Final Objective & Proposal in Next Two Year (1992-1993)
Tentative Schedule of Implementation

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
1.Classification of Agro-ecological Zone and Land Use Planning 1.1 Land resources survey, mapping and research			
1.1.1 Survey, study and mapping of soil erosion status of NE Thailand at regional and provincial level. For regional level the scale of map is 1:500,000 while for provincial level is 1:500,000.	DLD	4 Provinces have been accomplished in the scale of 1 : 100,000 maps are printing.	Map illustrating the soil erosion status of the areas and reports. 1993 : The other 6 provincial levels will be accomplished.
1.1.2 Survey, study and mapping the distribution of salt affected soil and properties of the shallow ground water in the NE	DLD	4 Provinces have been accomplished in the scale of 1 : 50,000 maps are in the cartographic section.	Map illustrating the distribution of salt affected soil and proper of shallow ground water at scale 1:50,000 including the reports. 1993 : Maps and reports of the other 5 provinces will be accomplished.
1.1.3 Survey, study and mapping of the suitability of land for small reservoir development in NE, the provincial level (scale 1:100,000)	DLD	3 Provinces have been accomplished, maps are drafting in the scale of 1 : 100,000.	Map illustrating the suitability of land for small reservoir development and reports. 1993 : Maps and report of the other 3 provinces.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
1.1.4. The study on the correlation of properties of the virgin and agricultural soil, the loamy Palustults, in NE.	Mr. OTA DLD	Five sets of virgin and corresponding arable soils were examined to obtain detailed and reliable information on how soil have been degraded by agricultural practices. The virgin soils had higher contents of organic matter, exchangealbe bases, available phosphorus and water-stable aggregates than their corresponding arable soils.	Report of the study.
1.1.5 The study on the variation of the properties of the same soil series but situating in different geologic formation in NE.	DLD	Field work still carry on and collecting the soil samples.	Report of the study. 1993 : Study and report will be accomplished.
1.1.6 The comparison of the properties of the salt affected soil in Sakon Nakorn and Korat Basin.	DLD	Soil samples are being analysed.	Report of the study. 1993 : Study and report will be accomplished.
1.1.7 Forming process of laterite in NE Thailand	Dr. WADA	A new theory was proposed about laterite formation. Survey and sample-collection are under way to find evidence to support the theory.	To elucidate native and properties of the skeletal soil. 1993 : Analysis of the samples will be completed.
1.1.8 Origin of parent materials of the sandy soil in NE Thailand	Dr. WADA	Parent materials of the sandy soil were assumed to be sediments at flood plains of big rivers in pleistocene.	To characterize the sandy soil from the point of pedogenesis. 1993 : The assumption will be supported by analysis of the samples.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
1.3 Agro-ecological zoning and land planning combining environmental and ecological conditions			
1.3.1 Integrated zoning for development planning combining environmental and ecological conditions			
1) Soil potential of some economic field crops in NE.	DOA	Fertilizer trials for 8 field crops : cassava, cotton, castor bean, corn, mungbean, soybean, sorghum and sesame on 2 soil group units (No. 35, No. 44) in Khon Kaen Province. Each soil group unit has 2 locations.	To create soil fertility map for fertilizer recommen-dation on regional crop production. 1993 : To accumulate information through the regional fertilizer trials for preciseness on fertilizer recommendation regarding the specific crop and soil groups.
2. Development of Farm Management System			
2.1 Farm management on upland suited to each locality			
2.1.1 Testing adaptability of crops/ varieties (including trees and pasture grasses/ legumes) under different soil and crop management practices.			

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
1) Techniques to suppress salinization and to cultivate plants at salt affected areas in NE Thailand.	DLD	Improvement of the " Core technique " is successfully going on in the field.	To find out effective techniques to suppress salinization and cultivate plants at salt affected areas. 1993 : Farm demonstration to the farmers of effective techniques to suppress salinization and cultivate plants at salt-affected areas.
2) Demonstration of lay farming (at the Khao Suan Kwang Demonstration Field)	DLD	No operation in 1992 because of no budget to be carried on.	To combinate pasture, crops fruit trees and domestic animal to increase productivities. 1993 : To maintain pasture and fruit trees for growing of cassava.
3) Demonstration of soil erosion control by using biological management (at the Khao Suan Kwang Demonstration Field)	DLD	No operation in 1992.	To implement the appropriate soil management measure to farmers to improve their farm for sustainable agriculture e.g. cover crops, crop rotation, strip cropping, grasses line, terracing, alley cropping etc. 1993 : To maintain the system for farm demonstration to the farmers.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
4) Observation on the use of some grasses to control soil erosion and surface run off in water way	DLD	To establish vetiver grass strip in waterway.	To implement the appropriate technology to the farmers to control soil erosion and surface run off in waterway. 1993 : Farm demonstration to the farmers in simple technique to control soil erosion and surface run off in waterway.
5) Observation on salt tolerance of grass varieties.	DLD	Twelve varieties of grass and legumes were tested in severely and moderately salt affected soil at Khon Kaen province. The data of survival percentage, scoring of growth, growth, yield and nutritional value were collected.	To select suitable grass varieties for livestock in saline soil. 1993 : Suitable grass varieties from field trial are selected.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
6)Adaptability of some halophyte in severely salt affected soil.	DLD	Some halophytes have been tested under severely salt affected soil field condition at Ban Pan Dung, Nakhon Ratchasima province and Ban Kheng, Mahasarakam province where the soil electrical conductivity at planting period were 20 and 30 ds/m and the soil pH were 8.0 and 9.5 respectively. During the very dry season the Ece were >100 and 72 ds/m, respectivity, only sporobolus virginicus both coarse and smooth types that could survive with very virgorous growth and normal tillering at both locations, while spartina patens and Distichlis spicata could survive with some reduction in tillering and rolled leaves. The plant analysis showed that they have high protein percentage and they could be eaten by the buffalows and cows in the area.	To study the physiological and morphological change of halophyte in severely salt affected soil. 1993 : On farm demonstration.
7) Effects of ratoon cultivation on yield sugarcane in Kumpawapee district, Udornthani province	DOA	The experiment were carried out in the first year. The yield has not been harvested yet.	To keep the ratooning population after cutting and maintain yield. 1993 : Further modification of proper technique to increase number of ratooning stand and ratoon yield.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
8) Study on the growth of recommended cassava cultivars in different conditions of planting date	DOA	The experiment was carried out in the first year. The yield has not been harvested yet.	To find out the growth of cassava in different planting date and the relation between yield and number of branching height, leaf area index, etc. 1993 : To confirm the proper planting date for cassava cultivation in the Northeast region.
9) Study on the planting time of Buckwheat.	DOA	No carry out in 1992.	To evaluate suitable planting date of seven varieties of Buckwheat. 1993 : Confirmation of adapted planting date during late rainy season.
10) Study on Growing Azuki bean in the NE conditions.	DOA	No carry out in 1992.	To develop Azuki planting in the NE conditions. 1993 : Selected the most suited cultural method for actual yield trial.
11) Farm trial on recommended varieties and promising crops at Khao Suan Kwang.	DOA	Eleven recommended field crops namely sugarcane, roselle, kenaf, jute peanut, cassava, soybean, castor bean, sorghum, sesame and mungbean, total of 47 varieties were planted for demonstration of common practices for farmers.	To demonstrate the most adopted crops on acquiring economic yield and return in specific soil and regional adaptation 1993 : Successive practices on similar demonstrating with and without crop residue removal in addition from crop species.

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12) Varietal selection of sesame growing before rice in NE.	KKU	Ten improved varieties of sesame were tested on paddy field in June 1992. The results indicated that there were three i.e. KKU 1, KKU 2, and KKU 3 found to performed well for the pre-rice planting systems.	To select sesame suitable for growing before rice on upland area in NE. 1993 : Yield testing of improved varieties of sesame on upland area.
13) Use of multi-purposed trees to develop small holder's farming systems in NE.	KKU	Two interspecific hybrids of leucaena were planted as hedgerows at spacing 10 x 0.5 m. of alley cropping in July 1991. Mungbean was grown as the intercrop during the rainy season of 1991. The two hybrid lines were established well with vigorous growth and a little better than the leucaena common line. Grain yield of mungbean in this experiment was around 1.2 ton/ha.	To assess benefits derived from planting multi-purposed tree together with field crops in alley cropping. 1993 : Terminated.
14) Study on oil palm (Elaeis guineensis) adaptable to NE of Thailand in accent to control of flowering and fruit setting.	KKU	It has a potential to cultivate the oil palm in Northeast of Thailand. The plant could be able to flowering and fruit setting in the Northeast condition. However, a good flowering and fruit setting should be studied by the application of plant growth regulators. The result showed that the paclobutrazol at 3000 ppm. could be induced more flowering and earlier than the control plant about 3 weeks.	To promote the oil palm plantation in NE at a large extended. 1993 : On going.

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15) Study on Aloe spp. adaptation in the NE	KKU	The results showed that plant weight was maximum in 80 x 60 cm. followed by 60 x 60, 70 x 60 and 50 x 60 cm. respectively. Number of sucker per plant was not different. It can be conclude that 80 x 60 cm. spacing was better than others. In addition, improve soil quality by applied some organic fertilizers and watering in dry season was also neccessary.	1. To study suitable cultural practice of Aloe spp. in NE. 2. To study adaptability of Aloe spp. to drought stress. 1993 : Cultural practices of promising varieties will be studied.
16) Study on bamboo adaptation to NE	KKU	Germplasms of bamboo were collected at university farm. Twelve varieties can establish on Yasothon soil. Bambusa blumeana, early variety of Dondocalamus asper, Thyrsos tarchys siamensis and some native varieties show good adaptablility on this soil series. While the increasing of the highest plant height was found in T. siamensis.	1. To study water requirement of bamboo in NE. 2. To study drought tolerant mechanism of bamboo varieties. 1993 : Rappid propagation technique and cultural practices will be studied.

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17) Area analysis for economic fruit crops production in the NE by using physical secondary data.	KKU	Soil map, description of soils and data of rainfall in the Northesast were collected base on characters of soils (drainage, fertility and soil depth) for preliminary evaluation. These informations indicate that 3.6 million rai of agricultural area over this part is suitable for economic fruit crops. It's mainly in Korat and Chaiyaphum, 1.5 and 1.2 million rai, respectively. Climatic data will be analysed. Precipitation and soil description will be integrated for final evaluation.	1. To determine suitable area for fruit crops cultivation in the NE region by using physical..... 2. To characterize and identify the species of fruit crops that suitable for analyzed data. 3. To divide agro-economic zone for fruit crops cultivation in the NE region. 1993 : To determine the suitable area for growing appropriate fruit crop.
18) Study on the rattan in the NE condition.	KKU	Six lines of rattan were collected at Chulabhorn Research and Training Station, Faculty of Agriculture, KKU. Plant growth and development was studied under sheded condition (under forest tree) compared to unsheded conditions. Propagation techniques also studied. The data being analysed and will be reported by January 1993.	To study the methodology of rattan propagation by seeding and the different stem parts. 1993 : Study on cultural practices with emphasize in plant growth.

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19) Effect of liming blossom-endrot and stem rot of tomato.	KKU	Soil sample was taken from Nong Khai province and calculated for lime requirement. Soil at various degree of acidity (pH) was put into the pots and left for 3 weeks before further studies. The tomato seedlings cv. TW-3 were transplanted into the soil at various pH. The blossom-end rot at fruiting stage was observed. Unfortunately, the fruit was unable to be set due to extremely high temperature and light intensity. However, this experiment in being re-investigated. Sclerotium rolfsii causing agent of stem rot was isolated. It is found that the fungal growth was correlated negatively with the concentration of lime. For the pathogenicity test in the pot trail, 100 percent tomato seedling grown in the soil at various pH (4, 4.5, 5, 5.5, 6 and 6.5) were infected.	1. To determine optimum rate of lime application and optimum calcium content in tomato which reduce the loss. 2. To be guideline for reducing the loss due to the such diseases in other soil types. 1993 : To determine rate of lime application under condition.

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20) Improvement of production technique for downy mildew resistant of cucumber (Cucumis sativus) and muskmelon (Cucumis melo).	KKU	The project was canceled because the project leader on leave for doing a research work in Germany.	1. To improve screening method for downy mildew resistant of muskmelon and cucumber. 2. To develop propagation technique of downy mildew resistant cultivars of muskmelon and cucumber. 3. To select downy mildew resistant cultivars of muskmelon and cucumber for future quality improvement. 1993 : To propagation and release downy mildew resistant variety.
21) Crop performance of high yielding soybean in the dry season	Mr. OKA DOA	The performance of yield increase and farmer's practice in irrigated soybean observed.	To make a technical manual of high yielding soybean in dry season. 1993 : To find out an adequate irrigation method in farmer's field afer rice.
22) Crop performance of high yielding soybean in the wet season	Mr. OKA DOA	The crop performance of IITA's line including other varieties evaluated.	To make a technical ,manual of high yielding soybean in wet season. 1993 : To demonstrate the high yielding soybean cultivation.
23) Screening test of vegetable soybean	Mr. OKA DOA	The varieties from Japan and others evaluated.	To find out how to cultivate the vegetable soybean with good quality in Northeast Thailand. 1993 : To evaluate the yield of vegetable soybean in farmer's field after rice.

