoderma viridae* 5% for ruminal VFA and N-NH₃ by *in vitro* method. The experimental design was nested classification with two levels (group). Main group, by-product of agroindustry was L₁= cassava shell, L₂= cacao shell and L₃= coffee shell. Subgroup was micromineral supplementation, there were m₀ (without supplementation), m₁ (50 ppm Zn supplementation), m₂ (6 ppm Cu supplementation) and m₃ (50 ppm Zn and 6 ppm Cu supplementation). Each subgroup were nested to main group (3 x 4) and 3 times replications. Variables observed were digestibility, concentration of VFA and N-NH₃ by *in vitro* method. It is concluded that the supplementation of 50 ppm Zn and 6 ppm Cu (m³) on cassava shell fermented by *T. viridae* gave higher average production of DMD, DMO, VFA and N-NH₃ than that of cacao shell and coffee shell.

111 SUHARLINA

Solubility of calcium (Ca) and phosphor (P) of several tree legumes using *in vitro* technique. *Kelarutan mineral kalsium (Ca) dan fosfor (P) dan fermentabilitas beberapa jenis legum pohon secara *in vitro** / Suharlina (Sekolah Tinggi Ilmu Pertanian, Kutai Timur (Indonesia). Program Studi Peternakan); Permana, I.G.; Abdullah, L. [Proceedings of the

national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 772-777, 4 tables; 15 ref. 636:619/SEM/p

LEGUMES; TREES; CALCIUM; PHOSPHORUS; MINERAL CONTENT; IN VITRO; SOLUBILITY.

An *in vitro* experiment was carried out to examine the solubility of Ca and P of selected trees legume in ruminal fluids. The legumes were *Pterocarpus indicus*, *Sesbania grandiflora*, *Gliricidia sepium*, *Leucaena leucocephala* and *Caliandra calothyrsus*. The leaves were dried, ground and incubated in the ruminal fluids at 12 and 24 hours. The observed variables were solubility of Ca and P, concentration of ammonia and total VFA concentration. The data were analyzed using analysis of variance. The result showed that the VFA production of legume trees was not different statistically ($P>0.05$). However, the solubility of Ca and P and the ammonia concentration of *Sesbania grandiflora* were significantly higher than those of other legumes ($P<0.05$). There was significant relationship between solubility of Ca and P and ammonia concentration.

112 YATNO

Protein retention and metabolizable energy of protein concentrate from palm kernel meal of chemico-physical combination extracted. Retensi protein dan nilai energi metabolis konsentrat protein bungkil inti sawit hasil ekstraksi kombinasi fisik-kimiawi / Yatno (Universitas Jambi (Indonesia). Fakultas Peternakan); Ramli, N.; Wiryawan, K.G.; Setiyono, A.; Purwadaria, T.; Hardjosworo, P.S. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 669-673, 2 tables; 9 ref. 636:619/SEM/p

QUAILS; PROTEINS; ENERGY VALUE; PROTEIN CONCENTRATES; PALM KERNELS; EXTRACTS; CHEMICO-PHYSICAL PROPERTIES.

The experiment was conducted to study protein retention and metabolizable energy value of protein concentrate extracted from palm kernel meal (PKM). Twenty heads of male quails age 30 days were used where 15 heads of the animals were randomly assigned to one of the three dietary treatments. The remaining quail were used to measure endogenous protein. The treatments were (a) RKPBS (diet composed of 9% crude protein from protein concentrate from PKM), (b) RBIS (diet composed of 9% crude protein from PKM) and (c) RBKD (diet composed of 9% crude protein from soybean meal). The parameters observed were protein retention and metabolizable energy value; apparent metabolizable energy (EMS), true metabolizable energy (EMM), apparent metabolizable energy corrected by nitrogen value (EMSn), and true metabolizable energy corrected by nitrogen value (EMMn). Data were analyzed by analysis of variance and followed by Orthogonal Contrast Test if the treatments are significant. The protein retention of protein concentrate from PKM was better than that of PKM and was equal to that of soybean meal. Protein retention of RKPBS, RBIS and RBKD were 69.82, 61.19 and 70.57%, respectively, while value of EMS were 2684.69, 2524.5 and 2913.58 kCal/kg; EMM were 2605.97, 2480.07 and 2857.35 kCal/kg; EMSn were 2501.22, 2440.66 and 2770.11 kCal/kg, and EMMn were 2578.94, 2485.06 and 2826.30 kCal/kg, respectively for RKPBS, RBIS and RBKD. It is concluded that protein

retention and metabolizable energy value of protein concentrate from PKM (RKPBS) was better compared with that of RBIS, and was equal with that of soybean meal.

L53 ANIMAL PHYSIOLOGY - REPRODUCTION

113 ADIATI, U.

Sexual development of kosta goat. *Perkembangan seksual kambing kosta* / Adiati, U. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 381-384, 1 table; 4 ref. 636:619/SEM/p

GOATS; SEXUAL MATURITY; OESTROUS CYCLE; SPERMATOZOA.

Kosta goat represents one of Indonesian goats which is formed by crossbreeding between Kacang goat and one imported goat (Kashmir, Angora or Etawah). Kosta goat has high fertility with litter size usually more than one and does not show the seasonal sexual activity, so they can bear any time along the year. Puberty can be defined as age or time of when reproductive organ have started to functioning and propagating. Puberty of male kids livestock marked with its readiness to produce sperma and to breed ewes beside same changes of secondary reproductive organ, while for ewes marked with onset of oestrus and ovulation. Research was conducted in Research Institute of Animal Production at Cilebut on 13 male kids and 11 female kids. All livestock were given unlimited fresh grass and concentrate of GT 03. Observation of male production was done based on Pretorius and Maricowitz method, while for the female by introducing male goat into ewes flock every morning and evening, of 10 minutes, and continued by oestrus checking, every 2 hours to know the amorous duration. Parameters measured were age at complete penis growth, female and male age at puberty, oestrus, male libido and semen quality. Result indicated that early male Kosta kids puberty reached at age 253.68 ± 18.46 day, bodyweight 12.00 ± 0.82 kg, scrotum length 9.30 ± 0.18 cm and scrotum circle 19.35 ± 0.29 cm and sperma concentration $2430 \pm 840.00 \times 10^6/\text{ml}$; while early female Kosta kids puberty was at age 7 month; with the body weight of 10.9 ± 0.57 kg, oestrus duration 46 ± 2.83 hours. It is concluded that age and body weight of the kid influence the onset of puberty.

114 MAHMILIA, F.

Correlation between pregnancy length, birth weight, litter size and survival of Boerka-1 goat. *Korelasi lama bunting dengan bobot lahir, litter size dan daya hidup kambing Boerka-1* / Mahmilia, F.; Elieser, S. (Loka Penelitian Kambing Potong, Sungai Putih (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 391-394, 2 tables; 12 ref. 636:619/SEM/p

GOATS; PREGNANCY; BIRTH WEIGHT; LITTER SIZE; SURVIVAL.

An experiment was conducted on 95 heads of Kacang doe mated with male boer. The parameters perceived were pregnancy period, birth weight, litter size, and survival performance for up to two weeks old and correlation of all characters. The study was undertaken at Research Institute for Goat Production, Sungai Putih. The data were analysed

in accordance to a Simple Correlation Test. The results showed there were positive correlation between pregnancy period and birth weight ($t = 0.525$). In contrast, negative correlation ($P < 0.05$) was found between pregnancy period and litter size.

115 ONDHO, Y.S.

Effect of various diluter on frozen semen quality of dombos texel in Wonosobo Regency [Indonesia]. *Pengaruh jenis pengencer terhadap kualitas semen beku dombos texel di Kabupaten Wonosobo* / Ondho, Y.S.; Wuwuh, M.I.S.; Sutopo; Samsudewa, D.; Suryawijaya, A. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan) [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 416-420, 5 tables; 8 ref. 636:619/SEM/p

SHEEP; SEMEN PRESERVATION; BIOLOGICAL PRESERVATION; FREEZING; QUALITY; JAVA.

