THE INTERNATIONAL CONFERENCE ON
THE 6th KU-UT SYMPOSIUM 2016 ON
“The Environmentally Friendly Agriculture and Food Innovative Technologies”

25 February 2016
Faculty of Agriculture, Kasetsart University, Thailand
It is with great pleasure that I would like to welcome all of you to The International Conference on the 6th KU-UT Student Symposium 2016 on “Environmentally Friendly Agriculture and Food Innovative Technologies”. This symposium, like the others before it brings together high school, undergraduate and graduate-level students to share their research findings, exchange information, and incorporate what they have learned from their peers into their own scholarly studies. This year, 2016, is the second year of collaboration with some new universities namely; Yezin Agricultural University (Myanmar) and University of Muhammadiyah Malang (Indonesia). We are very pleased with their participation last year and extend a warm welcome to them again this year.

I am equally delighted as this is the sixth consecutive meeting following the last five years of highly successful cooperation and networking between the Faculty of Agriculture, Kasetsart University and the University of Tsukuba. I am very positive that this symposium will succeed not only in strengthening our bilateral efforts, but also in sharing creative ideas for research and collaboration in the areas of environmentally friendly agriculture and innovative food production technologies.

Our faculty, the Faculty of Agriculture, was founded in 1943 as the first higher educational institution offering agricultural education in Thailand. It prides itself not only on being the premier resource for tropical agricultural systems in the country and in Southeast Asia but also as a perpetually reliable avenue for the provision of the aforementioned resources. Our strong commitment is to prepare students for life in the global communities through research and educational programs which support viable communities and healthy environments. The Faculty of Agriculture is fostering knowledge and academic exchange with local and overseas universities and regards partnerships and networking efforts as major avenues towards achieve our goals.

On this auspicious occasion, I would like to make use of this opportunity to express my appreciation to the professors and staff from the University of Tsukuba and our new partner the principal and the teachers from Kasetsart University Laboratory School for their significant contribution and continued commitment to this joint symposium. I sincerely wish you all success and hope that all aspirations will be fulfilled.
Thank you very much.
The International Conference on the 6th KU-UT Symposium 2016 on “Environmentally Friendly Agriculture and Food Innovative Technologies”

25 February 2016
1st Floor, Vajiranusorn Building, The Faculty of Agriculture
Kasetsart University

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Chilli (Capsicum annuum L.) under the family of Solanaceae is one of the important spice crops not only in Indonesia but also in many countries of the world. Production of chilli (Capsicum frutescens) in 2014 as much as 854,000 tons of chilli came from all regions in Indonesia with a total requirement of reaching 799 237 tonnes per year (Indonesia Central Bureau Statistical, 2015). The total production and demand look like no problem, but at certain moments needs greatly increased so the price is very expensive (6 USD per kg). An investigation was carried out to determine the effectiveness of beeswax in several concentration (0%, 2%, 4%, and 6%) and many storage temperature (room temperature (±26°C), 3°C, 6°C, and 9°C) to extend shelf life of chilli (Capsicum frutescens). Based on the results of research of beeswax coating technology and storage temperatures, can be summarized as follows. Beeswax coating treatment with different concentrations had no effect on the control of fruit rot, weight loss, Vitamin C, and total soluble solid of chilli. The best storage temperature treatment to control fruit rot was on temperature of 9°C. So, combination of beeswax and 9°C storage temperature can be cost effective and environmentally friendly for extending chili shelf life.
Identification of Maintainer and Restorer Lines for Three-Line Hybrid Rice System

Hybrid rice is one of technologies for rice production in many countries. The maintainer lines are used for seed multiplication of male sterile lines (A lines). The restorer lines (R lines) are used to crossing with male sterile lines (A lines) for F₁ hybrid seed production in three-line hybrid rice system. This study aimed to identify the 21 rice varieties as maintainer and restorer lines for the three-line hybrid rice production. Crossing between two cytoplasm male sterile (cms) lines (IR80151A and CH1A) used as female parents and the 21 varieties used as male parents were performed in nursery. The 40 F₁ hybrid seeds of each cross and their parents were planted in the experimental field with the spacing of 20 x 20 cm. Pollen fertility of the F₁ hybrids was determined by 2 methods, visual anther observation, staining pollen with 1% I₂-KI solution and seed-setting rate by selfing. The F₁ plants showing stainable pollen of 0, 1-50, 51-80 and >81% were defined as maintainer, partial maintainer, partial restorer and restorer lines, respectively. For seed-setting rate, the F₁ plants with seed-setting rate of 0, 1-50, 51-75 and >75% were defined as maintainer, partial maintainer, partial restorer and restorer lines, respectively. The result from both pollen and spikelet evaluation of the 34 F₁ hybrids indicated that among the 21 male parent varieties were identified as restorer, partial restorer, partial maintainer and maintainer lines of 3, 4, 12 and 13 varieties, respectively. Those varieties identified as restorer and maintainer lines will be employed to develop new adapted A, B and R lines for three-line hybrid rice system.

Key words: CMS line, maintainer line, restorer line, three-line hybrid rice system, pollen sterility
Effects of Maize-Cowpea Intercropping on Yield and Forage Quality

In developing countries, effective land use in crop production is needed because of the rapid increase of population. Intercropping is one of the effective ways to increase crop yields in limited arable land. Meanwhile, utilizing residue of crops as forage is an economic and efficient land use. Therefore the objective of this study is to investigate advantages of maize-cowpea intercropping on yield and the forage quality of inedible parts.

Maize (Zea mays L. var. saccharata) and cowpea (Vigna unguiculata L.) were sown in May 2014. This experiment included 3 treatments; mono-cultured maize, mono-cultured cowpea and intercropping (maize: cowpea=1:1) with 3 replications. The size of each plot was 5 m x 5 m. The row distance was 50 cm for mono-cultured plots, 25 cm for intercropping plots. The hill distance was 30 cm for all treatments. The plant length or plant height was measured once a week. Photosynthetic rates were determined with a portable photosynthesis system on 55~59 DAS (days after sowing). SPAD values were measured at vegetative and reproductive stage. The water content of soil was measured once a month. Fresh ear yield of maize and dry grain yield of cowpea were investigated at harvest 90 DAS and 111 DAS, respectively. Dried leaf and stem samples of each crop at harvest (1st sampling) and one month after the harvest (2nd sampling) were used for chemical analysis.

As a result, plant heights of intercropped cowpeas were larger than those of mono-cultured, because shade by maize leaves made them grow spindly. SPAD values were higher in mono-cultured plots than intercropping plots. There were little differences in photosynthetic rates between the treatments. Cowpea plants covered the soil surface between maize hills in intercropping plots, so that water contents of soil in intercropping plots were higher than those in mono-culture maize plots during cultivation period. Stored water in soil of intercropping could be available in dry area where people have to use limited water source for irrigation. The yields of maize were not different between the treatments, but those of intercropped cowpea were higher than those of mono-cultured cowpea by 66%. Therefore land equivalent ratio (LER) of intercropping with maize and cowpea was 1.55, which indicated yield advantages of intercropping.

