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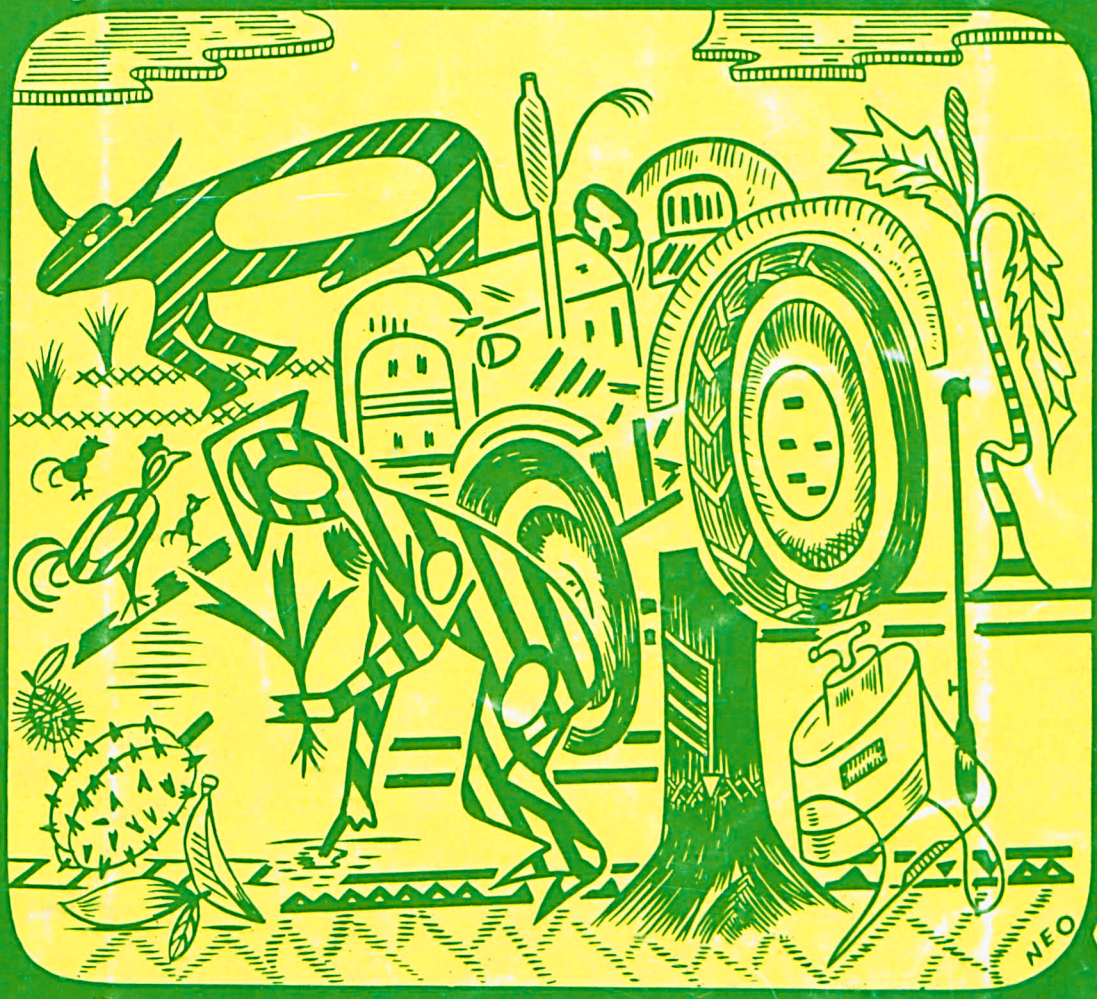

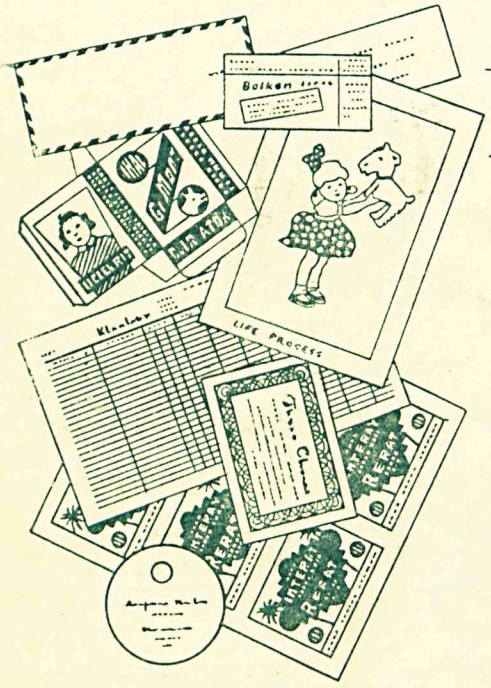

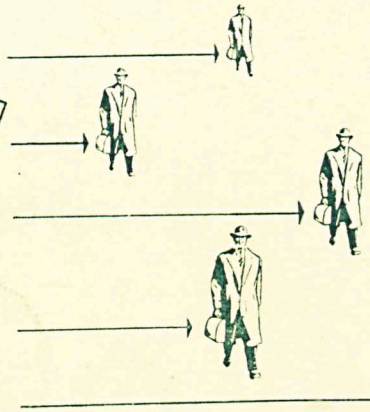

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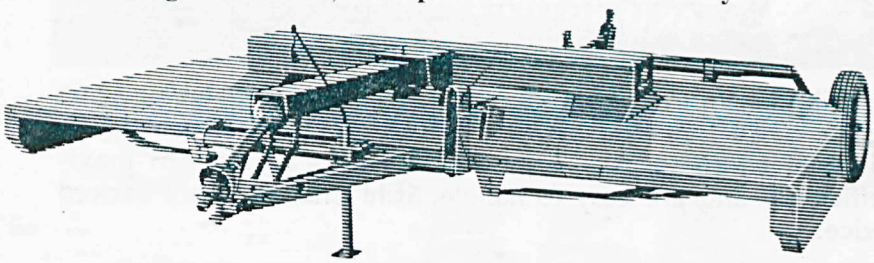

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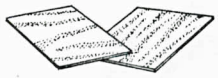

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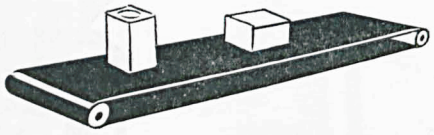

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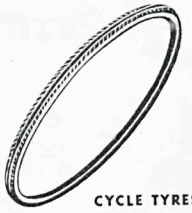

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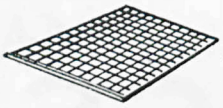

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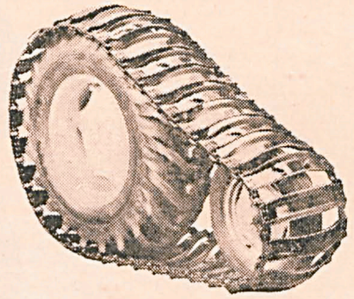

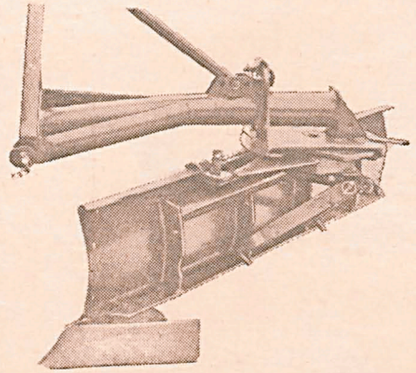

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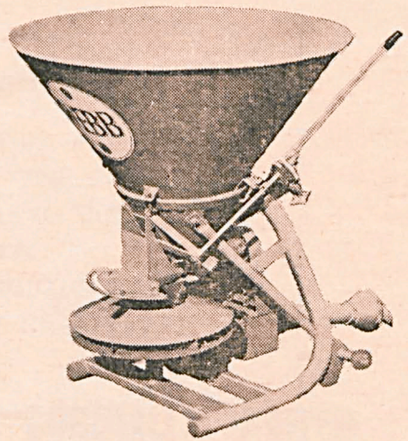

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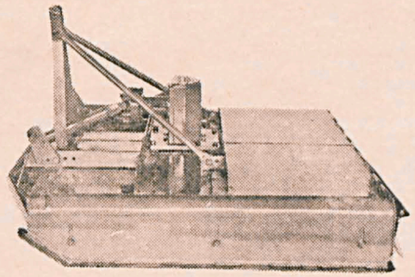

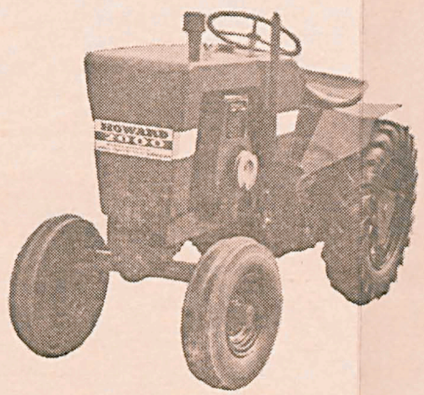

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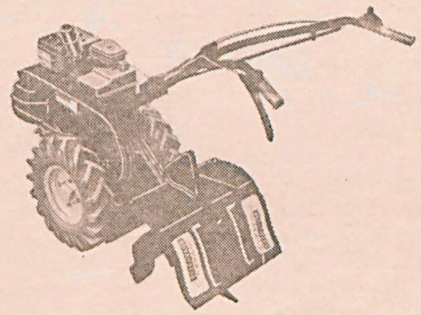

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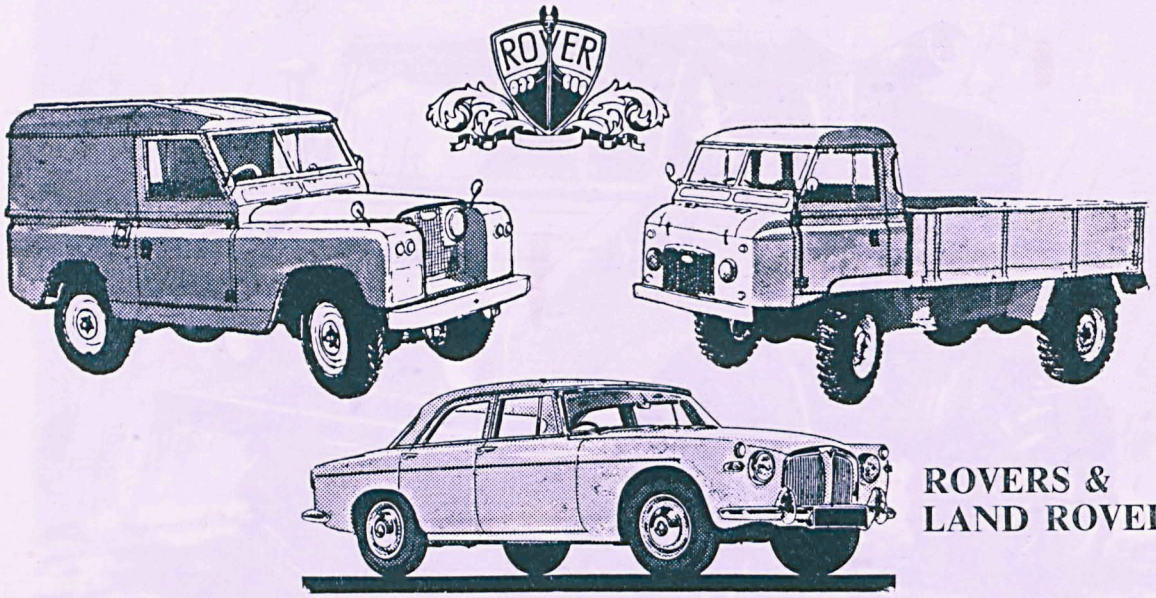

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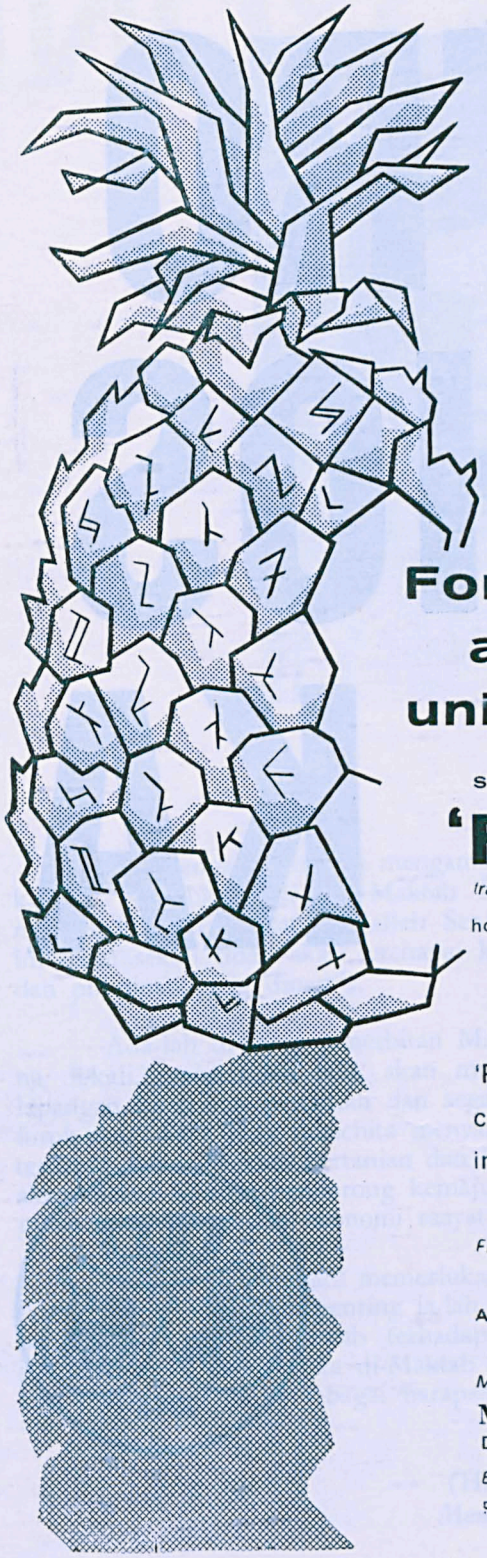

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Saya dengan sukachita mengambil kesempatan ini menguchapkan tahniah kapada Persatuan Pelajar2 Maktab Pertanian Serdang yang telah berusaha mengekalkan penerbitan Majallah Serdang Sun berkibar di-angkasa. Kejayaan ini tentu sekali tidak akan terchapai kalau tidak dengan kechekapan, kegiatan dan pimpinan yang dinamis.

Ada-lah di-harap penerbitan Majallah Serdang Sun kali ini, sabagai mana di-kali2 yang telah lalu, akan memainkan peranan-nya yang berkesan di-lapangan kemajuan pertanian dan segala2 yang berkaitan dengan pertanian seluroh-nya. Saya juga sukachita menyatakan bahawa banyak kuntum2 pimpinan terdapat dalam Maktab Pertanian dan Persatuan Pelajar2 Maktab Pertanian yang akan mekar sabagai pendorong kemajuan pertanian dalam ranchangan meninggikan taraf hidup dan ekonomi raayat luar bandar di-negeri ini.

Negara kita sangat2 memerlukan pemuda pemudi yang terlateh dan berijazah, tetapi yang lebeh penting ia-lah pemuda pemudi yang penoh initiatif dan bersemangat tanggong-jawab terhadap kemajuan bangsa dan nusa-nya. Saya perchaya tiap2 pelajar kita di-Maktab Pertanian Serdang akan dapat membuktikan sifat2 yang mulia sabagai harapan bangsa yang sejati.

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VOL. 13
ACADEMIC YEAR 1965-1966
KDN. 1477

CONTENTS

Cover design by

CHOOI LAM KHONG.

Message

It was four years ago, 30th October, 1961, to be exact, when the Council of the College of Agriculture, which was constituted earlier, took over the management and responsibility for the College from the Ministry of Agriculture and Co-operatives. Since then the College has undergone a tremendous change both physically and academically. It is hoped that during the first five-year Malaysian Plan, in accordance with the Government Agricultural Policy, the College will be developed to double its present size in the number of its students, its teaching staff and other facilities.

It is also the declared policy of the Government to expand agricultural education by establishing agricultural colleges in other parts of the country, particularly in the East Coast of Malaya and in the Borneo territory of Sabah and Sarawak. But the establishment of similar institutions in other parts of the country will in no way detract the importance of our College as the pioneer establishment in the field of agricultural education in this country. With the development of the College, the Serdang Sun will I am sure, play an increasingly greater role than in the past.

(Dato Dr. Haji Mustapha Albakri)
Chairman,
Council of the College of Agriculture.

Message

The "Serdang Sun" rises again to shed lights on everybody connected with the College of the varied activities of the College of Agriculture Students' Union. This publication is symbolic of the dynamism and enthusiasm with which the student body has pursued its activities. It is a further testimony of the fact that the Students' Union has maintained its traditional role in developing among others, the qualities of humanity among its members who have played and will continue to play an important part in the development of the agricultural industry in the Malaysia territories.