The aim of the study was at investigating the quality and availability of semen for processing frozen semen, and also to observe types of diluter that could be used to produce frozen semen of Dombos Texel. The study was conducted for 5 months. Four selected rams were used in this study. Parameters observed were sperm motility, membrane damage and sperm motility after water incubator test. The result showed that sperm motility and abnormality test in Dombos Texel was appropriate to produce frozen semen. Furthermore, andromed was a better diluter to produce frozen semen of Dombos Texel compared to skim milk and Tris.

116 PAMUNGKAS, F.A.

Application of oestrus synchronization for Boerka goat on dryland of orange crop-plantation area. *Penerapan sinkronisasi birahi kambing Boerka dengan lokal di areal perkebunan berbasis tanaman jeruk pada lahan kering* / Pamungkas, F.A.; Doloksaribu, M. (Loka Penelitian Kambing Potong, Sungai Putih (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 560-564, 4 tables; 8 ref. 636:619/SEM/p

GOATS; OESTRUS SYNCHRONIZATION; PREGNANCY; DRY FARMING.

This study was conducted in Guru Kinayan Village, Karo District, North Sumatra involving four cooperators determined through a field survey. Goats were raised intensively in cages, and were previously synchronized with Reprodin at 1.25 ml/head intramuscularly. Since low artificial insemination results in goats, natural mating was applied by placing a Boerka male into a group of mature female goats. Parameters observed female weight and pregnancy percentage. Data were analysed using Mean Standard Deviation. The result showed that female weight of lower than 20 kg was 38.78% or 19 heads. From a total of 49 female goats to be mated, 30 goats were not pregnant then were synchronized. The pregnancy rate of synchronized goats was 76.67%.

117 PAMUNGKAS, F.A.

Comparative characteristics of Boer and kacang goat semen. *Perbandingan karakteristik semen kambing Boer dengan kacang* / Pamungkas, F.A.; Mahmilia, F.; Elieser, S. (Loka Penelitian Kambing Potong, Sungai Putih (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 367-370, 2 tables; 11 ref. 636:619/SEM/p

GOATS; SPECIES; SEMEN; SPERMATOZOA.

The purpose of this study was to evaluate the characteristics of goat semen between Boer and Kacang. The study was undertaken at the Station of Research Institute for Goat Production, Sei Putih, North Sumatra. Two sires of Boer and Kacang goat, respectively were used in this study. Semen were collected twice weekly using an artificial vagina and a female as an attractor. Parameters of semen characteristic were volume, colour, consistency, mass movement, motility and concentration of sperm. The data were analysed based on mean test and characteristic comparison between Boer and Kacang which was analysed with T-test package of SPSS version 1.0. The results showed the semen characteristics of Boer and Kacang were not significantly different except the concentration of Boer spermatozoa ($2.975 \times 10^6/\text{ml}$) which was lower than that of Kacang spermatozoa ($3,893 \times 10^6/\text{ml}$).

118 SAMSUDEWA, D.

Consistency, accuracy and sensitivity test of "DEEA GestDect" pregnancy detector in Etawah grade goat. *Uji konsistensi, akurasi dan sensitivitas bahan deteksi kebuntingan "DEEA GestDect" menggunakan kambing peranakan Etawah* / Samsudewa, D.; Lukman, A.; Sugiyanto, E.; Setiatin, E.T. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 556-559, 1 table; 11 ref. 636:619/SEM/p

GOATS; CONSISTENCY; PREGNANCY; URINE; METHODS.

The aim of this study was at determining consistency, accuracy and sensitivity of "DEEA GestDect" pregnancy detection in etawah grade goat. Materials consisted of urine samples from 86 goats, a "DEEA GestDect" pregnancy detector, ewes recording, stickers, harness, reaction tubes and pipettes. The method used was the comparison of partus and "DEEA GestDect" pregnancy detector. This study was done based on descriptive and chi square analysis. The result showed that consistency, accuracy and sensitivity of "DEEA GestDect" pregnancy detector were 90.70%, 91.86% and 2 weeks of gestation period, respectively. All parameters showed a significant results by chi-square analysis ($P < 0.05$). It is concluded that "DEEA GestDect" pregnancy detector had a good consistency, accuracy and sensitivity to detect pregnancy in etawah grade goat.

119 SOLIHATI, N.

Study on quality and viability of garut ram cauda epididymides spermatozoa in different kind of extender. *Studi terhadap kualitas dan daya tahan hidup spermatozoa cauda epididimidis domba garut menggunakan berbagai jenis pengencer* / Solihati, N.

(Universitas Padjadjaran, Bandung (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 401-408, 1 ill., 3 tables; 10 ref. 636:619/SEM/p

SHEEP; SPERMATOZOA; SEMEN; QUALITY; VIABILITY; LIQUIDS.

The purposes of this research was to examine the quality and viability of garut ram cauda epididymides spermatozoa in different solution and to study the extender that can maintain the best quality and viability of garut ram cauda epididymides spermatozoa. In this research cauda epididymides of new slaughtered garut ram was used and immediately brought to laboratory. Liquid semen was produced by six kinds of extenders as treatment consisting physiologic NaCl, coconut water, coconut milk, skim milk, citrate and Tris; 20% of egg yolk was added to all of the extender. The mixture was stored at 5°C of temperature, then both quality and viability were evaluated every 24 hours. This research was designed based on completely randomized design with six treatments and three replications. Result showed that extenders significantly ($P < 0.05$) affected motility, live sperm and intact plasma membrane. The extenders also affected viability of garut ram cauda epididymidis spermatozoa. It is concluded that Tris and citrate egg yolk extenders were the best solution in maintaining quality and viability of garut ram cauda epididymides spermatozoa. Physiologic NaCl and coconut water egg yolk solution were the simplest extenders and could be chosen if Tris and citrate egg yolk solution were not available.

120 TAGAMI, T.

Differentiation of female primordial germ cells in the male testes of chicken. *Diferensiasi primordial germ sel dalam testes ayam* / Tagami, T. (National Institute of Livestock and Grassland Science, Ibaraki (Japan)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 15-22, 3 ill., 4 tables; 13 ref. 636:619/SEM/p

CHICKENS; FEMALES; MALES; TESTES; SPERMATOZOA; CHIMAERAS.

We demonstrated that female primordial germ cells (PGCs) have the ability to differentiate into W chromosome-bearing (W-bearing) spermatozoa in male gonads of germline chimeric chickens. In this study, three germline chimeric chickens were generated by injecting female PGCs into the male recipient embryos to investigate the differentiation pattern of female PGCs in male gonads in chickens. After these male chimeras reached sexual maturity, the semen samples were analyzed for detecting W-bearing cells by PCR and *in situ* hybridization analyses. The results indicated that the female PGCs had settled and differentiated in their testes. A histological analysis of the seminiferous tubule in those chimeras demonstrated that the W-bearing spermatogonia, spermatocytes and round spermatids accounted for 30.8, 32.7 and 28.4%, respectively. However, the W-bearing elongating spermatid was markedly lower (7.7%) as compared to the W-bearing round spermatid. The W-bearing spermatozoa were hardly ever observed (0.2%). It was concluded that although female PGCs in male gonads are capable of passing through the first and second meiotic division in adapting themselves to a male environment, they are hardly complete spermiogenesis.

L70 VETERINARY SCIENCE AND HYGIENE – GENERAL ASPECT

121 KUSUMANINGTYAS, E.

Inhibition test of extract and cream extract of *Piper betle* against *Candida albicans* and *Trichophyton mentagrophytes*. Uji daya hambat ekstrak dan krim ekstrak daun sirih (*Piper betle*) terhadap *Candida albicans* dan *Trichophyton mentagrophytes* / Kusumaningtyas, E.; Gholib, D. (Balai Besar Penelitian Veteriner, Bogor (Indonesia)); Widiati, R.R. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 805-811, 4 tables; 15 ref. 636:619/SEM/p

PIPER BETLE; INHIBITION; TESTING; PLANT EXTRACTS; CREAM; CANDIDA ALBICANS; TRICHOPHYTON MENTAGROPHYTES; TRADITIONAL MEDICINE.