Crude protein contents of maize leaves were decreased from 1st to 2nd sampling whereas those of cowpea leaves did not decrease. In addition, crude fat contents of cowpea leaves were higher than maize at all sampling times. Both crude protein and fat contents per unit area of intercropping plots were higher than those of mono-cultured plots. These results indicated that intercropping improved the forage quality by blended residue, compared to mono-cultured maize plots.
Evaluation of Energy Efficiency of Middle Temperature and Low Pressure Hydrothermal Treatment for Microalgae Oil Extraction

Minamisoma City in Fukushima Prefecture was dramatically damaged by the Great East Japan Earthquake in 2011 and huge abandonment of cultivated land area is still remained. Then, microalgae biofuel production with cultivation as new energy industry is expected as one of solutions to these farmlands rehabilitation. On the other hand, hydrothermal liquefaction (HTL) treatment decomposes microalgae and produces a low molecular lipid component by steam heating. In this research, four combinations of temperature and pressure in HTL treatment were examined to clear the lipid extraction ratio from native microalgae in Minamisoma City (Desmodesmus sp.).

500 cc of reactor of HTL equipment and 50 g of microalgae (90% of water content, 5.0 g of solid weight) were used in a) 150˚C & 1.5 MPa, b) 150˚C & 3.3 MPa, c) 200˚C & 1.5 MPa, and d) 200˚C & 3.3 MPa in the HTL treatment. Lipid quality and quantity were measured in before and after the HTL treatment by the chloroform/ methanol (2:1) extraction. Total lipid content was increased from 0.126 [g/50 g] to a) 0.959 [g/50 g], b) 0.642 [g/50 g], c) 0.891 [g/50 g], and d) 0.895 [g/50 g] respectively. There is a possibility that hydrolysis of protein and carbohydrate of the microalgae is converted to hydrocarbon, triglyceride, glycolipid and phospholipid, and/or destruction of algae's cell wall contributes to increase the lipid. However, the lipid content of b) condition was low than others. 150˚C of temperature of the HTL treatment and/or 100 minutes of processing time for target temperature in the reactor condition possibly contribute not to achieve stable and sufficient reaction of hydrolysis of protein and carbohydrate. On the other hand, a) 0.334, b) 0.224, c) 0.311, and d) 0.332 of energy profit ratio (EPR) were shown by 1200 kJ of input energy in the HTL experiment, and a) 1.04, b) 0.699, c) 0.969, and d) 0.971 of EPR was calculated by theoretical energy consumption. Results of the HTL treatment for microalgae oil extraction showed a possibility to save input energy and avoid other chemical reactions by middle temperature and low pressure hydrothermal treatment compared with supercritical or subcritical treatment.
Genetic variation among the geographic populations of cowpea aphid, *Aphis craccivora* (Hemiptera: Aphididae) in Thailand inferred from *COI* gene sequences

The cowpea aphid, *Aphis craccivora* Koch (Hemiptera: Aphididae), is a serious insect pest of cowpea varieties. The species cause significant economic damage to cowpea either directly by feeding on leaves, pods and other aerial tissue of the plant, or indirectly through transmission of at least 14 plant viral diseases. More than 50% of product yield loss occurs when heavy infestations are not controlled. In order to determine and characterize the genetic structure of the geographical population of *A. craccivora* in Thailand, a 613 base pairs of the mitochondrial cytochrome oxidase subunit I (*mtCOI*) gene was sequence and analyzed. Forty-two *A. craccivora* samples (clones) were collected from 31 localities in Thailand that cover most of the rage for the species. Eleven distinct *COI*-haplotypes of *A. craccivora* were identified, ranging in nucleotide diversity from 0.00093-0.00870. Phylogenetic analysis showed weakly associated possibly due to small nucleotide acid difference among them. A median-joining network analysis revealed that all 11 haplotypes were interconnection with each other. The low genetic differentiation (Fst= -0.01014 – 0.43381) and high pre-generation migration rate (Nm) suggest that *A. craccivora* is long distance migratory insect pest. Our result therefore indicated no evidence for geographic clustering of *A. craccivora* populations in Thailand. These might important implications for future studies of the phylo-geographical genetic structure of this aphid species and other insect pests.
Opinion of farmers Toward Pak-Wanpa (*Melientha suavis* Pierre.)
Cultivation in Nongbua Sub-district, Ban Moo District Saraburi Province

The objectives of this research were to study 1) demographic factors, 2) economic factors, 3) behavior of life regarding to sufficiency economy of farmers, 4) media exposure toward agricultural information, and 5) the opinion of farmers toward Pak-Wanpa (*Melientha suavis* Pierre.) Samples consisted 30 Pak-Wanpa (*Melientha suavis* Pierre) farmers. Data were collected by using questionnaires. Statistical analyze were frequency, percentage, mean, standard deviation, minimum and maximum.

According to the research, the results showed that farmers were female (86.7%) with an average age of 54.77 years old, graduated in an elementary school or lower (86.7%) and married, The average experience were 11.3 years. The average areas of Pak-Wanpa (*Melientha suavis* Pierre) growing were 2.80 Rai. Household labors for Pak-Wanpa (*Melientha suavis* Pierre) growing were 0-1 person (40.0%). Hired labors for Pak-Wanpa (*Melientha suavis* Pierre) growing were none (73.3%) . Most of farmers earned income from Pak-Wanpa (*Melientha suavis* Pierre) plantation with the average 196,620 Baht/year and the average expense of Pak-Wanpa (*Melientha suavis* Pierre) plantation was 31,085.67 Baht/year. The average cost of Pak-Wanpa (*Melientha suavis* Pierre) was 78 Baht/kg. Moreover, behavior of life regarding to sufficiency economy of farmers, overall had reasonableness and moral condition moderation in the high level, self-immunity, and well-rounded knowledge condition were in the moderate level. They got information about agricultural from person media from community leaders, mass media from television. Most of farmers never got specialized media with (47.6%). The opinion of farmers toward Pak-Wanpa (*Melientha suavis* Pierre.) about its cultivar and propagation, production, harvesting techniques, costs and benefits which were at the high level. Opinion about pest management was at the moderate level.
Factors Related to Purchasing Decision towards Pesticide Free Agricultural Products of Consumers, Golden Place Shop, Kasetsart University Branch

The objectives of this research were to study 1) demographic factors, 2) knowledge of pesticide free agricultural products, 3) behavior on purchasing products at Golden Place Shop, 4) media exposure towards pesticide free agricultural products, and 5) purchasing decision towards pesticide free agricultural products of consumers, Golden Place Shop. Samples were 30 numbers of consumers who purchased pesticide free agricultural products at Golden Place Shop, Kasetsart University Branch. Data were collected by questionnaire. Statistical analyse were frequency, percentage, mean, standard deviation, minimum, and maximum.