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24) Productivity of azuki bean	Mr. OKA DOA	The effect of the rhizobium inoculation on azuki bean was unclear. Same trial continue.	To find out the possibility of yield increase on azuki bean. 1993 : To evaluate the yield of azuki bean in farmer's field after rice.
25) Soil improvement using soil conditioners	Mr. OKA DOA	Effect of yield increase of the carbonized rice husk mixed into soil on soybean was recognized.	To improve the soil productivity using soil conditioner. 1993 : To find out how to apply the carbonized rice husk.
26) Soybean root in sandy soil	Mr. OKA DOA	The severe damages of nematode for kenaf, soybean and others observed. Testing the effect of marigold on the inhibition of nematode.	To suggest how to control the root knot nematode. 1993 : To observe the control method of nematode by the marigold grown in the infected soil.
27) Improvement of Physic nut for high yield by irradiation or F1 hybridization	Ms.Wimonrat Mr.Yoshida DOA	On the clonal selection field consisted of F1 hybrid and M4 generation by irradiation, fruit setting number of Physic nut were counted.	To select high yield Physic nut clones show different ecotype in their fruiting habit. 1993 : Select the higher seed yielding clones compared with the best of the original variety was used radiation breeding.

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28) Test of adaptability of several field crops in NE	Ms.Wimonrat Mr.Yoshida DOA	Castor bean ; F1 hybrids showed higher yield than pure line varieties. Sunflower ; F1 hybrid of specific combining showed high yield and high disease resistance. Sweet potato ; There was a cultivar showed high yield for both rainy and dry season cultivation. Indian marrow ; Showed yield poorly.	To select adaptable cultivars of each field crop (Castor bean, Sunflower, Sweet Potato, Indian marrow, etc.) in Northeast. 1993 : Select high yield cultivars and clarify the most suitable cultivating condition for them.
2.1.2 Studying plant soil water relationship and other relevant issues			
1) Response of peanut lines to water deficit.	DOA	To compare selection technique for drought resistant in peanut lines, 4 techniques in field study, 1) chlorophyll content ; 2) canopy temperature ; 3) relative water content ; 4) visual observation in stress condition among the lines and 2 techniques in laboratory ; 1) germination test in osmotic stress and 2) membrane stability test. The suitable technique should be high correlation with yield in stress and non stress condition. Now we are doing germination test. The result will be reported soon.	Technique to evaluate peanut lines to water deficit. 1993 : Repetition of the selected lines on general yield trial.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
2) Effect of water stress at different growth stages on yield of peanut.	DOA	This project was carried out at ADRC. Now the report is proceeding.	To obtain suitable soil moisture content for supplying on yield and water use efficiency of peanut. 1993 : Selection of most effective on economic treatment on actual yield trial.
3) Kenaf improvement for drought tolerance : varietal selection	DOA	Cuban kenaf grown in the rainfed area could produce the fibre yield 226 kg/rai in average, it decreased 36% when compared to the irrigated ones. Kenaf varieties which adapted well in dry condition were NO.056, NS 1974-78-104-5 and 977-044.	Kenaf lines for growing drought conditions. 1993 : 1-2 lines of kenaf which adapt well and have high yield in dry condition.
4) Water management for sugarcane ratoon at Khao Suan Kwang	DOA	No carry out for this project, because the soil are latterite.	To find out water requirement of sugarcane and ratoon which increase yield to maximum yield. 1993 : To remain sugarcane ratoon in second year.
5) Water management for mulberry at Khao Suan Kwang	DOA	No carry out for this project, because the soil are latterite.	To find out how to manage water supply for mulberry 1993 : Confirm the accumulation of mulberry biomass.

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6) Light and water utilization of some sesame cultivars grown under different water regimes.	KKU	Four sesame cultivars (KKU 1, KKU 2, and MK 60) were used for investigation of light and water use efficiency. Dry matter yield, leaf area index and grain yield were recorded. Soil moisture in the root zone also monitored once a week. The results are being analysed.	1. To investigate of water and light utilization of some sesame cultivars grown under different stress conditions. 2. To study on mechanism of adaptation of water and light utilization in some sesame cultivars. 1993 : To study on mechanism of adaptation of water and light utilization in some sesame cultivars.
2.2 To develop farm management system on lowland suited to each locality			
2.2.1 Testing adaptability of crops/varieties under different soil and crop management practices.			
1) Establishment of legume crops before rice.	DLD	Use of cowpea, mungbean and S rostrara before rice, evaluate adaptability and growth in salt affected area under rainfed condition.	To study the response of local and high yielding varieties. 1993 : Proper legume for increasing of rice yield and soil.
2) Effects of precipitate on yield of some field crops growth on upland paddy soil before rice.	DOA	This project was carried out at the farmer's fields. Now the report is proceeding.	To specify crops to grow on upland by criteria of soil moisture and amount of rainfall. 1993 : Actual trial of most adapted methodology to specify crop cultivars in upland conditions.

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3) Fertilizer trial for growing sesame, kenaf, peanut and mungbean in upland paddy soil before rice.	DOA	This project was carried out at the farmer's field. Now, the report is proceeding.	To acquire most economic fertilizer application for maximum benefit of the crops on upland soil. 1993 : Actual trial in farmers' fields.
4) Soil fertility and nutrient availability under rice-soybean system using various combinations of rock phosphate, nitrogen and potassium on irrigated paddy area in Khon Kaen province	DOA	Rock phosphate was found to be replaceable for triple super phosphate. When rock phosphate was applied to rice in the first year, it would remain the effect of availalility and residual to the third year of soybean growing. The high rate (266 kg/rai) of rock phosphate was more effective than the lower one (133 kg/rai)	To evaluate the fertility of soil base on the fertilizer management under rice-soybean system. 1993 : Further field trial on sulted management of both cropping pattern in various soil and fertilizer situation.
5) Soil fertility and nutrient availability under cowpea-rice using various cowpea varieties on rain fed upper paddy in Ubon Ratchathani Province.	DOA	The rice will be harvested in November.	To compare various varieties of cowpea on soil fertility status and the availability of nutrients under cowpea-rice system. 1993 : Confirmation of green manuring from cowpea to influence soil fertility status for rice culture.

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6) The relation of leave nitrogen contents and yield of rice.	KKU	Investigation on the time course of nitrogen contents in tissues of rice has suggested that remobilization of nitrogen from leaves may occur at early stage of growth. This suggestion can also be applied to those of the stem and root, providing that the requirements of nitrogen for the formation of these tissues are constant as is the case with grain development. Because nitrogen content of leaves has direct effect on the leaf photosynthesis, therefore the mobilization of nitrogen will unevitable effect growth and yield of rice crop. The information obtained from this investigation will be used to model the effect of nitrogen on growth and yield of rice grown under various agronomic managements.	To investigate the dynamics of leaf nitrogen content and its effect on growth and yield of rice RD6. 1993 : Terminated.
7) Effect of weed control methods on yield of rainfed direct-seeded rice.	KKU	In general, cropping season of rice in rainfed start from August to December, so this project should be completed by January 1993. However, RD6 shows a little bit higher than Suphanburi 90 in plant height after 6 weeks of planting, but there is no significant from methods of weed control (chemical control vs mechanical control).	1. To study weed control methods in direct-seeded rice practical to farmers in NE Thailand. 2. To study difference rice varieties suitable to rainfed direct- seeded rice. 1993 : Terminated.

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8) Technique in growing castor bean on paddy upland rice with respect to chemical fertilizer 15-15-15 and 13-13-21 NPK formulas.	KKU	The experiment has been carried out to investigate the effect of fertilizer application upon growth and seed yields of castor bean cultivars. Chemical fertilizer 13-13-21 and 9-24-24 NPK at the rates of 30 and 50 kg/rai were used. Seed of castor bean were sown on the 1st August 1992. Plant samples were taken once at 50% bloom, only top growth dry weights and leaf areas per plant were determined. Up to this press time, the plant are still going well. It is anticipated that the final seed yields can be collected during December 1992 or January 1993. Further details of the experiment will be presented in the final report.	1. To be able to grow castor bean crop at late rainy season upland paddies those without rice crop transplanted. 2. To achieve some income out of farmer's empty upland paddy areas. 3. To transfer technology in growing castor bean crop as alternative source of income for growers in selected village. 4. To introduce new breed of short duration on growth of castor bean crop.
9) Effect of salt on the the growth of *Azolla* accessions growing on Northeastern saline soil.	KKU	The results of the experiment showed that average yield of Azolla across all 4 NaCl levels (0, 1.65, 3.3 and 6.6 g NaCl/pot) was highest in A. microphylla NE 4003 (2.82 g/pot) followed by A. coroliniana A1 (2.744 g/pot) and A. coroliniana (2.649 g/pot) respectively,	1. To select the high yield of Azolla accession growing on different level. 2. To study the effect of salt levels to the protein yield in Azolla accession. 1993 : Utilization of bio-fertilizer.
3. Development of Low-input Technology 3.1 Improvement of soil fertility in problem soils.			

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
3.1.1 Improvement of soil fertility in problem soils through application of fertilizers including minor elements, organic matter, etc.			
1) Effect of humica and compost on rice yield.	DLD	Data analysis and report proceeding.	Report of the study and simplify into appropriate technology to the farmers. 1993 : Finish.
2) Study on plant growth and decomposition of soil improvement legumes in some soil series.	DLD	Data analysis and report proceeding.	Report of the study and to recommend the suitable legumes and appropriate managements of green manuring for the farmers to get sustainable high productivity. 1993 : Finish.
3) A field trial on grass/ legume pasture and cassava for sustainable soil productivity.	DLD	Data analysis and report proceeding.	Report of the study and to recommend the suitable legume and grass in accompanying with cassava to the farmers for sustainable high productivity. 1993 : Conducting the study and report will be accomplished

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4) Planting date of legume after rice in saline soil.	DLD	The study on growing of legumes a few days after rice harvesting was laid out in split-split plot design with four replications. Cowpea and jackbean (subplot) were planted at 1,3,5 days (sub-sub plot) after harvesting, rice varieties of KDML 105 and RD 15 (main plot). Biomass and yields of legumes were recorded. Two legume crops were sown by using of residual moisture after rice harvesting. They could grow at early stage but couwpea were dead at two months after sowing because of excess water therefore biomass and yield was not produced. For Jackbean it was found that sowing at 1 and 3 days after harvesting tended to give higher biomass and yield than at 5 DAH.	To determine the optimum field trial time for planting legume after rice. 1993 : The optimuim time for planting legume crops after rice was determined.

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5) Screening for halophyte species.	DLD	Twelve species of exotic and native halophyte species were grown in sand cultured with Arnon's solution at five salinity levels ranging from 10 to 40 ppt in a net house. Survival percentage, fresh and dry weight of shoot and root, water and cations content in plant were recorded, sporoholus virginicus, both coarse and smooth forms could survive 100 percent at 40 ppt, however native species could survive with normal growth at 10 to 20 ppt Nacl level and survival percentage decreased to 10 at 40 ppt. As salinity level increased, all species tended to have higher Na contents, lower K and water contents. Evapotranspiration at high saline solution of the plants was significantly decreased. S.virginicus, Spartina patens and Distichlis spicata excreted salt through leaves, while sesuvium portulacustrum and Batis maritima showed suculence at higher concentratin. S. virginicus, S. patens, D. spicata and Batis maritma are designated	To find out proper halophyte in specific salinity levels. 1993 : Screened halophytes from nethouse and laboratory will be screened in field condition.

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		euhalophyte. S. portulacusirum, Fimbristylis acaminata, Thyropyrum panticum, Jusslaearepens, Fimbristylis ferruinea, Ipomea pes-carpae, and Azima sarmentosa are designated miohalophyte.	
6) Application of dispersion of Na 2:1 clay (Phimai) to sandy paddy soil as a soil conditioner	DLD	The results showed that rice yields tended to increase with increasing rate of Na-clay and clay content. The treatments of 2% of Na-clay, phimai clay and unplough gave the highest rice yields which were not significantly different. Infiltration rates, bulk density and hydraulic conductivity showed no significant difference between Na-clay and clay of the same rate, but they showed significantly different between plough and unplough of the control treatments.	To assess changes in physical soil upon various rates of Na 2:1 clay applied to sandy soil. 1993 : To find out the proper rate of Na 2:1 clay for good physical properties of soil and rice yield increased.
7) Use of Sesbania as green manure before rice crop in saline soil.	DLD		To determine the response of rice to four species of Sesbania as green manure. 1993 : Some species of Sesbania are selected as green manure in saline soil.