Piper betle leaf as traditional medicine is known as antifungi. This research was conducted to find out antifungal activity of n-hexane, ethyl acetate, ethanol extract, aromatic oil and cream of ethyl acetate extract and aromatic oil of *Piper betle* leaf. Antifungal activity of each extract was assayed by agar diffusion assay. Inhibition zones that formed were measured. Minimum inhibitory concentration (MIC) was defined by dilution method and then the growing colony was counted. Ethyl acetate extract and aromatic oil which have the lowest MIC was made extract and aromatic oil cream. The antifungal activity of extract and aromatic oil cream was assayed by agar diffusion assay. The result of antifungal activity assay revealed that inhibition diameter zones of ethyl acetate extract and aromatic oil were bigger than that of n-hexane and ethanol extract in a various concentration. MIC for ethyl acetate extract and aromatic oil were 10% to *Candida albicans* 5% and to *Trichophyton mentagrophytes*. Cream of ethyl acetate extract and aromatic oil were still could inhibit fungal growth in concentration 5% but their inhibition diameter zone were narrower than ethyl acetate extract and aromatic oil of *Piper betle*.

122 PURWANTI, S.

Study of turmeric, garlic and zinc effect on the performances, cholesterol and health status of broiler. Kajian efektivitas pemberian kunyit, bawang putih dan mineral zink terhadap performa, kolesterol karkas dan status kesehatan broiler / Purwanti, S. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan); Mutia, R.; Widhyari, S.D.; Winarsih, W. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 690-695, 3 tables; 13 ref. 636:619/SEM/p

BROILER CHICKENS; TURMERIC; GARLIC; ZINC; ANIMAL PERFORMANCE; CHOLESTEROL; ANIMAL HEALTH.

The consumers are now selective in choosing broiler carcass, especially for carcass with low fat and cholesterol. Fat and cholesterol from broiler chicken are known for its negative effect on human health, which can cause heart disease, obesity and hypertension. Garlic and turmeric are known as herbal medicine that have active material of allisin and curcumin. These active materials can reduce fat and cholesterol, improve performance and health status of broiler. The function of zinc as zinc oxide (ZnO) is for metalloenzym and to give immune response to broiler. An experiment was conducted to study the effect of turmeric (1.5%),

garlic (2.5%) and ZnO (120 ppm) in the diets on performances, cholesterol and health status of broiler. Turmeric and garlic were offered in powder form. The data were analyzed by a completely randomized design with 5 treatments and 4 replications with 5 chicks in each replication. Diets were formulated to contain 23.5% crude protein (CP) and 3215.04 kCal/kg metabolizable energy (ME). The treatments were R₀ (basal diet as a control), R₁ (R₀ + 1.5% turmeric powder + 2.5% garlic powder), R₂ (R₀ + 2.5% garlic powder + 120 ppm ZnO), R₃ (R₀ + 1.5% turmeric powder + 120 ppm ZnO) and R₄ (R₀ + 1.5% turmeric powder + 2.5% garlic powder + 120 ppm ZnO). Diets and water were offered *ad libitum*. Data were collected during 35 days to obtain the performance data, cholesterol content in carcass, erythrocyte, hemoglobin, and hematocrit. Three chicks of each replication were slaughtered for cholesterol carcass parameter. The results showed that there was no significant different (P>0.05) on the performances, cholesterol in carcass, and health status of the chickens. The results showed that diet of R₂ containing garlic (2.5%) and ZnO (120 ppm) tend to improve performances and health status, decrease cholesterol in carcass of the broiler chickens.

L73 ANIMAL DISEASES

123 AHMAD, R.Z.

Lethal time 50 of *Beauveria bassiana* and *Metarhizium anisopliae* fungi on *Sarcoptes scabiei*. Lethal time 50 cendawan *Beauveria bassiana* dan *Metarhizium anisopliae* terhadap *Sarcoptes scabiei* / Ahmad, R.Z.; Haryuningtyas, D.; Wardhana, A. (Balai Besar Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 498-503, 2 ill., 1 table; 18 ref. 636:619/SEM/p

GOATS; ANIMAL DISEASES; BEAUVERIA BASSIANA; METARHIZIUM ANISOPLIAE; SARCOPTES SCABIEI; IN VITRO; DISEASE CONTROL.

Beauveria bassiana and *Metarhizium anisopliae* fungi were entomophagous fungi. These fungi belong to Deuteromycetes. The aim of this experiment was at studying lethal time 50 (LT50) of *B. bassiana* and *M. anisopliae* isolates against *S. scabiei* mites from goat by *in vitro* test. After multiplication these isolates were tested with the addition of 10⁵, 10⁶ and 10⁷ spores (conidias) of *B. bassiana* and *M. anisopliae* to *S. scabiei* mite in counting chamber. The killed mites were counted in specific times. The result showed that LT50 of *M. anisopliae* was different from *B. bassiana* in reducing *S. scabiei* mites.

124 CHOTIAH, S.

Viability of *Pseudomonas* spp. after long term storage at room temperature and -15°C. Kelangsungan hidup plasma nutfah mikroba *Pseudomonas* spp. setelah penyimpanan jangka lama pada suhu kamar dan -15°C / Chotiah, S. (Balai Besar Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 819-826, 3 tables; 23 ref. 636:619/SEM/p

PSEUDOMONAS; SURVIVAL; STORAGE; TEMPERATURE

A wide variety of techniques is used for the preservation of microbes and it may be difficult to choose the most suitable way for a particular microbes. The preservation method used should minimize of viability losing during processing and storage, so that after preservation, cultures will survive for long periods. Survival of lyophilized *Pseudomonas* spp. after long term storage at room temperature and -15°C have been evaluated for achieving the suitable and efficient monitoring in the microbial germplasm preservation. A total of 45 lyophilized samples of seven *Pseudomonas aeruginosa* collections, two *Pseudomonas fluorescens* collections and one *Pseudomonas stutzeri* collection prepared in vacuum glass ampoules, stored for more than 16 years at different temperatures were grown on specific medium and identified for the bacterial species. The results showed that four of ten (40%) collections and eight of ten (80%) collections of *Pseudomonas* spp. were still viable to live after storing at room temperature and -15°C during 16 until 23 years respectively. All of *Pseudomonas fluorescens* collections were not survived after 16 years of storage at above both temperatures. There was indicated that survival of lyophilized *Pseudomonas* spp. after long term storage at -15°C is better than that at room temperature.

125 DEWI, A.P.

***In vitro* test using tea tree extract (*Melaleuca alternifolia*) to *Sarcoptes scabiei* in goat. Uji *in vitro* ekstrak tea tree (*Melaleuca alternifolia*) terhadap tungau *Sarcoptes scabiei* pada kambing / Dewi, A.P.; Haryuningtyas, D. (Balai Besar Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 510-515, 5 ill., 14 ref. 636:619/SEM/p**

GOATS; ANIMAL DISEASES; DISEASE CONTROL; MELALEUCA ALTERNIFOLIA; IN VITRO; USES; PLANT EXTRACTS; SARCOPTES SCABIEI.

Scabies caused by *S. scabiei* var. caprae often attack goat in the village. This disease makes considerable impact of highly economic loss in goat production (decrease of weight gain, milk production and animal death) and significant cost due to the continuous use of acaricides in infested animal. Research on acaricide from herbal remedies require to be done as alternative drug for scabies medication. Tea tree oil (TTO) was suspected to have an acaricidal activity. The aim of this study was at investigating the acaricidal effectivity of tea tree oil (*Melaleuca alternifolia*) to *Sarcoptes scabiei* var. caprae. Tea tree oil used in this research was obtained from ISMCRI. *Sarcoptes scabiei* var. caprae was collected from the goat that was naturally infected by *Sarcoptes scabiei* from the field. Ten adult mites were put in the incubation chamber which filled up with 1%, 0.5% of liquid TTO and 5% TTO in vaselin. Aquadest was used as negative control and neguvon was used as a positive control. Observations were conducted every 6 hours until all the mites died. The result showed that 1% TTO was more effectively killed *S. scabiei* var. caprae *in vitro* with LT50 at 2.3 hours and significantly different ($P < 0.05$) compared with 2 other treatments. Treatment with 0.5% liquid TTO and 5% TTO in vaselin have LT50 at 59.1 and 45.6 hours, respectively.