The research revealed that 1) most of customers who purchased pesticide free agricultural products were female (73.3%), The average age of 29.07 years old, single 76.7%, Educational level was bachelor's degree or equivalent (76.7%), the occupation was students (50%). Most of the consumers had an average income 23,540 Baht/month. 2) Overall knowledge about pesticide free agricultural products of the consumers were in high level (86.7%). The frequency of purchasing was once a week, with 190.57 Bath/time an average. 4) Most consumers exposed media about pesticide free agricultural products from personal media was acquaintance, internet, and poster. 5) purchasing decision towards the pesticide free agricultural products was product.
Germination and Storability of Germinated Rice (*Oryza sativa* L.) Seed Left Over from the Previous Broadcasting

In rice growing areas where wetland broadcasting is practiced, farmers always face a problem with seed loss from the left-over of germinated seed prepared for broadcasting. However, there is a possibility to reuse this left-over germinated rice seeds if they possess desiccation tolerance ability. Therefore, the objectives of this research were to evaluate the desiccation tolerance and the storability of germinated seed of rice cv. Supan Buri 1. Rice seeds were prepared to germinate by soaking for 24 hours and then incubated for different periods of time, i.e. 0, 12, 24, 36 to 48 hours comparing with the untreated control. After soaking and incubating, the seed was dried back to 12% moisture content and stored at room temperature. Completely randomized design (CRD) with 4 replications was employed. The results showed that the germinated-rice seed had the ability to tolerate desiccation and could be stored for a period of time. Before storage (week 0), the germination percentages of all treatments were higher than 88% indicating that the germinated-rice seeds left over from previous broadcastings could be dried and reused as planting materials. At 1 week of storage, the germination percentages of all treatments decreased but still higher than 80%. At week 6, the germination percentages of the untreated control and the other treatments; soaking for 24 hours plus incubating for 0, 12, 24, 36 and 48 hours were 90.25, 92.00, 81.00, 80.00, 76.75 and 75.00 %, respectively. At week 8, only the untreated control and soaking for 24 hours without incubating that maintained the germination higher than 80%, all the rests of the treatments had germination lower than 70%. Therefore, it can be concluded that the germinated-rice seed prepared following the farmers’ normal practice by soaking for 24 hours plus incubating for 12-24 hours could be dried back and stored for 6 weeks with the germination percentage higher than 80%. This indicates that the germinated-rice seeds left over from the previous broadcasting are desiccation tolerant and can be stored and reused as planting materials after storing at room temperature for 6 weeks.
Effects of Agronomic Practices in Thailand and Sri Lanka on Mungbean (Vigna radiata (L.) wilczek) Production in Rice Based Cropping System

Cereal-legume cropping system is very often adapted because it provides cheap sources of energy and protein. Mungbean (Vigna radiata L.) is an important legume crop of Asia and a major component of many cropping systems.

Rice-mungbean cropping system is not a novel introduction for both Thailand and Sri Lanka. Technical appropriateness of agronomic practices as well as effectiveness of socio-cultural, economic and institutional factors influences the sustainability of the cropping system.

This study evaluated the effects of agronomic practices on mungbean production, using randomized complete block design (RCBD) conducted at Farming Research Development Center (FRDC), Phaniat sub-district, Khok Sumrong district, Lop Buri province during the period of February to July, 2015 and conducted a farmer survey to find other related limitations for sustainability of cropping system.

Five agronomic practices, Thailand farmer practice (TFP) as control, Thailand recommendation (TR), Sri Lanka farmer practice (SLFP), Sri Lanka new recommendation (SLNR) and Thailand recommendation with paddy straw mulch (TRM) which are consisted with different tillage methods, seeding rates, mulching and seed inoculation (with Rhizobium), were tested with four replications. At the maturity stage the lowest height (38.04 cm) was recorded in TFP, with TRM, SLNR, SLFP and TR recorded as 78.8, 56.6, 31.5 and 20.8 % higher respectively. Furthermore, results showed that different agronomic practices resulted in significant differences in number of leaves plant-1 and leaves appearance rate (LAR). At maturity stage in TFP, leaves plant-1 were recorded 8.73 while TR, SLFP, SLNR and TRM results were 20.9, 27.4, 33.1 and 60.1% higher than TFP respectively. The lowest yield (0.657 MT ha-1) was recorded in TFP. The TRM yield (1.374 MT ha-1) was the highest recorded, showing 109.13% increase on the control practice (TFP), while TR, SLFP and SLNR showed 41.4, 46.1, and 86.8 % yield increases respectively. Furthermore results showed that the lowest cost of production (13.80 baht/kg) occurred in TR and the highest benefit cost ratio (2.75) occurred in SLNR.

Overall, TRM was found to be better than other practices and the research suggests Thai farmers in this area should be encouraged to adopt it for the improvement and sustainability of growing mungbean after rice along with providing remedies for their financial and socio-economic issues which found in farmer survey in this study while further study with Sri Lankan soil would be benefitted to Sri Lankan farmer community.
Factors Related to Knowledge on Engaging in Urban Agriculture of Trainees: A Case Study at the Naturally Organic Rooftop Garden Learning Center, Lak Si District, Bangkok Metropolis

The environmentally friendly agriculture is one of the main concerns in urban agriculture. This research focused on knowledge about urban agriculture for the natural resource and its development. This study, therefore, aimed: 1) to study the basic demographic characteristics, 2) to study the exposure to the urban agriculture information and participation of urban agriculture activities, 3) to study the knowledge on urban agriculture, 4) to study the relationship between basic demographic characteristics, exposure to the urban agriculture information, participation of urban agriculture activities and the knowledge of the trainees, and 5) to study the problems and recommendations. Data were collected from 137 samples during January to March 2015 by using the questionnaire. Data were analyzed and presented through frequency distribution, percentage, arithmetic mean, and standard deviation, minimum, maximum. Chi-square test was employed to test hypotheses.

Results revealed that the most of samples were female (67.88%) with the average age of 46 years old. Educational level was the bachelor’s degree (80.29%). Marital status was married/widowed/divorced (51.83%). Occupations were entrepreneurs and freelancers (40.88%). An average land holding of 232 square meter per person. Information on urban agriculture was received from friends and relatives who practiced urban agriculture (42.34%), internet (53.28%), and training (65.69%). Knowledge of samples was at the moderate level (X = 0.58). Recommendation was the training should be extended into two days. Hypotheses testing showed that age, occupation, and activity media were related to knowledge at 0.05 level of significance.
how can use saline water for irrigation on *dendrobium* sonia ‘earsakul’ at flowering stage