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8) Comparative study of Sesbania spp. as green manure for rice in saline and non saline soil	DLD	The results showed that four species of Sesbania responded to amendments especially S. rostrata gave the highest biomass at both non saline and saline sites. S. rostrata with amendments gave the highest biomass. Residual effects of green manure and nutrients were found at only non saline soil. N-accumulation in Sesbania were lower in saline soil than those in non saline soil. The application of amendments increased N-accumulation at both saline and non saline sites. The application of NPK to rice after Sesbania incorporation significantly increased rice yield. the residual effect of nutrients of PKS+KL+FYM applied to Sesbania was found which significantly increased rice yield.	To determine the response of rice to four species of Sesbania as green manure. 1993 : Some species of Sesbania are selected as green manure in saline soil.

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9) Use of perennial legume crops as green manure for rice in saline soil.	DLD	Results in 1991 show that cutting at 50 cm gave higher biomass than cutting at 100 cm of 4.90 and 4.08 t/ha, respectively but not significantly difference. Planting trees at spacing of 50x50 cm tended to give higher biomass than those of the spacing of 100x100 cm. but not significantly difference. It was found that S. seshan. gave the higher than S. grandiflora and L. leucocephala. After incorporation as green manure it was found that the use of S. sesban tended to give higher rice yield but not significantly difference. The effect of height of cutting and spacing on rice yield were not found.	To assess the response of rice to the biomass of tree species of N-fixing trees. 1993 : Suitable perennial legume as green manure in saline soil.
10) Influences of green manures chemical fertilizer on Rayong-3 cassava cultivar.	DOA	Cowpea is the most effective for cassa a production on Yasothon soils when compared with Crotalaria, Pigeon pea and control. Using green manuring crops are advantage strategy to sustain soil productivity.	To study on soil fertility change under cassava continuous cropping and to find out suitable legumes for green manures. 1993 : To continue practices as long term effect of cowpea in green manuring to encourage cassava yield as related to residual of chemical fertilizer.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
11) Effects of ameliorating crops and chemical fertilizer on Rayong-3 cassava cultivar on Warin soil.	DOA	By using cowpea and sword bean intercropped to cassava row and cutting at 2 months ages for mulching and applied fertilizer 8-8-8 kg of N-P_2O_5-K_2O/rai could produce the highest yield of cassava.	To maintain the long term cassava yield by using leguminous crops inter cropping. 1993 : Long term practical in continuous operation will be practiced for further evaluation and in actual farm trial.
12) Research development on soil productivity for crop production in NE.	DOA	The experiment was carried out at farmer's field, 4 locations at Khon Kaen province. Applying compost with chemical fertilizer showed the best growth than the other.	To evaluate the proper fertilizer usage and appropriate rates in relation to low input in order to get response appropriate crop yield. 1993 : To intensity the multi-locations of the trial in order to take the accuracy of fertilizer recommendation under specific methodology in further study.
13) Study on timing of fertilizer application for cassava grown in latle rainy season.	DOA	Timing of fertilizer application showed significant difference on yield of cassava. The fertilizer rate of 8-8-8 kg. N-P_2O_5-K_2O/rai was applied both at the first and the seventh months after planting could produce the highest yield. The sub-ordinate one was the cassava which were applied the fertilizer rate of 4-4-4 kg. N-P_2O_5-K_2O/rai at the same time as above. The control plot (no fertilizer application) could produce the lowest yield.	To specify the proper use and most benefit response of fertilizer on cassava yield as respected to growth seasonal. 1993 : Emphasizing the repetition of the treatments in order to verify the results for confirmation.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
14) Effect of mulching and green manuring on nitrogen fertilizer to cotton yield	DOA	From the experiment, the follow treatments got the highest biomass at the average 5 tons per rai. The growth of cotton was ununiformity, slowly due to toxicity of soil Al.	To obtain most beneficial use of nitrogen fertilizer as contributed by green manure crops and mulching operation on promoting cotton yield. 1993 : Distinct crop yield response to the treatment could be expected more efficient than that of initial results.
15) Residual effects of phosphate fertilizer on growth and yield of corn.	DOA	This project was carried out at the farmer's field. Now the report is proceeding.	Effective and economic used of rock phosphate and the combination of rock phosphate and super phosphate on long term corn production. 1993 : Further study on phosphate residual by added both rock phosphate and super phosphate to maintain or increase corn yield.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
16) Foliar application of molybdenum to soybean grown in Yasothon soil.	KKU	This study was conducted on Yasothon sandy loam soil (Oxic Paleustults) at Khon Kaen University's Research Farm Experiment Division. Treatements consist of 4 rates of sodium molybdate applied as a folliar spray. Grain yield and nodulation of soybean were determined. The resuts of this study show that spray molybdenum treatments had no significant yield effect (at P= 0.05). The application of molybdenum increased nodule formation.	To study the effectiveness of Mo by foliar application for soybean growth on acid Yasothon soil. 1993 : -
17) Improvement test of fertility of sandy soil	Dr. ISHIDA DOA	Dressing of clay loam was effective to improve a fertility of sandy soil	Further improvement of sandy soil fertility by application of organic material together with clay loam.
18) Lysimeter test for repression of fertilizer loss due to rainfall	Dr. ISHIDA DOA	Nitrogen loss was decreased by application of Azolla or Styro and soil dressing of clay loam.	Elucidation of relationship between nitrogen loss, precipitation and plant growth.
19) Application test of liming material	Dr. ISHIDA DOA	Liming at the lower part of plow layer was practically effective.	Confirmation of acidification in sandy soil after cropping and harvesting.
3.1.3 Identification of nutrients deficiency and toxicity of several elements			
1) Study on the cause of reducing growth of cotton plant in sandy soil	Dr. ISHIDA DOA	A probable cause of reducing cotton growth was toxicity of Al ion activated in a acidified sandy soil.	Improvement of strong acidity in sandy soil by liming and application of compost.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
2) Diagnosis of deficient or toxic symptom of elements by water culture in several crops	Dr. ISHIDA DOA	Toxic symptom of Al ion was appeared in corn and cotton plant by water culture	Making of a manual for diagnosis of deficient or toxic symptom of several elements in crop.
3.2 Management of organic matter			
3.2.1 Investigation of the availability of organic matter in NE			
1) Sort and amount of organic matter in NE of Thailand	DLD	Some of solid and water wastes from agro-industrial factories as sugar cane, distillery and food cans, there are lots of quantitative nutrient as nitrogen, phosphorus, potassium and magnesium which are higher than agricultural wastes.	To exploration of the sort and amount of organic waste-material management in soil and increasing crop yield. 1993 : Evaluated potential and arrangement of organic material for soil improvement.
2) Study on some properties of eucalyptus plantation soil in NE of Thailand	DLD	In the area of eucalyptus plantation, soil microbial activities and some soil essential nutrient as P_2O_5, K_2O and Mg were increase which were higher than the outside areas.	To study soil chemical properties change and microbial activities in eucalyptus planted area which has low soil available potential. 1993 : Comparison on soil biochemical changes between eucalyptus and non-plantation area.
3) Seed production Sesbania rostrata as green manure in saline soil.	DLD	Sesbania rostrata was grown at the rate of 2,4,6,8 and 10 kg/rai and decapitated at height of 50 and 100 cm under split plot design, with 3 replication. Height, biomass, N accumulation and yield of S. rostrata were recorded.	To assess the proper methodology of seed production of S. rostrata. 1993 : Appropriate technique of seed production of S. rostrata as green manure are found.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
4) Study on various sub-soiler operation for green manure crops with saturated soil on Korat series.	DLD	Data analysis and report proceeding.	Report of the study and simplify into appropriate technology to the farmers. 1993 : Finish.
5) Studies on utilization of leguminous weed as green manures.	KKU	The result obtained indicate that these leguminous seeds were relatively high (> 75%) except Sanoh-Khon which only 2% of the seed germinated under . normal condition. Incorporation of the organic matter from these leguminous weeds showed positive impact on various growth parameters of paddy rice. Results are to be presented in a final report.	To determine germination percentage, nitrogen content and the effect of the leguminous weeds. 1993 : Terminated.
3.2.2 Examination of the effects of organic matter			
1) Effect of compost on on changes of some soil properties in NE region.	DLD	In Roi-et, Nampong, Ubon and Phonphisai soil series, compost application 4 tons/rai showed effects on increasing soil microbial activities (xylanase and phosphatase) and plant nutrients as nitrogen, phosphorous, calcium and magnesium in soil.	To evaluate compost rate determination in each soil series. 1993 : Consideration compost effect to response of each soil series.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
5) Seed production of green manure and cover crops at Khao Suan Kwang Project	DLD	Plantation of Crotalaria juncea and Sesbania canabina in 4 plots area which are planted in 5 rai.	To select kinds of green manure and cover crops for extension in this region. 1993 : Arrangement the quantitative and qualitative green manure and cover crop seeds.
6) Utilization of green manure crops at Khao Suan Kwang Project.	DLD	Plantation of Crotalaria juncea and Sesbania canabina in 4 plots area which are planted in 5 rai.	To research and demonstrate green manure utilization. 1993 : Determination some field crops production after cooperated green manure plant.
7) Utilization of organic fertilizer at Khao Suan Kwang Project.	DLD	During in the stage of implementation.	To research and demonstrate various kinds of organic fertilizer for soil improvement and increasing crop yield. 1993 : Comparison kinds of organic fertilizer for improvement of soil properties and crop production.
8) Study on the incorporation of rice straw to increase organic matter for paddy soil in NE of Thailand.	DLD	Incorporation of 1 ton/rai rice straw 20 kg/rai chemical fertilizer (16-16-8) had effect more increase rice yield than no incorporation by increasing from 370.7 to 436.8 kg/rai.	To evaluate potential incorporated rice straw for increasing organic matter. 1993 : Determination suitable rate of rice straw incorporation for soil improvement and increasing crop yield.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
9) Use of nitrogen, phosphorus and potassium fertilizers for Crotalaria seed production on Yasothon series.	DLD	The weight of 100 Crotalaria seed production responded to higher rate of potassium application as 8 kg. K_2O/rai.	To evaluate suitable rate of chemical fertilizer for Crotalaria seed production. 1993 : Determination chemical fertilizer rate for increasing crop seed of Crotalaria.
10) Optimum period of decomposition after incorporated Sesbania and Crotalaria in soil for soybean yield.	DLD	During 45 days decomposed green manure plants in soil, it indicated that Sesbania planting for green manure had the effect increasing nitrogen contents in soil as 0.16% which was better than Crotalaria planting as 0.09%.	To study suitable time of decomposition green manure for soil improvement and soybean yield. 1993 : Evaluation qualitative soybean yield after incorporated green manure.
11) Study on the decomposition rate of three green manures for some soil series.	DLD	The results showed that after incorporated green manure plants as soybean, mungbean and Vigna 45 days, it had effect increasing the growth rate of sweet corn plant.	To study suitable time of decomposition mungbean soybean and cowpea for soil improvement. 1993 : Appropriate decomposition time of three green manures for soil improvement.
12) Study on various broadbed and furrow for green manure crops with saturated soil on Korat series.	DLD	Data analysis and report proceeding.	Report of the study and simplify the result and transfer an appropriate technology to the farmers. 1993 : Finish.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
13) Amelioration of chemical properties with soil amendment.	DOA	Poor growth of cotton was observed in Satuk soil with low pH and fertilizer. Lime and city compost was used for amelioration. Increase in pH and better growth of cotton was observed by this improvement. However, city compost seem to be better than lime for increasing available plant nutrient and nitrification enhancement.	To search for the most effective remedy and proper methodology in order to improve the degraded soil by using the proper amendment in respective to the ease of their availability. 1993 : Positive response on further degree of improvement from the treatment could be revealed the readjustment of the treatments could be revealed the readjustment of the treatments could also be operated.
14) Effect of organic materials management on improvement of chemical properties of Warin soil	DOA	No carry out in 1992.	To evaluate the adopted organic materials that could be applied to improve the properties in relation to their productivity of Warin soil. 1993 : Long-term evaluation of those adopted organic material must be confirmed for actual field recommendation.
15) Nitrogen cycling and organic matter in cropping patterns at Khao Suan Kwang.	DOA	Cropping pattern was set up at the first year with several patterns by using leguminous plants and economic crops.	To utilize the crop residue as nutrient recycling emphasizing on nitrogen and the enrichment of organic matter in soil form cropping pattern assessment. 1993 : To confirm the results and further recommendation of soil improvement in NE.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
16) Effects of surface placement of sesbania debris prior to incorporation in the submerged soil on growth and yield of rice and on soil properties.	Dr. WADA KKU	Effectiveness of the surface-placement of sesbania debris on plant growth was confirmed.	A propose feasible technique to farmers in utilizing sesbania debris for paddy rice. 1993 : Demonstration of the technique to the farmers.
17) Application of organic complexes for improvement of sandy soils.	Dr. WADA KKU	The test is going on in farmer's field.	1. Make use of organic materials of decrease the amount of chemical fertilizer. 2. Try to find mean to sustain soil organic matter in sandy soil. 3. To improve fertility and physical properties of sandy soil. 4. The obtained results will support courses in soil fertility, soil physics and soil microbiology. 1993 : Demonstration for improvement of sandy soil will be done at Khao Suan Kwang Demonstration Farm.
18) Study on physical properties of sandy soils after decomposition of organic matter.	KKU	Importance of fungal phyphae was found in aggregate formation.	Clarify mechanisms of aggregate-formation by applying organic amendments. 1993 : The result from prior experiment will be confirmed in the farmers' field.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
19) Effect of green manure on Nitrogen Availability in Warin Soil	DOA	Soil organic matter, total N as well as NH^{+}_{4} and NH^{-}_{3} increased in the soil amendend by green manure either mulch or incorporation. Moreover, higher uptake of N by cotton occurred in the plot treated with green manure.	To obtain the green manures which produce the high soil organic matter and N when amended by mulch ore incorporation. 1993 : To select the highest beneficial use of green manures.
20) On farm soil improvement for cassava production at Khao Suan Kwang	DOA	There were 12 treatments for improving soil productivity to raise up cassava yield and sustainable soil fertility in long term.	To obtain the treatments could improve the soil productivity and raise up the cassava yields. 1993 : To confirm to test the treatments in long term.
3.2.3 Development of techniques for making compost including appli - cation of micro-organisms.			
1) Decomposition rate of eucalyptus leaves in composting process	DLD	The results showed that the population of bacteria and actiromycetes including cellulase activities in eucalyptus residue with addition of 20% urea or with microbial were higher than only the residue. Decomposition time of eucalyptus leaves were 50 days.	To evaluate potential eucalyptus leaves utilization for compost production. 1993 : Comparison and relation on biochemical and physical properties change in decomposition process.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
2) Utilization of some organic solid waste from some industrial factories for composting.	DLD	Solid wastes from food-can industry and rice mill had the composting potential because of low C/N ratio values which were below 50 and high plant nutrient content.	To evaluate potential kinds of solid waste from the factories for compost production. 1993 : Evaluation of quantitative and qualitative solid wastes for utilizing compost.
3) Utilization of sewage from some industrial factories for composting	DLD	The water wastes from sugarcane distillery and food cans industries had the potential in industrial compost because there were lot of quantitative nitrogen content.	To evaluate potential kinds of sewage from the factories for compost production. 1993 : Evaluation of quantitative and qualitative sewages for utilizing compost.
4) Compost production at Khao Suan Kwang Project.	DLD	During in the stage of implementation.	To extent agricultural and industrial waste products for compost production. 1993 : Estimation decomposition rate of each waste material in compost pile.
5) Effect of sunn hemp management in different seed rates on some properties of soil and sunflower production.	DLD	Data analysis and report proceeding.	To transfer appropriate technology on the use of sunn hemp as green manure crop for optimizing sunflower production. 1993 : Finish.
3.3 Development of Bio-fertilizers			
3.3.1 Development of biological nitrogen fixation bacteria under problem soil condition.			