Most of our farmers have limited formal agricultural training, albeit often with a great deal of emperical skill but normally reluctant to change traditional methods. Thus the challenge facing agricultural technicians demands not only exacting technical knowledge but also ability to get this through to the farmers. The latter requirements can often be met by the good qualities of humanity. The part played by the Students' Union in this connection is a happy augury for the future and with widening activities there are solid grounds for optimism that it will continue to give an even richer reward.

For much a worthy cause I wish every success to the College of Agriculture Students' Union and the "Serdang Sun".

(Dr. Mohd. Rashdan Bin Baba)
Principal,
College of Agriculture, Malaya.

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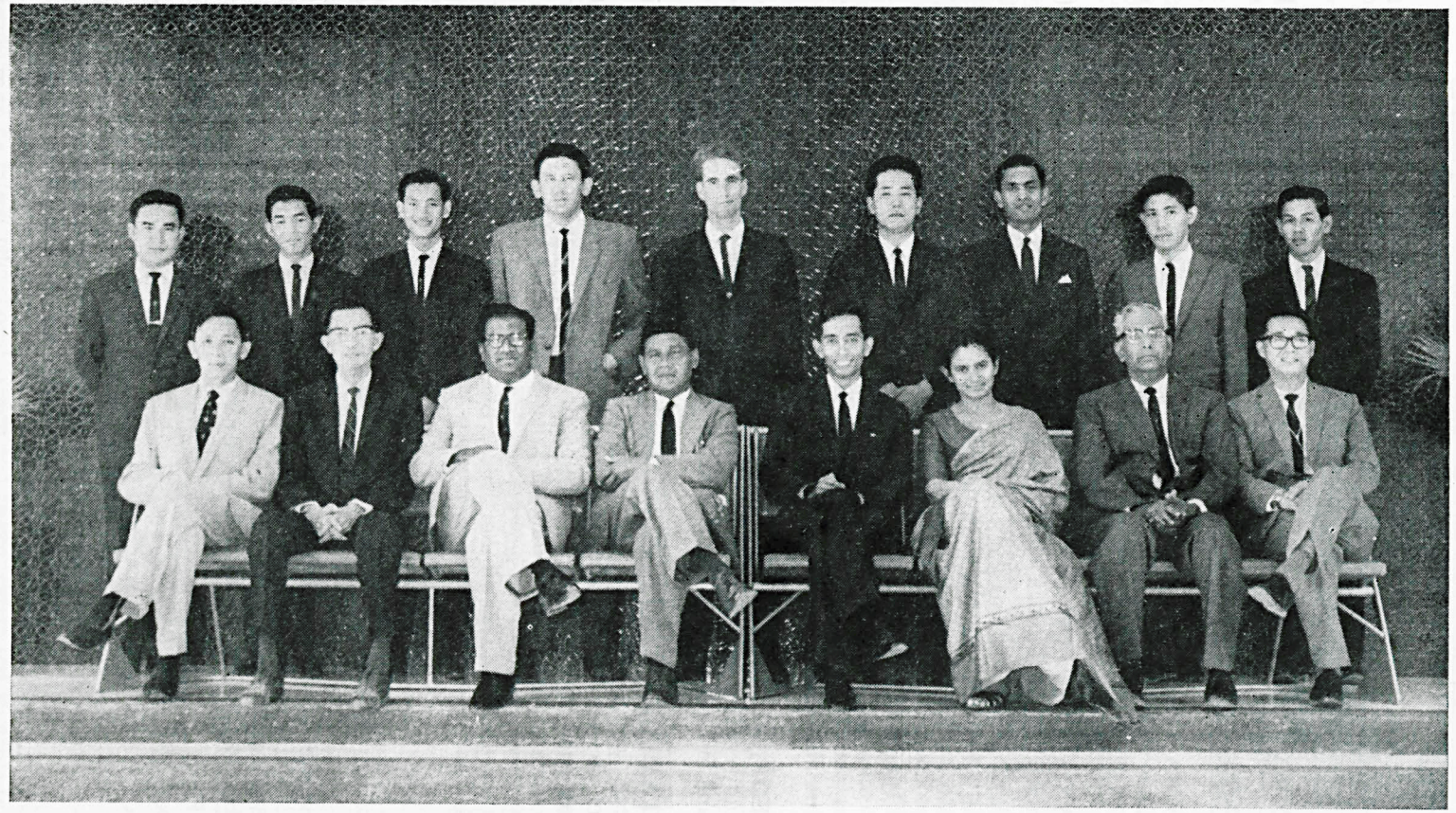

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MALAYSIA is primarily agricultural in nature, but it has limitations imposed by industrialization advancement. Because of the absence of rich natural resources to provide fuel and power, one can expect Malaysia to be bias towards agricultural development rather than industrialization. Moreover, with the concept of Malaysia, the field of agricultural development has been further extended to Sabah and Sarawak.

Agriculture forms the main occupation of people in the non-urban areas of our country or specifically in the rural areas. It is a practice in which a relatively large rural population is subsisting on small scale units of production and this provides the livelihood of about three quarters of our people. Farming therefore, forms a part of the economic strength of the country.

Till lately, the agriculture of this country is dominated by perennial tree crops, of which rubber is the most important. Unsafe in placing all our eggs into one basket, it would be time for us to place emphasis on other crops as well. Moreover with the inclusion of the Borneo States, a more diversified variety of crops can be grown and tackled by the cultivators of our soil.

Another crop like oil palm had only been popular recently. Fruits, sugar-cane, fibre crop and short term crops like tobacco, groundnut and maize are all potential crops for diversification. The animal side of agriculture should not be forgotten for there is much development in that field too.

Malaysia has to advance agriculturally and now with the implementation of the First Five Year Malaysian Development Plan; therefore there accentuates in the spirits of the sons and daughters of our soil, the need to bring about an economic advancement in his or her occupation and to oppose the privation of old times.

Agriculture of Malaysia should now expand and advance to prove beneficial in these following factors:-

(a) There is a growing demand by our growing population for foodstuffs to meet the nutritional needs of our people and as such, our farmers must improve their techniques and exploit the use of approve strain of crops and the use of fertilizers. This would lead to self sufficiency, if not somewhat nearer to that aspect.

(b) New industries are further developing in the urban areas and there is a crying demand for provision and supply of raw materials for these industries . The cultivators and farmers would have to meet this demand. Defeat would mean that we have to import raw materials from other countries.

(c) In the rural areas, poverty and undernourishment exists. But with an advancement in rural agriculture, the countryside will flourish. There will be little reason for people to flock to urban areas for work and for livelihood. There should occur a total agricultural revolution in the rural areas in order to bring about a better educational, social and economic condition in the rural areas.

(d) Development brings about sound production, but then production should not only apply to increase in quantity but in quality too, for quality is one overall factor.

Although agriculture forms the means of livelihood of some three quarters of our population, it had not been given a proper place in our educational system and above all little encouragement has been given to the perpetuation of agricultural interest, especially towards agricultural education.

The present government of ours is concurrently reconstructing a platform for agriculture to be in our educational system and to reorientate our students towards this agricultural aspect.

The immediae expansion of facilities for promoting agricultural education lies at the following levels:-

(1) At secondary school level, to train field operators who will deal directly with the farmers.

(2) Field supervisors and extension workers at Diploma level. These people will be the solid tool of conveyance of agricultural knowledge and in proper extension work.

(3) Research workers at university level.

To date, the number of Malaysian extension workers is far below the optimum number in the ratio of worker to acreage of cultivated land, as compared to Taiwan or Japan.

To date, the sole College of Agriculture, Malaya, located at Serdang turns out field supervisors and extension workers. Additionally, the annual number graduated from the College is still far below the optimum requirement.

Though expansion and progress has taken place considerably at this College and with the promotion of agricultural interest amongst our students, the College will not be able to produce the optimum graduates until in a couple of years time.

Additionally, every attention should also be given in the promotion of our young generation to take up an agricultural profession. Much attention should be given to raise the status of agriculture in our country. The manual labourer or practical worker or farmer in our country had often been regarded as a social outcast and the impression of getting white collar jobs had always been instilled in the minds of our youths.

More educated youths should be encouraged to take up practical farming or agriculture as a whole. A farmer should always be given a fair return for his effort for he stand high and lofty; he is the supplier and provider of cheap food for people of the urban areas and for this it should be noted that to maintain a cheap food supply in town, the farmer should be subsidised and in this way the returns of the farmer will never be diminished.

The farmer on the other hand should never be stagnant in the traditional ways of cultivation. Development and improvement must occur and such could only be possible if there is constant contact, exchange of information both useful and practical from the outside world. The extension workers here holds the upper hand for here they are the people, the very workers who must work diligently with his people to improve them. He must possess a sense of responsibility, keeness, enthusiasm and delightness in his work. All these factors should be trained unto him — for him to possess and to possess them, to make use of them. The College and the Student union here provides the basic adaptation in the students who will be future extension workers, the concept towards a directed sense of responsibility, moulding of a firm character but yet enriched with endurance and patience.

To train agriculturists would be one line and get them going towards that line will also be one factor. A student may have all enthusiasm to be trained towards that line and even though facilities are available he could not be able to do so for there are little ways for him to work his way through his education. The lack of agricultural scholarships becomes his main setback and also with many more students like him assistance to him is altogether very important and the loss of one agriculturist does signify in our agricultural development.

The Government has already improved the existing College at Serdang and also would be teaching agricultural Science to Secondary schools. Such attention is indeed gratifiable. With such measures taken and given the full attention and implementation, our country will have adequate officers of agriculture and would contribute a great deal in the economic development and progress of agriculture within our country, Malaysia.

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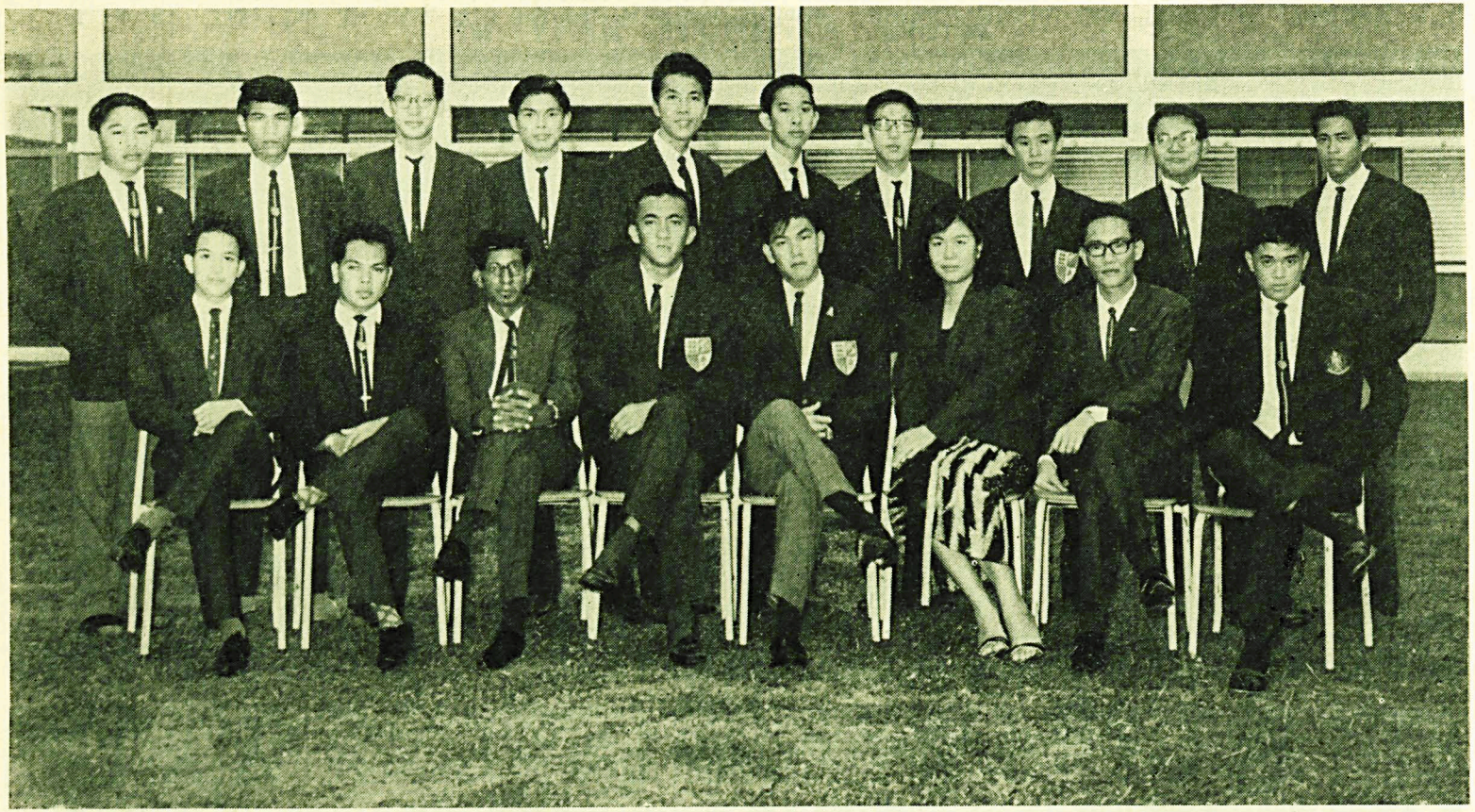

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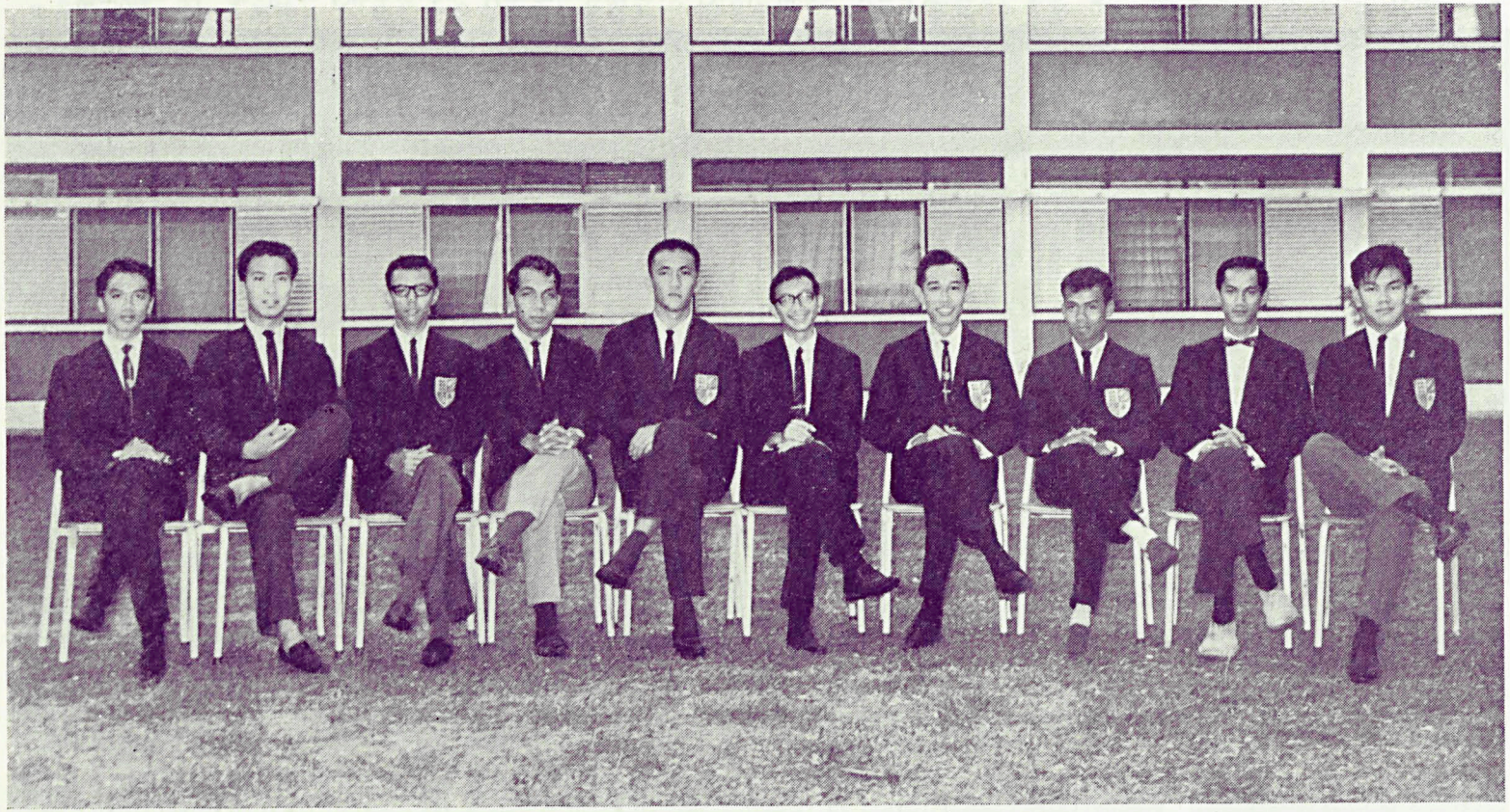