*dendrobium* sonia ‘earsakul’ is the one of the most important cut flower orchid in thailand. for growing orchid plant, water is the main factor for growth and development. in 2014-2015 orchid farm faced with saline water, it is the major environmental factor limiting on growth and productivity of orchid. orchid farmer afraid to use saline water for irrigate to plant because they not sure on the effect will be occur. for this study, want to fine out the EC of saline water and how long time can be use saline water for irrigation, have no effects on growth and flower quality of D. Sonia ‘Earsakul’ at flowering stage. It was investigated from september to November 2015 at Kasetsart University, Bangkok. Eighteen-month-old, from tissue culture, orchid plants at flowering stage (1-5 cm inflorescence length) were used in this study. There were 5 treatments of saline water; less than 250 (control), 1000, 2000, 3000 and 4000 µS cm\(^{-1}\) in electrical conductivity (EC). Orchid plants sprayed with saline water about 25 ml per plant every 2 days for 2 months. The results showed that after 1 month, orchid plants sprayed with saline water above 2000 µS cm\(^{-1}\) in EC significantly had lower root number while those above 3000 µS cm\(^{-1}\) in EC; leaf number and pseudobulb diameter were decreased. No significant difference in flower appearance, i.e. 5.8 - 6.2 opened flowers, 29.4 - 32.2 cm in inflorescence length, 8.0 - 8.1 cm in flower width and 7.1 - 7.3 cm in flower height, was observed for all the treatments. However, after treating with saline water for 2 months, sprouting of new shoot decreased 42.9, 71.4 and 71.4% in 2000, 3000 and 4000 µS cm\(^{-1}\) treatments, respectively. Therefore, saline water about 25 ml per plant every 2 days at EC 2000 and 3000-4000 µS cm\(^{-1}\) might be used to water D. Sonia ‘Earsakul’ in flowering stage for 2 and 1 month, respectively.

**Keywords**: Salinity, Orchid, Irrigation
Genetic diversity assessment in waxy corn germplasm using microsatellite markers associated with agronomic Traits

In the development of waxy corn single-cross hybrid, good parental lines with high heterosis are importance. Population formation with broad genetic base is a way to produce elite lines. The objective of this study was to evaluate genetic diversity in waxy corn germplasm using simple sequence repeat (SSR) associated with agronomic traits for population formation. One hundred and twenty-two germplasm were planted and propagated for three seasons. Then the 95 germplasm were selected using eating quality scores and analyzed at 21 SSR loci. The average number of alleles per SSR locus was 9.0952 with a range between 2 and 49. The average polymorphic information content (PIC) was 0.5872 and varied from 0.2214 to 0.9254. Using SSR-based genetic distance and Neighbor Joining (NJ) dendrogram can cluster the waxy corn germplasm into three major groups. Average of tenderness, sweetness and favor of group I was 2.08 (1.25-3.50), 0.78 (0.50-1.25), 2.17 (0.75-3.00), group II was 2.26 (0.50-3.25), 0.76 (0.50-1.75), 2.41 (0.50-4.00) and group III was 2.73 (1.75-4.50), 0.78 (0.50-1.50) and 2.69 (0.75-4.50). This method is effective for assessment of genetic diversity of these waxy corn germplasm. The genetic diversity, especially eating quality can be used for waxy corn population formation with broader genetic base and high eating quality.

Key words: waxy corn germplasm, SSR marker, genetic diversity, agronomic trait, eating quality
Effects of leaf and rhizome extract of *Typha angustifolia* L. on seed germination and seedling growth of giant mimosa and cell division of onion root

The research studied effects of leaf and rhizome extract of *Typha angustifolia* L. by soaking in water for 12 h. on seed germination and seedling growth of giant mimosa (*Mimosa pigra* L.) and cell division of onion root. The results showed that leaf and rhizome extract (25, 50, 75 and 100 g/L) did not inhibit seed germination but seedling growth of giant mimosa. The rhizome extract was able to restrict seedling growth more efficiently than the leaf extract. Both extracts did not affect the malondialdehyde content, indicating no lipid peroxidation. However, rhizome extract at 75 g/L significantly arrested cell division of onion root tip. Here, we concluded that the inhibition of seedling growth of giant mimosa by the extract maybe due to arrested mitosis, but not lipid peroxidation.

**Keyword**: mitosis, onion root tip
Different strains of antagonistic bacteria obtained from various sources including *Bacillus amyloliquefaciens* KPS46 (from soybean rhizosphere), *Pseudomonas fluorescents* SP007s (cauliflower rhizosphere) and six-gram positive unidentified bacterias (isolated from paddy soil) were evaluated for their biological control activities to suppress eight phytopathogenic pathogen (both of bacteria and fungi), *Acidovorax avenae* subsp. *avenae*, *Pectobacterium carotovorum*, *Xanthomonas axonopodis* pv. *glycines*, *X. campestris* pv. *campestris*, *X. oryzae* pv. *oryzae*, *Alternaria solani*, *Fusarium moniliforme* and *Pyricularia oryzae* under laboratory conditions using paper disc and dual culture methods. The results revealed that all of tested bacterial strains have antagonistic activities against all phytopathogenic pathogens. The most effective antagonistic bacterium is strain S20A1 obtained from paddy soil show highest ability to suppress growth of various phytopathogenic pathogens, *A. avenae* subsp. *avenae* (with the inhibition size of 45.7 mm), *X. oryzae* pv. *oryzae* (136.25 mm), *A. solani* (80% of colonies growth inhibition), *F. moniliforme* (60.63%) and *P. oryzae* (83.13%), respectively. Follow by *P. fluorescents* SP007s that shows greatly suppression on *X. campestris* pv. *campestris* (34 mm), *X. oryzae* pv. *oryzae* (151 mm), and *P. carotovorum* (39.1 mm) and *B. amyloliquefaciens* KPS46 which could suppress *X. axonopodis* pv. *glycines* (48.20 mm), *A. solani* (85%) while *A. solani* and *P. oryzae* were suppressed by strain S15L1 (from paddy soil) with 85% and 88.75% of colonies growth inhibition respectively. These effective bacteria can be utilize in further investigation to control the diseases on host plant and produce a bio-formulation which can be use for controlling various plant diseases under filed production and having the potential to replace or reduce the use of chemical fungicides.
Seed Purity Testing of Hybrid Rice Varieties KUH1 and KUH2 by Evaluation of Phenotypes and DNA Fingerprints

Hybrid rice seed production for distribution to farmers may have been contaminated by pollens from other sources which resulted in hybrid seed impurity. This research aims to test the purity of hybrid seeds of rice varieties KUH1 and KUH2 by evaluation of phenotypes and DNA fingerprints. Hybrid rice varieties KUH1 and KUH2, parental varieties and check varieties were planted in paddy field using randomized complete block design with 2 replications. Phenotypic characters of all varieties were recorded. Evaluation of hybrid seed purity was conducted by comparison the phenotypes of hybrid varieties with those of parental varieties and check varieties. It was found that seed purity of hybrid varieties KUH1 and KUH2 were 71.5 and 70 percent by average, respectively. Seed purity evaluation of hybrid rice varieties KUH1 and KUH2 using DNA fingerprint was done by DNA isolation of hybrid varieties, parental varieties and check varieties. The DNA fingerprints of all varieties were made using SSR marker (RM208) in KUH1 hybrid and SSR marker (RM222) in KUH2 hybrid. Evaluation of hybrid seed purity was performed by comparison the fingerprint of hybrid varieties with those of parental varieties and check varieties. The results showed that seed purity of hybrid varieties KUH1 and KUH2 were 47.83 and 41.30 percent by average, respectively. The impurity of hybrid seeds may be caused by contamination of pollens from other sources, seed impurity of male parent (R line) and incomplete sterility of female parent (A line).
Screening of Cassava Lines for Waterlogging Tolerance Potential