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
1) Selection of nitrogen fixing bacteria that suitable for the growth of rice which grown in the NE of Thailand	DOA	42 Samples of associative N fixing bacteria were collected from rice roots and examined the acetylene reduction activities in culture. The 3 of high activities were used with rice RD 23 in pot experiment. The result showed stimulate at the growth, dry weight of rice plant and acetylene reduction.	To find the effective strain of nitrogen fixing bacteria for use as bio-fertilizer for rice. 1993 : Selection N-fixing bacteria in field experiment.
2) Application of Azolla for rice production in the NE of Thailand.	DOA	120 samples of Azolla were collected from Thailand and grow at ADRC. Three of them were selected to study the growth in field condition Khao Suan Kwang and Ubonratchathani.	The aim of this project is to develop Azolla to be used as a bio-fertilizer for rice. 1993 : The further selection of specific Azolla suited in the region will be confirmed in actual field.
3) Effect of sodium chloride on growth and nitrogen fixation efficiency of Azolla.	DOA	Three of Azolla samples were conducted in the field at salty soil in Mahasarakam. The result is under collection.	To find the sodium chloride tolerant Azolla accession suitable for the NE. 1993 : Actual field trial on salt tolerant Azolla species selection.
4) VA Mycorrhiza inoculum production in field trial I.soil sterilization by using solarization technique.	DOA	Compare the sterilization technique for VA mycorrhiza inoculum production.	To find the method inoculance production of VA Mycorrhiza. 1993 : Similar operation will be adopted for most suited technique of VA Mycorrhiza inoculum.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
5) VA Mycorrhiza inoculum production in field trial II. selection the suitable host plant for VA Mycorrhiza production in field trial.	DOA	The sorghum was used to be the host for VA mycorrhiza production.	To find the suitable host plant. 1992 : Selection the host plant for VA Mycorrhiza production in the field. 1993 : Extensive study in selection of VA Mycorrhiza host will be extended in vast areas.
6) Effect of associative nitrogen fixing bacteria on growth and yield of sorghum at Khao Suan Kwang.	DOA	Field trials were conducted at Khao Suan Kwang. The result is under collection.	To use of N-fixing bacteria for increasing yield of sorghum in field. 1993 : Evaluation of N-fixing bacterial on yield response to sorghum.
7) Effect of blue green algae on growth and yield of rice at Khao Suan Kwang.	DOA	No carry out in 1992.	To use of BGA for increasing yield of rice. 1993 : Actual field practices of blue green algae for benefit rice yield.
8) Application of Azolla as green manure and fish fodder in rice-Azolla-fish system at Khao Suan Kwang	DOA	Field trials were conducted at ADRC. The result are under collection.	To use of Azolla as a bio-fertilizer and fish fodder for increasing farmer income in the NE with low cost input. 1993 : Field trial operation of BGA for fish feeding in rice field beside bio-fertilizer purpose.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
9) The residual effects of phosphate fertilizer and rhizobial inoculation in cropping patterns at Khao Suan Kwang.	DOA	Owing to the unsuitable soil condition this experiment was stop to proceed.	To evaluate the beneficial effect of P residue for the soybean as successive crop with the activation of rhizobium as fertilizer in cropping assessment. 1993 : Continuous operation for cropping system would be repeated in the plot treatments.
10) Study on hydrogenase of rhizobia to increase nitrogen fixation and yield of soybeans.	DOA	The relative efficiency of nitrogen fixation of the three soybean varieties (SJ. 2, SJ.5 and CM 60) by five strains of Bradyrhizobium japonicum decreased in the following order: USDA 110> USDA122> TAL379> THA7> THA2.	To find the effective strains of rhizobia for soybean. 1993 : Study on rhizobial strains for soybeans in different field conditions
11) Study on specificity of rhizobia and vegetable soybeans in Northeast.	DOA	The most effective of Bradyrhizobium japonicum for the two vegetable soybean varieties (TVB1 and TVB4) were USDA 110, TAL 379 and THA7.	To find the effective strains of rhizobia for vegetable soybean. 1993 : Selection of high nitrogen fixation of rhizobia in lowland condition.
12) Effect of rhizobial management on rootknot nematode of soybeans and blackgrams.	DOA	The amount of Bradyrhizobium 0 (control), 10^a and 10^a cells/ml were inoculated to soybeans and blackgrams grown in pots which contained the soil that nematode attacked to soybean roots. There were not sinificantly different on nodulation of Bradyrhizobium and root-knot nematode of each legumes.	To decrease the damage of nematode by rhizobial management including another methods. 1993 : To confirm the effect of rhizobial management and nematocides.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
13) The uses of rhizobial inoculation and chemical fertilizers for soybeans in Northeast at Khao Suan Kwang.	DOA	Owing to the unsuitable soil condition this experiment was stop to proceed.	To recommend the rhizobial inoculation and optimal fertilizers for soybean in NE. 1993 : Study on rhizobial inoculation and chemical fertilizer uses in irrigated areas.
14) Biological nitrogen fixation in crop patterns at Khao Suan Kwang.	DOA	Study on the nitrogen fixing activity leguminous plants by acetylene reduction assay and the total nitrogen uptake of all crops by Kjeldahl method. Now all samples were analysed in chemistry.	To quantify the amount of nitrogen fixed by biological nitrogen fixation in crop patterns grown in different soils. 1993 : Study on nitrogen fixation in crop patterns in Yasothon soil.
15) Mutagenesis on several field crops by chemical mutagen	Mr.Woravich Mr.YOSHIDA DOA	M2 seeds of Mung bean, Azuki bean, Rice bean and Cowpea (treated with EMS or EI) were harvested and sowed on September 1992.	To select super root nodule setting or other useful mutant lines of some leguminous crops. 1993 : Attempt fixation of the selected mutant lines.
3.4 Soil and water conservation on crop management. 3.4.1 Study on relationship among the parameters related to erosion such as soils, rain, crops and soil management practices.			

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
1) Effect of some vegetation covers management on soil and nutrient loss under cassava based cropping system.	DLD	No operation in 1992 should be conducted in 1993 if no problem about the budget.	To verify the management practices, e.g. contour cultivation, strip cropping, crop rotation, cover cropping and terracing to control soil erosion and to conserve moisture from crop lands, finally to transfer an appropriate technology to the farmers for sustainable high productivity. 1993 : Conducting the study and report will be accomplished.
2) Soil management for cassava cultivation.	DOA	The experiment has done in the 6th year, Verano as the live mulching crop from 1986 to 1992 has been able to grow well and cover fully in cassava area, so that it has completed to cassava.	To verify the effect of soil management practices of cover crop in related to the land preparation on cassava culture. 1993 : The effect could systematically become more pronounce as the practices have been continued.
3.4.2 Trials on various counter measures through soil and crop management.			
1) Water run off and soil loss study (Sakon Nakorn Province)	DLD	Conducting the study and collecting data until finish rainy season.	To verify the management practices, e.g. contour cultivation, strip cropping, and terracing to control soil erosion and to conserve moisture from crop land, finally to transfer an appropriate technology to the farmers for sustainable high productivity. 1993 : Conducting the study and report will be accomplished.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
2) Water run off and soil loss study (Ubon Ratchathani Province)	DLD	Conducting the study and collecting data until finish rainy season.	To verify the management practices, e.g. contour cultivation, strip cropping, and terracing to control soil erosion and to conserve moisture from crop land, finally to transfer an appropriate technology to the farmers for sustainable high productivity. 1993 : Conducting the study and report will be accomplished.
3) Water run off and soil loss study (Nakorn Ratchasima Province)	DLD	Conducting the study and collecting data until finish rainy season.	To verify the management practices, e.g. contour cultivation, cover cropping, strip cropping terracity, and grass waterway to control soil erosion and surface run off from crop land, finally to transfer appropriate technology to the farmer for suitable land utilization. 1993 : Conducting the study and report will be accomplished.
4) Study on compactness of farm-pond to prevent seepage.	DLD		To find out the proper methodology to conserve water resource in farm-pond. 1993 : Conducting the study and report will be accomplished.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
5) Study on water-run off and soil loss from different practices on inclined land.	DLD	No operation in 1992 and should be conducted in 1993.	Report of the study and to recommend the suitable vetever strip to control soil erosion. 1993 : Conducting the study and report will be accomplished.
6) Soil erosion control and moisture conservation by vegetative and mechanical method	DLD	To improve water run off storage tank ; check dam construction; growing cassava 12 plots ; conducting contour band, vetiver strip, Bahia Strip, Ruzi strip, Leuceana 2 rows and check for 6 treatments and 2 replications.	To transfer an appropriate technology to the farmers for sustainable high productivity. 1993 : Conducting the study and report will be accomplished.
7) Comparison of Srip-width of cover crop for soil and water conservation and economic out-put	DLD	Growing Crotalaria spp on 6 plots (5x60 metres) and conducting vetiver grass strip to 3, 5 and 7 rows each plot, Ruzi grass strip to 50, 100 and 150 cm width each plot.	To transfer an appropriate technology to the farmers for sustainable high productivity 1993 : Conducting the study and report will be accomplished.
8) A field trial of integrated conservation cropping system on slopping land in the Northeast	DLD	To establish ; Vetivar line, Bahia line, Ruzi line and sesbania line, growing sword bean, cowpea, black bean and mung bean as inter row between cassava.	To demonstrate various cropping system for increasing crop yield and soil water conservation. 1993 : Conducting the study and report will be accomplished.
9) A field trial on the use of some green manure crops for soil fertility	DLD	To grow ; crotalaria, cow pea, sword bean, pigeon pea and black bean, cut on blooming stage and incorporated in soil for evaluate soil fertility and using cassava as indicator plant.	To select the appropriate green manure crop for extension in this region. 1993 : Conducting the study and report will be accomplished.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
3.5 Development of plant propagation technique			
3.5.1 Plant propagation techniques by mean of tissue culture and other			
1) Tissue culture of kenaf	DOA	To select the appropriate culture and growth regulators for plantlet generations.	To achieve genetic transformation by regeneration plantlet from somatic organs. 1993 : Further searching for most effective culture media and growth regulators to produce most active plantlet for regeneration of economic field crop cultivars.
2) Tissue culture of peanut	DOA	To select the appropriate culture and growth regulator for plantlet generations.	To achieve genetic transformation by regeneration plantlet from somatic organs. 1993 : Further searching for most effective culture media and growth regulators to produce most active plantlet for regeneration of economic field crop cultivars.
3) Tissue culture of soybean	DOA	To select the appropriate culture and growth regulators for somatic embryo.	To achieve genetic transformation by regeneration plantlet from somatic organs and able to high N_2-fixation. 1993 : Study on genetic transformation by regeneration of plantlet and symbiotic N_2-fixation.