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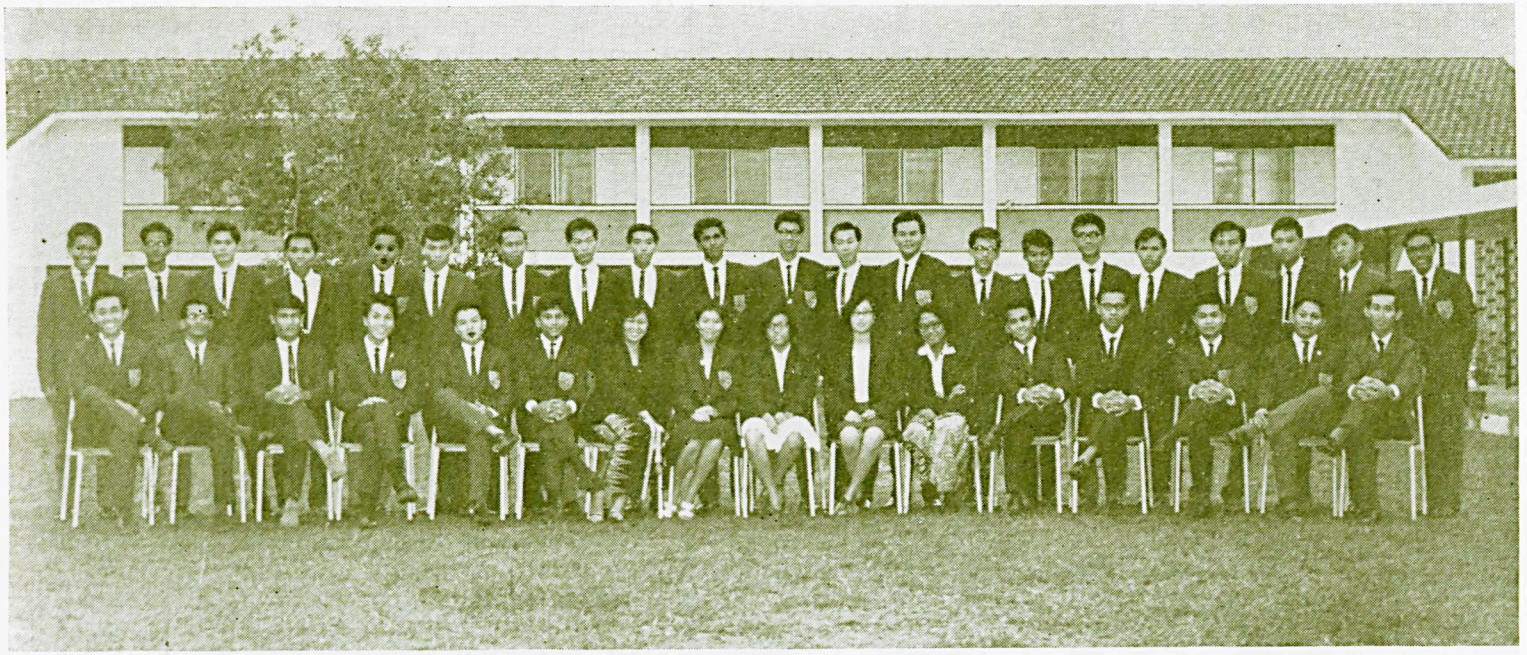

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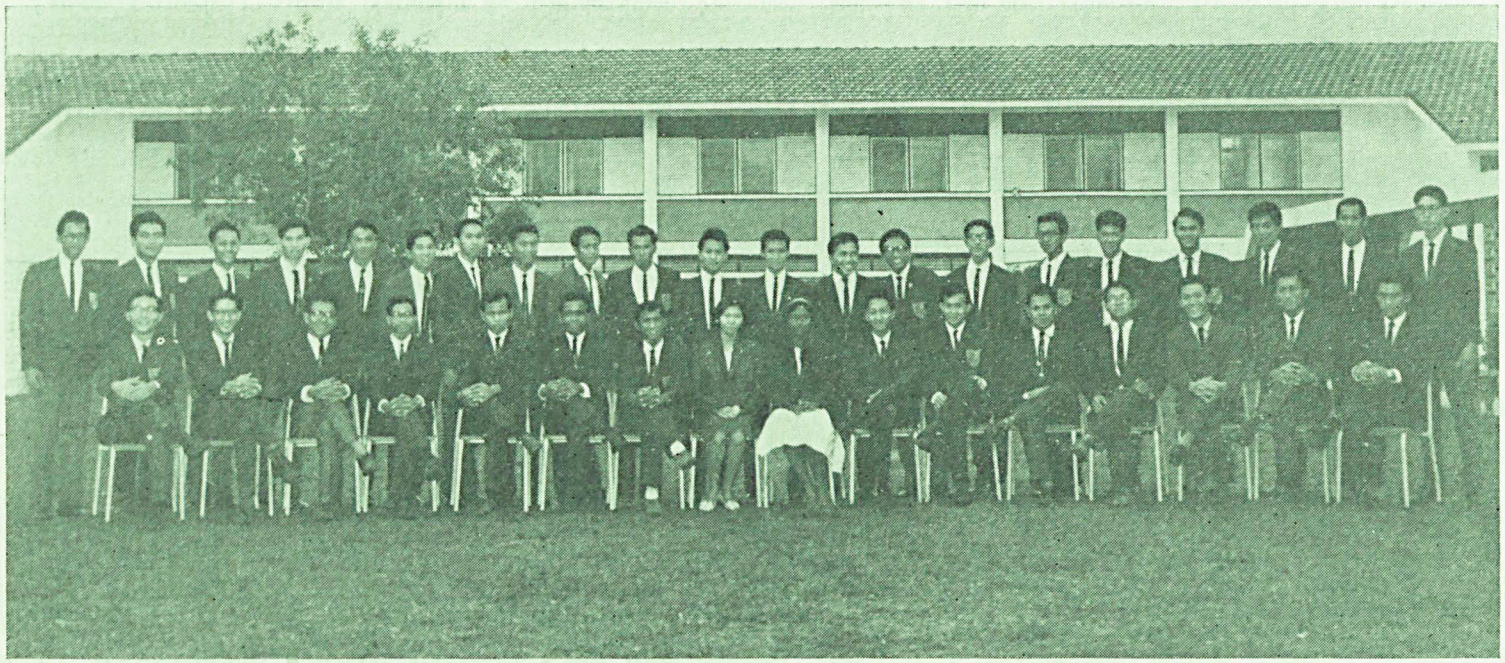

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Agricultural Importance of Fungi

MOHAMED ISMAIL — 2nd Year.

Farmers often suffer great loss to their crops and products in the field as well as in the stores owing to attack by pests and diseases. In the tropics, the environment which favours fast luxuriant growth of vegetation also favours the growth of weeds which compete for moisture and nutrients, insects, mites, bacteria, worms, fungi and virus diseases. These maladies may give rise to serious epidermics that the economy of the country is threatened. Loss of rice in hungry Asia from stem borers and blast diseases and also loss of cocoa pods from Phytophthora palmivora which may account for 75% of the potential crop if uncontrolled, in badly infected areas have been recorded. Moreover, the loss of crop from pests and diseases adds to the cost of production of many crops. Therefore the need to apply protective chemicals to obtain a worthwhile yield should be emphasised.

Fungi, though minute in size, are all of great importance to the farmers. Yeasts are useful for fermentation, ringworms blemish the skin, edible mushrooms contribute to home consumption, mildew disfigure rosebuds, etc. All food, fibre, timber, trees and numerous other agricultural and industrial products are susceptible to fungal attack.

The plants that have been attacked are usually weak and cannot function properly. Many symptoms of disease appear and these indicate the key to identification, classification and control. However, a symptom may appear as the result of any one or a number of causes, for example, wilting may be due to attack from insects, nematodes, fungi and unsuitable soil conditions. It must be remembered that the part in which the diseases become manifested to the eye is not necessarily the seat of the disease; the cause of the disease may be in a part of the plant very remote from the portion in which one or more of the symptoms appear.

Wilting and changes in colour, size or habit of growth are probably the commonest types of generalised symptom. Discoloration, especially of chlorophyll containing tissues is one of the most frequent sign of diseases. This may take the form of a general yellowing or silvering, or there may be localised areas that are yellow, white, brown, purple or black. If the discoloration is accompanied by necrosis, that is, death of tissues, the dead areas may fall out leaving a perforated leaf. Spotting both external and internal, is also a frequent symptom of trouble in fruits and root diseases of vegetables. Premature leaf fall, very early maturation, to form reproductive organs or their transformation into new structures, the production of galls, cankers and large numbers of small roots shoots and leaves be looked for and recognised as danger signals.

The common diseases that appear in plants are as folows :-

I) *Rotting.*

Fruits, tubers and vegetables show sign of decay which normally accompanied by stinking smell, seed rot, edible portion of fruits disintegrate, and vegetables wilt and die. Some examples are :-

1. Soft rot of vegetables, caused by — Erwinia carotovora.
2. Heart rot of pineapples, caused by — Erwinia carotovora.
3. Dry rot of cucumber, caused by — Cladosporium cucumarium.
4. Root rot of papaya caused by — Phytophthora nicotinae var parasitica.
5. Foot and root rot of citrus, caused by — Phytophthora nicotianae.
6. White root disease of hevea, caused by — Fomes lignosus.
7. Brown root disease of hevea, caused by — Fomes noxius.
8. Red root disease of rubber, caused by — Ganoderma pseudoforeum.

2) *Damping off.*

It is another form of rotting too. Roots are often weak and decay resulting in collapsing of the seedling. This phenomenon is associated with excessively damp seed beds, e.g. damping off of tobacco, stem rot of papaya, rhizome rot of ginger and root rot of cotton.

3) *Leaf spot disease.*

It is not so prevalent. The colour and shape of the spot depends on the type of fungus which attack the leaf. The attack may lead to chlorosis, reduction of photosynthetic activity, and indirectly affecting the fruit formation and general vigour of plant, e.g. early blght of potato, white spot of cabbages, bird's eye spot of rubber (Helminthosporium hevea), and brown spot of rice (Helminthosporium oryzca).

4) *Wilt.*

This affects roots and vascular tissue in seedling stages due to secretion of toxic substance which kills the living tissue. Some examples are :-

1. Vascular wilt of bananas — Fusarium Oxysporium f. cubense.
2. Vascular wilt of oil palm — Fusarium oxysporium.
3. Wilt of tomato — Pseudomonas solanacearum.

5) *Cankers.*

Cankers are slow rot of outer part of stem or fruits. The attacked part is usually eaten away bit by bit and enlarges but very often the spread of canker in woody plants is limited b the formation of wound cork. e.g.

Pink disease of rubber — Corticium salmonicolor.
Citrus canker — Xanthrosomonas citri.
Patch canker of durian — Phytophthora palmivora.

Besides these, there are also other diseases such as scab, anthracnose, mosaic, leaf curl, dwarfing, gall and transformation of floral or fruiting structures of plants.

Beneficial effects.

However, fungi also are useful to farmers. They decompose organic matters making them available to plants, fix nitrogen as in legume crops, attack harmful insects, and some form source of food like mushrooms.

Fungi bind soil together, improve aggregation and fertility. Various residues are converted to humus. They indirectly, by their action in soil, prevent alkalinity and acidity. There will be less deficiency diseases when the soil has enough humus content.

Fungi too are able to cause a number of diseases to insects, which often appear in epidermic form. They form a biological control to the insects especially those which are pests of crops. It is also probable that competition between fungi in the soil may keep a serious parasite in check. A number of actinomycetes and soil bacteria have been shown to have that effect and also widespread in their occurence. Unfortunately such a balance is easily upset by a change in soil condition brought about by drought, irrigation or cultivation. This is just too unreliable and subject to too many varying factors which have not yet been analysed to be applied to other areas. Some examples of fungi which are of biological importance are Asperigillus parasiticus, found effective against mealy bugs, Metarhizium anisophae, against corn borer and Pseudosomona spp. which destroy certain crop pestts.

Fungi too play an important role as scavanger. They participate in the dispersing off of the sewage, converts insoluble proteins, fats and carbohydrates into soluble odourless compounds which may then be removed. Some live symbiotically with hosts such as termites and ruminants. In the rumen of the ruminants, they render the proteins available to the host. Thus, the animal requires very little protein in the diet as it is present in the grasses and the concentrates.

Control

When an invasion by fungi is anticipated, the crop can be protected by spraying with fungicides such as the copper compounds, Bordeaux mixture and Fylomac 90. Bordeaux mixture has been used in pre-treatment of pineapple suckers to prevent shoot rot. In rubber estates, it has been widely used to spray pink diseases but unfortunatley, it cannot be used on tappable plants owing to the contamination of copper in the latex. However, Fylomac 90 can be used instead.

Information on the life cycle of the parasite may indicate the point at which control can best be applied. Thus it is important to have the knowledge of the biology of the parasites. The use of fungicides and insecticides has neverthless, been able to ontrol diseases and at the same time destroy the entomogenous fungi resulting in increased population of certain pests.

Great care must be taken to destroy any diseased materials. They should be pruned from the trees, infected fruits collected wherever possible, burnt or buried. If the disease is seed borne, seed treatment should be carried out. Where outbreak occurs, rapid action must be taken to destroy the infected crop. Where attack is serious, destroy the whole crop and the alteranate host plant. A new crop might then be safely planted.

It is important to develop resistant varieties to certain diseases. But even with a resistant variety constant vigilance is necessary. About 1875, planters in Java started to replace their Arabica coffee with Liberica which was rust resistant. But 30 years later fungus adapted itself to this variety and it went out in favour of Robusta, which still remain resistant to rust. Thus it is important to find numerous varieties which are suitable to local conditions.

Too frequent cropping of soil with the same crop will no doubt lead to serious build up of plant diseases and pests as well. Thus rotation of crops, where ever possible should be practised to avoid piling of disease organisms.

Plant quarantine or the restriction or the importation of planting material is an effort to check the introduction of pests and diseases to a country. The government, in this case, should take the greatest step as a means of legislative control. The Agricultural Officers too can play a great part by advising the rural folks from planting any exotic plant or crop without being quarantined, for fear of introducing new diseases.

Conclusion.

From the factors outlined above, we come to understand that fungi can be detrimental as well as beneficial to the farmers and all beings as well. They provide havoc to the farmers and source of study to the enthusiasts. There are thousands of plant diseases whose causes are still unkown. Thus the study of fungi has led to the construction of many industries in search of different types of chemicals and methods to curb the outbreak of fungal diseases and, indirectly, the country benefits and prospers by it.

Animal Feeding Stuffs And Their Constituents

AHMAD ABDULLAH — 2nd Year

Animal feeding stuffs can be classified into the following groups :-

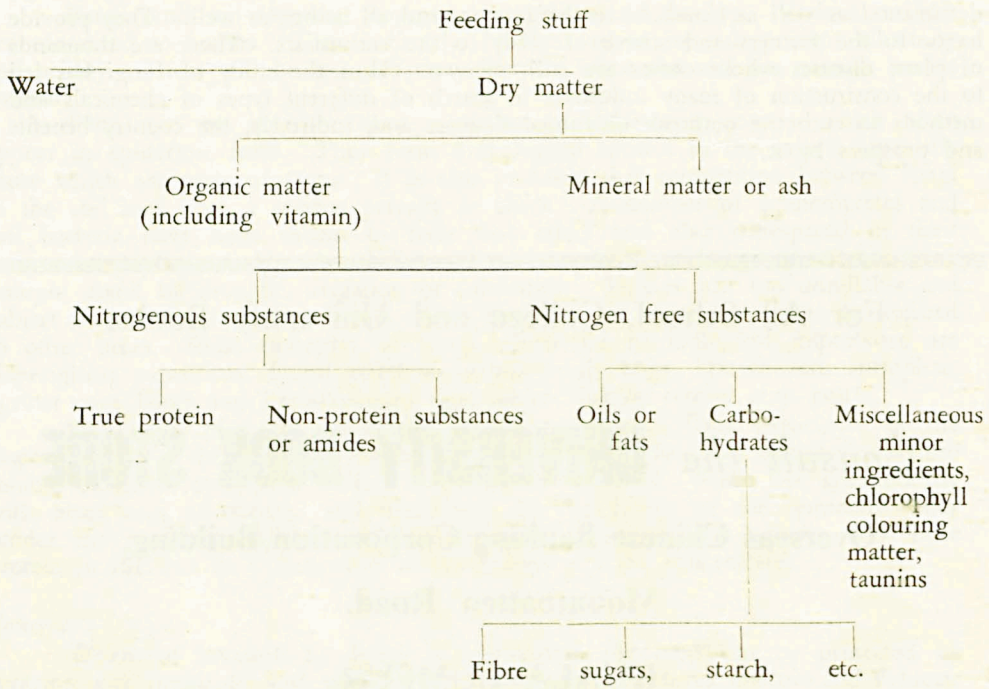
(a) Green fodders
(b) Pasture grasses
(c) Roots and by-products
(d) Dry fodders
(e) Concentrates — (i) grains and oil-seeds
(ii) By-products

(f) Miscellanous — including eight feeding stuffs all except one of which are of animal origin.

The food is supplied to the animal for the successful mainteanance of life and the production of offspring, milk, growth, eggs, fattening and also energy for work.