Cassava is regarded as one of the drought-prone crops. However, in climate change era, waterlogging becomes a factor for cassava yield reduction. Waterlogging can cause root rotten due to oxygen depletion. This process can happen along with oxidative stress. Carotenoid is one of antioxidant compounds which can help plant to defend oxidative stress. The hypothesis is that carotenoid can help yellow-flesh root cassava to be more tolerant to waterlogging than white-flesh root cassava. This experiment had the objective to screen cassava lines for waterlogging tolerance potential. Five yellow-flesh root cassava lines from cross between Kolog varieties and white-flesh root commercial cassava such as Huay Bong 60 and Huay Bong 80 were grown in pots. Two white-flesh root varieties, Hanatee and Kasetsart 50, were used as check varieties. There were three treatments in this experiment which were control treatment without waterlogging, subjecting to waterlogging at 3 months after planting and subjecting to waterlogging at 5 months and a half at 5 months after planting. Most of yellow-flesh root cassava lines showed longer leaf retention than check varieties in both ages of waterlogging treatment in the first week of waterlogging treatment. However, after 12 days in waterlogging, all lines had rotten storage roots even though some of them could survive and recover. Therefore, it can be concluded that yellow-flesh root cassava can tolerate to waterlogging condition longer than white-flesh root cassava. However, due to high variation of genetic background, more lines should be tested in the future.
The Potential to Use Cassava Leaf Chlorophyll Content and Leaf Cyanogenic Glucoside Content to Predict Cassava Root Cyanogenic Glucoside Content

Cassava is one of Thailand’s economic crops used mainly in starch-based industrial process. However, cassava is also used for human consumption in many countries worldwide such as Indonesia and countries in Latin America and Africa. For food security issue in Thailand especially upon climate change concern, cassava is good source of carbohydrate which can be alternative to major carbohydrate crops in Thailand which requiring more water for growing than cassava. Nevertheless, cassava has high cyanogenic glucoside in root which is harmful for human health when it is hydrolyzed in to hydrogen cyanide. Therefore, breeding for low cyanogenic glucoside content in root is important for food security in the near future. This research is a part of cassava breeding program for low cyanogenic glucoside content in root. The objective of this research is to find other related traits to help identifying low cyanogenic potential in cassava root before harvesting time. Linamarin, which is the major cyanogenic glucoside in cassava, is synthesized in leaf and is transported to be store in root. Therefore, cyanogenic glucoside in cassava leaf and leaf chlorophyll which is also nitrogen-based compound were suspected to be related to cyanogenic glucoside in cassava root. At five and nine months after planting, cassava leaf chlorophyll was measured using SPAD chlorophyll meter and cassava leaf cyanogenic glucoside was measured. The correlation between cyanogenic glucoside in leaf and chlorophyll was significantly positive (r=0.88) in five months old cassava, but not significantly positive (r=0.14) in nine months old cassava. However, cyanogenic glucoside and chlorophyll in leaf in both ages were not significantly correlated (r=0.14) to cyanogenic glucoside in root at harvesting age of 12 month. Therefore, these two triats cannot be used as indicators for cyanogenic potential in root of cassava before harvesting time.
Study Optimum Ratio of Major Ingredients in High Fiber Snack Bar

Snack bars are widely consumed as a fast snack with high nutritional value. Moreover, they are easy to carry and are available on the market in different types, flavors and nutritional compositions. The ingredients can influence the qualities of the snack bar products, which may have an impact on consumer acceptability. The objective of this study was to identify the optimum ratio of major ingredients that suitable for producing high fiber snack bar and acceptable to consumer. The optimum ratio of major ingredients to produce high fiber snack bar was determined by using mixture design. Three factors were conducted, 30-50% Leum Pua glutinous puff rice, 30-50% dried Jerusalem artichoke, 20-30% dried fruits and study effect of these ratios on physical properties (color L*, a*, b* and hardness), chemical properties (fiber, fat and protein content) and sensory properties using a 9-point hedonic scale (1=dislike extremely, 5=neither dislike nor like and 9= like extremely). The result showed that increasing of dried Jerusalem artichoke content increased the hardness, fiber and protein content. The increasing of Leum Pua glutinous puff rice content caused a decrease in L* value and fiber content, but an increase in fat content. Results from sensory evaluation which was done by 50 untrained panels showed that hedonic score of all sensory attributes from all the ratios of ingredients were not significant different (p>0.05). Therefore, the optimum ratio of major ingredients to produce high fiber snack bar was the formula containing Leum Pua glutinous puff rice, dried Jerusalem artichoke and dried fruits at the ratio of 1.5: 2.5: 1 obtaining the high fiber content and overall liking were like slightly (6.34). This study demonstrated the feasibility of producing high fiber snack bar from Thai ingredients that were acceptable to consumer.
Satisfaction of students towards GABA ice cream with vanilla and chocolate

The objective of this study was to determine satisfaction of students towards germinated brown rice (GABA) ice cream with vanilla and chocolate favors. The total of 61 undergraduate students, Major Communication and Agricultural Development, Bachelor of Science Program in Agricultural Science, Faculty of Agriculture, Kasetsart University served as population of this study. Research instruments were germinated brown rice (GABA) ice cream with vanilla and chocolate favors and questionnaire. Data were analyzed and presented through frequency, percentage, means and standard deviation.

Finding revealed that respondents chose eating ice cream with cone. They preferred to eat ice cream in the afternoon. They bought ice cream from convenient stores. Respondents had ice cream two time/week. Most of respondents know the benefit of GABA ice cream. Level of satisfaction of students towards GABA ice cream both vanilla and chocolate was at moderate.
Changes in isoflavone aglycone content during fermentation of Thua-nao with and without Bacillus subtilis LPO-2 inoculation