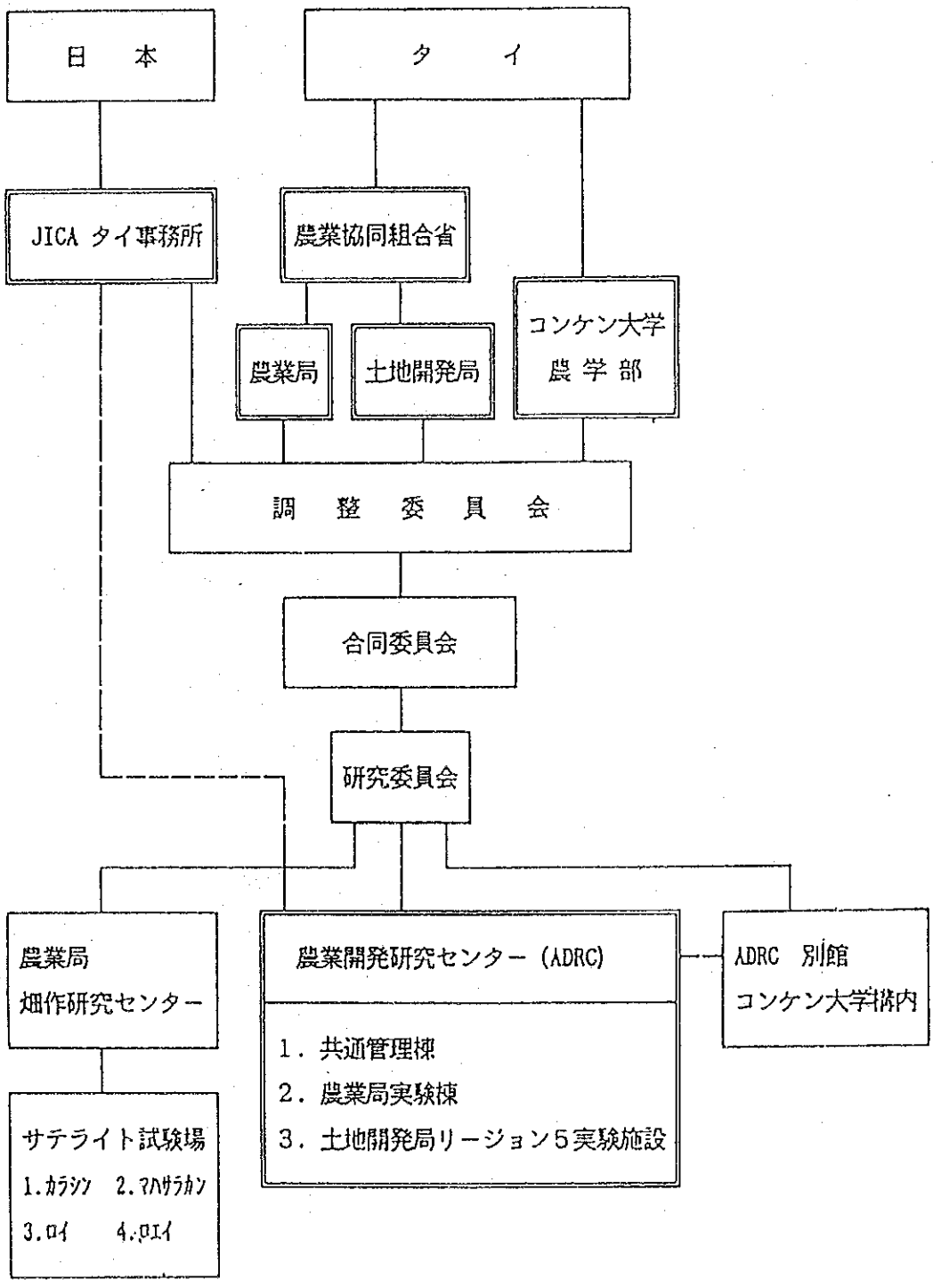
Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
4) Tissue culture of lime	KKU		To develop the methodology in production of good quality and disease free lime stock suitable for cultivation in the NE. 1993 : To select for citrus canker resistant plant.
5) Protoplast culture of tomato.	KKU	The 3rd or 4th leaves of tomato is suitable for protoplast isolation using 1% cellulase Onozuka R-10 and 0.5% maceroayme Onozuka R-10 in 0.5 M manitol. The treatment affects within 30 min. and completed within 90 min. Tomato-mesophyll protoplasts could be regenerated cell wall quickly in liquid modified B5 media with 7% manitol, 1% sucrose, 0.5% glucose, 1% liquid endosperm of coconut which containing 0.1% liquid endosperm of coconut which containing 0.1 ppm BA, 1 ppm NAA and 1 ppm 2, 4-D.	1. To study suitable conditions for protoplast culture of various tomato varieties. 2. To develop methodology and technique for tomato protoplast culture and to increase variability. 3. To develop suitable media for plantlet formation from protoplast. 1993 : On going.

Program & Sub-program Research Title	Thai Authority	Achievement in 1992	Final Objectives Proposed progress in 1992 Proposed progress in 1993
6) Improvement of agricultural productivity through biotechnology.	KKU		1. To develop biotechnological technique for using as a mean of agricultural productivity improvement. 2. To develop new crop varieties suitable for growing in NE condition. 3. To use tissue culture technique for rapid multiplication of some economic crops. 1993 : 1. Embryo culture of inter specific hybridization of peanut and sesame. 2. Study on transplanting technique from laboratory to the field.

Ⅳ　プロジェクト関係組織図

プロジェクト関連組織・機構図

プロジェクト関連組織・機構図



V　カウンターパート等配置状況

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		CP: Mr.Teardsak Subhasaram(DLD)
		TR: Ms.Tadtaya Boonjing
		WK: Mr.Bouyfong Jumpabung(DLD)
土壌分類	神山和則	CP: Mr.Somsak Sukchan(DLD)
		Dr.Paiboon Pramojanee(DLD)
		Mr.Pichai Wichaidit(DLD)
		TR: ~~Ms.Taddawan Phukheed~~
		WK: ~~Mr.~~Samorn Keoynaiwang(~~DLD~~)
土壌肥沃	石田　博	CP: Mr.Boonlert Boonyong(DOA)
		Mr.Woravich Rungrattanakasin(DOA)
		TR: Ms.Pensri Kumpituk (Lab.)
		WK: Mr.Densho Chanreong(DOA)
作物育種	吉田博栽	CP: Ms.Wimonrat Sukarin(DOA)
		TR: Mr.Danai Chantaket"
		WK: Mr.Suriyon Janthree(DOA)
作物栽培	岡　　啓	CP: Mr.Somsak Ithipongse(DOA)
		TR: Mr.Danai Chantaket"
		WK: Ms.Plern Buddanoi(DOA)

註；CP=カウンターパート、TR=トレイニー（臨時雇用）、
WK=室内及びほ場作業員、"＝共用トレイニー。

VI パイロットファームにかかわる活動計画

SUMMARY

Proposal for Research and Demonstration

at Khao Suan kvang Demonstration Farm, Fy 1992 (2535)

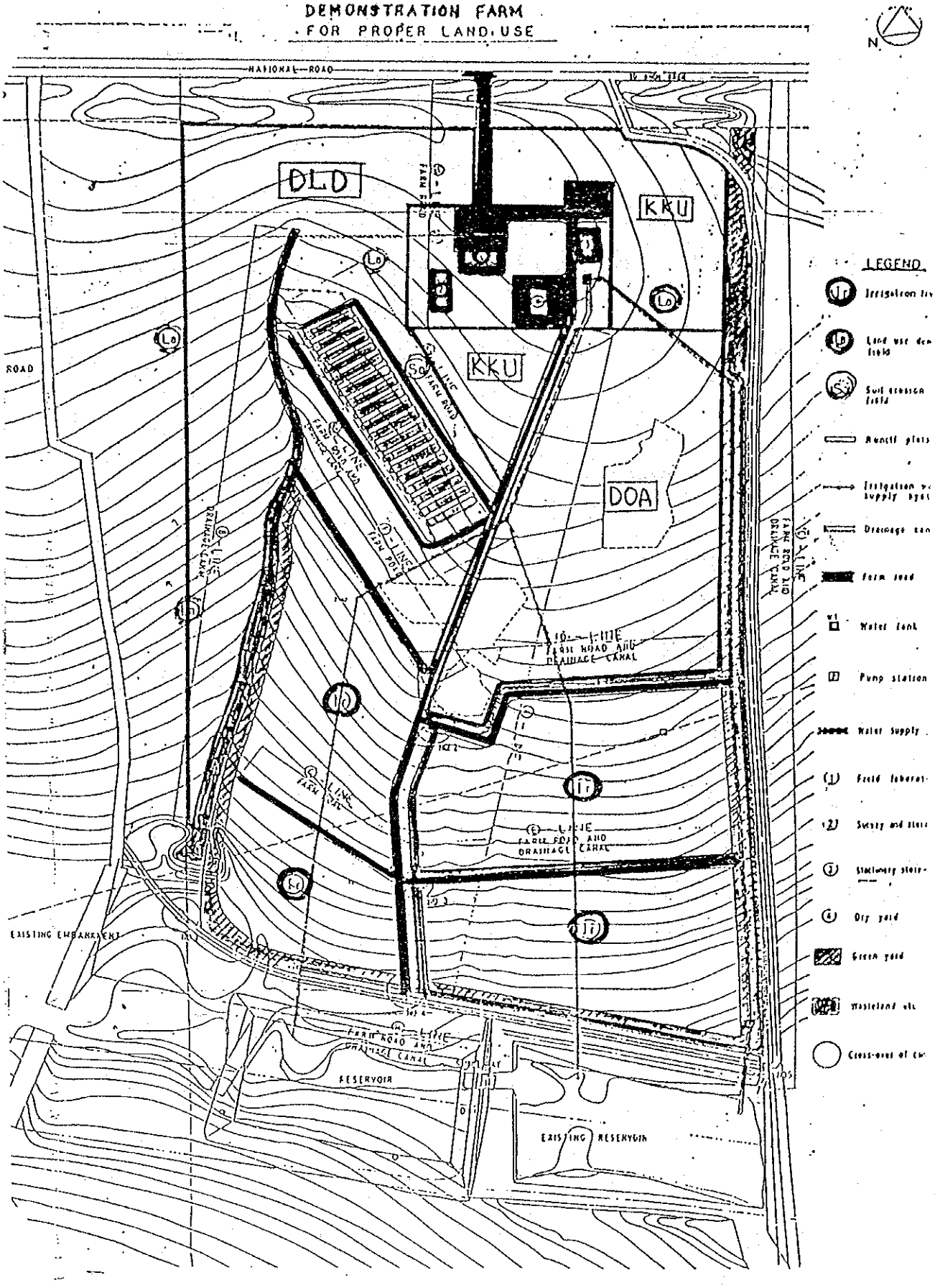
Agency	Projects	Period	Location		Remarks
			Block No.	Area (rai)	
1) DOA	1. On Farm Promising Crop Varieties Trials	Jun 1992-1996	A-3 (Non - Irrigated)	2.0	Mr. Veerachart
	2. On Farm Cultural Practice Trials for cassava and Roselle	Jun 1992-1996	A-3	1.0	Mr. Vinai Sornwat
	3. On Farm Cropping Patterns Trial for some crops	Jun 1992-1996	Highway Patrol (Non-Irrigated)	3.0	Mr. Tithi Sintunakorn
	4. On Farm Maximum Yield Trial for Economic crops	Jun 1992-1996	A-3	3.0	Mr. Prasart Kesawapitak Mr. Boonlert Boonyong Mr. Kobkiet Paisancharoen
	5. Biological Nitrogen Fixation (BNF) and Organic Residue in Cropping System	Jun 1992-1996	A-3	2.0	Mr. Woravich Rungrattanakasin Mr. Nanthakorn Boonkerd Mr. Prosope Weerakornpanichya