Feeding stuffs can be regarded as mixtures of complex substances, each of which contribute to the nourishment of the animal. For the sake of simplicity and present limitation of analytical chemistry, all feeding stuffs are divided into six consitituents, namely, water, protein, fat or oil, soluble carbohydrates, fibre and ash or mineral matters. A knowledge of the constituents of these feeding stuffs is essential as farm animals are more or less dependant on plants and their products for their food.

The composition of a feeding stuff is shown diagramatically as follows :



In any feeding stuff, the percentage of each of the constituents, except the the soluble carbohydrates, is obtained directly by chemical analysis. The percentage of soluble carbohydrate is obtained by substracting the total percentages obtained by

analysis from a hundred.

These soluble carbohydrates are composed of many substances including starch, various celluloses, sugars and in addition several minor non-carbohydrates substances such as resins, taunins, etc.

In addition, feed stuffs also contain minute quantities of one or more of the vitamins.

Constituents of Feeding Stuffs

Water

Water is present in feeding stuffs to a very extent. Water hyacinth and banana leaves and other green and growing materials contain as high as 94%. Most of the cereals and oil-seeds contain a very small amount of water about 8 to 14%. Green fodders and freshly cut grasses contain about 70 to 80%.

Water serves several important functions in nutrition. These include wetting of the food to facilitate churninb, swallowing and digestion and the conveyance of nutrients from one part of the body to the other. Another vital function is the removal of waste matter.

Nitrogenous substances

These can be divided into two groups, the protein and the non-protein compounds.

(a) *Proteins*

These are complicate substances containing carbon, oxygen, hydrogen nitrogen and often sulphur and phosphorus. As they are complex substances they are broken down into simpler compounds, known as amino acids, by scientists for easier study. So far only twenty-three have been identified and of these, ten are probably essential either for life or normal growth. These are lysine, tryptophane, histidine, leucine, isoleucine, phenylalamine, threonine, methione, valine and arginine. A protein is usually made up of several of those amino acids.

Proteins are essential to life and are the chief flesh-forming constituent of a food. They are essential for growth, production, and repair due to normal metabolic processes. A protein deficiency symptom results in a marked slowing down of the rate of development of an animal. Protein also can be transformed into fat and utilised for the production of heat and energy within the animal.

Both plant and animal proteins can be utilised by animals. Groundnut cake and soyabean cake are especially rich in proteins. Rotten fish, meat meal and prawn-meal are examples of feeding stuff rich in animal proteins.

(b) *Non-Protein Compounds*:

These include many nitrogenous compounds which are simpler in nature than the proteins. They are often called amides. Green fodders and other fresh plant materials usually contain an appreciable amount of this class of simpler nitrogenous compounds. The true significiance of such compounds is greatly appreciated in nutrition as they resemble the primary products of the digested proteins and having the same nutritive value.

Fats and Oils

These are compounds of fatty acid and glycerine. At room temperature they are termed fats when solid and oils when liquid. A common example is coconut oil.

Fats may be either of animal origin or of vegetable origin. Example of the former can be found in meat meal and the latter in coconut cake or groundnut cake. In Malaya they are largely found in oil-bearing seeds and their by-products.

Fats are one of the two main sources of supply of energy to the animal for both work and maintenance of body heat. The other main sources are from carbo-hydrates but fats have approximately $2\frac{1}{2}$ times the energy value of carbohdrates.

A minimum quantity of fats is essential for growth and maintenance of good health. The reason is that small quantities of certain compounds associated with the fat are present in the animal body. An important example is Ergostrol from which vitamin D is derived. Fat deficiency brings about the lowering of digestibility of a ration. On the other hand excess fats affects the apetite. The reasons for these are still unkown.

Carbohydrates

These are a large group of compounds composing of carbon, hydrogen and oxygen. They form by far the largest proportion of the dry substances of plants, especially the plant tissues and food reserve.

In animal nutrition, they are divided into two groups i.e. the soluble carbohydrates and the crude fibre.

(a) *Soluble Carbohydrates*

These compounds are not necessarily soluble when orginally consumed. They become soluble as a result of changes taking place during the process of digestion, being thus absorbed into the system. Two examples of this group are sugars and starch.

(i) *Sugar*

These are comparatively simpler substances among the soluble carbohydrates. They are all sweet to the taste and soluble in water. They are widely distributed in nature but in sugar cane and sugar beet, they are only present in small quantities.

Sugars can be sub-divided into simple sugars and compound sugars. Of the former, the most common ones are glucose and fructose, which occur in ripe fruits. The latter are more important substances which include ssucrose or cane-sugar; maltose, the sugar found in germinating seeds, and lactose, the sugar found in milk.

Sugars are highly digestible and easily absorbed into the body system. Together with starch they are the principle fuel of the animal body but are synthesised into fat and stored in that form when fed in excess.

(ii) *Starch*

It is a complex carbohydrate and occurs in practically all the vegetable foods. It is the chief compound stored as reserve food by plants, principally in the roots as in tapioca and potatoes and in grains as in rice. Starch is the best fat-forming constituent of a feeding stuff. Its chief function is to accelerate the rate of growth of animals for the market.

(b) *Crude Fibre.*

Fibre usually consists of several substances, the principal being cellulose, lignin, pentosans and bean celluloses.

Fibre is usually reckoned as the useless protein of a feeding stuff, being little digestible and unavailable. The proportion of lignin is however, important, as this constituent of fibre is almost wholly unavailable even to herbivorous animals.

Fibre is a very essential constituent of a feeding stuff although it needs more mastication and undue expenditure of energy. It gives a comfortable sense of fullness and satisfaction to the animal. Fibre defiency makes the animal very restless and often results in eating of any material which may be near at hand and this as such is harmful.

Ash

Ash represents only a small percentage of the feeding stuff. The ash is composed of mineral matter. Only a small portion of the ash contains useful elements while the rest is made up of insoluble matter. This insoluble fraction is nearly wholly siliceous, and it may amount to a fairly large proportion in a feeding stuff such as padi-straw.

From the beginning, it was thought that calcium, phosphorus and common salt were the only minerals required by the animals for bone formation, normal growth and milk production, sodium and chlorine fisthe secretion of saliva and the digestive juices. As the science of nutrition progresses, more elements are found to play important roles. Iron is an essential constituent of blood, while copper plays an important part in its synthesis Potassium, magnesium, sulphur, iodine, manganese, zinc and cobalt are also known to be essential. As these elements are only needed in minute quantities the requirements of the body are easily fulfilled by normal rations.

Animals have an extraordinary but limited power of storage of mineral compounds. When these mineral reserves are allowed to be exhausted serious consquences will result such as lowering of the productive capacities e.g. growth and milk yield, or the increasing of susceptibility to certain diseases,

Vitamins

Vitamins are complex organic substances. One or several of them may be present in a simple feeding stuff. Only minute traces of these vitamins are necessary either for growth or good health. Absence of any one of them from food may result in serious disorders and ultimately death.

The vitamin needs of the various species of animals are different and some of them are not apparently essential to certain animals. All the animals with which we are concerned can synthesize their own vitamin C requirement, while the B complex is not essential to the ruminants.

The following vitamins are important in the field of animal feeding:

(a) *Vitamins A, B and E*

These are oil-soluble vitamins. Only A and D are important from the point of animal nutrition.

Vitamin A is often called the "disease-resisting" vitamin. This is not truly correct as it only keep the body membranes in a healthy condition, and makes it more efficient against bacterial attacks. The vitamin also plays an important part in promoting reproduction and growth. The defiency often results in young animals being born dead, or dying soon after birth. It also leads to a form of swine paralysis. Animals get their supply of vitamin A from carotene, which is its precursor. Carotene is found in all green matter and is the substance which gives characteristic yellow colour to carrot, sweet potato, milk and butter. In Malaya carotene is found in red liquid portion of palm oil.

Vitamin D, often called the anti-rachitic vitamin, is the most important one in the field of anmal nutririon. In the tropics, animal do not depend on cod-liver oil or artificial irradiated oil as they can bask in the sun and get the benefit of its ultra-violet or ricket-preventing rays. These rays penetrate the skin and produce vitamin D from the traces of a waxy substances called ergosterol. The important functicn which this vatimin plays is in calcium and phosphorus circulation Animals require these two elements not only in adequate supply but they also should be present in certain proportions. The ideal proportion is 1 to 2 parts of calcium to each of phosphorus. Defiency of vitamin D lowers the amount of phosphorus and calcium in the blood and the supply of these elements to the bones is seriously diminished. Normal calcification of the bones takes place again when the defiency is corrected.

Vitamin E is concerned with the sterility and appears to be essential for reproduction in certain farm animals. It is widely distributed in the various feeding stuffs especally in the embryo of grains.

Of the water-soluble B complex B1 is the most important. It is known as the anti-neuritic or beri-beri vitamin. Defiency results in the emaciation and generally weakens the animal., and the animal finally dies. In Malayan deficiency of this vitamin seldom occurs as source of feeding stuff such as rice polishings, rice bran, the grains are rich in vitamin B1.

Water-soluble vitamin C is also known as anti-scorbutic vitamin. The deficiency results in scurvy in man, monkey and guinea pigs. All green fodders which are fed raw to livestock, are rich in this vitamin and many animals can synthesizes it in their bodies.

Lastly comes vitamin K which is a fat-soluble vitamin. Deficiency of this vitamin results in the increase of time in the clotting of blood and animals suffer serious haemorrhages. In livestock ration, this vitamin is never deficient for all green leafy fodders and other plant materials are rich sources of this vitamin.

Some Observation on Goat and Cattle Rearing in Pulau Lumut.

by

C. DEVENDRA.*

Pulau Lumut is a small island off the coast of Port Swettenham. One reaches it from Port Swettenham by a boat journey lasting about an hour and fifteen minutes. It has a developed area of about 18 square miles and some 2,500 inhabitants, nearly all of whom are Malays. The bicycle is the chief means of transport on this tiny island, and bicycling to explore the nature of goat and cattle rearing in the many kampongs was rare experience indeed.

One of the first things that strikes the visitor is the excellent condition of both goats and cattle on the island. The extra good constitution of these animals was one of the best that has been seen and it is a tribute to the islanders and the lush supporting vegetation that the animals can be maintained thus. The livestock populations are made up of about 2,300 "local" (indigenous and cross-bred) goats, 200 head of cattle (mostly Kedah-Kelantan or Kedah-Thai breed) and some poultry ("kampong" birds). The population of 2,300 goats represents about 1 goats per head of population and reflects the importance and also the profitable returns of rearing them to the inhabitants of the island. Whereas goats were kept by most of the small holders, cattle were owned only by a few people.

All goats are stall-fed, not allowed out and only receive a mixture of tree leaves, waste grasses and creepers. These are fed *ad libitum* twice daily in addition to the provision of water and salt licks. Mineral licks were not provided but one farmer overcame this by providing the ashed remains of coconuts husks.

The common components of the mixed herbage fed are as follows:—

(i) Bamboo grass (*Ischaemum spp.*)
(ii) Tapioca leaves (*Manihot utilissima*)
(iii) Jack fruit leaves (*Artocarpus heterophyllus*)
(iv) Carpet grass (*Axonopus spp.*)
(v) Daun paku uban (*Nephrolepis exaltata*)
(vi) Daun sendayan (*Scleria sumatrensis*)
(vii) Daun kedudok (*Pternandra spp.*)
(viii) Rumput ribu ribu (*Anciophyllea scortechinii*)

That the goats are only fed the mixed herbage, are able to remain productive and in excellent condition is quite remarkable indeed. It would appear that the nutritional requirements for maintenance and production are adequately met and at almost no cost, since all the herbage fed are not cultivated. Furthermore the fact that the same mixture of herbage was fed in nearly all the farms suggests the possibility that it is a standardized ration of some signficance. The important point that this method of feeding demonstrates and takes advantage of is that goats are voracious feeders, with an ability to utlise a great variety of plants and thus extend their feed preferences. Cows on the other hand are allowed to undergraze coconut plantations or any available grazing.

No supplementary feeding with concentrates is practised and this feature conforms with the general pattern of feeding goats and cattle in Malaya. The lack of use of concentrates is due to at least three factors. Economic limitation is by far the most important factor. Secondly, it is a traditional practice not to feed con-

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Fig. I. Stilted Pattern of Goat Housing.

Fig. II. Ground Level Type of Goat Housing.

centrates to meat animals which are considered to be able to subsist under local conditions. The third and a real reason may be that the use of concentrates is inadequately appreciated.

It has been well established however that the digestibility of mixed feeds (herbage and concentrates) is higher than that of herbage alone (Topps, 1962), and that the voluntary intake of roughage can be greatly influenced by the amount and type of concentrates given (Campling, 1964). Furthermore whereas the voluntary intake of diets containing roughage and concentrates can be increased to three or even four times the amount required for maintenance, with roughage alone it will rarely exceed twice the amount for maintenance (Balch and Campling, 1963).

Another interesting feature pertaining to management is the two kinds of goat housing in use. Some farmers favour the stilted pattern of housing where houses are raised 3 to 5 feet in height (Fig. I), while others housed their goats at ground level (Fig. II). In both cases small fires were lit at night to keep the goats warm and comfortable. The use of the ground level type of houses supports the suggestion (Devendra, 1964) that these can also be used to rear goats. It must be emphasised however that unless there is provision for the removal of dung and urine in ground level houses, disease and discomfort, particularly from Helminth parasites would be common. Where this is not done or done occasioally, the stilted pattern of housing is therefore more superior since there is no contact between the animal and the return of dung and urine.

Marketing of animals is done by butcher's agents purchasing the animals on the hoof to be taken to nearby Carey island as well as the mainland. Goats are marekted at about 50 to 60 lb. live-weight and fetch a price of about $50 each. Cattle are marketed at about 700 lb. live-weight and like the goats are transported by small boats from the island.

The day's visit to Pulau Lumut was most interesting. The outstanding impression was quite successful animal husbandry — of simple methods of rearing goats and cattle in perfect harmony with the environment.

Acknowledgement.

The author would like to record his sincere thanks to Mr. C. Nagendram, Assistant Veterinary Officer, Klang district for having facilitated this visit.

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THE VALUE OF GOAT'S MILK IN HUMAN NUTRITION

In general, goat husbandry in Malaysia is a subsistence enterprise and intense production from goats is very much at its infancy. For example, very little is known and appreciated about the value of goat's milk. However, studies overseas particularly in the U.S.A. and the United Kingdom, wherein animal husbandry is very advanced, has shown that the milk of goat's has certain nutritive values which are important in human nutrition.

Goat's milk shows a soft curd, small fat globules, and has a rather high buffer index. It contains a high ratio of albumin and globulin to caesin and the greater quantities of fatty acids than cow's milk. The calcium and phosphorus content of milk is quite high. It is, also relatively high in vitamin B1 and sufficiently high in vitamin A and D.

A few decades ago, medical men discovered that goat's milk was good for their patients and they did prescribe it whenever it was necessary. However, nowadays, the use of goat's milk in medicine has been somewhat suppressed because of increased knowledge of the use of drugs for the treatment of diseases such as tuberculosis, peptic ulcer and certain liver diseases and by the introduction of infant food prepared from cow's milk. But the drugs on the whole, cannot replace wholely a highly digestive food such as goat's milk which is important to a weak and sick person, in enabling him regain strength and energy. Although , goat's milk finds little progress in competing with the effectiveness of drugs, it is good nourishment for weak persons, for the old and young in poor health, and as a protection from other diseases. Furthermore, it is far better than cow's milk.

It is obvious, therefore, that the qualities of goat's milk cannot be totally neglected in human nutrition. The following are some of the qualities of goat's milk that are much superior to cow's milk.

1. The protein in goat's milk can be easily digested and much more easily than cow's milk. The protein helps in building up resistance and convalescence from most sickness. It can be an important treatment for peptic ulcer and in marginal cases of infantile pyloric stenosis where the pyloric region of the stomach is narrowed by ulceration or the malformation and therefore forbidding the passage of normal food.

2. Goat's milk can replace cow's milk beneficially as food for people suffering an allergy of cow's milk protein. The symptoms of allergy consist of digestive upsets, eczema in adults and children and some form of ear disease in infants.

3. The fat content in goat's milk is much easier to digest than cow's milk. Digestion of the fat in cow's milk is often laxed in cases of metabolic disorder. Thus, goat's milk has special value in the treatment of metabolic diseases such as ketosis or acetoanemia and liver diseases.

4. It is also a suitable diet for those suffering from neurotic indigestion, insomnia and rheumatism in view of its digestibility, mild laxative quality and increased richness by about 50% in vitamin B1 over cow's milk.

5. Its high buffering index is valuable for those suffering from peptic ulcer and other digestive ailments which call for treatment with antacid drugs.

6. Its high content in vitamin A1, calcium and phosphorus makes goat's milk a source for those suffering from vitamin A defiency which is serious in Malaya, and to vegetarians who take food of low protein content.

These are some of the qualities of goat's milk. However, only 10% of the goats in Malaya are kept for milk production. The reason for this is largely due to ignorance and prejudice. Their production can be increased by encouraging goat rearing, by breeding and selection of suitable milk breeds which have the ability to give more milk. Of equal importance is the need for education regarding the value of goat's milk in human nutrition.