Thua-nao is a Thai traditional alkali-fermented soybean. During fermentation, B. subtilis is a predominant microorganism, which involved in its unique texture and flavor. The most important activity that occurs during fermentation has been reported on nutritional enhancement of fermented soybean food for human consumption and increasing of some bioactive components, particularly isoflavone. Interest in Bacillus species with a high capacity to secrete a β-glucosidase to hydrolyze glycoside to aglycone of isoflavones has been intensively studied. As our previous study, the B. subtilis LPO-2 isolated from Thua-nao had the highest β-glucosidase activity at 37°C. Thus, the objective of this study was to investigate the effect of B. subtilis LPO-2 inoculation on changes in daidzein and genistein contents during Thua-nao fermentation. Changes in total viable count, pH, β-glucosidase activity and isoflavone aglycones, daidzein and genistein, of Thua-nao inoculated with Bacillus subtilis LPO-2 as a starter to cooked soybean with (CBSBS) and without sterilization (CB-BS) during fermentation at 37°C for 72 h were investigated. Generally, higher total viable count was found in sample inoculated with starter, compared with the control (without inoculation). The increasing rate of pH was more pronounce in samples inoculated with starter. During 48 h of fermentation time, the extract of samples inoculated with starter exhibited higher β-glucosidase activity than the control ($P<0.05$). The results suggested that β-glucosidase released by the dominant species in the inoculums, particularly B. subtilis LPO-2. In addition, higher contents of daidzein and genistein were observed in samples inoculated with starter. Therefore, the inoculation with B. subtilis LPO-2 might enhanced in isoflavone aglycone, which is functional compounds for a heath soybean food.
Investigation of physical and antioxidant properties of Karanda fruit 
(Carissa carandas Linn.) during Puree production

Karanda (Carissa carandas Linn) is commonly known as Ma-Muang-Haw-Ma-Now-Ho or Nam-daeng which widely grown in Samut Songkhram province. Karanda fruit shows highlighted in food and beverage which contains strong purple color, favour and presents a rich of bioactive compounds e.g phenolic, anthrocynanin and Vitamin C. So far, it has been used to develop various products using fresh and by-products e.g. pomace Karanda puree such as juice, jam and three-taste pickling. However, the nutrition is necessary to investigate. This work is to use fresh and by-product for puree production. Here, our aim is to investigate effect of processing on physical and antioxidant properties of both flesh and pomace Karanda puree. Firstly, purees were made by pulverizing Karanda flesh or pomace, adding the sucrose, glucose syrup, fructose syrup and citric acid and heated at 80°C for 5 min. This found that the color (L* and b* values) of puree prepared from flesh Karanda was significantly decreased whereas there was no effect in puree prepared from pomace Karanda. Total phenolic and anthocyanin content of flesh puree were decreased compared to pomace puree about 30 and 44% respectively. In addition, flesh puree showed higher antioxidant property using ferric reducing antioxidant potential (FRAP) and antioxidant activity (DPPH) compared to pomace puree. However, addition of sugar and syrup showed influence on antioxidant property of flesh puree but no difference was found in pomace (p>0.05). To conclude, addition of sugars and syrup affect a total solid content and color properties of the both flesh and pomace puree but no significant difference was found in viscosity. This suggests that the flesh and pomace suit for puree production.
Satisfaction of students towards Salapao corn milk cream and pumpkin juice recipes

The objective of this study was to determine satisfaction of students towards Salapao corn milk cream and pumpkin juice recipes. The total of 61 undergraduate students, Major Communication and Agricultural Development, Bachelor of Science Program in Agricultural Science, Faculty of Agriculture, Kasetsart University served as population of this study. Research instruments were Salapao corn milk cream and pumpkin juice cream and questionnaire. Data were analyzed and presented through frequency, percentage, means and standard deviation.

Finding showed that most of respondents were female with age between 21-23 year olds. Respondent preferred Salapao with diameter of 10 centimeter and 10 Bath in price. Student satisfied regular size, shape and form of Salapao. Respondent chose to have Salapao in the morning. Respondent needed Salapao with paper packaging. They bought Salapao from convenient stores. Respondents had Salapao one time/week. Satisfaction of students towards Salapao both corn milk cream and pumpkin juice cream was at high level.
In daily life, some people are at risk of receiving heavy metals by consuming contaminated water especially in the community near the factories that drain the wastewater into the nature without right treatment so this will cause a lot of health problems. Therefore I would like to study how to treat heavy metal contaminated wastewater by using natural material. This project is aimed to create eggshell water filter that has efficiency to filtrate heavy metals from contaminated water. The procedure include of 1. Creating eggshell water filter and activated carbon water filter, 2. Test the efficiency of the eggshell filter by filtrating Pb(NO$_3$)$_2$ solution and mixed the filtrated solution was mixed with NaCl and compare the height of sediment from eggshell filter to carbon filter.

The result showed that The eggshell filter can filtrate Pb(NO$_3$)$_2$ but less efficiency than the activated carbon filter because of the majority of the eggshells pores are bigger than activated carbon pore and the quality of activated carbon surface is permitted to absorb Pb(NO$_3$)$_2$ more than the eggshell’s.

In conclusion, eggshell water filter has efficiency to filtrate heavy metal from contaminated water. For testing the efficiency of the eggshell filter in this study, I used the solution which has higher concentration of heavy metal than in real environment so to confirm the efficiency of eggshell water filter in real situation, we need to test it in real environment.
The study of water treatment effectiveness of Nanostructured TiO$_2$ thin films by Electrophoretic Deposition Technique

Water pollution is the big huge critical crisis globally. It is needed to develop more environmentally-friendly and efficient water treatment technology. At this moment, nanotechnology is the most of the interesting application. This project is aimed to study 1) factors of fabrication TiO$_2$ thin films by Electrophoretic Deposition (EPD) technique, 2) its effectiveness for treating water. The factors affecting electrophoretic process including the voltages used in electrocoating and their deposition times were explored. Its characterization was defined by microscopes and X-ray Diffractometer. Its photocatalytic activities were also examined under 3 conditions, light (Photocatalysis), light with electric current (Photoelectrocatalysis) and light with electric current and supporting electrolyte. Its outcome was measured by the degradation test of Methylene blue, the representative of organic compound, at 0, 1 and 3 hour of incubation. Furthermore, an example of everyday water usages degradation efficiency was also performed by analyzing its COD value after an extra doped silver nanoparticle compared with the none-doped film.

The result showed that the best and the worst condition in photocatalytic test on Methylene blue were 10 volt, 10 minutes and 5 volt, 5 minutes, respectively. However, the best condition wasn’t strongly adhered with the Ti Substrate. Therefore, 5 volt, 10 minutes and 10 volt, 5 minutes were chosen for the next step. The degradation result from the selected condition was 32.3 % and 21.4%, respectively. Moreover, the Methylene blue degradation performance could be enhanced by supplementing with electric current. In contrast, effectiveness was decreased by adding Na$_2$SO$_4$ as a supporting electrolyte in the system. Finally, doped silver nanoparticle could be increase the effectiveness of everyday water usages degradation by decrease COD value from 94.34 to 86.79 mg/L.