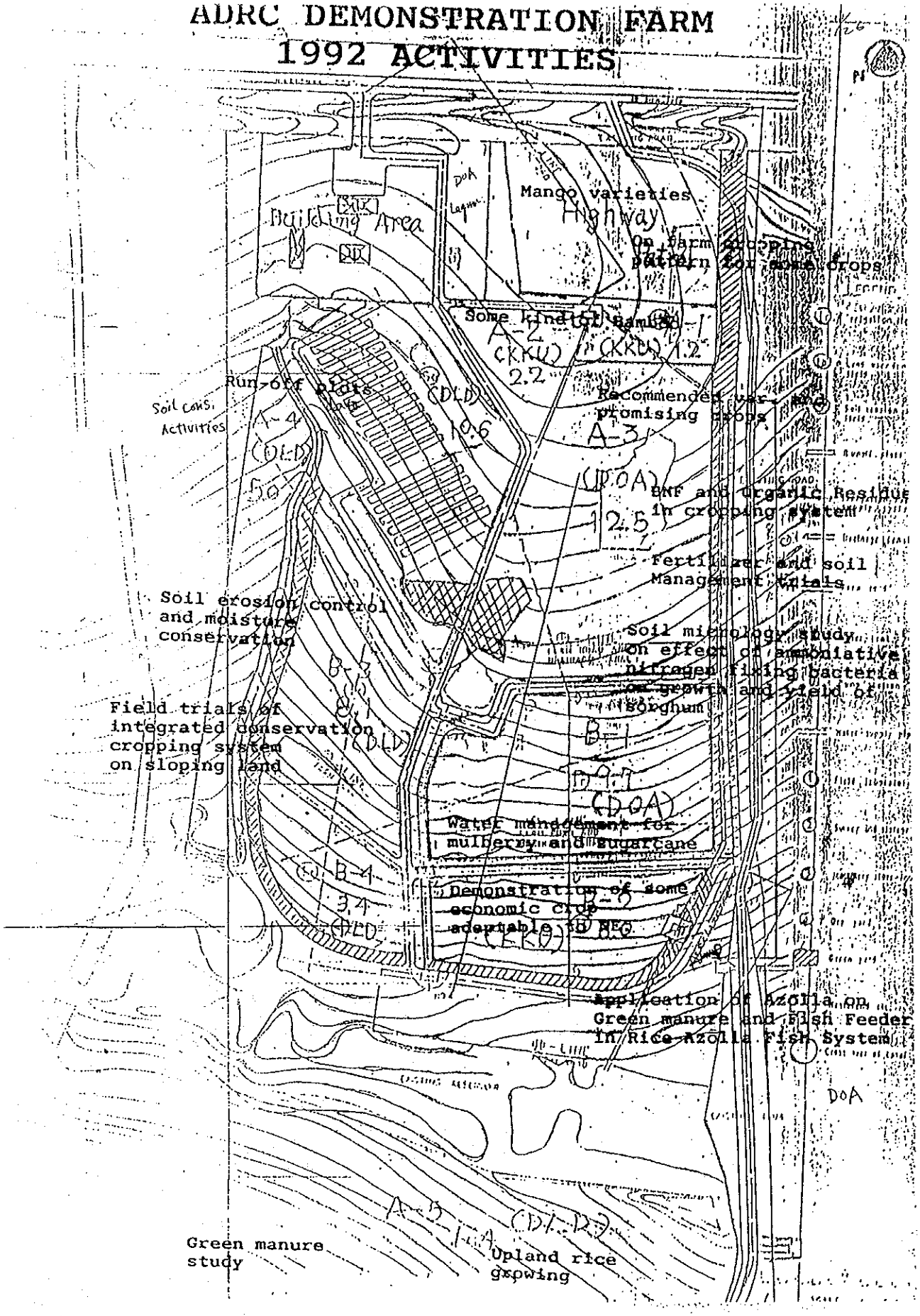
Agency	Projects	Period	Location		Remarks
			Block No.	Area (rai)	
	6. Effect of Associative Nitrogen Fixing Bacteria on Growth and Yield of Sorghum	Jun 1992-1996	A-3	1.0	Mr. Banhan Tangchum
	7 Water Management for Sugar-cane	Nov. 1992-1996	B1 (Irrigation)	2.0	Mr. Uthai Arromratana
	8 Water Management for Mulberry	May, 1993-1996	B1	2.0	Mr. Uthai Arromratana
	9. Effects of Tree and Cover crop on soil fertility and upland Rice Yield	Jun 1992-1996	Ley farming area	3.0	Mr. Wittaya Seetanun Mr. Jiraphong Prasithikete
	10 Effect of Blue Green Algae on Growth and Yield of Rice	Jun 1991-1996	Farmer Land	4.0	Mr. Somporn Choonluchanon
	11. Application of Azolla as Green Manure and Fish Feeder in Rice Azolla-Fish System	Jun 1992-1996	Farmer land	4.0	Mr. Prayoon Swatdee Mr. Somporn Choonluchanon

Agency	Projects	Location		Remarks
		Block No.	Area (rai)	
2) DLD	1) STudy on Soil Erosion Control and Moisture Conservation by Vegetative and Mechanical Methods	Lo	@ 10	
	1.1 Soil Erosion Control and Moisture Conservation by Vegetative and Mechanical Methods - Check - Contour bank - Vetiver strip - Bahia strip - Ruzi - leuciana			Mr. Rungrote Puengpan
	1.2 Comparison of Strip-width of Cover crop for soil and water conservation and Economic out-put - Vetiver Grass : 1, 3, 5 rows - Ruzi Grass : 50, 100, 150 cm. in strip	Lo		Mr. Rungrote Puengpan
	2) Study on improvement Korat Soil series by using organic and chemical fertilizer to growth and yield of corn	A5		

Agency	Projects	Location		Remarks
		Block No.	Area (rai)	
	3) A Field trials of integrated conservation cropping system on slopping land in the Northeast	B3		Mr. Choompol Khone-Silapa
	4) Seed production of green manure and cover crops at Khao Suan Kwang Project	A5		Ms. Siangjeaw Piriyaprin
	5) Utilization of green manure crops at Khao Suan Kwang Project	A5		Ms. Siangjeaw Piriyaprin
	6) Utilization of organic fertilizer at Khao Suan Kwang Project	B4		Ms. Siangjeaw Piriyaprin
	7) Compost production at Khao Suan Kwang Project	B4		Ms. Siangjeaw Piriyaprin

Agency	Projects	Location		Remarks
		Block No.	Area (rai)	
3) ANNEX (KKU)	1. Demonstration of Mangoes var. and demonstrate grafting	A-1 (Non-Irrigated)	1.8	3x3 m of spacing
	2. Demonstration of bamboo	A-2 (Non-Irrigated)	2.4	6x6 m of spacing
	3. Demonstration of economic field crops adaptable to Northeast condition eg. Sesbania spp.	B-2	1.0	
	4. Demonstration of some fruit crops and promising trees ie. mango	B-2	2.0	


DEMONSTRATION FARM
FOR PROPER LAND USE
N
NATIONAL ROAD
DLD
KKU
KKU
DOA
ROAD
EXISTING EMBANKMENT
RESERVOIR
EXISTING RESERVOIR
LEGEND


ADRC DEMONSTRATION FARM
1992 ACTIVITIES
Mango varieties
On farm cropping pattern for some crops
Some kind of Banana
Run-off plots
Soil cons. Activities
Recommended var. and promising crops
BNF and Organic Residue in cropping system
Fertilizer and soil Management trials
Soil erosion control and moisture conservation
Soil microbiology study on effect of ammoniative nitrogen fixing bacteria on growth and yield of sorghum
Field trials of integrated conservation cropping system on sloping land
Water management for mulberry and sugarcane
Demonstration of some economic crop adaptable to the area
Application of Azolla on Green manure and Fish Feeder in Rice-Azolla-Fish System
Green manure study
Upland rice growing

日本側投入実績

平成４年度（1992年）については予定分。

１．長期専門家の派遣

(1)	八田貞夫	チームリーダー	84. 3. 25. ～90. 3. 24.	フェーズIより継続
(2)	岡部俊	作物栽培	85. 4. 3. ～89. 11. 30.	フェーズIより継続
(3)	大東宏	栽培／永年作物	86. 9. 24. ～89. 8. 19.	フェーズIより継続
(4)	白石勝恵	土壌肥沃度	86. 12. 23. ～89. 12. 22.	フェーズIより継続
(5)	三浦憲蔵	土壌分類	87. 4. 14. ～90. 5. 31.	フェーズIより継続
(6)	鎌田和彦	業務調整	87. 4. 14. ～91. 4. 13.	フェーズIより継続
(7)	牛膓英夫	作物育種	87. 12. 10. ～89. 12. 19.	フェーズIより継続
(8)	和田秀徳	土壌化学	89. 9. 12. ～91. 9. 11.	
(9)	岡　啓	作物栽培	89. 12. 12. ～93. 12. 19.	
(10)	石田博	土壌肥沃度	90. 2. 2. ～93. 1. 30.	
(11)	後藤虎男	チームリーダー	90. 3. 6. ～92. 4. 5.	
(12)	吉田博哉	作物育種	90. 4. 12. ～93. 4. 11.	
(13)	太田健	土壌分類	90. 9. 1. ～92. 10. 31.	
(14)	大谷和彦	業務調整	91. 3. 31. ～93. 3. 30.	
(15)	日高輝展	チームリーダー	92. 3. 31. ～93. 12. 19.	
(16)	和田秀徳	土壌化学	92. 3. 31. ～93. 12. 19.	
(17)	神山和則	土壌分類	92. 10. 7. ～93. 12. 19.	

２．短期専門家の派遣

平成元年度			
(1)	谷山一郎	土壌物理学	89. 8. 3. ～89. 10. 21.
(2)	蒲生卓磨	土壌微生物	89. 10. 10. ～89. 11. 8.
(3)	藤元秀光	機械修理	89. 11. 6. ～89. 12. 15.
平成２年度			
(4)	江田一之	水文	90. 4. 24. ～90. 6. 7.
(5)	服部共生	地質	90. 5. 24. ～90. 7. 23.
(6)	秋山豊	土壌物理学	90. 10. 11. ～90. 11. 24.
(7)	山田一郎	土壌分類	90. 12. 3. ～91. 2. 2.
(8)	野中昌法	土壌微生物	91. 3. 12. ～91. 4. 1.
平成３年度			
(9)	石山茂	施工監理	91. 7. 20. ～91. 9. 17.

(10)	後藤義徳	施工監理	91. 7. 20. ～92. 3. 15.
(11)	石田良作	作物体系	91. 8. 7. ～91. 9. 6.
(12)	石原暁	土壌保全	91. 8. 20. ～91. 9. 19.
(13)	松田長生	植物組織培養	91. 11. 1. ～91. 11. 30.
(14)	松口龍彦	土壌微生物	91. 11. 26. ～92. 1. 8.
(15)	高橋英一	作物生理	91. 12. 21. ～92. 2. 20.
	平成４年度		
(16)	久島繁	作物育種	92. 8. 5. ～92. 9. 29.
(17)	櫻井泰弘	土壌分類	92. 9. 17. ～92. 10. 16.
(18)	上野義視	土壌侵食	92. 10. 20. ～92. 12. 20.
(19)	高見晋一	作物生理	92. 10. 30. ～92. 11. 30.
(20)	石田良作	作付体系	92. 12. 8. ～93. 3. 7.
(21)	大谷卓	土壌微生物	93. 2. 15. ～93. 4. 14.
(22)	浅川征男	少資材持続型農業	93. 2. 15. ～93. 3. 14.

３．研修員の受入れ

	平成元年度		
(1)	Mr.Bunharn Tangcham (DOA)	土壌細菌	89. 9. 4. ～90. 2. 23.
(2)	Dr.Somsri Arunin (DLD)	土壌塩分	89. 9. 24. ～90. 10. 7.
(3)	Ms.Ketsuda Dejbhimon (KKU)	土壌分析	89. 10. 29. ～90. 3. 4.
(4)	Mr.Nukun Tawinthung(DLD)	土壌肥沃度	90. 2. 5. ～91. 2. 28.
	平成２年度		
(5)	Mr.Paitoon Palayasoot(MOAC)	視察	90. 8. 6. ～90. 8. 21.
		潅漑・土地開発	
(6)	Mr.Seree Supametee(ADRC･OPS)	果樹・野菜	90. 8. 27. ～90. 11. 13.
(7)	Mr.Poonya Paosritongkum(DLD)	土壌調査	90. 8. 27. ～90. 11. 3.
(8)	Ms.Taksina Sansayawichai(DOA)	大豆・豆類生産	90. 9. 2. ～90. 11. 13.
(9)	Mr. Varin Tongchareon(KKU)	竹栽培	90. 10. 7. ～90. 12. 1.
	平成３年度		
(10)	Mr.Uthai Arromratana(DOA)	土壌物理	91. 7. 15. ～91. 11. 12.
(11)	Mr.Chumpol Knsilapa(DLD)	土壌肥沃度	91. 9. 16. ～91. 10. 15.
(12)	Mr.Wisuthi Amaritsut(ADRC･OPS)	視察	91. 9. 23. ～91. 10. 8.
(13)	Dr.Adul Apinantava(KKU)	視察	91. 9. 23. ～91. 10. 8.
	平成４年度		
(14)	Dr.Phaisal Supharugkasen(DOA)	視察	92. 9. 6. ～92. 9. 17.
(15)	Mr.Somsak Sukchan(DLD)	土壌調査	92. 9. 7. ～92. 11. 17.
(16)	Ms.Wapakorn Amondham(ADRC･OPS)	情報処理	92. 9. 7. ～92. 11. 17.
(17)	Dr.Nimit Vorasoot(KKU)	土壌気象学	92. 12. 16. ～93. 1. 30.