LEE KING WAT
Second Year

PROJECT REPORT

Effect of Artificial Light on the efficiency of Feed Conversion

Aim

1. To determine the effect of artificial light on broiler meat production.
2. To evaluate production costs for Goto Broiler I.

Procedure

Purchase

600 day old Goto Broiler I chicks were ordered from the Advanced Poultry Farm, Klang, with 3% free mortality allowances. Cost was 50 cents each after discount and transport charges.

N.B. These birds are now available at 45 cents.

Breed

Goto Broiler I is a specialized broiler cross between Goto Cornish male and Goto Barred Rock female. It is essentially a Japanese breed and is reputed to be the most profitable broiler bird in Japan. Also, it is supposed to have high feed conversion efficiency, faster growth rate, good conformation and excellent livability.

Observations

There was a rapid rate of feathering within 3-4 weeks and the birds had an almost white plummage colour. There was a good conformation at marketing age. It was also noted that the meat was tender and there was no complaints about the carcass colour. However, there seemed to be a rather uneven growth among the birds and consequently the bigger birds tend to bully the smaller and stunted ones. Note that no culling was affected during the experiment, except for a few sick birds.

Management

Feeding was ad-lib and the birds were fed with Zuelligs broiler starter for the first 2 weeks. (Broiler I).

I. Analysis provided by the manufacturer: —

Broiler Starter . . . . Guaranteed Analysis					
Crude Protein	—	—	—	min.	22.0%
Crude Fibre	—	—	—	max.	3.5%
Crude Fat	—	—	—	min.	4.0%
Ash	—	—	—	max.	8.0%

Additives: Methionine, Vitamins A, D3, K, E, B12, Riboflavin Niacin, Pantothenic acid, Chlorine, Micro-mineral Coccidiostat, Aurofac, Anti-oxidant, etc.

Cost/pikul — $25.90 (transport provided)
7% reduction, 30 cents/pikul less if own transport

From the 5th week until marketing, the birds were fed broiler finisher, analysis guaranteed as shown: —

Crude Protein	—	—	—	min.	18.5%
Crude Fibre	—	—	—	max.	4.0%
Crude Fat	—	—	—	min.	4.0%
Ash	—	—	—	max.	8.0%

Additives: As shown above.

Cost/pikul — $23.90 (transport provided)
7% reduction, 30 cents/pikul less if own transport

Housing

Housing was in the deep litter system and the birds were kept in one of the semi-intensive units. Initially, brooding of the chicks for 2 weeks was in one pen of dimensions 14'x9'. An electric hover-type brooder with 2x90 watts carbon bulbs was used.

After 2 weeks the chicks were separated into 2 groups of 300 in each unit. One group was used as a control and the other for the treatment. Light was provided in the experimental unit, 2x90 watts bulbs, and gunny sheets were used to prevent any light getting into the control section.

Before housing, the pens were cleaned and disinfected and a 4-inch deep litter of wood shavings provided. Water troughs were initially situated at random together with the feed troughs but later replaced by plastic ones fitted at the side of the pens. This was to facilitate easier watering from the outside.

Lights

The light in the experiment pen was switched on every evening at 6 p.m. and switched off in the morning at 6 a.m. The hours/day of electricity consumed was calculated at 12 hours.

Weighing

The feeds were given ad-lib but records were kept and these gave the feed intake per week. Also, the weights of the birds were taken, all weighings done in the late evenings. Initially it was possible to weigh all the birds while still young but towards the end of the experiment, sample weighings were taken and these gave the average figure per bird. Care was taken to catch the birds at random.

Disease

The birds were bought guaranteed pullorum free. At the 8th week they were vaccinated against fowl pox by the Veterinary Department free of charge. Initially, Terramycin 1 teaspoon per gallon of water was added to the drinking water to give the birds a good start and also increase their resistance to disease. This treatment was continued for two weeks because of the sudden death of a few chicks.

Sulphaquinoxaline 25% and sulphamezathine 16% were also used at one teaspoon per gallon to treat for Coccidiosis and other ailments. After the third week, no medication was used.

General

1. All dead birds were removed and so were obviously sick ones culled to prevent the spread of disease.
2. The water posed a problem as it was extremely difficult not only to provide a constant supply but also to prevent excessive spilling and wetting of the litter. Consequently, the litter had to be turned over and fresh litter added.

Mortality

Most of the death and cullings were during the first four weeks. There were no signs of cannabalism.

Results and Observations

1. *Feed consumption*

Shown below is a table for feed consumption for both control and

experiment : —

	Control		Experiment	
Week	Wt. 300 birds	Wt./birds	Wt. 300 birds	Wt./birds
1	30.96	0.1032	30.96	0.1032
2	64.8	0.216	64.8	0.216
3	108.9	0.363	102.9	0.343
4	132.0	0.44	144.0	0.48
5	177.0	0.59	180.6	0.602
6	177.0	0.59	180.0	0.60
7	186.6	0.622	216.9	0.723
8	264.6	0.882	314.4	1.048
9	280.5	0.935	345.0	1.15
10	344.7	1.149	354.0	1.18
Total	1807.06	5.8802	1913.56	6.4452

2. *Mortality*

	Control			Experiment		
Week	Deaths	Culls	Total %	Deaths	Culls	Total %
1	2	2	1.32	2	2	1.32
2	3	2	1.66	3	2	1.66
3	1	—	0.33	3	—	1.0
4	1	1	0.66	1	—	0.33
5	—	—	—	—	—	—
6	—	—	—	—	—	—
7	—	—	—	—	—	—
8	3	—	1.0	2	—	0.66
9	2	—	0.66	—	2	0.66
10	—	—	—	—	1	0.33
Total	12	5	4.63	11	7	5.96

3. *Weights*

Time (days)	Wt. 300 birds	Wt./birds	Wt. 300 birds	Wt./birds
1	18.375	0.0295	18.375	0.0295
15	74.4	0.248	74.4	0.248
56	400.95	1.35	464.52	1.58
63	529.2	1.80	642.4	2.20
70	641.7	2.30	754.2	2.60

From the above table, the birds under treatment showed greater live-weight increases after brooding.

4. *Wastage*

There was considerable wastage due to spilling of feed from the troughs. This was due largely to the crowded space and also the insufficient feeding space especially when the birds were bigger. Also, because of the limited troughs they had to be topped with feed. Attempts to estimate this amount of waste was given up as it was found to be impossible without any special equipment.

Spilling of water onto the litter was an everyday occurance, wetting together with the dung trampled by the birds tend to compact the litter. Raking of the litter and addition of fresh litter had to be carried out regularly.

5. *Observations*

a. Feeding was rather uneven as the birds were fussy eaters tending to pick and choose the bigger grains like maize etc. and leaving the more powdery

forms. They have the tendency to wait for the next feeding period. Only if the next period was delayed, there was attempt made by the birds to eat the remaining feed.

b. Temperature was observed to have a considerable effect on the birds feeding habits. In the hot afternoon, the birds looked tired and less active and feeding is less. Feeding was usually limited to the mornings and early evenings. This did have the effect of giving the birds in the experiment block the advantage of more feeding hours with artificial light.

Nightfall and the lowering of the temperature caused the birds to feel cold and cuddle up together in the corners. Observations at various hours of the night revealed this more clearly in the "control" section. In the experiment section, the light did have an effect of inducing the birds to spread out.

An experiment following-up could be carried out reversing the feeding periods, that is, closing out all light in the hot day and letting the birds sleep, and allowing them to feed during the cooler night with artificial light. With a cooler weather there could possibly be better efficiency in conversion of feed.

c. Space

Each section was housed in pens of dimensions 17'x14'. This could house 300 birds and thus the floor space was fully utilized. 17'x14' = 238 sq. ft. and this gave each bird an area of 0.793 sq. ft.

Floor space per bird is a question often debated and seldom agreed upon. For example, in temperate regions, 2 authorities in 2 different articles have given completely different figures.

0.65-0.82 sq. ft. per bird as recommended by J.A. Marshall in "Poultry Farmer and Packer" 21st. Nov. st. '62 and $3\frac{1}{2}$ sq. ft. per bird as stated by C. Arthur Pearson in "Pictorial Poultry Keeping".

6. *Conversion Ratio*

	Control	Experiment
Total feed consumption — —	1730.20	1899.83
Conversion Ratio — —	2.777	2.580
Total live-weight increase — —	623.33	735.83

From the table above, it can be shown that the birds given artificial light showed a better conversion ratio over those of the control.

Budget

Expenditure

	Control	Experiment
Cost of chicks at 50 cts. each	139.50 (291)	145.50 (291)
Feed		
Prestarter 23.75 lbs.	4.81	4.81
Broiler 1 323 lbs at 17.31 cts.	55.91	56.76 (343 lbs.)
Broiler 2 1,392 lbs at 16.7 cts.	241.77	264.47 (1556 lbs.)
Labour		
at 0.5068 cts week	14.14	14.14
Electricity		
32.4 units	2.27	7.56 (108.1 units)
Medicine		
	1.79	1.74

Depreciation

1. Building at $222.50 expected to last 20 yrs. calculated at 97 cts/mth.	2.42	2.42
2. Brooder	0.55	0.55
3. Feed troughs 50 cts/feet 6x3 ft. expected to last 5 yrs.	0.38	0.38
4. Water troughs Plastic 12 ft. at $3.20 2 joints at $100 each	0.50	0.50
TOTAL	$464.04	$499.44

Income

At $1.10/lb.	$705.87	$829.62
Profit	$241.83	$330.18
Profit/bird	86.68 cents	113.46 cents

Thus it is shown that the birds under artificial light treatment showed an extra profit of 26.78 cts as compared to the birds under control.

Conclusions

1. There is a significant difference in live-weight increase of the birds when kept under artificial lighting at night. There is a percentage increase over control of:—

17.04% — 8th week
22.22% — 9th week
13.04% — 10th week

2. Conversion ratio calculated showed that the birds under treatment were more efficient in converting feed into live-weight.

Control — 2.777
Experiment — 2.580

3. The birds under treatment thus fetched a better profit within the same space of time:—

Control — 86.68 cts per bird profit
Experiment — $1.13 23/50 cts per bird profit

4. [Best time to sell — from the experiment, it was found that the best time to sell was at 10 weeks or later.]

Recommendations

More experiments using other types of breeds should be carried out to check out this experiment and to see if the results here hold true for all breeds. Thus, a general idea of the benefits could be obtained.

WILLIE SEAH SENG PAU
Final Year
1965/66

A study of the effect of additional antibiotics on growing chickens

Antibiotics are used widely in human medicine as well as in the treatment of certain animal diseases. The antibiotics commonly used at present include Terramycin, Aureomycin and Streptomycin.

The reasons for the growth response to antibiotics are not known, although there are some theories about them. The site of the effect is quite evidently the digestive tract. The effect is brought about by some changes in the microbial flora of the intestinal tract. By selecting the type of organisms in the intestinal tract, the antibioti s may make it possible for those remaining to synthesize more of a particular nutrient needed by the young chick. The growth of certain harmful bacteria is suppressed or stopped and the growth of certain beneficial bacteria is stimulated. Some bacteria are harmful because they produce toxic materials or they compete with the host for nutrients or do both. Others are useful because they produce beneficial materials (vitamins or unidentified growth factor *i.e.* biotin and folic acid) that are not present in the food in sufficient quantity.

An antibiotic given at low levels of 5-10 gms/ton as feed supplement shows that it does pass into the blood stream. An antibiotic in this manner acts as stimulus to the ductless glands of the body such as the thyroid or the pituitary glands.

Furthermore, antibiotics can also be used to prevent or treat poultry diseases. Terramycin-Oxytetracycline HCl- Poultry Formula with anti-germ 77 kills on contact, germs causing fowl cholera, fowl typhoid, pullorum parathyphoid, infectious diarrhoea and enteritis.

Aim of Project:

Nowadays for commercial as well as the kampong farmers are using ready mixed feed, for example those from Zuellig Feedmills. These ready mixed feeds are thought to contain certain percentage-trade secret of antibiotics. Some of the above farmers are observed to use extra antiboitics in the feeding water during the early stages of the birds life. So this project is carried out to find whether there is an increase in liveweight of the birds with the additional application of antibiotics in the feeding water and if so, is it economical to do so.

Experiment Method and Technique:

For this project the fast growing Nichols were used, 104 day-olds Nichols were divided into 2 groups of 52 each.

The chicks were reared by the deep-litter system. Heat was provided by an electric hoover with a 90 watt carbon bulb. A hoover was placed in the middle of each pen.

In order to provide uniformity of environment each of the two pens had equal areas of 5ft. by 8.5 ft. and equal numbers of feed and water thoughs.

The chicks, in order to prevent disease outbreaks had been previously 'nasal dropped' to prevent Ranikhet Disease, and also, at 5 weeks age the birds were vaccinated against Fowl Pox by the Veterinary Department. These services were given free of charge.

The maximum response of antibiotics as indicated by Professor Leslie E. Card, Ph.D. occurs during the first 4 weeks after hatching. It was also shown that there will be no advantage, as measured by live weight gain from beginning of the use of antibiotics in the ration of healthy chicks after about 6 weeks after hatching.

Basing on the economic point of view, the additional Terramycin Poultry Formula with anti-germ 77 was given for only 2 weeks on an alternate day basis.

Furthermore it was also shown that most of the loss of chicks occured during the first 2 weeks. So, in order to protect the birds against disease and to promote greater uniformity of growth, 1 teaspoonful of Terramycin was added to 1 gallon of drinking water. This rate of dosage was in accordance to the recommendation of the manufacturer.

During the period when Terramycin was applied, the 'Poultry Starter' supplied by Zuellig Feedmills was given. This feed contains less amount of calcium than the other feeds. So the reaction of calcium with Terramycin is kept at a minimum so that it won't affect the result of the experiment to a great extent. After completing the application of additional terramycin, Broiler No. 1 was given for 3 weeks.

For the rest of the period until the 12th week, when the experiment was stopped, Broiler Finisher (Br. II) was given.

The basic procedure of the project is to record the amount of feed given daily, the amount of Terramycin given to the Treated groups and also to weigh the birds as it grows. The first weighing was done at day old. The second weighing, after the application of Terramycin and subsequent weighing were done at monthly intervals from the first day. There was no frequent weighing because it was found that this would upset the growth of birds. Every bird in each pen was weighed and the average weight was calculated for each pen.

Results and Conclusions:

I. Treated Group — Age, Weight, Feed Quantity, Conversion Ratio:

No. of Birds	Age:	Weight:		Total Feed used.	Conversion Ratio
		Total:	Average:		
52	1st. day	80 oz	1.50 oz.	—	—
52	3rd. week	380 oz	7.31 oz.	808 oz.	2.12
51	4th. week	591 oz.	11.60 oz.	1,265 oz.	2.14
49	8th. week	107 lb.	2.18 lb.	279 lb.	2.61
49	12th. week	188.75 lb.	3.85 lb.	559 lb.	2.90

II. Control Group

No. of Birds:	Age:	Weight:		Total Feed used.	Conversion Ratio
		Total	Average:		
52	1st. day	80 oz.	1.5 oz.	—	—
52	3rd. week	342 oz.	6.57 oz.	808 oz.	2.36
51	4th. week	551 oz.	10.8 oz.	1264 oz.	2.29
49	8th. week	101.5 lb.	2.07 lb.	268.2 lb.	2.64
49	12th. week	170.0 lb.	3.47 lb.	550.0 lb.	3.20

Budget:
Expenditure of Project:

	Treated Group	Control Group
Purchases/group of 52 day old Nickols	37.00	37.00
Feed	93.74	92.26
Labour	4.72	4.72
Medicine (Terramycin)	2.29	
Electricity	1.63	1.63
Depreciation	2.49	2.49
Rent	1.50	1.50
Total Expenditure:	143.37	139.60
Income:		
188 lb. 12 oz. at $1.30/Kati	184.03	
170 lb. 0 oz. at $1.30 kati		165.75
4 sacks group at 40 c. each	1.60	1.60
	185.63	167.35
Total profit/group	42.26	27.75
Net profit/bird sold	82.6c.	56.6c.

On comparing the 2 groups of datas and the above budgets, the following conclusions can be deduced:—

1. As mentioned earlier the inclusion of antibiotics stimulates growth rate. The increase in growth rate is mainly confined to the early stages of the chicken. An increase of 10.9% in live-weight was recorded by the treated group at the end of the experiment *ie.* at the 12th week.

An increase in growth rate means an increase in profits. As shown in the budget, the average profit per bird of the treated group was 86.2c. whereas the average profit of the control group was only 56.6c. Therefore with the usage of additional terramycin a surplus profit of 29.6c. can be obtained per bird.

2. There is also a better feed conversion ratio in the treated group. At the end of the project the difference in conversion ratio was 0.3. This means that the amount of feed consumed for a given weight is less when antibiotics are used.

3. The mortality rate in both the groups was 5.7% *i.e.* 3 died out of 52 chicks. The chicken died in the later stages of its life *i.e.* after 2 weeks. This shows that the additional Terramycin checks the mortality during the early stages when Terramycin was applied in the drinking water.