In conclusion, it is needed to find out a better condition of this fabrication technique and apply in the large scale in the future.
Award

2011 Award

2011 Award for the Best Graduate Poster Presentation
Ms. KANTAYOS, Vipada
Department of Horticulture, Faculty of Agriculture, KU
Poster Title: “Antioxidant Activities, Total Phenolics Content and Total Curcuminoids Content in Some Zingiber in Thailand”

2012 Awards

Graduate Level:

2012 Award for the Best Graduate Poster Presentation
Mr. WANNAPRASERT, Chalermphol
Department of Horticulture, Faculty of Agriculture, KU
Poster Title: “Effect of Paclobutrazol on Indoor Display Life of Ficus deltoidea Jack”

2012 Second Prize for Graduate Poster Presentation
Ms. JINDAPUNNAPAT, Kansiree
Department of Plant Pathology, Faculty of Agriculture, KU
Poster Title: “First Report of Meloidogyne enterolobii Infecting Guava (Psidium guajava Linn.) in the Central Region of Thailand”

2012 Third Prize for Graduate Poster Presentation
Mr. BUTTACHON, Suradet
Department of Entomology, Faculty of Agriculture, KU
Poster Title: “Ovicidal Activity of Crude Extracts from Different Species of Hirsutella against Tetranychus urticae Koch (Acari: Tetranychidae)”

Undergraduate Level:

2012 Award for the Best Undergraduate Poster Presentation
Mr. KASEMSAP, Pornpipat
Department of Horticulture, Faculty of Agriculture, KU
Poster Title: “The Appropriate Supporting Material for Vanilla Cultivation”

2012 Second Prize for Undergraduate Poster Presentation
Mr. LIMRUKSASIN, Danunun
Department of Horticulture, Faculty of Agriculture, KU
Poster Title: “Effect of Paclobutrazol on Growth and Flowering of Globba williamsiana”

2012 Third Prize for Undergraduate Poster Presentation
Ms. LEENARONGTHORN, Kanika
Department of Home Economics, Faculty of Agriculture, KU 40
Poster Title: “Effect of Sodium Chloride Soaking on Proteolysis of Thau-nao, a Thai Fermented Soybean, During Fermentation”
2013 Awards

Graduate Level:

2013 Award for the Best Graduate Poster Presentation
Mr. Md. MOLLA, Samim Hossain
Tropical Agriculture, Department of Agronomy, Faculty of Agriculture, KU
Poster Title: “Dynamism of Maize Root and Its Influences on Crop Growth and Yield under Contrasting Water and Nitrogen Levels”

Undergraduate Level:

2013 Award for the Best Undergraduate Poster Presentation
Ms. CHUAMNAKTHONG, Sumana
Department of Entomology, Faculty of Agriculture, KU
Poster Title: “Analysis of actin sequences using for detection of timeless expression in Aedes albopictus, vector of chikungunya in rubber plantation area”

2014 Awards

UT Graduate Level:

2014 Award for the Best Graduate Poster Presentation
ANKYU, Eriko
Graduate School of Life and Environmental Sciences, University of Tsukuba
Poster Title: “Performance and Economical Evaluation of Introducing Oil-Water Separation Technology for Wastewater Treatment based on Separation Engineering”

KU Graduate Level:

2014 Award for the Best Graduate Poster Presentation
JUNHAENG, Pinpinatt
Department of Agronomy, Faculty of Agriculture, KU
Poster Title: “Effect of Seed Priming Techniques on Barley Seed Storability”

2014 Second Prize for Graduate Poster Presentation
KUNAPHAN, Amonporn
Department of Entomology, Faculty of Agriculture, KU
Poster Title: “Evaluation of cassava resistance to spiralling whitefly, Aleurodicus dispersus, infestation on various cassava varieties”

2014 Third Prize for Graduate Poster Presentation
SAENGTHARATIP, Suthisak
Department of Horticulture, Faculty of Agriculture, KU
Poster Title: “Sensitive assessment of Musa(Nam Wah group) to Fusaric acid”
UT Undergraduate Level:

2014 Award for the Best Undergraduate Poster Presentation
FUKASAWA, Yuki
College of Agrobiological Resource Sciences, University of Tsukuba
Poster Title: “System Analysis of Methane Gas Emission from Palm Oil Mill Effluent”

2014 Second Prize for Undergraduate Poster Presentation
MIYAZAKI, Wataru
College of Agrobiological Resource Sciences, University of Tsukuba
Poster Title: “Effects of light qualities on the early growth of some leafy vegetables of Brassica family grown under continuous lighting”

KU Undergraduate Level:

2014 Award for the Best Undergraduate Poster Presentation
VINICHEVIT, Neeranut
Under Graduate School, Department of Agronomy, Kasetsart University
Poster Title: “Effect of Napier grass cultivars on the change of Biogas Volume and its Composition”

2014 Second Prize for Undergraduate Poster Presentation
LEENARONGTORN, Kannika
Under Graduate School,
Department of Home Economics, Kasetsart University
Poster Title: “Changes in Protein, Reducing Sugar and Maillard Reaction Products during Thua – nao Fermentation”

2014 Third Prize for Undergraduate Poster Presentation
NUNKAEW, Nutkamon
Under Graduate School,
Department of Home Economics, Kasetsart University
Poster Title: “Effect of Fertilizers on Antioxidant Activity of Wildbetal (Piper samentosum Roxb.)”

Kasetsart University Laboratory School, Center for Educational Research and Development Level:

2014 Award for the Best Student Poster Presentation
SANGKOOL, Tanatip
High School, Kasetsart University Laboratory School, Center for Educational Research and Development
Poster Title: “Nanostructured TiO$_2$ for Solar Cell Application”

2014 Second Prize for Student Poster Presentation
ROJPUBLUSTIT, Penpitcha
High School, Kasetsart University Laboratory School, Center for Educational Research and Development
Poster Title: “Nanostructured TiO$_2$ thin films for water treatment”
2014 Third Prize for Student Poster Presentation
NAGAMATI, Punnapop
High School, Kasetsart University Laboratory School,
Center for Educational Research and Development
Poster Title: “Investigation of Home-Made High Surface Area Activated Carbon Electrode for Water Treatment”

Special prize
2014 Special prize of Poster Presentation
HEMAKOM, Chidkwan
High School, Development Communication,
Department of Agricultural Extension and Communication,
Kasetsart University
Poster Title: “Sexual Knowledge and Awareness towards Students Sexual Relationship of Bangkok Vocational Colleges Students”

2015 Awards
UT Graduate Level:
2015 Award for the Best Graduate Poster Presentation
LIU, Qiang
Graduate School of Life and Environmental Sciences,
University of Tsukuba
Poster Title: “Behavior of lignin reaction in pulping industry: A study on lignin model compounds treated by peroxymonosulfuric acid”

KU Graduate Level:
2015 Award for the Best Graduate Poster Presentation
WANKHADE, Dipti
Department of Agronomy, Faculty of Agriculture, KU
Poster Title: “Development of breeding lines with four pyramided resistance genes that confer broad-spectrum blast disease resistance in rice using marker assisted selection”

2015 Second Prize for Graduate Poster Presentation
TRITHAVISUP, Kamonrat
Faculty of Agro-Industry, Kasetsart University, KU
Poster Title: “Effect of Addition of Acids on Textural Properties of Frozen Cooked Aged Rice (Oryza sativa L.) cv. Khao Dawk Mali 105”
KU Undergraduate Level:

2015 Award for the Best Undergraduate Poster Presentation
SUNGKANIT, Arada
Under Graduate School, Department of Agronomy, Kasetsart University
Poster Title: “Bio-based Packaging Plastics from Fish Scale”