126 GHOLIB, D.

Inhibition test of red ginger (*Zingiber officinale* var. rubrum) and white ginger (*Z. officinale* var. amurum) ethanolic extracts against *Trichophyton mentagrophy* and *Cryptococcus neoformans*. Uji daya hambat ekstrak etanol jahe merah (*Zingiber officinale* var. rubrum) dan jahe putih (*Zingiber officinale* var. amarum) terhadap *Trichophyton mentagrophytes* dan *Cryptococcus neoformans* / Gholib, D. (Balai Besar

Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 827-830, 2 tables; 6 ref. 636:619/SEM/p

ZINGIBER OFFICINALE; TRICHOPHYTON MENTAGROPHYTES; CRYPTOCOCCUS NEOFORMANS; INHIBITION; ETHANOL; EXTRACTS.

The aim of this study was to detect the potency of ethanolic extract of red ginger (*Zingiber officinale* var. *rubrum*) and white ginger (*Zingiber officinale* var. *amarum*) to inhibit the growth of *Trichophyton mentagrophytes* and *Cryptococcus neoformans* in vitro. Extract dilution of 0.1, 0.15, 0.2, 0.25 and 0.30% were tested to *T. mentagrophytes*, and 10, 15, 20, 25, 30 and 35% were tested to *C. neoformans*. The fungi were serially diluted in decimal dilution. Each of 1 ml extract and fungi dilution (10^{-3}) were transferred into sterilized petridish Sabouraud's dextrose agar (SDA) medium (20 ml), then it was poured into each petridish. The plating cultures were incubated at 37°C for 4 - 5 days. The growth of the colonies was observed, and confirmed to the extract dilution which showed no growth of colonies minimum inhibition concentration/MIC). The results showed both extracts have the same inhibition potency 0.30% to *T. mentagrophytes*, 35% and 30% inhibition potency of red and white ginger respectively to *C. neoformans*.

127 GHOLIB, D.

Viability of *Aspergillus* spp. and *Fusarium* spp. after long period of *ex situ* conservation.
Viabilitas plasma nutfah mikroba Aspergillus spp. dan Fusarium spp. setelah konservasi ex situ jangka lama / Gholib, D.; Kusumaningtyas, E.; Chotiah, S. (Balai Besar Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 813-817, 3 tables; 9 ref. 636:619/SEM/p

ASPERGILLUS; PSEUDOMONAS; GERMPASM; VIABILITY; SURVIVAL; STORAGE; TEMPERATURE.

The study was conducted to assess viability of freeze isolates of fungi collected in Balitvet Culture Collection (BCC). A number of 147 samples consisted of 104 samples from 37 isolates of *Aspergillus* sp. (11 species), and 43 samples from 14 isolates of *Fusarium* sp. (3 species) were recultured on Sabouraud's dextrose agar (SDA) plating medium. The isolates were 10 times serially diluted (10.1-10.6), and each 1 ml of dilution was cultured in the medium, and incubated at 25-28°C. The growth of colonies were examined macro and microscopically, identified to the species and its purity. The results showed that *Aspergillus* isolates of 100% samples revealed the colony growth consisted of *Aspergillus flavus*, *A. fumigatus* and *A. parasiticus* after 15 years, *A. clavatus* after 12 years, *A. awamori* and *A. ficuum* after 11 years, and *A. terreus* after 10 years, *A. niger* and *A. amstelodami* 83.3 and 0% respectively after 11 years, and *A. nidulans* 66.6% after 10 years freeze dried. *Fusarium moniliforme* showed 100% colony growth and *F. graminearum* 14.3% after 17 years, and *F. solani* 66.6% after 20 years freeze dried. Based on this results, it can be concluded that preservation of fungi by means of freeze drying is very effective and long lasted.

128 NEGARA, M.

Study of organic acid salt production from complete feed silage to inhibit *Salmonella typhimurium* and *Escherichia coli* isolated from chicken. *Kajian produksi garam asam organik sebagai penghambat bakteri *Salmonella typhimurium* dan *Escherichia coli* secara *in vitro / Negara, M. (Badan Pengkajian dan Penerapan Teknologi, Jakarta (Indonesia)); Ridla, M.; Lubis, A.D.; Winarsih, W.; Ramli, N. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 641-648, 1 ill., 4 tables; 32 ref. 636:619/SEM/p**

CHICKENS; SILAGE; ORGANIC ACIDS; SALTS; SALMONELLA TYPHIMURIUM; ESCHERICHIA COLI; ISOLATION.

The development of antimicrobial resistance in bacteria has become a global problem. This study was designed to determine the bactericidal activity of organic acid salts as an alternative to antibiotic on *Salmonella typhimurium* and *Escherichia coli* isolated from chicken (10^6 CFU/ml). Antibacterial activity analysis used agar well diffusion method with organic acid salts dose at 12.5, 25 and 50%. The result showed that organic acid salts Ca-J (CaOH + SRKJ effluent), Zn-J (ZnO + SRKJ effluent), Zn-S (ZnO + SRKS effluent) and Zn-U (ZnO + SRKU effluent) had antibacterial activity on *S. typhimurium* and organic acid salt Na-J (NaOH + SRKJ), Ca-J, Zn-J, Na-S (NaOH + SRKS), Zn-S and Zn-U had antibacterial activity on *E. coli* isolated from chicken ($P < 0.05$). Organic acid salt Zn-J from complete feed corn silage showed the strongest bactericidal effect on *S. typhimurium* and *E. coli* isolated from chicken.

129 NURADJI, H.

Isolation and identification of avian influenza virus from ducks. *Isolasi dan identifikasi virus avian influenza asal bebek* / Nuradji, H.; Parede, L.; Adjid, R.M.A. (Balai Besar Penelitian Veteriner, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 684-689, 3 ill., 2 tables; 7 ref. 636:619/SEM/p

DUCKS; AVIAN INFLUENZA VIRUS; ISOLATION; IDENTIFICATION.

Ducks are considered to play an important role as a major reservoir for avian influenza viruses. Isolation and identification of the virus were conducted by collecting tracheal and cloacal swabs (or faeces), inoculated into Specific Pathogen Free (SPF) Embryonating Chicken Eggs (ECE's) for 10-12 days. Amnio-allantoic fluid (AAF) was tested by using haemagglutination (HA) and haemagglutination inhibition (HI) methods as well as commercial rapid test for avian influenza. Results indicated that 3 out of 62 collected (4.84%) samples contained viruses which killed ECE's within 20-24 hours post inoculation. Based on serological test, the isolates were not newcastle disease (ND) as well as egg drop syndrome (EDS). Thus, it can be concluded that the virus is Avian Influenza H5N1 and duck as reservoir of this virus.

130 SUMARTONO

Repetitive sequence of *Toxoplasma gondii* genome in perspective as a molecular probe. *Sekuen repetitif genom *Toxoplasma gondii* dalam perspektif sebagai probe molekuler* /

Sumartono (Universitas Gadjah Mada, Yogyakarta (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 516-521, 1 ill., 2 tables; 10 ref. 636:619/SEM/p

TOXOPLASMA GONDII; GENOMES; PCR; ISOLATION; DIAGNOSIS.

The diagnosis of toxoplasmosis is necessary to be developed. Genome of *T. gondii* has a 529 bp and more than 300 times. It could be used as a molecular probe. The aim of this study was as assessing the homology among repetitive sequence of Toxoplasma and the specificity of the repetitive sequence to genomes of the protozoa that phylogenetically closed to Toxoplasma. The tachyzoite genome was isolated by the lytic alkali method from 6×10^7 tachyzoites of RH isolate and 8×10^7 tachyzoites of local isolate. The target sequence was amplified by PCR (polymerase chain reaction) method using 5' GAG ACCGCGGAGCCGAAG 3' (Tox-8) as forward primer, 5' CCTCTCCTACGC CTCCTC 3' (Tox-5) as reverse primer, and Ready to Go Beads (Amarsham). The PCR product was sequenced using Big Dye Terminator Mix through ABI 377A sequencer in the Laboratory of Molecular Biology Eijkman, Jakarta. The homology analysis among the repetitive sequence of Toxoplasma isolates and its specificity to the protozoa that phylogenetically closed to Toxoplasma were carried out by DNA-DNA blasting. In conclusion, the result showed that the 529 bp repetitive sequence was very specific of the *Toxoplasma gondii* genome and it was highly homology among Toxoplasma isolates.