4. And lastly it was observed that the chickens in the treated groups were uniform in growth while in the control group there were a few below average live-weight.

From the above results a conclusion can be made. Chickens fed with additional antibiotics during the early stages of its life can give a surplus profit of 29.6c. per bird. Therefore application of additional Terramycin is profitable.

Md. Zaki Salleh
3rd. Year

Seed Storage In Malaya

By
CHIN HOONG FONG

Introduction

Seed storage to a farmer means keeping of seeds safely from the period of harvest to the next season. Basically it embraces a number of factors to ensure no deterioration in seeds. Properly stored seeds are not only viable but must maintain their vigour in seedlings and yield of the plants obtained from them.

The average life of seed varies greatly with different families, genera, species and varieties (8). The oldest known viable seeds occuring in nature are those of the Indian lotus, Nelumbo nucifera Gaertn. These particular seeds were found in a naturally drained lake bed in Manchuria where, it is estimated, they had been buried for at least 160 years and probably for more than 250 years. Normally many seeds remain in a state of full vigour for only a comparatively short period. After maturity seeds begin to age and die off one by one and the survivors gradually lose their vigour. However, contradictory reports are found as to the effect of age of seeds on the vigour and yield of the plants obtained from them. It is reasonable to conclude that, if storage conditions are good seed viability is preserved for a long period and the risk of obtaining inferior plants from old seed is reduced.

The length of time a given seed remains viable is dependent on the storage environment. The principal factors affecting viability of seed in storage are moisture and temperature (8). Under Malayan conditions both these factors reach high figures, thus producing a far less satisfactory environment and creating numerous problems in seed storage.

Reasons for storage

The farmers, seed merchants and plant breeders store seeds for different reasons. One reason in common to all of them is to reduce losses of seeds.

There is an established custom among Malay padi planters to store sufficient padi to supply food for home use over a period of at least one year. A major part of the farmers' produce is meant for marketing, a small portion is stored both for consumption and as seeds for raising next year's crops. The main aim in storing stock seeds is that seeds are kept safe without losing their germination capacity. Some farmers with large acreage may store their padi for a longer period before marketing them. Prices as a rule were considerably higher after the main harvesting period. Padi sold during off season fetched better prices. In padi, many varieties exhibit dormancy in seeds. During dormancy, seeds will not readily germinate and as such are unsuitable for sowing. The length of the dormant period ranges from 5 to 16 weeks among the varieties studied, Mayang Ebos 80 has a dormancy period of 14 to 16 weeks (5). Therefore dormant padi seeds have to be stored for different periods before sowing.

Seeds are stored and sold either for consumption or stock seeds as planting material. Seed merchants dealing with the former, store seeds with the aim to reduce losses caused by pest, disease and loss in weight. Seeds not properly protected during storage may be eaten up by rats, attacked by insects, turned mouldy and reduced in weight.

Seed merchants and producers dealing with stock seeds in addition to prevention of losses caused by pests and diseases, have to ensure seeds do not deteriorate in quality, maintaining high percentage germination and vigour in seedlings. Seeds for export have to be stored in containers made of proper packaging materials while seeds are transported. Seeds during transport en-

counter changes in environment. Unless they are protected against the various hazards of high temperature and moisture, seeds on reaching their destination may perish.

Finally, the plant breeders confront the same problems as the seed merchants but the most important problem is maintaining the viability of stock seeds. The breeders have under their care small quantities of very valuable seeds for a number of years, for breeding new varieties or hybrids. The breeders will and can afford to use special methods to ensure viability in the stored seeds.

Storage in Practice

Safe storage of seeds may be achieved in many ways. This can be carried out by storing in cool, dry environment or air-conditioned buildings or by drying the seed to 4-7% moisture content, and sealing in moisture proof containers.

Many seeds including padi deteriorate quickly at high moisture levels and must be dried promptly. But seeds also vary in their capacity to withstand particular drying conditions. In case of rubber, seeds quickly lose their viability in a dry environment.

Padi after harvesting is normally sundried and stored in bulk in specially constructed stores. In Kedah these stores are commonly known as 'Jelapang' and 'Kepok' (9).

The jelapang type is usually a rectangular granary raised on posts 2 to 3 feet from the ground. The floor is of wood and walls of galvanished-iron sheets, planks, or closely interlaced split bamboo. The span roof is covered with galvanished-iron or attap. This store has capacity to hold 30,000 to 40,000 gantangs of dry padi. The cylindrical bin known as 'kepok' is the common family grain store. It is constructed of wood and split bamboo with an attap shed, or span roof. The bin is of light construction throughout and can be readily transported. From one to three bins are assembled under one shed. Each bin is 12 feet 4 inches in circumference, 3 feet 5 inches high and can hold 250 gantangs of padi. Rice millers store the padi in bulk in ware houses constructed of planks or bricks.

Vegetable seeds are stored in different ways by farmers, seed merchants and plant breeders. The small commercial growers sometimes produce seeds for their own use. Seeds after sun drying are often kept in gunny, cloth or paper bags, open tins or bottles, such storage conditions are often unsatisfactory. The seed vendors store their seeds in a similar manner. Vegetable seeds of moisture content 4-7% sold by the internationally recognised companies are stored in air-tight containers such as tin cans and polyethylene-aluminium kraft paper laminated bags for transoceanic transport and subsequent storage. In the market, moisture proof packs of vegetable seeds are obtainable. This provides for home gardeners and small scale commercial growers. The plant breeders on the other hand with a small quantity of seeds can afford to store them in air-conditioned rooms or in dessicators quite successfully.

Leguminous cover crop seeds are widely used in association with plantation crops. Annually tons of these seeds are imported and handled by seed merchants representing reputable companies. Seeds are kept in bulk in dehumudified stores. These seeds are later sold and distributed in paper or hessian bags. Today cover crop seeds sold are commonly scarified because by nature they are 'hard' seeds. Scarified seeds can be kept under dry conditions for about six months without deterioration in germination.

Many tropical seeds have to be kept moist to maintain viability and thus do not have long life-spans in storage. Among these are the seeds of the cacao (Evans 1950), tea, coffee and rubber. Seeds of rubber (Hevea brasiliensis) are short-lived and must be planted soon after harvest or put in special

storage. Fresh seed may be stored in a cool place for a few days but lose viability rapidly if stored without protection, germination dropping to less than 45% in one month. In the store, freshly collected seeds are kept in moist sawdust at 45°F. In this manner life span of Hevea seeds is prolonged to 3 to 4 months. Seeds for export are packed in wooden or cardboard boxes filled with moist sawdust.

In oil palm (Elaeis guineensis), cleaned seeds after drying for a day in the sun possess moisture content around 14 to 15%. Seeds at this level of moisture content can be stored in loosely packed bags on racks in a cool well aired store at a temperature of 80°F. For best germination results, storage to 3 to 4 months is considered ideal as it is found that after this period of storage there will be a rapid and even germination. The storage period can of course be longer or shorter than this but there will be an increasing reduction of viability after six months of storage.

Normally after storage oil palm seeds take six months to germinate in sand beds. In order to hasten germination, they are kept in special germinators at 40°C for a period of 3 months. For the first two months moisture content of seeds in polythene bags is raised to 18%. During the third month the moisture content of seeds is raised to 22%, after the seeds have germinated in 3 months, they are planted in sand beds or baskets as the pre-nursery stage.

Causes and Prevention of Losses During Storage

Losses of seeds incurred during seed storage can be broadly divided into two groups: —

(1) Destruction by pests and micro-organisms.
(2) Loss of viability and vigour.

In group (1) the loss is visible as shown by discoloration and reduction in the quantity of seed stored. The causes for loss can be easiy detected. The causes begin operating from the pre-storage stage. Faulty field practices such as harvesting at abnormal times, improper threshing, under drying and improper cleaning create conditions conducive for the attack of insects and moulds. During storage, faulty stores which are neither insect proof, nor rat proof nor moisture proof provide conditions favourable for the development and spread of pests and moulds of stored grains. Under such circumstances, seeds may be eaten up by rats and other pests or destroyed by moulds and other pathogenic organisms.

Losses of this nature can be controlled easily. Scientific storage is based on preventive and remedial measures. Preventive measures begin at the pre-storage stage and the following are recommended: —

(a) Harvesting of crop at right time.
(b) Avoid physical injury to seed during processing of seeds.
(c) Clean seeds properly, by removal of broken seeds, diseased seeds and impurity.
(d) Adjust seed to suitable moisture content.
(e) Provide suitable storage accommodation.

The remedial measures to be taken depend on type of infection. The following are the four common measures: —

(a) Fumigation against insects.
(b) Use of raticidal chemicals against rats.
(c) Use of fungicides against moulds.
(d) Clean dirty stores.

Losses in group (2) arising from farm-stored seeds are insiduous; a farmer may be unaware both of the steady loss of germination of the seed in his stores and of the consequent loss in production from crops. Visually seeds may look perfectly alright but germination and tetrazolium tests can confirm

their viability. Vigour may be reduced without any noticeable effect on germination.

It has been well established that moisture content and temperature determine to a large extent, the keeping quality of seeds in storage. Neither moisture nor temperature can be considered alone, as the effect of one depends upon the other. These factors are directly or indirectly responsible for loss in viability of seed in storage. Some seeds lose their germination capacity in a very short time when they are kept in the open air after harvest. This has been assumed to be due to the drying effect of the air. Most of these such as mangosteens (*garcinia mangostana*), cacao and citrus are of tropical or semi-tropical origin. On the other hand many tropical seeds including rice deteriorate quickly at high moisture levels. As the moisture level rises so does the respiration rate and the effect is intensified at higher temperatures. When moisture reaches 18 to 20% accelerated respiration and increased insect and fungal activity may raise temperature to a lethal level and sterilize the seed. This danger arises mainly in bulk storage. Many of the local seeds deteriorate very rapidly, it is possible, through humidity and temperature control, to extend the life span of many valuable seeds.

Decline in vigour of seed embryo is associated with a number of causes. As moisture content in seeds rises there is corresponding increase in respiration rate which leads to physiological decline or reduced vigour in seedling.

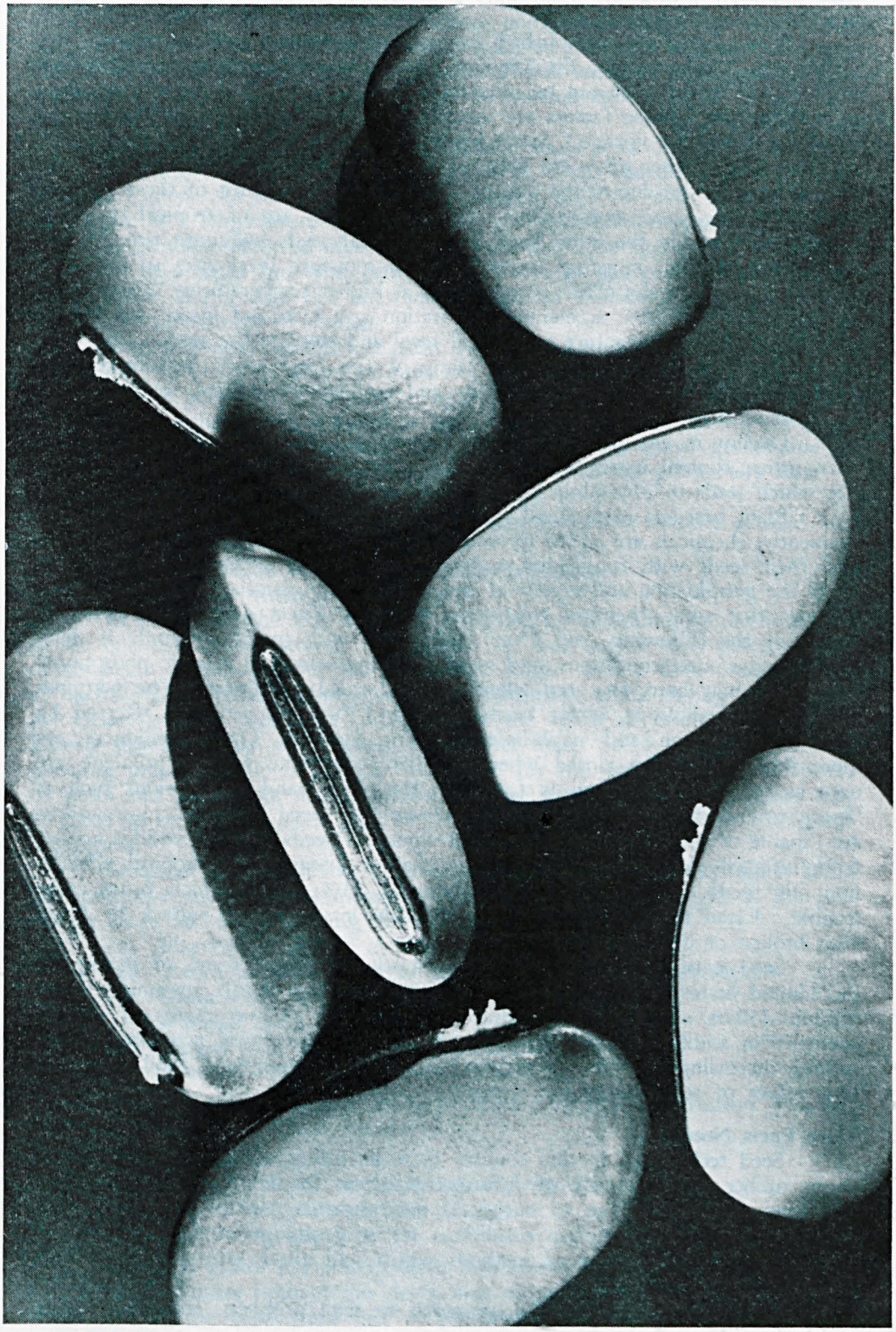
Plant breeders store small quantities of seed for a number of years and frequently, chemicals are added to seed to control seed storage insects. Farmers treat their seeds with fungicides as protectants. These chemicals are likely to affect the germination and vigour of the seeds. In Australia there is mounting evidence that some chemical treatments adversely affect germination and the vigour of the following crop (3). Fumigation with methyl bromide is deleterious under some conditions, and mercurial fungicides and organic phosphorus insecticides may harm the seed when used in sealed containers. The germination of oil seed crops, castor beans, corn and flax are seriously affected by paradichlorobenzene and naphthalene during storage. Open containers are more satisfactory than closed when paradichlorobenzene and naphthalene are used as seed storage chemicals (4). On the other hand preparations such as 'Spergon' and 'Dieldrin' are apparently harmless. Seed borne micro-organisms are capable of reducing germination and vigour of seeds. The seedlings arising from infected seeds may either be abnormal or diseased. In tropical climates non oily seeds have a safe moisture limit of 13%, above which fungi cause trouble. Clean high quality seed is obviously less subject to attack by fungi than broken or damaged seed.

Seed storage losses can reach a fantastic amount in terms of money. In the United States in 1954 estimated storage losses of cereals amounted to 90 million dollars excluding losses due to insects (1). Governments of various countries in addition to individuals in responsible agricultural positions are becoming increasingly aware of the possibilities of retaining both food and seedling values of seeds by proper storage.

More Facts Needed

Seed technology in this country is at its infancy. Except for padi, oil palm, rubber, there is lack of information about the application of accepted principles of seed storage to our local environments. There is urgent need first to find out the optimum conditions for seed storage of locally produced seeds and the development of methods which will allow safe storage of such seeds for longer period.

There should be a broad approach to seed problem, embracing many problems such as: —



(a) Fundamental knowledge of physiology and structure of seed.
(b) Role of harvest conditions in determining the germination and longevity of seed.
(c) Optimum temperature and moisture for seed storage.
(d) Effects of sealed storage on seed viability.
(e) Effects of seed dressings and fumigation on germination and vigour.
(f) Causes of deterioration.
(g) Duration of storage and its effects.

With active research, findings to the above form the basis of recommendations for safe storage of various seed produced locally.

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FARM MECHANISATION IN THE COLLEGE OF AGRICULTURE, MALAYA FROM 1963 TO 1965

by
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THIS article deals with the effort devoted towards the promotion of farm mechanisation by the Agricultural Engineering Section, College of Agriculture, Malaya from 1963 to 1965 during which the section was at formative stage.

A serious attempt to set up the Agricultural Engineering Section started in April, 1963. At that time, the mechanical unit was located in a small building with a floor space of 24 ft.x48 ft. which was inadequate to provide space for practical classwork, maintenance and repair work, spare parts storage and indoor parking of machinery. At the beginning of 1964 the construction of a new garage and workshop with a floor space of 48 ft. x 131 ft. and 36 ft. x 120 ft., respectively, was completed and they were used immediately. By May of the same year, the Agricultural Engineering Laboratory with a floor space of 22 ft. x 60 ft. was made available for occupation.