2015 Second Prize for Undergraduate Poster Presentation
KASEMSRI, Janejira
Under Graduate School,
Department of Home Economics, Kasetsart University
Poster Title: “Analysis of dyeing silk fabric dyeing with dyes from Pak Kad Nor Phong (Parmotrema praesorediosum)”

2015 Third Prize for Undergraduate Poster Presentation
BEAUKE, Kanokwan
Under Graduate School,
Department of Home Economics, Kasetsart University
Poster Title: “Silk fabric dyeing with dyes from Lichen (Usnea flame)

Kasetsart University Laboratory School, Center for Educational Research and Development Level:

2015 Award for the Best Student Poster Presentation
RUJIRAPISIT, Tanakrit
High School, Kasetsart University Laboratory School, Center for Educational Research and Development
Poster Title: “Bread Supplemented with three mushrooms”

2015 Second Prize for Student Poster Presentation
JINTANA, Patawee
High School, Kasetsart University Laboratory School, Center for Educational Research and Development
Poster Title: “Water Quality Affected by National Agriculture Fair 2013”

2015 Third Prize for Student Poster Presentation
ASAWALERTSAENG, Thatchanon
High School, Kasetsart University Laboratory School, Center for Educational Research and Development
Poster Title: “Coronary Occlusion, A clinical study of 30 patients in paolo Memorial Hospital”

Special prize

2015 Special prize of Poster Presentation
TRITHAVISUP, Kamonrat
Faculty of Agro-Industry, Kasetsart University, KU
Poster Title: “Effect of Addition of Acids on Textural Properties of Frozen Cooked Aged Rice (Oryza sativa L.) cv. Khao Dawk Mali 105”
### Lists of Participants

**University of Tsukuba**

1. Ms. Megumi SASAKI  
   Agro-Biological Resource Sciences and Technology, Graduate school of Life and Environmental Sciences, University of Tsukuba, Japan

2. Ms. Kasumi MATSUO  
   Agro-Biological Resource Sciences and Technology, Graduate school of Life and Environmental Sciences, University of Tsukuba, Japan

**Yezin Agricultural University**

1. Dr. Myint Thaung  
   Former Rector, Yezin Agriculture University, Yezin, Myanmar

**University of Muhammadiyah Malang**

1. Dr. Henik SUKORINI  
   Department of Agrotechnology, Faculty of Agriculture – Animal Husbandry, University of Muhammadiyah Malang, Indonesia

**Kasetsart University**

1. Miss Yaowamarn KEAWSAARD  
   Ph.D. Student, Department of Agronomy, Faculty of Agriculture, Kasetsart University

2. Miss Naphassorn ANEKBOON  
   Master degree student, Department of Agricultural Extension and Communication, Faculty of Agriculture, Kasetsart University

3. Mr. Wachira NOINART  
   Master degree student, Agricultural Extension, Department of Agricultural Extension and Communication, Faculty of Agriculture, Kasetsart University

4. Miss Yanika TONTHONG  
   Master degree student, Department of Agronomy, Faculty of Agriculture, Kasetsart University

7. Mr. Bhakitkrom SANGTRIPHETKRA  
   Master degree student, Department of Agricultural Extension and Communication, Faculty of Agriculture, Kasetsart University
8. Miss Napasorn CHIEWCHOOKUL  
   Master degree student, 
   Department of Horticulture, 
   Faculty of Agriculture, Kasetsart University

9. Miss Pawida Chaiyawong 
   Master degree student, 
   Department of Agronomy, 
   Faculty of Agriculture, Kasetsart University

10. Miss Phetphan NAMWAT 
    Master degree student 
    Department of Botany, 
    Faculty of Science,

11. Miss Patcharapond HOMKRUN 
    Master’s Degree Student 
    Department of Plant Pathology 
    Faculty of Agriculture, Kasetsart University

12. Mr. Thanakorn WANGSAWANG 
    Master degree student, 
    Department of Agronomy, 
    Faculty of Agriculture, Kasetsart University

13. Mister Chaiyathorn AREERATTANAWECH 
    Undergraduate student, 
    Department of Agronomy, 
    Faculty of Agriculture, Kasetsart University

14. Miss Metheeya BOONHENG 
    Undergraduate student, 
    Department of Agronomy, 
    Faculty of Agriculture, Kasetsart University

15. Miss Kanjana JALERNPIRIYA 
    Undergraduate Student, 
    Food and Nutrition Program, 
    Department of Home Economics, 
    Faculty of Agriculture, Kasetsart University

16. Miss Natchanun SRISUK 
    Undergraduate student, Department of 
    Agricultural Extension and Communication, 
    Faculty of Agriculture, Kasetsart University

17. Miss Nutwara MEANNUI 
    Graduate student, 
    Department of Agronomy, 
    Faculty of Agriculture, Kasetsart University
18. Miss Pratumkaew PORNPUTISATID  Graduate student,  
Department of Agronomy,  
Faculty of Agriculture, Kasetsart University

19. Miss Sirarat JIDKOBKAEW  Undergraduate student, Department of  
Agricultural Extension and Communication,  
Faculty of Agriculture, Kasetsart University
The International Conference  
on the 6th KU-UT Symposium 2016 on  
“Environmentally Friendly Agriculture and Food Innovative Technologies”

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Assist. Prof. Donludee Jaisut  Associate Dean for International Affairs, KU
Assoc. Prof. Ryozo NOGUCHI  Faculty of Life and Environmental Sciences, UT
Assist. Prof. Atsushi ASANO  Faculty of Life and Environmental Sciences, UT

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Dr. Sarunya Khunadilok 
Committee

Assist. Prof. Ratiya Thuwapanichayanan 
Committee

Dr. Theerawit Poeikhampha 
Committee

Dr. Atsalek Ratanawannee 
Committee

Dr. Jenjira Duangjit 
Committee

Dr. Patcharavipa Chaijuckam 
Committee

Dr. Tanapon Chaisan 
Committee

Dr. Siriporn Riebroy 
Committee
Since 2011, Faculty of Agriculture, Kasetsart University organized an International Symposium with University of Tsukuba, Japan and Kasetsart University Laboratory School Center of Educational Research and Development.

“KU-UT Student Symposium” is the name of this project, for supporting MOU between institutes and promoting academic, student research in term of agriculture, environment and innovation that related with globalization and also developed the knowledge of agricultural science based on education for student who studies or interested in this field.

The International Conference on the 6th KU-UT Student symposium 2016 was held on February 25th at the Faculty of Agriculture, Kasetsart University, Focused on “The Environmentally Friendly Agriculture and Food Innovative Technology”. Twenty-six participant from this year participated in program:

1) Faculty of Agriculture, Kasetsart University, Thailand
2) University of Tsukuba, Japan
3) Yezin Agricultural University, Myanmar
4) University of Muhammadiyah Malang, Indonesia
5) Kasetsart University Laboratory School Center of Educational Research and Development, Thailand