131 UTAMI, A.S.J.

Use of liquid smoke (brolisis) for scabies treatments in goats. *Pemanfaatan asap cair sebagai obat scabies pada kambing* / Utami, A.S.J.; Dinata, A.A.N.B.S.; Guntoro, S. (Balai Pengkajian Teknologi Pertanian Bali, Denpasar (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 504-509, 1 table; 16 ref. 636:619/SEM/p

GOATS; LIQUID SMOKE; MANGE; USES; PYROLYSIS.

Within green technology era benefit from the nature as a solution of environmental green effects is necessary to be developed. Any kind of chemical products should be avoided and replaced by the use of organic products. Pyrolysis is a technology to save the environment. Material used in this study was material waste of cattle feed. The result of pyrolysis was liquid smoke. This liquid smoke was dispersed from smoke steam in the water or as a result from pyrolysis condense from leaf and branch. By applying this technology topically on the skin lesions infected by scabies, 2 weeks after application the sheep showed healing progress from scabies. This application was done to 15 sheep, applied 3 times within 2 weeks.

P06 RENEWABLE ENERGY RESOURCES

132 RUSTIJARNO, S.

Biogas as renewable alternative energy source at Prima Tani location in Kulon Progo Distric [Indonesia]. *Pemanfaatan biogas sebagai sumber energi alternatif terbarukan di lokasi Prima Tani Kabupaten Kulon Progo* / Rustijarno, S. (Balai Pengkajian Teknologi Pertanian Yogyakarta (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 831-835, 2 tables; 6 ref. 636:619/SEM/p

BIOGAS; ENERGY SOURCES; USES; WASTES; ORGANIC FERTILIZERS; JAVA.

The use of unrennewable energy is becoming limited, whereas requirement of energy is increasing along the population growth. The study of biogas use as an alternative energy sources was carried out in May - June 2008 at Prima Tani location, Kulon Progo District. The study is to assess biogas application at household scale. The study was undertaken by purposive method of field survey at Benggolo group, Banaran Village, Galur Subdistrict, Kulon Progo District. Results indicated that number of livestocks were 18 bulls with ownership of livestock 1 bull/person and managed by batch system, source of capital about Rp 117 million was from district government by loan system. The biogas installation was donated by the provincial government. The use of biogas at household scale using manures from 6 bulls have been applied for cooking. Waste of biogas has been used for crop fertilizer, while manures were processed for organic fertilizer. The use of biogas could be developed for lighting and home industry purposes.

P34 SOIL BIOLOGY

133 MUSFAL

Potential of vesicular arbuscular mycorrhizae in increasing maize yield. *Potensi cendawan mikoriza arbuskula untuk meningkatkan hasil tanaman jagung* / Musfal (Balai Pengkajian Teknologi Pertanian Sumatera Utara, Medan (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(4) p. 154-158, 4 ill., 22 ref.

ZEA MAYS; VESICULAR ARBUSCULAR MYCORRHIZAE; SOIL IMPROVEMENT; SOIL CHEMICOPHYSICAL PROPERTIES; NUTRIENT UPTAKE; DROUGHT RESISTANCE; YIELD INCREASES; SOIL BIOLOGY.

Vesicular arbuscular mycorrhizae (VAM) is able to associate and symbiose with 97% high level plant family. VAM is included in ordo Glomales, and based on the body structure and infection way can be grouped into endomycorrhizae and ectomycorrhizae. VAM is able to improve the physical and chemical properties of soil, increase nutrient absorption, improve plant resistance to drought, protect roots from pathogens, increase plant yield, and release the P fixation. Ectomycorrhizae fungi can be consumed as food and medicine. Application of VAM up to 20 g/plant and 100% NPK dosage in Inceptisols affected root infection, P absorption, biomass weight, and increased maize yield. P absorption was positively correlated with the maize yield. VAM reduced the rate of NPK fertilizer up to 50%. Application of 50% NPK fertilizer added with VAM 15 g/plant produced maize yield that was not significantly different with application of 100% NPK fertilizer. The highest maize yield was produced with application of 100% NPK fertilizer added with VAM 20 g/plant.

Q02 FOOD PROCESSING AND PRESERVATION

134 NURDJANNAH, N.

Clove oil as antimicrobe. *Minyak cengkeh sebagai antimikroba* / Nurdjannah, N.; Hoerudin (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). *Buletin Teknologi Pasca Panen Pertanian* (Indonesia). ISSN 1858-3504 (2010) v. 6(1) p. 51-62, 3 tables; Bibliography: p. 59-62

CLOVES; ESSENTIAL OILS; EUGENOL; CHEMICAL COMPOSITION; ANTIMICROBIALS.

Some of the chemical medicine and preservatives were categorized as cancer agent and poisonous residue. For that reason, a lot of research have been done to find out the active components and its biological activity of plants containing essential oil. Some results showed that essential oil is potential to be used as an active component in functional food/beverage, cosmetic and medicine. Clove contains essential oil deposited in bud (15-20%), bud stem (5-10%) and leaf (1-4%). The use of clove in Indonesia as medicine has been known for a long time ago, either in single component or in a mixture with other components. Some research showed that eugenol was the main component of clove oil exhibiting antibacterial and antifungal properties. However, most of research have been conducted in culture media and not in food matrices. Further research need to be done to find out the right formula and application method, to meet the required quality and safety, both in food/beverages and in medicine.

135 WIDOWATI, S.

Food processing technology of rice-based functional. *Teknologi pengolahan pangan fungsional berbasis padi* / Widowati, S.; Lubis, S.; Hadipermata, M. (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). *Buletin Teknologi Pasca Panen Pertanian* (Indonesia). ISSN 1858-3504 (2010) v. 6(1) p. 38-50, 6 tables; 44 ref.

RICE; POSTHARVEST TECHNOLOGY; HEALTH FOODS; QUALITY; INSTANT FOODS; CHEMICOPHYSICAL PROPERTIES.

Rice is currently functioned as a staple food, as well as functional foods. Therefore, rice production now began emphasize on active compounds of rice and its physiological properties that beneficial for health. Among other functional rice, there are low glycemic index (GI) rice and iodized rice. Consumption of low GI rice could control blood glucose levels of diabetes mellitus patients. This rice is rich in dietary fiber and has low starch digestibility, so that it is suitable to be consumed by adults and obese. Low GI rice (GI<55) can be processed using the parboiled technology or instanziation process by using green tea extract. Iodized rice has a good prospects to overcome the iodine deficiency in endemic goiter area. Iodine fortification of rice around 1 ppm have been able to meet the needs of this micro mineral (120 µg/day) with the assumption that the average rice consumption of 200 g/day, and the loss of iodine during cooking approximately 30-40%. Iodine fortification technology is quite simple and can use the rice milling unit with a modification on the part of polisher with mist sprayer. Rice bran has a good prospect as a functional food because of rich in dietary fiber, particularly soluble dietary fiber that can help decreasing blood glucose and insulin response, increasing HDL-cholesterol and maintaining the levels of LDL-cholesterol. Rice bran also contains oryzanol and tocopherol which are constituents of vitamin E, as well as tocotrienols which acting as a super antioxidant.

Q03 FOOD CONTAMINATION AND TOXICOLOGY

136 SUWITO, W.

Bacteria commonly contaminating milk: detection, pathogenesis, epidemiology and control strategies. *Bakteri yang sering mencemari susu: deteksi, patogenesis, epidemiologi, dan cara pengendaliannya* / Suwito, W. (Balai Pengkajian Teknologi Pertanian, Yogyakarta (Indonesia)). *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(3) p. 96-100, 2 ill., 2 tables; 25 ref.

MILK; BIOLOGICAL CONTAMINATION; STAPHYLOCOCCUS AUREUS; SALMONELLA; ESCHERICHIA COLI; DETERIORATION; MICROCOCCUS; PSEUDOMONAS; BACILLUS; PASTEURIZING; UHT TREATMENT; BACTERIOCINS; CONTAMINATION; FOODS; PCR.