４．機材供与

昭和６３年度（1988･12 ～ 1989･ 3）

供与機材（購送）	0 円
供与機材（現地）	0 円
計	0 円

携行機材　470千円

平成元年度（1989･ 4 ～1990･ 3 ）

供与機材（送付）	26,984 千円
供与機材（現地）	6,169 千円
計	33,153 千円

主要機材内容（本部）：トレンチャー噴霧機、通話システム
（現地）：農業機械、車両、分析機器

携行機材　4,898 千円

平成２年度　（1990･ 4 ～1991･ 3 ）

供与機材（購送）	2,705 千円
供与機材（現地）	21,354 千円
計	24,059 千円

主要機材内容（本部）：広域土壌ｐｆ測定器、土壌団粒分析器
（現地）：オーディオシステム、画像解析システム、
作物カッター装置

携行機材　4,711 千円

平成３年度　（1991･ 4 ～1992･ 3 ）

供与機材（購送）	21,997 千円
供与機材（現地）	21,001 千円
計	42,998 千円

主要機材内容（本部）：マントルヒーター、恒温培養器
（現地）：種子保存庫、トラクター

携行機材　4,124 千円

平成４年度　（1992・４～1993・３）

供与機材（購送）　　0 円

供与機材（現地）　27,361 千円

計　　27,361 千円（12月現在）

主要機材内容（現地）：走査電子顕微鏡、電子天秤、ワゴン、ピックアップトラック他

携行機材　　3,500 千円

㊟ 1)供与機材（購送）はタイ側の要請で日本で調達して送付した機材
2)供与機材（現地）はタイ側の要請で現地で調達した供与機材
3)携行機材は赴任時又は任期中の専門家からの要請で携行又は購送された機材

５．ローカルコスト負担事業

(1) 現地業務費

昭和63年度	2,721,058円
平成元年度	11,069,799円
平成２年度	11,472,210円
平成３年度	51,672,941円
平成４年度	10,521,000円

(2) ローカルコスト負担主要内訳

①一般現地業務費	昭和63年度	1,731,058円	
	平成元年度	6,831,799円	
	平成２年度	4,817,000円	
	平成２年度	964,000円	臨時支給分（報告書作成費）
	平成３年度	6,680,675円	
		7,715,000円	
②現地研究費	昭和63年度	660,000円	
	平成元年度	2,400,000円	
	平成２年度	2,400,000円	
	平成３年度	1,620,000円	
	平成４年度	2,379,000円	
③貧困国対策費	昭和63年度	330,000円	
	平成元年度	1,200,000円	
	平成２年度	1,200,000円	
	平成３年度	810,000円	
④応急対策費	昭和63年度	2,513,000円	平元へ繰越　ADRC浄水施設

⑤技術普及広報費　　平成２年度　　511,000円
　　平成４年度　2,146,000円
⑥現地セミナー開催費　平成２年度　1,236,000円　示達分
　　平成３年度　1,500,000円　示達分
　　1,200,000円
⑦技術交換費　　平成２年度　1,513,000円　追加示達分
ネパール村落共同森林開発計画及びネパール流域管理保全訓練計画を対象とした地力低下防止のための技術交換

⑧ﾌﾟﾛｼﾞｪｸﾄ基盤整備費　　平成３年度　　810,000円
・パイロットインフラ　平成３年度　51,245,941円　（専門家派遣）
畑作実証試験・展示農場整備工事

⑨ﾌﾟﾛｼﾞｪｸﾄｾﾐﾅｰ開催費　　平成元年度　　638,000円
　　平成２年度　2,544,210円
　　平成３年度　1,475,754円

６．調査団の派遣

平成元年度
計画打合調査団　　1989年 8月 9日～1989年 8月19日
総括／土壌：大野芳和　農林水産省熱帯農業研究センター調査情報部長
研究協力：　後藤正義　農林水産省農林水産技術会議事務局国際研究課研究協力係長
栽　　培：　桃木徳博　農林水産省九州農業試験場総合研究第２チーム長
業務調整：　宮下信夫　国際協力事業団農業開発協力部付

平成２年度
実施設計調査団　1990年11月28日～1990年12月 9日
総　　括：石田　哲　　農林水産省構造改善局事業計画課
業務調整：永井和夫　　国際協力事業団農業開発協力部農業技術協力課
圃場計画：石山　茂樹　日本技研株式会社
施設設計：近藤兼一郎　日本技研株式会社

平成３年度

巡回指導調査団　1991年12月 8日～1991年12月18日

総括／営農体系：	日高輝展	農林水産省熱帯農業研究センター研究第一部長
土　　壌：	西 宗 昭	農林水産省北海道農業試験場畑作管理部 畑土壌管理研究室長
栽　　培：	松尾和之	農林水産省農業研究センター耕地利用部 畑作付体系研究室主任研究官
業務調整：	渋澤孝雄	国際協力事業団農業開発協力部 農業技術協力課

備考：　本プロジェクトは昭和６３年度に実施したフェーズＩの終了時評価調査（1988年 7月18日～1988年7 月28日）時に更なる５年間の協力についての勧告を基に要請がなされ（1988年12月）、現地にて斉藤勉ＪＩＣＡタイ事務所長によりＲ／Ｄの署名が行われた（1988年12月16日）。従って事前調査団及び実施協議調査団は派遣されていない。

主要機材の利用、管理、処分状況表

（１６０万円或いは３０万バーツ以上の機材）

１６０万円未満の機材については、その数が多いいことから、記載しない。

プロジェクト名：東北タイ農業開発研究計画フェーズII

平成４年10月１日現在

TY	YR	EQUIPMENT	MAKER	MODEL	SUPP	EXIS	PLACEMENT	USE	MA	CR	PRICE	REMARK
GA	83	Geological Model	Tokyo Maekawa	Topoger & Geology	1	1	CM-EH	A	B	Y	11,590,000	
GA	83	Show Case	Tokyo Maekawa	NO.1	16	16	CM-EH	A	B	Y	3,544,000	
GA	83	Plate Maker	Mitsubishi P. Mills	Silver Master 150V	1	1	CM-PR	C	B	Y	1,715,000	
GA	83	Printing Offset Press	Ryobi	3200A	1	1	CM-PR	C	B	Y	3,351,000	
GA	83	Folding Machine	Shukosha	Olipet P-470	1	1	CM-PR	C	B	Y	4,186,000	
GA	83	Station Wagon	Mitsubishi	A163JJR	2	2	CM-STRWS	A	B	Y	3,110,000	
GA	83	Jeep	Mitsubishi	LO43GVFSR	1	1	CM-STRWS	A	B	Y	1,832,000	
GA	83	Buldozer	Caterpillar	D3B	1	1	DLD-RV	C	A	Y	6,376,000	
GA	83	Wheel Loader w/Back Hoe	Furukawa	FL-120A	1	1	DLD-RV	C	A	Y	8,578,000	
GA	83	AA Flame Emission Spectrophotometer	Sanshi Kogyo	AA-630-12	1	1	DLD-SC	A	A	Y	3,200,000	
GA	83	Auto Titrator	Hiranuma Sangyo	Comtite-75	1	1	DLD-SC	D	B	Y	1,750,000	計測の初期設定が困難な為
GA	83	Microscope	Nikon	Optiphot (xt-21)	1	1	DLD-SM	C	A	Y	2,511,800	
GA	83	Pressure Membrane Apparatus	Daiki Rika Kogyo	DIK-3500	2	2	DLD-SP	A	A	Y	1,623,000	
GA	83	Motor Drive Drilling Rig	Itoh Chisitsu	SM-20	1	1	DLD-SS	C	B	Y	2,048,000	
GA	83	Climatic App.(Weather Station)	Nakaasa	M-702	1	1	DLD-SS	A	C	Y	4,250,000	
GA	83	Side Table (W180 cm)	Siam Steel		20	20	DOA	A	A	Y	2,600,000	
GA	83	Super Porometer	LI-COR Instruments		1	1	DOA-CS	C	A	Y	3,709,700	
GA	83	Leaf Area Meter w/Calculator	Hayashi Denkoh	AAM-7	1	1	DOA-CS	E	C	Y	2,576,200	研究員不在の為
GA	83	AA/Spectrophotometer	Shimadzu	AA-630-12	1	1	DOA-SC	B	A	Y	3,220,200	
GA	83	Freezer	Mitamura Riken Kogyo	MDF-339	1	1	DOA-SM	A	A	Y	1,932,000	
GA	83	French Press	Ohtake	5501-M	1	1	DOA-SM	A	A	Y	1,661,600	
GA	83	Gas Cromatograph	Shimadzu	GC-7AGPRTF	1	1	DOA-SM	B	A	Y	3,246,000	
GA	83	Pressure Membrance Apparatus	Daiki Rika Kogyo	DIK-3500	2	2	DOA-SP	A	A	Y	1,623,000	
GA	83	Center Table w/Sink	Siam Steel		6	6	DOA*	A	A	Y	2,354,400	
GA	83	Tractor (2 Wheel Drive)	Kubota	M4500	1	1	DOS-FCRC	A	A	Y	3,060,000	
GA	83	Tractor (2 Wheel Drive)	Kubota	M7500	1	1	DOS-FCRC	A	A	Y	3,570,000	
GA	83	Center Table w/Sink	Siam Steel		8	8	KKU	A	A	Y	3,139,200	
GA	83	Jeep	Mitsubishi	LO43GVFSR	1	1	KKU	A	B	Y	1,832,000	
GA	83	Solarimeter	EKO Instruments	MS-42	1	1	KKU-AGC	A	A	Y	1,880,000	
GA	83	Self Recording Rain Guage	Ota Keiki	OS-48,48A	20	19	KKU-AGC	C	A	Y	3,090,000	1器:雷により破損、10器現場にて使用
GA	83	Neutron Probe	Vinten Instruments	NO.225	1	1	KKU-AGC	B	B	Y	6,103,100	
GA	83	Soil Core Tube	Maruhon Kohsan	ST-1	500	500	KKU-AGC	C	B	Y	7,000,000	
GA	83	Plasma Emission Spectrometer	Shimadzu	ICPS-50A	1	1	KKU-CA	B	B	Y	11,000,000	
GA	83	UV Recording Spectrophotometer	Shimadzu	UV-240	1	1	KKU-CA	B	A	Y	2,580,000	

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プロジェクト名：東北タイ農業開発研究計画フェーズII　　平成４年10月１日現在

TY	YR	EQUIPMENT	MAKER	MODEL	SUPP	EXIS	PLACEMENT	USE	MA	CR	PRICE	REMARK
GA	83	Bomb Calorimeter	Shimadzu	CA-3P	1	1	KKU-CA	D	A	Y	2,400,000	研究が第１フェーズで終了した為
GA	83	High Speed Liquid Chromato.	Hitachi	NO.665	1	1	KKU-CA	D	C	Y	13,400,000	インジェクターの修理が現地では困難
GA	83	Gas Chromatograph/Data Processor	Shimadzu	GC-7AGPrTF,C-RIB	1	1	KKU-CA	B	A	Y	3,246,000	
GA	83	Leaf Area Meter w/Calculator	Hayashi Denkoh	AAM-7/CBM1610	1	1	KKU-CP	B	A	Y	2,589,000	
GA	83	Root Scanner	Common Wealth	Comair Root	1	1	KKU-CP	B	A	Y	2,820,000	
GA	83	Super Porometer	LI-COR Instruments	LI-1600C	1	1	KKU-CP	C	A	Y	4,200,000	
GA	83	Binocular Microscope	Nikon	PFX	1	1	KKU-MBA	B	B	Y	2,780,000	
GA	83	Safety Cabinet	Hitachi	SCV-1301 ECII	1	1	KKU-MBA	B	C	Y	2,670,000	
GA	83	Liquid Scintillation System	Beckman Insrument	LS-1800	1	1	KKU-PA	B	A	Y	6,917,000	度の使用
GA	83	N 15 Analyzer System	Japan Spectroscopic	N-15	1	1	KKU-PA	D	A	Y	9,446,000	N15が非常に高価である為、必要最小
GA	83	Chemicals (Isotopes)	Shokotsusho		1	1	KKU-PA	D	A	Y	2,044,000	担当研究員が不在の為
GA	83	Microbus	Mitsubishi	LO68PWQNR	1	1	KKU-RDI	A	B	Y	3,044,000	
TA	84	Pick-up Truck (Double Cab Type)	Isuzu	KBD27	1	1	CM-STRWS	A	B	Y	1,900,000	
TA	84	Tractor (80 PS)	Kubota	M7500DT	1	1	DLD-RV	C	A	Y	5,432,200	
TA	84	Pick-up Truck (Double Cab Type)	Isuzu	KBD27T	1	1	DLD-RV	A	A	Y	1,900,000	
TA	84	Hot Air Drying Oven	Ikeda Rika	YK-120SP	2	2	DOA-FCRC	B	A	Y	2,636,000	
TA	84	Ultrasonic Vibrator for Soil	Tokyo Rika	UD-2N-700	1	1	DOA-SP	C	A	Y	1,646,120	
TA	84	X-Ray Diffractometer	Shimadzu	XD-3A	1	1	KKU-PA	B	A	Y	8,775,800	
TA	84	Ultra Centrifuge w/Attachments	Hitachi	55P-72	1	1	KKU-PA	D	A	Y	4,800,000	修理中、修理後は使用頻度は高まる
TA	85	Land Cruiser	Toyota	HJ60RG-K	1	1	CM-STRWS	A	B	B	316,700	
TA	85	Microbus(Coaster Deluxe)	Toyota	BB20R-MDR	1	1	CM-STRWS	A	B	B	410,300	
TA	85	Water Tank Lorry	Isuzu	FSR-102	1	1	CM-STRWS	A	B	B	575,000	
TA	86	Kjeldatherm Digestion Complete Syste	Gerhardt		1	1	DLD-SC	B	B	B	358,800	
TA	86	N/C Analyzer	Sumitomo Kagaku	NC-80-Auto	1	1	DLD-SM	A	C	Y	10,960,000	
TA	86	Auto Green Leaf Meter	Hayashi Denkho	AAC-400	1	1	DOA-CS	B	A	Y	2,900,000	
TA	86	Portable Photosynthesis System	LI-COR Instruments	LI-6200	1	1	DOA-SM	B	A	B	644,750	
TA	86	Green House	Universal Food		1	1	KKU	A	A	B	548,000	
TA	86	Osmo Meter	Advance	3WIII	1	1	KKU-CP	C	A	Y	2,350,000	
TA	86	Bio-Tron	Nihon Rika	LH300RDS	1	1	KKU-MBA	D	A	Y	2,176,000	1回の使用で占有する時間が長い為
TA	87	Water Pump	Ritz	4620.3	1	1	CM	C	B	B	480,000	
TA	87	Micro Computer	IMB	PS-2 8580/111	1	1	CM-CP	A	B	B	409,880	
TA	87	Land Cruiser	Toyota	HJ60RG-KN	1	1	CM-STRWS	A	B	B	479,500	
TA	87	Pick-up Truck	Isuzu	KBD28TW/W	1	1	DLD	A	A	B	349,200	
TA	87	Pick-up Truck	Isuzu	KBD28TW/W	1	1	DOA	A	A	B	349,200	
TA	87	Autoclave	Kiya Seisakusho	NO.270SS-8	1	1	DOA-SM	B	A	Y	4,660,000	
TA	87	Neutron Probe (Surface Type)	Troxler	3401B	1	1	DOA-SP	C	C	B	371,250	
TA	87	AA Flame Spectrophotometer	Shimadzu	AA-670	1	1	KKU-CA	B	B	B	835,200	
TA	87	Portable Photosynthesis System	LI-COR Instruments	LI-6200	1	1	KKU-CP	B	A	B	644,750	