Teaching

From 1963 to 1965, a yearly total of 60 hours of lecture supported by 60 hours of practical work was alloted to Tractors and Power Farm Machinery and Implements for the final year students. The study of Tractors and Power Units covers engine operating principles, nomenclature and function of engine parts, valve arrangement, the various system such as fuel, ignition, cooling, lubrication and power transmission, engine fault finding and tractor operation safety precautions. In Farm Machinery and implements the major topics are: hand and animal tools, land clearing machinery, tractor operated implements such as mouldboard ploughs, harrows, rotavators, cultivators, seeding machine, mowers and manure distributors, threshers, pumps, sprayers, dryers and crop processing machinery.

With the gradual increase of teaching aids and facilities, instruction was correspondingly improved. In 1963 and 1964, the Public Work Department donated to the Agricultural Engineering Section old units of the following : two Fordson engines, one Ford engines, and four 2-cylinder diesel engines. Likewise, the Department of Agriculture made donations to the section. They were 1 unit of old combine, 3 units of old Landrover jeeps and two units of old Fordson tractors. An old student of the college also donated an old car whose engine has been used for practical work.

The classroom instruction in Tractor Power Units and Farm Machinery and Implements has been supplemented by fieldwork tractor operation. Both the second and final year students' groups were taught the tractor operation during fieldwork with 45 hours and 24 hours per year respectively.

The operations carried out during fieldwork included mould-board and disc ploughings, disc harrowing, rotavation, grass mowing and shrub-cutting, mechanical earth shoveling and loading, ground levelling with tractor mounted blade, spraying, and hauling work with trailer.

A student devotes an adequate period of Farm Power and Machinery in the entire span of the diploma course. Percentage-wise, it is 6.2% of the 3060 total hours of classwork and fieldwork. The latter figure excludes the one-week Special Training Experience conducted each term.

College Farm Equipment.

The range of College farm equipment was gradually increased. This permitted wider scope of mechanical operations in conjunction with teaching and farm work. Table I shows the farm equipment acquired by the College before and during the period under review.

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TABLE 1. Tractor and Farm Equipment Acquired by the College.

TRACTOR AND EQUIPMENT	BEFORE 1963	1963—1965
(a) Tractor	1 unit (54hp) $7,810	1 unit (41hp) $7,435
	1 unit (28hp) $4,180	1 old tractor (20hp) $271
	5 units (Pedestrian) $2,155 per unit	—
(b) Plough	2 unit mouldboard $750 per unit	Reversinle mouldboard $2350
	1 unit disc plough $900	—
(c) Harrow, disc	2 units, $1,800 per unit	1 unit, heavy duty $1,395
(d) Rotavator	1 unit (60″) $2,405	1 unit (50″) $2,483
(e) Tine cultivator	—	1 unit $720
(d) Rotavator	1 unit (60″) $2,405	1 unit (50″) $2,483
(e) Tine cultivator	—	1 unit $720
(f) Seed drill	—	1 unit $3,250
(g) Spinner broadcaster	—	1 unit $810
(h) Ridger	—	1 unit $800
(i) Sprayer	—	1 unit $1,800
(j) Grass cutters	1 unit, Servis cutter, $1,850	3 units, Pedestrian $527 per unit
	1 unit, Hayter gang mower $1,515	—
	1 unit, cutter bar type $1,665	—
	2 units, Pedestrian $527 per unit	—
(k) Post hole digger	1 unit $1,605	—
(l) water pump	—	2 units $302 per unit
(m) Thresher, padi	—	1 unit $898
(n) Sheller, ground nut and maize	—	2 units $140 per unit
(o) Winnower, padi	—	1 unit $155

(p) chain saw	—	1 unit $652
(q) concrete mixer	—	1 unit $1,543
(r) Front-end loader	—	1 unit $1,815
(s) Trailer, 3 ton	1 unit $2,590	—
(t) Tractor mounted grader		1 unit, $949

Mechanical Studies

Three of the four final year students who carried out project work in the section in 1963 did mechanical studies. Investigations were carried out on the sprinkler nozzle capacity, comparative performance of the various pedestrian tractors, and control of lalang by mechanical methods. The salient results of each of these projects are herewith discussed.

The investigation on the sprinkler nozzle capacity (Abdul Aziz bin Sheikh Abdul Kadir 1964) showed that neither the size nor the number of nozzles had any considerable effect on the radius of water throw considerably. However, there was a tendency towards a lesser radius as the number of nozzles was increased from one to three and as the size of the nozzles was decreased from 11/62 to 5/32. On the average 11/62 sized nozzle gave a 40 feet radius of water throw while the 5/32 gave a 35 feet radius of water throw. One gallon of water could be discharged by the 11/62 sized nozzle in 15 seconds, the 11/64 in 17 seconds and the 5/32 in 22 seconds. In this study a small centrifugal pump with an r.p.m. of 1300 was used throughout the tests. It was powered by a 5 h.p. tractor. The pipelines were 3/4 inch in diameter and the average pipeline pressure was 25 pounds per square inch.

Four pedestrian tractors were tested in an effort to evaluate their efficiencies under various field condition (Jamlus bin Abu Hashim 1964). The tractors tested were: Howard GEM (9 h.p.)Yamar Kyowa Queen (5 h.p.) Mitsubishi (5 h.p.) and Landmaster (4.5 h.p.). With the exception of the Landmaster, the machines were tested in field with 20% moisture. Rotavations were performed except for the Landmaster which did ploughing in a field flooded to 2 inches. Soil texture ranged from silty clay loam to clay loam. Both the Howard and the Landmaster used petrol fuel the Yamar used diesel whi e the Mitsubishi used kerosine. Depth of tillage averaged 4 inches. The rate of work and fuel consumption of the various pedestrian tractors are shown below.

TABLE 2 Rate of work and fuel consumption of the various pendes rian

TRACTOR	RATE OF WORK (HOURS/ACRE)	FUEL CONSUMPTION GAL/AC
Howard	12.2	6.04
Yamar	18.0	6.0
Mitsubishi	36.0	10.8
Landmaster	20.2	5.5

In the work on control of lalang (Imperata cylinderica) by mechanical operation (Nik Hassan bin Sulaiman, 1964) it was shown that two alterntate disc ploughing and rotavation controlled lalang by 90%. Rotavating thrice at 8 days interval gave only 80% eradication. Disc ploughing and disc harrowing alternated twice at 8 days intervals gave 70% eradication, while mouldboard ploughing — rotavation alternated twice at 8 days interval gave about 60% eradication. The least effective operation in the control of lalang was periodic disc harrowing 3 times at 8 days interval.

During 1964, two students conducted project work in the agricultural Engineering Section. One of them designed and constructed a windmill. The first phase of the work was completed with the construction of the windmill wheel and the power transmission system. The other student made a study on the performance of the small four-wheeled tractor. The result of the study forms part of the article published in Serdang Sun 1964/1965.

The 1965 student project on the development and testing of a groundnut seeder is in progress.

TABLE 3.

Mechanical Field Day Participants and their Equipment.

MACHINERY COMPANIES	1964	1965
1. Malayan Development Machinery	Nuffield tractors with discplough, rotavator, slasher, rear dozzer and ditcher and post hole diggers.	Nuffield tractors with ditcher rotoslasher, grader & tyer pump. Chainsaws & welder.
2. The Cycle and Carriage	Unimog tractors with disc plough, sprayers and atomise	
3. Howard Rotavators (Far East)	Heavy duty rotavator Howard 2000 general purpose tractor complete with attachments.	Howard 2000 general purpose tractor with plough, rotavator planter and sprayer. Mower, saw rotoslesher.
4. Anglo-American Corp.	—	Chainsaws.
5. Tractor Malaysia Ltd.	Fordson Major and Fordson Dextra tractors with allied equipment. New Kubota L 15 tractor & rotavator	New Ford tractors with plough and rotavator. Kubota L 15. Caterpillar tractor.
6. Pacific Engineering	—	Michigan 35 A tractor shovel with trench hoe. Ace tractor, roller and water pump.
7. Malayan Fertilizers.	Fontan sprayer, and mistblower	Fontan and knapsack sprayers. Fogging machine.
8. Harrison and Crossfield	Motoble 70 for sulphur dusting and as a flame thrower.	—
9. Borneo Motors	Massey-Ferguson tractors with disc plough & harrow	New models of Massey Ferguson tractors with ploughs & harrows. Dithcers and trailers.
10. Chong Lee Leong Seng Co.	—	Yanmar power tiller sprayer and pump.
11. I.C.I. (Malaya)	Spraying equipment for rubber and oil palm estates	Spraying equipment for rubber and oil palm estates.

Machinery Companies	1964	1965
12. James Warren	—	Hayter grass cutters, sprayer, pumps, welder and saw.
13. Breckwoldt & Co.	Superior 4-wheel and pedestrian tractors with attachments. Mistblower & generating sets.	Superior 4-wheel tractors with plough, sprayer and rotavator.
14. Champion Motors	—	Landrover and P.T.O. operated attachments. Kombi vehicles.
15. Jardine Waugh (M)	Allis-Chalmers B-1 and B-10 simplicity walking tractors, chain saw, water pump, self-welder	Allis-Chalmers small tractors welder.
16. Behn-Meyer Co.	—	Chemicals & Fertilizers.
17. Paterson-Simons	—	John Deere tractors with plough harrow, rotoslasher & maize sheller.
18 Malayan Air Charter.	—	Aerial sprayers and duster.

The Agricultural Enigneering staff had carried out the following mechanical work

During 1964 Construction of the following:
(a) Groundnut stripper, motorised (undertaken by Ng Hoe Hun)
(b) Sweet potato digger, tractor mounted
(c) Coffee depulper, hand operated (undertaken by Ng Hoe Hun)

During 1965 —
a. construction of a groundnut digger, tractor mounted (undertaken by Ng Hoe Hun)
b. Converting a ridger to sow seeds. (undertaken by Ng Hoe Hun)
c. Trials on mechanical threshing of soya beans and other legumes. (Co-worker — Lim Eng Siong)

Field Day.

Twice, the College of Agriculture sponsored a mechanical field day to stimulate interest in Agricultural equipment and encourage its wider use. The first field, held in September 1964 during which ten machinery companies participated, was a success. For the second field day held in July, 1965, seventeen commercial firms made very elaborate and impressive preparation but the outoome was disappointing due to inclement weather.

Table 5 shows the participating firms and their equipment during the first and second field days. The increase in number of participants is an indication of the growing awareness of the value of a field day as one of the steps toward promotion of farm mechanization.

In addition, the Faculty of Agriculture, University of Malaya brought its teaching mechanical aids and prepared demonstration on tillage implements especially rotavators for the second field day.

Summary:

1. A student devotes a fairly adequate period to Farm Power and Machinery in the entire span of the diploma course.

2. The range of College farm equipment was gradually expanded allowing a wider scope of students mechanical practical training.
3. Several mechanical studies were carried out in the Agricultural Engineering Section during the three-year under review.
4. The College of Agriculture sponsored a mechanical field day twice to stimulate interest in Agricultural equipment and encourage its wider use.

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Perekonomian Penanaman Padi Dari Aspek Persaorangan:

Sejarah penanaman padi boleh-lah di-katakan sama tua-nya dengan sejarah manusia. Sa-lagi manusia perlukan makanan sa-lama itu sa-bahagian besar dari pendudok2 di-dunia ini akan menanam padi, sa-tiap tahun lebeh berhasil dari yang sudah. Perchubaan dan penyiasatan dari berbagai aspek untok menambahkan lagi hasil padi berjalan terus. Tiada mengenal penat dan lelah, wang dan masa. Pendudok2 dunia yang makin bertambah dari sa-hari ka-sahari perlu makanan.

Malaysia ada-lah sa-buah negara pertanian. Negara yang penoh dengan tanah rata yang subor dan berbaja. Padi pula ada-lah merupakan makanan yang paling penting, beras. Sunggoh menghairankan bahawa negara kita tiada dapat menghasilkan keperluan-nya sendiri. Terpaksa mengimpotkan dari negara2 jiran sa-tiap tahun.

Penanaman padi boleh-lah di-tinjau dari dua aspek, ia-itu aspek ekonomi dan aspek national. Aspek ekonomi pula boleh di-pechahkan kapada ekonomi petani atau persaorangan dan ekonomi national. Kedua aspek ini sama penting-nya. Keburokkan ekonomi petani2 ini memberi kesan kapada ekonomi nasional, dan mencherminkan sa-takat mana kejayaan kerajaan di-dalam memperbaikki mutu kehidupan petani2 ini dan menghapuskan kemiskinan di-dalam mereka.

Ada tiga jenis padi yang di-tanam di-negara ini ia-itu Padi ringan, padi pertengahan dan padi berat. Padi ringan mengambil masa dari menyemai hingga menuai sa-lama 140 hari atau kurang, padi pertengahan dari 140-200 hari dan padi berat lebeh daripada 200 hari. Perbinchangan di-sini hanya mengenai penanaman padi ringan sahaja, padi Mahsuri dan padi Malinja. Kedua2 jenis padi ini boleh menghasilkan lebeh dari 3500 pounds atau 600 gantang sa-ekar. Dasar kerajaan ia-lah menggalakkan petani2 menanam padi ringan saperti ini tetapi hasil-nya baik dan boleh menandingi pendapatan hasil2 dari tanaman2 yang lain.

Padi, saperti lain2 tanaman, memerlukan tenaga yang agak banyak untok melaksanakan-nya. Hasil yang munkin di-dapati daripada padi itu terkurang

atau kekurangan sakira-nya padi itu di-biarkan sahaja tanpa jagaan yang sempura. Sa-ekar sawah padi menghendaki leehb kurang 500 jam daripada tarikh menyemai hingga menuai. Kehendakan tenaga2 ini boleh-lah di-bahagikan saperti berikut : —

Menyediakan tapak semaian	24 jam	...	5%
Menyediakan sawah	91 jam	...	17%
i. Membajak & menyikat	41.5 jam		
ii. Menggulong	28.5 jam		
iii. Membaja	21 jam		
Mengubah	70 jam	...	14%
Mengawal tanaman	145 jam	...	29%
i. Merumput	87 jam		
ii. Membaja sabelum mengubah	47 jam		
iii. Mengawal ayer & parit	11 jam		
Menuai	170 jam	...	34%
i. Menuai	96 jam		
ii. Membanting	55 jam		
iii. Mengangin	19 jam		
JUMLAH	500 jam	...	100%

Jumlah tenaga masa yang di-atas ada-lah tanpa tenaga yang di-gunakan untok menchegah musoh saperti tikus dan musoh2 serangga serta penyakit padi, kerana padi yang di-jaga dengan baik biasa-nya tiada di-serangi oleh penyakit atau musoh atau kedua2-nya sakali. Dalam lain perkataan sa-orang petani tiada boleh menumpukan masa sa-banyak yang tersebut di-atas kapada lain pekerjaan di-musim menanam padi. Sa-kira-nya beliau ingin menumpukan tenaga kapada tanaman yang lain, maka terpaksa beliau mengajikan orang lain untok megerjakan sawah itu. Dengan gaji katakan $3.10 sahaja sa-hari, maka beliau terpaksa membayar sa-banyak $193.75, bagi tiap2 ekar sawah. Nilaian ini mesti di-tolak dari ke-untongan tanaman yang lain itu, mithal-nya jagong, untok mengetahui tanaman mana yang lebeh berfaedah. Dengan lebeh tepat lagi 'peluang pendapatan' dari sa-ekar padi ia-lah kerugian hasil dari sa-ekar jagong.

Hasil padi boleh bertambah di-dalam kebanyakan kawasan2 padi jika di-bajai. Tanah, sakali pun subor, akan kehausan jika baja2 yang di-hisap oleh padi tiada di-ganti balek. Pendapatan-petani2 yang menggunakan baja dagangan di-Tanjong Karang mithal-nya, ada-lah berganda dari sawah tanpa di-bajai. Banyak-nya baja dagangan yang patut di-gunakan ada-lah bergantong kapada kesuboran asli tanah itu dan banyak-nya baja2 organik yang telah di-buboh. Umum-nya 1-1½ kampit baja padi dan ½ kampit baja urea (lebeh kurang) bagi kawasan negeri Selangor, Perak & N. Sembilan atau 2 kampit baja padi bagi kawasan pantai timor bagi tiap2 ekar ada-lah menchukupi. Pendek-nya sa-orang petani patut-lah membelanjakan lebeh kurang $25/- bagi tiap2 ekar padi.

Kedua2 padi Mahsuri dan Malinja boleh menghasilkan lebeh kurang 600 gantang sa-ekar dalam masa 130-140 hari. Penanaman dua kali sa-tahun dengan menggunakan kedua2 jenis padi ini akan menghasilkan lebeh kurang 40 pikul sa-ekar sa-tahun. Dengan harga $16/- sa-pikul sa-orang petani boleh mendapat sabanyak $640/- bagi tiap2 ekar padi. Dalam lain perkataan keuntongan dari sa-ekar padi ia-lah $202.50 sa-tahun ia-itu sa-telah di-tolak nilaian harga baja dan gaji. Tetapi tiap2 petani mengerjakan sawah-nya sendiri. Pendapatan beliau sekarang ada-lah meningkat $590/- sa-ekar sa-tahun. Sa-kira-nya beliau mempunyai 2 atau 3 ekar tanah sawah, maka bermaana-lah pendapatan beliau ia-lah di-antara $90/- - $145/- pukol rata sa-bulan. Pendapatan

sa-banyak ini ada-lah sa-tanding dengan pendapatan dari hasil getah yang seluas itu juga. Dari segi ini dan jika di-tinjau dari aspek keluasan yang hanya 1-3 ekar sahaja, maka padi ada-lah lebeh beruntong dari getah.