Milk is one of the highly nutritious food, however it is easily contaminated by bacteria. Contamination in milk is begun at the milking process until consumption. Contaminant bacteria in the milk can be divided into two groups, namely pathogenic and spoilage bacteria. Pathogenic bacteria include *Staphylococcus aureus*, *Escherichia coli*, and *Salmonella* sp. while spoilage bacteria are *Micrococcus* sp., *Pseudomonas* sp., and *Bacillus* sp. Cases of poisoning after drinking milk can be divided into two kinds: infection and intoxication. Infection occurs after consuming milk contaminated bacteria, while intoxication occurs after drinking milk containing the toxin. Symptoms of intoxication are more quickly detected compared to that of infections. Contamination of milk can be minimized by improving the receiving fresh milk, handling, processing, storage until consumption. Safey milk is produced from healthy cows and pasteurized on processed in ultra high temperature (UHT), using bacteriocin and washing equipment with neutral electrolysed water (NEW). Poisoning after drinking milk can be avoided by not consume raw milk and milk that has changed its physical and organoleptic appearances.

Q04 FOOD COMPOSITION

137 RESNAWATI, H.

Organoleptic test on broiler thigh meat fed on ration containing *Lumbricus rubellus* earthworm. *Uji organoleptik terhadap daging paha ayam pedaging yang diberi ransum mengandung berbagai taraf cacing tanah (*Lumbricus rubellus*)* / Resnawati, H. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 599-603, 2 tables; 18 ref. 636:619/SEM/p

CHICKENS; MEAT; BROILER CHICKENS; ORGANOLEPTIC ANALYSIS; ORGANOLEPTIC PROPERTIES; LUMBRICUS RUBELLUS; RATIONS.

Lumbricus rubellus earthworms are one of animal protein sources regarded as an alternative for unconventional feedstuff. The objective of this experiment was to determine the effect of dietary earthworm levels in the ration on organoleptic test of broiler thigh meat. Eighty day-old chicks of broilers were randomly divided into four dietary treatments in five replications. The treatment was level of earthworm 0, 5, 10 and 15% in the ration. The chickens were reared for a 5 weeks period, then 10 chickens of each treatment were slaughtered to evaluate thigh meat organoleptically. Parameters measured were texture, color, flavor, taste and tenderness. The average panelist score on thigh meat were 2.95-4.0 (texture), 2.03-3.09

(color), 2.04-2.07 (flavor), 2.07-3.03 (taste) and 3.01-3.05 (tenderness), respectively. Results showed that all parameters were not significantly ($P>0.05$) affected by the earthworm levels in the broiler ration. It is concluded that consumers tend to prefer thigh meat of broiler fed by the dietary earthworms similar to control diet.

Q52 FEED PROCESSING AND PRESERVATION

138 ANDINI, L.

Effect of irradiation on the shelf life of feed supplements for ruminant. Pengaruh iradiasi dan penyimpanan dari suplemen pakan ruminansia / Andini, L.; Suharyono; Harsojo (Pusat Aplikasi Teknologi Isotop dan Radiasi Batan, Jakarta (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 754-760, 3 ill., 5 tables; 6 ref. 636:619/SEM/p

RUMINANTS; FEEDS; SUPPLEMENTS; IRRADIATION; PRESERVATION

Research had been done to study the effect of irradiation on the feed supplements for ruminant. The purpose of the research was to prolong the shelf life of the feed supplements to aid distributions to the remote area. Irradiation was done in Irradiator Panorama Serba Guna with Co-60 as a source at dose ranges of 0; 1,5; 3; dan 4,5 kGy and dose rate 1,149 kGy/hour. Time of storage were: 0; 2; 4; 6 and 8 weeks at room temperature $\pm 28^{\circ}\text{C}$. Parameters measured were dry weight, organic contents, and microbiological analysis such as total number of colony of bacteria, total number of colony of yeast, and coliform bacteria. Result showed that the existence of early bacterial contamination of UMMB and SPM by 5.80×10^5 and 1.65×10^6 colony/g, respectively. Treatment combination of irradiation and storage can reduce bacterial counts each by 3 and 4 decimals. In the storage for 6 weeks, no growth of fungi were found on the UMMB feed supplement, while on SPM, no growth of fungi was found after 4 weeks of storage. On both feed supplements UMMB and SPM no coliforms bacteria at dose 3,0 kGy at 0 week storage, while at 2 weeks storage growth of coliforms bacteria were not found. No coliform bacteria were found at SPM feed supplement.

139 RAHMI, B.

Effect of drying and freeze drying on cyanide content of cassava root and stem. Pengaruh pengeringan menggunakan oven dan freeze dryer terhadap kandungan sianida umbi dan batang ketela pohon / Rahmi, B.; Yanti, Y.; Mizumachi, S.; Achmadi, J.; Kawamoto, Y.; Purnomoadi, A. (Universitas Diponegoro, Semarang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 768-771, 1 table; 11 ref. 636:619/SEM/p

FEEDS; CASSAVA; ROOTS; STEMS; DRYING; FREEZE DRYING; OVENS; CYANIDES.

The objective of this experiment was to compare drying and freeze drying to reduce cyanides content (linamarin, acetone cyanohydrin and cyanide; HCN) in cassava root and stem. This experiment was done based on 2 x 2 factorial completely randomized design with 3 replications. The first factor was cassava root and stem, while second factor was drying using oven and freeze dryer. The result showed that there was an interaction among treatments on HCN content after treatments ($P < 0.01$). The content of acetone cyanohydrin showed no interaction among treatments ($P > 0.05$), but difference was found between root and stem ($P < 0.05$). The interaction was not found in linamarin content among treatments ($P > 0.05$), but difference was found between root and stem ($P < 0.01$) and between oven and freeze dryer ($P < 0.01$). The highest content of HCN and linamarin was found in freeze-dried root (FDR), while highest content of acetone cyanohydrin was in freeze-dried stem (FDS). Drying method was more capable to reduce HCN, acetone cyanohydrin and linamarin in cassava root and stem than that of freeze-drying since the reduction was affected by temperature.

140 SUSANTI, E.

Effect of different particle size of agro-industrial byproduct on physical quality. *Pengaruh ukuran partikel yang berbeda pada pakan limbah agroindustri terhadap kualitas fisiknya* / Susanti, E.; Nurhidayat (Universitas Jenderal Soedirman, Purwokerto (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 778-782, 5 tables; 5 ref. 636:619/SEM/p

FEEDS; BYPRODUCTS; PARTICLE SIZE; QUALITY.

A research to study the effect of different particle size of agro-industrial byproduct on physical qualities was conducted at Laboratory of IBMT of Faculty of Animal Husbandry General Soedirman University, Purwokerto. The agroindustrial byproducts were ground and passed through 1.5 mm (A_1) or 3.0 mm (A_2) screen and as well as coconut meal (B_1); epidermis of soybean (B_2); cassava meal (B_3) and soy-sauce byproduct (B_4). The study was conducted in a completely randomized design with factorial pattern (2 X 4) and replicated 3 times. The parameters of physical quality were density, floating capacity, solubility, WHC and bulkiness. The results showed means of density between 0.221 (cassava meal 3.0 mm) - 0.465 (soy sauce byproduct 3.0 mm) and 12.819 (soy sauce byproduct 1.5 mm) - 33.827 (coconut meal 1.5 mm); 1.393 (soy sauce byproduct 3.0 mm) - 2.410 (coconut meal 3.0 mm) also 1.903 (soy sauce byproduct 3.0 mm) - 3.973 (cassava meal 1.5 mm) for solubility, WHC, and bulkiness, respectively ($P < 0.01$). The kind of regression of particle size on floating capacity was $Y = 0.13106 + 0.1014X$; $r = 0.77$; $R^2 = 59.2\%$ ($P < 0.01$). The agroindustrial byproduct alter physical quality after grinding.