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プロジェクト名：東北タイ農業開発研究計画フェーズ II　　平成４年10月１日現在

TY	YR	EQUIPMENT	MAKER	MODEL	SUPP	EXIS	PLACEMENT	USE	MA	CR	PRICE	REMARK
TA	88	Net House			1	1	CM	A	B	B	520,000	
TA	88	2. Personal System (M.Computer)	IBM	8550/061	2	2	CM-CP	A	A	B	331,000	
TA	88	Land Cruiser	Toyota	HJ 60 RG-KN	1	1	DLD	A	A	B	557,000	
TA	88	Sprinkling Intensity Meter	Daiki Rika Kogyo	DIK-1260 S	1	1	DLD-SCV	C	A	Y	2,700,000	
TA	88	Data Acquisition/Control Syst.	Hewlett Packard		1	1	DOA-FCRC	C	A	B	483,900	
TA	88	Auto Analyzer	Technicon	AA II GTpc	1	1	DOA-SM	C	B	B	1,680,000	
TA	88	Draft Chamber	Kaname	TKT 160	1	1	DOA-SM	A	A	Y	1,800,000	
TA	88	Microbus (Coaster)	Tyota	BB21R-MDZR	1	1	KKU	A	A	B	897,000	
TA	88	Access. for AA-670 ,Graphite Furnanc	Shimadzu	GFA-4B	1	1	KKU-CA	E	A	B	510,000	研究テーマが終了した為,使用予定あり
TA	88	Inverted Microscope	Nikon	Diaphot TMD	1	1	KKU-MBA	C	A	Y	1,530,000	
TA	89	Clear Well (Clean Water System)			1	1	CM	C	A	B	657,030	
TA	89	Trencher	Kawabe	F-45LH	1	1	CM-STRWS	C	A	Y	1,996,000	
TA	89	Tractor	Kubota	M8950DT	1	1	CM-STRWS	B	A	B	719,000	
TA	89	Agricultural Incubator	Yamato Scientific	CR-20L	2	2	KKU-CP	B	A	B	450,000	
TA	90	Electro magnetic	Geonic	EM-34-3DL	1	1	DLD-SA	B	A	B	550,000	
TA	90	Liquid chromatograph	Shimadzu		1	1	KKU-CA	B	A	B	498,000	
TA	90	Wide range pF meter	Daiki	DIK-3400	1	1	KKU-PA	B	A	Y	1,898,000	
TA	90	Pick-up truck (Double cab)	Toyota	LN106R-PRMRS	1	1	KSK	A	A	B	373,000	
TA	91	Copy Printer	Gestetner	5270	1	1	CM-PR	B	A	B	358,380	
TA	91	Tractor & attachment	Ford	5610	1 set	1 set	DLD-KSK	B	A	B	619,000	
TA	91	Walk-in Environette Chambers	Lab-Line	708A-2	1	1	DLD-SA	A	A	B	680,000	
TA	91	Equipment of Halofyte Center	Local Made		1 set	1 set	DLD-SA	C	A	B	325,900	
TA	91	Pick-up Truck	Toyota	LN106R-PRMRS	1	1	DOA	A	A	B	368,000	
TA	91	Spectrophotometer	Shimadzu	UV-106A	1 set	1 set	DOA-SM	B	A	B	348,000	

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収集資料リスト No.1

平成4年12月

調査団名：タイ東北タイ農業開発研究計画フェーズII巡回指導調査団
調査団派遣期間：平成4年11月22日～平成4年12月1日

MOAC：農業協同組合省　DLD：土地開発局　KKU：コンケン大学
ADRC：東北タイ農業開発研究センター　DOA：農業局　(ADRC ANNEX)

番号	資料の名称	形態	版型	ページ数	ｵﾘｼﾞﾅﾙ/ｺﾋﾟｰ	発行元又は作成者	収集先
1	Responsibilities and Organization of the Ministry of Agriculture and Cooperatives	製本	A4	91	オリジナル	MOAC	MOAC事務次官室
2	Agricultural Statistics of Thailand Crop Year 1990/1991	製本	B5	270	オリジナル	Center for Agricultural Statistics MOAC	MOAC事務次官室 西村個別派遣専門家
3	農業協同組合省 (Ministry of Agriculture and Cooperatives) の幹部リスト 平成4年11月10日現在	ホチキス綴じ	A4	3	コピー	MOAC事務次官室 西村個別派遣専門家	MOAC事務次官室 西村個別派遣専門家
4	1990 Research Report Agricultural Development Research Center in Northeast Thailand	製本	A4	715	オリジナル	ADRC	ADRC
5	ADRC Activities (ADRC概要説明時使用OHP資料抜粋)	ホチキス綴じ	A4	26	コピー	ADRC	ADRC
6	Final Objective & Proposal in Next Two Year (1992-1993) Tentative Schedule of Implementation	ホチキス綴じ	A4	47	コピー	ADRC	ADRC
7	Research Committee Meeting 資料 (タイ語)	紙ホルダー綴(緑色)	A4		オリジナル	ADRC	ADRC
8	Coordinating Committee Meeting 資料 (タイ語)	紙ホルダー綴(黄色)	A4		オリジナル	ADRC	ADRC
9	Coordinating Committee Meeting Agenda	1枚紙	A4	1	コピー	ADRC	大谷専門家
10	Agricultural Development Research Center in Northeast Thailand (ADRC)	パンフレット	A5	13	オリジナル	ADRC	ADRC
11	同上 タイ語版	パンフレット	A5	13	オリジナル	ADRC	ADRC
12	ADRC News Letter No.1 Sept.1992	簡易製本	A4	4	オリジナル	ADRC	ADRC
13	Land Development Offiece Region 5 (Khon Kaen) 組織図	1枚紙	A4	1	コピー	DLD	DLD
14	Research Topics of DOA 1989-1992	ホチキス綴じ	A4	35	コピー	DOA	DOA
15	Progress Report of DOA Research Program (1989-1992)	ホチキス綴じ	A4	36	コピー	DOA	DOA
16	Khon Kaen Field Crops Research Center	パンフレット	B6	2	オリジナル	FCRC	DOA
17	Field Crops Research Institute, Department of Agriculture, Ministry of Agricultrue and Co-operatives	パンフレット	B6	2	オリジナル	DOA	DOA
18	Research Activities for FY 1992 Agricultural Development Research Center in Northeast Thailand Research Annex, Faculty of Agriculture, Khon kaen University	製本 (黄色)	B5	18	オリジナル	KKU	KKU
19	Agricultural Development Research Center in Northeast Thailand Research Annex, Faculty of Agriculture, Khon kaen University FY 1992	製本 (青色)	B5	38	オリジナル	KKU	KKU
20	Research Abstract for FY 1992 Agricultural Development Research Center in Northeast Thailand Research Annex, Faculty of Agriculture, Khon kaen University	製本	B5	29	オリジナル	KKU	KKU

収集資料リスト No. 2

番号	資料の名称	形態	版型	ページ数	オリジナル/コピー	発行元又は作成者	収集先
21	Agricultural Development Research Center in Northeast Thailand Research Annex. Summary Report for FY 1992 Faculty of Agriculture. Khon kaen University	製本	B5	26	オリジナル	KKU	KKU
22	Bamboo adaptability in Northeast : Adaptation of Dendrocalamus spp.	ホチキス綴じ	A4	4	コピー	KKU	KKU
23	An Agroecosystem Analysis of Northeast Thailand	クリップ綴じ	A4	167	コピー	Cropping System Project. KKU	KKU・和田専門家
24	Outline of Khon Kaen University	パンフレット	A5	30	オリジナル	KKU	KKU
25	Faculty of Agriculture. Khon Kaen University	パンフレット	B6	2	オリジナル	KKU	KKU
26	Khon Kaen University AcademyExcellence	パンフレット		2	オリジナル	KKU	KKU
27	Summary - Proposal for Research and Demonstration at Khao Suan Kwang Demonstration Farm FY 1992	ホチキス綴じ	A4	5	コピー	ADRC	ADRC Khao Suan Kwang Demonstration Farm
28	ADRC Demonstration Farm 1992 Activities	1枚紙	A4	1	コピー	ADRC	ADRC Khao Suan Kwang Demonstration Farm
29	Rainfall during 92/6/28-92/10/29 Khao Suan Kwang Pilot Farm	1枚紙	A4	1	コピー	ADRC	ADRC Khao Suan Kwang Demonstration Farm
30	Research Proposal (塩害地域の研究)	ホチキス綴じ	A4	5	コピー	DLD・和田専門家	ADRC Khao Suan Kwang Demonstration Farm
31	ADRC計画 技術指導調査団への説明内容	ホチキス綴じ	A4	13	コピー	日高リーダー	日高リーダー
32	Progress Report of JICA Experts 1992	ホチキス綴じ	A4	2	コピー	日本人専門家	日高リーダー
33	東北タイの畑作農業と畑作研究	ホチキス綴じ	A4	3	コピー	DOA・岡専門家	岡専門家
34	営農体系の開発	ホチキス綴じ	A4	2	コピー	岡専門家	岡専門家
35	タイのケナフ栽培	簡易製本	B5	5	オリジナル	岡専門家	岡専門家
36	Biological Nitrogen Fixation (BNF) and Organic Residues in Crop Patterns	ホチキス綴じ	A4	3	コピー	DOA・石田専門家	石田専門家
37	育種関係 研究の概要(Phase II)	ホチキス綴じ	B5	2	コピー	吉田専門家	吉田専門家
38	Outline of Researches Related to the Soil	ホチキス綴じ	A4	5	コピー	和田専門家	和田専門家
39	土壌分類資料	ホチキス綴じ	A4	4	コピー	神山専門家	神山専門家
40	タイの農林水産業概況	クリップ綴じ	B4	130	コピー	在タイ日本国大使館 平島一等書記官	JICAタイ事務所
帰国後、プロジェクトより入手した資料							
41	熱帯畑地における有機物マルチの効果 平成2年10月	製本	B5	94	オリジナル	農林水産省熱帯農業研究センター 上野義視	日高リーダー
42	Nitrogen Absorption of Rice Plant (Paddy Nitrogen Economy March 1983 より抜粋)	ホチキス綴じ	B4	6	コピー	東京農業大学 農大調査研究所	日高リーダー
43	N：P：Kの連用試験研究成果の概要 英文 (Progress Report of DOA Research Program 1989-1992 より抜粋)	ホチキス綴じ	A4	10	コピー	DOA	日高リーダー

JICA