141 WIDIYASTUTI, T.

Effects of binders on ruminal fermented products and microbial protein synthesis of complete feed block of ammoniated agricultural byproducts. *Produk fermentasi rumen dan sintesis protein mikroba dari complete feed block berbahan dasar limbah pertanian dengan proses amoniasi dan penggunaan berbagai binder* / Widiyastuti, T.; Susanti, E. (Universitas Jenderal Soedirman, Purwokerto (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. 80

(eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 836-842, 3 ill., 2 tables; 16 ref. 636:619/SEM/p

RUMEN; FERMENTATION; PROTEINS; BYPRODUCTS.

A study was conducted to evaluate the effects of binders in ruminal fermentation of complete feed block with ammoniated agricultural byproducts as a basal component of feed. A completely randomized design (CRD) was applied in this study consisting of R₀ (without binder), R₁ (bentonite), R₂ (cellulose, CMC) and R₃ (molasses). Parameters were volatile fatty acid (VFA), N - NH₃ production and microbial protein synthesis. The results showed that the addition of binders significantly affected all responses observed. Based on analysis of variance and BNT test, the CMC was the best binder for all responses.

Q53 FEED CONTAMINATION AND TOXICOLOGY

142 RAHMAWAN, O.

Detoxification of HCN from rubber seed meal by physical treatments. *Detoksifikasi HCN dari bungkil biji karet (BBK) melalui berbagai perlakuan fisik* / Rahmawan, O.; Mansyur (Universitas Padjadjaran, Bandung (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.), Bogor (Indonesia): Puslitbangnak, 2009: p. 789-796, 4 tables; 18 ref. 636:619/SEM/p

FEEDS; RUBBER; BYPRODUCTS; DETOXIFICATION; CYANIDES

Rubber seed could be processed as rubber seed oil, whereas rubber seed meal as byproduct has not been used as animal feed. However the rubber seed meal contains high HCN. The purpose of this study was to remove HCN from rubber seed meal by physical treatments. A completely randomized design was employed in this research. The treatments were divided into ten physical treatments, i.e., rubber seed meal without treatment, steaming and boiling for 10, 20 and 30 minutes, and soaking in running water for 12, 24 and 36 hours. Each treatment was replicated five times. The measured variables were water content, crude protein, ether extract, and HCN. Data were analyzed by variance analysis, and followed by Duncan Multiple Range Test. The result showed that steaming for 30 minutes was the most effective way to decrease HCN content, and gave better quality of rubber seed meal for ruminant feed.

Q55 FEED ADDITIVES

143 BINTANG, I A.K.

Effect of antibiotics and *Morinda citrifolia* waste bioactive as feed additive on the egg quality of laying hens. *Penambahan antibiotika dan bioaktif ampas mengkudu terhadap kualitas telur ayam* / Bintang, I A.K.; Sinurat, A.P.; Purwadaria, T. (Balai Penelitian Ternak, Bogor (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 593-598, 1 table; 33 ref. 636:619/SEM/p

EGGS; QUALITY; ANTIBIOTICS; FEED ADDITIVES; AGRICULTURAL WASTES.

A study on the use of antibiotic and *Morinda citrifolia* waste as bioactive feed additive on egg quality was conducted. One hundred and twenty pullets Isa Brown strain were allocated into 5 treatments with 6 replications and 4 birds in each replication. The treatments were control, control + antibiotic 50 ppm zinc bacitracin and control + *M. citrifolia* waste at three levels (5, 10 and 15 g/kg ration). The treatments were conducted in a completely randomized design. Parameters measured were: egg weight, yolk weight, egg shell, shell thickness, haugh unit and yolk color. The result showed that antibiotic and *M. citrifolia* waste as additive did not measure except egg yolk color. Egg weight, yolk weight, and shell weight tended to be higher than that of the control. Yolk color of hens feed diets contains 15 g/kg *M. citrifolia* waste was significantly ($P < 0.05$) higher than that of control, and control + antibiotic, but the addition of 5 and 10 g/kg tent to be higher than control and control + antibiotic.

144 NATSIR, M.H.

Effect of citric acid and lactic acid combination in liquid or encapsulated form as feed additive on broiler performance. *Pengaruh penggunaan kombinasi asam sitrat dan asam laktat cair dan terenkapsulasi sebagai aditif pakan terhadap penampilan produksi ayam pedaging* / Natsir, M.H.; Sjojfan, O. (Universitas Brawijaya, Malang (Indonesia). Fakultas Peternakan). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 636-640, 2 tables; 5 ref. 636:619/SEM/p

BROILER CHICKENS; CITRIC ACID; LACTIC ACID; FEED ADDITIVES; PRODUCTION.

The purpose of this study was to investigate the effect of citric acid and lactic acid combination in liquid and encapsulated form on feed consumption, body weight, feed conversion ratio and income over feed cost (IOFC). The materials used were 100 Cobb broiler chicks with average initial body weight of 43.87 ± 3.48 gram. The method employed in this experiment was completely randomized design with 2 factors and 4 levels, and if there were significant effect it would be further tested with Duncan's Multiple Range Test. The result showed that citric acid and lactic acid combination in either liquid and encapsulated form showed no significant effect ($P > 0.05$) on feed consumption and feed conversion ratio, but it significantly affected ($P < 0.05$) body weight gain and IOFC. The addition of 0.6% citric acid and lactic acid combination in encapsulated form gave the best result on broiler performance, but the combination in liquid form required 0.8% to give the best performance. It is concluded that encapsulated form tended to increased production performance of broiler. The use of encapsulated form required lower rate (0.6%) than that of liquid form (0.8%) to produce similar performance. It is suggested to use 0.6% citric acid and lactic acid combination in encapsulated form or 0.8% in liquid form to improve broiler performance.

Q60 PROCESSING OF NON-FOOD OR NON-FEED AGRICULTURAL PRODUCTS

145 HERMIATI, E.

Utilization of lignocellulosic biomass from sugarcane bagasse for bioethanol production. *Pemanfaatan biomassa lignoselulosa ampas tebu untuk produksi bioetanol* / Hermiati, E. (UPT BPP Biomaterial-LIPI, Cibinong, Bogor (Indonesia)); Mangunwidjaja, J.; Sunarti, T.C.; Suparno, D.; Prasetya, B. *Jurnal Penelitian dan Pengembangan Pertanian* (Indonesia). ISSN 0216-4418 (2010) v. 29(4) p. 121-130, 1 ill., 4 tables; Bibliography: p. 128-130.

SUGARCANE; SUGAR BYPRODUCTS; LIGNOCELLULOSE; WASTE UTILIZATION; BIOCONVERSION; HYDROLYSIS; FERMENTATION; PURIFICATION; ETHANOL; BIOENERGY.

Sugarcane bagasse is one of potential lignocellulosic biomass for energy through physical, chemical or biological conversion. The material is renewable and abundantly available, especially as wastes or byproducts of sugarcane industries. Of many conversion processes, lignocellulosic conversion to ethanol becomes focus of interest recently, since ethanol can be further used as biofuel to substitute gasoline for transportation. Lignocellulosic material, including sugarcane bagasse mainly consists of three components: cellulose, hemicellulose, and lignin. The conversion of these materials basically consists of pretreatment, cellulose hydrolysis, sugar fermentation to ethanol, and purification of ethanol. Production cost of this conversion is still high, therefore, many researches have been conducted to improve the conversion process, either pretreatment, hydrolysis, fermentation or purification, so that the cost could be reduced. This paper reviewed literatures on potency and characteristics of lignocellulosic materials, especially sugarcane bagasse and conversion of these materials to ethanol. There is as much as 614,827 kL/year of ethanol potentially produced from sugarcane bagasse resulted from sugarcane factories in Indonesia. This amount of ethanol would have a great contribution to meet 1.10 million tons demand of ethanol. However, there are still some recalcitrans in production and implementation of lignocellulosic bioethanol, especially due to the unproven conversion technology of lignocellulosic biomass to ethanol and the high production cost. Therefore, government policies in supporting research and development, providing special incentives for sugarcane factories that produced ethanol from sugarcane bagasse, and giving subsidy to reduce bioethanol price are needed.

146 PRABAWATI, S.

Application of postharvest technology for quality and increasing added value of jasmine flowers. *Penerapan teknologi pascapanen untuk mempertahankan mutu dan meningkatkan nilai tambah bunga melati* / Prabawati, S. (Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian, Bogor (Indonesia)). *Buletin Teknologi Pasca Panen Pertanian* (Indonesia) ISSN 1858-3504 (2010) v. 6(1) p. 63-72, 1 table; 35 ref.

JASMINUM; FLOWERS; ESSENTIAL OILS; POSTHARVEST TECHNOLOGY; HARVESTING; EXTRACTION; STORAGE; QUALITY.

Potency of jasmine flower has not been fully utilised yet. Its use is limited as flower decorations, flower offerings, and tea fragrance. Improved quality of flowers, a longer shelf life and product diversity could increase usability of jasmine flowers in modern life. Postharvest technology which has been available for the development of jasmine flowers

were stage of harvest, the concept of quality standard, packaging and storage, and jasmine flower oil extraction. Packaging techniques and storage of jasmine flowers using 0.03 mm LDPE plastic combined with a temperature 2-5°C was able to maintain the flower buds until 12-18 days in white color, and still be able to bloom normally. Jasmine flowers arranged in chain has storage life 8-10 days. Packaging technique combined with cold storage can be applied to store jasmine flowers. Processing of jasmine flowers with enfleurage technique produce the yield of absolute 0.23%. The use of leaching methods with processing time 20 minutes produced the highest yield of 0.19% jasmine absolute. Implementation of technology for production of jasmine absolute in cooperation with private sector showed that, leaching time 20 minutes and the ratio of flower to solvent = 1:2.5 produced absolute yield 0.34% and the highest absolute yield (0.118%) of red jasmine with a higher solvent recovery ranged from 81.62 to 85.48%, the refractive index was 1.47 with the major components benzyl acetate 5.28%, benzyl benzoate 6.55%, cis jasmone 2.58%, linalool 3.14%, methyl jasmonate 0.39%, and other compounds. The recommended technique for jasmine absolute production was leaching extraction using hexane continued with the use of advanced extraction technology such as supercritical CO₂ extraction to process concrete into good quality absolute.

147 ULFAH T.A.

Study on the halalness of leather and its product. *Kajian kehalalan kulit dan olahannya* / Ulfah T.A. (Balai Besar Pengkajian dan Pengembangan Teknologi Pertanian, Bogor (Indonesia)). *Buletin Teknologi Pasca Panen Pertanian* (Indonesia). ISSN 1858-3504 (2010) v. 6(1) p. 73-81, 1 ill., 2 tables; 26 ref.

HIDES AND SKINS; FOODS; GELATIN; FOOD SAFETY; FOOD LEGISLATION.

Consumption of animal leather (hide) and its processed products in Indonesia is high. However, due to limited local stocks, deviations occur in the use of leather and its processed products. In several regions in Indonesia, there is a phenomenon of the use of pig leather as raw material for crackers. In the production of gelatin, a commonly used raw materials is derived from pigs while from cows and fish is in smaller amounts. It is reported that in the overseas, almost 50% of raw material of gelatin derived from pig organs. According to the Indonesian Food and Drug Administration, processed product of gelatin in Indonesia are imported from abroad which use cow organs, but it is not clear whether slaughtered by halal method or not. It was also reported that pig leather is widely used as an inner-part of the shoe. Policy and mitigation efforts is required to address these distortions, both by government and society to protect consumers against circulation of non halal leather products.

148 WIJAYA, C.H.

Prospects of functional flavour development of indigenous Indonesian plants. *Prospek pengembangan flavor fungsional berbasis bahan baku indigenous Indonesia* / Wijaya, C.H.; Silamba, I. (Institut Pertanian Bogor (Indonesia). Fakultas Teknologi Pertanian). *Buletin Teknologi Pasca Panen Pertanian* (Indonesia). ISSN 1858-3504 (2010) v. 6(1) p. 1-16, 1 table; Bibliography: p. 9-16.

FLAVOUR; HEALTH FOODS; LAND VARIETIES; INDONESIA.

A lot of flavor compounds exhibited the role of flavor in food products and the ability to physiologically active for body health and fitness. This group of flavors is known as functional flavor. The physiological active benefits of ethnic flavors, particularly those

derived from spices and herbs, have been reported by many researchers. Indonesia, as a tropical country is rich in biological resources as well as diverse culinary culture and since ancient times has utilized a lot of natural resources in getting the enjoyment of flavor while maintaining the beauty and vitality of the body. Indonesia is the ideal place for the development of a natural functional flavor. *Andaliman*, clove, *kencur*, *laos*, ginger, lime, sappan wood (*secang*), and coriander, are some sources which have been studied for their functionality. The world interest on exotic ethnic foods and the desire of back to nature will greatly add value to the development of these types of flavor groups in Indonesia. Opportunities to generate new functional flavor formula from natural resources and local knowledge which still unexplored are widely open.

Q70 PROCESSING OF AGRICULTURAL WASTES

149 HARLIA, E.

Effect of anaerobic fermentation to various manures on total bacteria and coliform in biogas sludge. Pengaruh fermentasi anaerob berbagai limbah ternak terhadap jumlah total bakteri dan coliform dalam sludge hasil sampingan pembuatan gasbio / Harlia, E.; Astuti, Y.; Suryanto, D. (Universitas Padjadjaran, Bandung (Indonesia)). [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 843-846, 2 tables; 6 ref. 636:619/SEM/p

BIOGAS; ENERGY SOURCES; ANAEROBIOSIS; FERMENTATION; FARMYARD MANURE; BACTERIA; COLIFORM BACTERIA.

The research was conducted to explore other benefits of biogas for environmental safety and health. The result will provide information about overcoming environmental pollution by reducing bacterial diseases brought by animal feces. The research was designed in completely randomized design with 14 treatments and two replications. The data was statistically analyzed using analysis of variance, while differences among the treatments were calculated by Multiple Range Duncan Test. The result showed that total bacteria were significantly decreased ($P>0.05$) by anaerobic fermentation and were highly significant decreased on coliform ($P<0.01$). In conclusion, the combination treatments of manures in digester and anaerobic condition would significantly decrease total bacteria, and could highly significant decrease coliform, with highly decreasing in the substrate acidity.

150 SYAHRUDDIN

Mannan polysaccharides in byproducts of protein concentrate from palm kernels as *Eschericia coli* control. Polisakarida mannan produk samping pembuatan konsentrat protein dari bungkil inti sawit sebagai pengendali *Eschericia coli* (in vitro) / Syahrudin (Universitas Negeri Gorontalo (Indonesia). Fakultas Pertanian); Yatno N.; Ramli; Wiryawan, K.G. [Proceedings of the national seminar on animal husbandry and veterinary technology]. Prosiding seminar nasional teknologi peternakan dan veteriner, Bogor (Indonesia), 11-12 Nov 2008 / Sani, Y.; Martindah, E.; Nurhayati; Puastuti, W.; Sartika, T.; Parede, L.; Anggraeni, A.; Natalia, L. (eds.). Bogor (Indonesia): Puslitbangnak, 2009: p. 617-622, 3 ill., 7 tables; 7 ref. 636:619/SEM/p

PALM KERNELS; BYPRODUCTS; PROTEIN CONCENTRATES;
POLYSACCHARIDES; ESCHERICHIA COLI.

The objective of the research was to evaluate efficacy of mannan containing polysaccharide against several strains of *Escherichia coli*, namely (ATCC 25922, EHEC 0157, *E. coli* from chicken gut and K 9 from cattle gut). Mannan polysaccharides (MP) was obtain from byproduct of protein extraction from PKM. The parameters measured were agglutination test, inhibition test in liquid media and resistance bacteria against *E. coli* strains. Agglutination test was done by mixing bacteria and MP (1:1) in object glass and observed under microscope. Inhibition test was done by culturing bacteria in liquid media containing 0, 3000 and 6000 ppm of MP of total sugar, while resistance test of bacteria was done in agar medium using disk paper containing PM and then clear zone was of observed. This result showed that there were positive result in agglutination test in all strains of *E. coli* bacteria, while clearing zone was not observed. However total number of all strains of *E. coli* decreased as the concentration of MP in the media increased. It is concluded that MP from PKM is capable of agglutinated of all *E. coli* strains and decreasing total number of bacteria without bactericidal effect.

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