Getah ada-lah tanaman jangka panjang. Tanaman ini mengambil masa sa-kurang2-nya 6 tahun sa-belum boleh mendatangkan hasil. Modal yang di-kehendaki untok mendapat hasil dari sa-ekar getah dari menyemai biji hingga menoreh ada-lah tinggi, di-antara $850/- - $900/-. Sa-lama 6 tahun ini sedikit hasil pun tiada boleh di-dapati. Menanam lain2 tanaman di-antara pokok2 getah ini tanpa jagaan yang memuaskan saperti membaja dll. akan mengurangkan hasil getah dan menambahkan hakisan tanah, penyakit dan menarik musoh2. Hasil yang akan di-dapati dari tanaman2 jangka pendek ini ada-lah lebeh kurang dari hasil yang sa-patut-nya boleh di-dapati dari getah tanpa tanaman2 ini. Di-sabalek-nya padi, dalam masa 6 tahun itu, telah menghasilkan pendapatan yang banyak. Dengan lebeh tepat lagi, 'the net earning capacity' tanaman padi ada-lah lebeh tinggi dari getah. Padi tiada berkehendakkan modal permulaan yang besar.

Memang menggembirakan jika apa yang di-harapkan oleh semua petani2 dan juga kerajaan akan terbukti. Malang-nya harga padi yang di-dapati oleh kebanyakan petani ada-lah lebeh jauh dari apa yang di-harapkan, ada kala-nya sa-murah $13/- sa-pikul. Tidak semua petani boleh menanam padi dua kali sa-tahun dan dengan jenis padi Mahsuri atau Malinja kini. Hampir satu juta ekar tanah di-tanam dengan padi, tetapi chuma 35000 ekar sahaja di-tanam dengan padi dua kali sa-tahun. Banyak pula di-antara petani ini tiada mempunyai sawah sendiri. Mereka terpaksa menyewa. Sewaan tanah padi ini ada-lah bergantong kapada kesuboran asli tanah itu, tempat, parit dan tali ayer di-tempat itu dan keluasan sawah yang ada di-tempat itu. Di-sa-tengah2 kawasan saperti di-Tanjong Karang, Krian dll. sewa-nya ada-lah lebeh dari yang berpatutan, ada kala-nya lebeh dari $100/- sa-ekar sa-tahun. Penyewa tanah ini juga terpaksa memberi duit teh atau duit kopi dan wang pertarohan terlebeh dahulu kapada tuan tanah sa-belum dapat menyewa tanah. Faktor2 saperti ini ada-lah di-antara faktor2 yang mustahak yang mesti di-beri perutamaan dalam mengkaji sebab2 rendah-nya ekonomi petani2 kita sekarang.

Sa-saorang petani, untok hidup dengan ekonomi yang baik, mesti-lah mempunyai sa-kurang2-nya 3 ekar tanah yang boleh di-gunakan untok bertanam padi dua kali sa-tahun, mempunyai chukup beneh dari jenis padi yang baik saperti Mahsuri dan Malinja, pengetahuan pertanian yang sa-patut-nya dan harga padi yang memuaskan. Yang penting di-sini ia-lah menambahkan dan memperbaiki keadaan parit dan tali ayer untok membekal sawah dengan ayer yang sa-chukup2-nya pada musim menanam, bukan menambahkan kawasan tanah untok bertanam padi. Keluasan tanah padi yang ada sekarang ada-lah lebeh dari chukup. Orang kaya pula patut di-sekat dari memonopolikan tanah sawah padi ini. Jika tidak, mereka2 ini di-kenakan mengikut peraturan di-dalam menyewakan tanah mereka. Sewaan ini mesti-lah sama pada tiap2 kelas tanah itu. Pengetahuan pertanian mesti di-kembangkan dengan sempurna kapada petani2 ini. Tempat latehan patut di-perbanyakan lagi untok melateh petani ini di-dalam hakikat menanam padi juga lain2 tanaman yang baik. Dalam pada itu pasaran padi dengan harga yang memuaskan mesti di-galakkan. Kejayaan di-dalam melaksanakan faktor ini dengan lichin bermaana negara ini tidak lagi akan mengimpotkan sa-jumlah lebah kurang 40% dari keperluan raayat, tetapi akan mengeksepot sa-jumlah itu pula. Ekonomi petani akan bertambah baik, dan ini bermaana ketegapan ekonomi negara juga. Revolusi sa-macham ini-lah yang sedang di-jalankan oleh kerajaan demi untok kapentingan perikonomian penamaman padi baik dari segi persaorangan (atau petani) atau nasional.

ABDULLAH ISMAIL

KEMUNDURAN IKTISAD PERTANIAN DI-KALANGAN PEKEBUN2 KECHIL

oleh:
OTHMAN HASANI.
Tahun Satu.

PADA dasar-nya memang amat susah bagi sa-saorang untok membuat kesimpulan bahawa pertanian di-kalangan pekebun2 kechil ada-lah keselurohan-nya telah maju, maju dalam artikata bahawa mereka mempunyai kehidupan yang lebih terjamin dan lebih baik daripada beberapa tahun yang baru lalu. Di-manakan terdapat kemajuan jika chara yang di-gunakan maseh jua lagi chara dulu, tanah maseh jua lagi tiga ekar tiada bertambah2, dan makin satu tahun makin banyak mulut yang mesti di-suap. Jika atap pondok makin sa-hari makin bertambah bochor-nya bagaimana boleh di-kata hidup telah lebih terjamin. Dan kalau masa bujang dulu biasa melaram dengan pakaian yang segak; sekarang ini, anak baru tiga sudah tiada dapat mengganti pakaian keluarga barang sa-kali sa-tahun. Nah, di-manakan boleh di-kata kehidupan telah terbaik?

Pabila sedar kehidupan mereka makin terpichik, ada-lah kebiasaan bagi petani untok membuat tuduhan bahawa kerajaan-lah yang chuai di-dalam membela kehidupan mereka. Biasa terdengar sungutan2 bahawa sistem parit dan taliayer di-sasuatu tempat tiada di-ambil berat oleh kerajaan. Jikalau lorong2 dan jalan2 telah rosak dan terbiar maka kerajaan jua-lah yang bersalah kerana tiada segera menaroh tanah merah atau menaroh minyak tar.

Sekarang ini kerajaan dan badan2 yang berkenaan menyogokkan beraneka projek dan ranchangan, demi untok kemajuan ekonomi di-daerah2 kampong. Pehak kerajaan sendiri telah membuat dan membaikki jalan2, balai2 raya, mesjid2 dan lain2 lagi dalam bidang Ranchangan Pembangunan Luar Bandar-nya. Tapi teori kejayaan-nya hanya terchatet indah di-Bilek Gerakan Pembangunan Luar Bandar, dan pada hakekat-nya keadaan sa-bagus itu jauh sakali dari yang sa-benar-nya. Lembaga Kemajuan Tanah Persekutuan munchul dengan ranchangan2 tanah-nya, dan telah membiayai tiap2 ranchangan dengan ongkos yang bukan sedikit, tapi kejayaan bagi tiap2 ranchangan itu tiada sa-bagaimana yang di-harapkan. Lembaga Tanam Samula (Getah) telah mengutarakan ranchangan tanam samula-nya, tapi ongkos yang di-terima oleh petani2 itu tiada digunakan untok keperluan2 mustahak demi jaya-nya perkebunan mereka itu. Perkhidmatan Penasehat Pekebun2 Kechil yang di-selenggarakan oleh Pusat Penyelidekan Getah jua mendapat kejayaan yang tiada sa-berapa.

Tanda so'al yang besar ia-lah kenapa-kah ranchangan2 itu tiada mendapat kejayaan yang sa-harus-nya terchapai? Dari sebab kegagalan ini penduduk kampong akan terus hidup mundur, akibat-nya di-rasa oleh mereka sendiri dan dengan sechara tidak langsung jua akan di-rasa oleh negara.

Semua kemunduran dan kegagalan ini dapat di-susul kembali kepada sifat2 mundur yang tiada mahu lekang dari masharakat kampong. Hal ini boleh kita pandang dari segi pelajaran yang mana ia-lah faktor yang amat ganal. Dari sini tindak balas yang tidak di-ingini nyata pula pada beberapa sifat yang tertentu pada aspek budaya dan tanggapan ekonomi.

Di-daerah kampong yang agak jauh dari tamaddun bandar nyata taraf ilmu pengetahuan amat mundur. Hanya beberapa orang ibu bapa dan penjaga kanak2 saja yang sadar bahawa pelajaran itu-lah tangga kepada kejayaan kehidupan anak2 mereka. Dan dari peratus ini hanya sebahagian sahaja yang sanggup berkorban apa saja demi kemajuan pelajaran anak2 mereka. Keadaan buta huruf yang maseh lagi berleluasa tiada boleh di-nafikan walaupun telah lama di-adakan sekolah2 dewasa. Dari sebab2 ini, jua sebab2 lain, anak2 kampong tiada punya pengajian dan ilmu pengetahuan yang boleh di-banggakan, jauh lagi ilmu pengetahuan yang dapat membimbing mereka kapada kemajuan dan kejayaan. Persekolahan hanya-lah membolehkan mereka membuat kira2 tolak, champor, darab dan bahagi. Buat pemuda2, andai-nya bisa membacha surat2 khabar dan menulis surat2 asmara pun chukup-lah. Tapi ilmu pengetahuan sedangkal ini tiada membolehkan mereka membereskan sendiri soal2 tanah mereka, umpama-nya untuk menukar nama atau mengambil kuasa. Mereka sendirian tiada berani berjumpa Pegawai Daerah untuk menguruskan sesuatu, mereka perlu mendapat pertolongan dari enche' Anu atau Dato' Penghulu baru-lah berani tampil.

Sifat rendah jiwa atau inferiority complex ini sangat2 merugikan mereka. Tiap2 perkara yang bersangkut dengan kerajaan ada-lah perkara yang sebesar gunung walau pun sa-benar-nya perkara itu ada-lah amat kechil sakali. Ular2 air di-Pejabat pejabat Daerah dan pejabat2 saperti-nya pun maju-lah Sharikat Ular Air-nya. Pada kebiasaan-nya untok bertukar nama atau hal2 bersangkut dengan jual-beli tanah, lima enam puloh ringgit jatoh katangan orang2 tengah ini. Dan untok menuntut kuasa pula biasa-lah dua tiga ratus ringgit masok kantong mereka.

Sifat rendah jiwa ini lebih2 lagi merugikan mereka dalam soal2 lain. Tuntutan2 mereka biasa-lah terabai, kerana mereka berharap sangat kepada pehak ketiga yang mana tiada menaroh simpati kepada mereka. Untuk urusan2 kechil mereka perlu memberi wang kopi. Tapi pendapatan mereka tiada sa-berapa. Hutang pun mulai-lah bertambah demi keberesan wang kopi dan urusan mereka. Sifat rendah jiwa jua membawa suatu penyakit yang dengan tiada di-sadari telah di-anggap oleh sa-tengah2 petani sa-bagai suatu perinsip. Pemikiran dan usaha mereka telah di-dungukan oleh pepatah, "yang sechupak ta'kan jadi segantang".

Taraf pengetahuan yang rendah tiada dapat mengubah chara pemikiran mereka. Jalan2 bagi kemajuan ada-lah buntu belaka. Penghidupan sa-hari2 di-teruskan sebagai kebiasaan sahaja. Chukup untok mengisi periok nasi pun sudah-lah. Bagi mereka yang ingin melebihi pendapatan, asas yang di-bawa ia-lah melebihkan penggunaan tulang empat kerat mereka saja. Biasakah pesawah2 padi berfikir "Kalau orang tanam sejarak lima belas inchi dan mereka buat sa-luas tiga ekar dengan tiada menggunakan baja, mungkin jua pendapatan saya boleh sama jika saya membuat sa-luas dua ekar tapi di-tanam sejarak sepuloh inchi dan saya beri baja dalam dua tiga puloh ringgit. Jika pendapatan saya sama dengan pendapatan tiga ekar, berma'ana-lah saya dapat menjimatkan masa bekerja untok satu ekar". Oh, tidak. Fikiran yang sedemikian amat susah hendak munchul pada pentas menongan mereka sa-hari2. Langkah2 yang di-ambil tiada di-dahului dengan pertimbangan 2 yang mesti di-pandang dari segi ekonomi.

Pekebun2 getah biasa melihat dan mendengar propaganda tentang menanam samula dengan baka2 baik. Kenapa-kah di-tempat2 di-mana pembukaan tanah2 baru yang tiada di-uruskan melalui ranchangan khas kerajaan, maka maseh jua lagi baka2 yang tiada terpileh yang di-tanam. Asalkan muka tanah itu berbaris dengan anak2 getah hati pun puas-lah. Kenapa-kah tiada berbelanja dua tiga puloh ringgit lagi untok membeli baka2 baik. Masa yang di-tunggu pun sama jua lama-nya (malahan lebih pendek lagi masa-nya bagi baka terpileh), dan pabila telah di-turis kelak baka yang terpileh boleh menghasilkan dua tiga kali ganda dari baka yang tidak terpileh.

Untuk menchapai kemajuan dalam artikata yang sa-benar, sa-suatu masharakat itu perlu-lah mempunyai keadaan2 precondition yang boleh menyenangkan kemasokan kemajuan itu. Baru-lah kejayaan itu sa-laras dengan usaha2-nya. Kemajuan sa-suatu kaum itu ada-lah berasas pada taraf pelajaran dan ilmu pengetahuan-nya. Di-Amerika, Jepun dan di-Denmark kaum2 petani dapat hidup dengan lumaian-nya. Mungkin kejayaan mereka ada-lah di-sebabkan oleh kesuburan tanah2 di-negeri mereka. Tapi bukan-kah kesuburan tanah Malaysia jua terkenal? Kalau-lah petani2 dapat memandang pertanian dari segi ekonomi tidak lagi dari segi kebiasaan sahaja, maka dengan sendiri-nya apa jua rupa ranchangan kemajuan akan di-reguk dengn nikmat-nya. Tapi taraf ini entah bila akan terchapai.

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PEMUDA PEMUDI DALAM LAPANGAN PERTANIAN

oleh:
MOHAMED ISMAIL.
2nd Year.

KITA memang sedia maalum bahawa beberapa kemajuan yang di-chapai di-dalam sa-sabuah negeri itu biasa-nya, satu daripada sebab2-nya, ia-lah dengan timbul-nya revolusi atau perubahan baru dalam pemikiran yang bermutlamatkan kapada kemajuan, dalam jiwa bakat2 baru atau dengan lebeh tegas-nya pemuda-pemudi. Mungkin kita tidak dapat menchapai apa2 kemajuan tanpa mereka2 ini dan perkara sa-demikian ada-lah merupakan satu kenyataan. Kita umpamakan kapada kebudayaan. Sedarkah kita apa-kah chara yang di-ambil untok memperkembangkan-nya? Ya, tak lain lagi

ia-lah dengan mengadakan kelab pemuda-pemudi. Mereka di-ajar, di-asoh dan di-lateh dalam usaha memperkembangkan lagi kebudayaan dengan luas-nya.

Kita harus akan bertanya apa-kah pemuda pemudi sahaja yang dapat membawakan sa-suatu perubahan? Bagaimana pula dengan orang2 tua atau apa yang di-katakan orang yang lama makan garam? Bila di-katakan pemuda pemudi tidak-lah berma'ana bahawa mereka yang maseh di-dalam belasan tahun sahaja tetapi ada-lah mereka2 yang mendapat didekan tinggi daripada orang2 yang terdahulu daripada mereka. Mereka2 berdarah muda dan sentiasa dynamik orang-nya. Orang tua kebanyakan-nya lebeh mementingkan kerja mereka dan anak2 isteri. Mereka kurang berpeluang memikir atau menimbangkan masa'alah tersebut. Oleh itu terpulang-lah beban tersebut ka-atas bahu pemuda pemudi kita. Apa yang di-harapkan benar2 ia-lah galakan dan kata perangsang yang akan memberi chahaya kapada pergerakan mereka.

Berbalek kapada tajok di-atas, harus-lah kita fikirkan tajok ini dalam2. Satu so'alan yang harus akan di-kemukakan ia-lah; Apa-kah rupa peranan dapat di-mainkan oleh pemuda pemudi dan bagaimana?

Dengan sa-chara kasar boleh-lah kita bahagikan masharakat muda mudi kita kapada dua peringkat, ia-itu:

i. Mereka yang bertani di-desa, dan kurang berpeluang menerima pelajaran tinggi.

ii. Mereka2 dari sekolah2 pertanian, kolej2 pertanian dan juga universiti2 di-dalam atau di-luar negeri.

Kita sedia maalum bahawa gulongan pertama ada-lah mereka2 yang melakukan pekerjaan tani sejak dari turun temurun lagi. Dengan lain2 perkataan, mereka bertani kerana kebiasaan atau sa-bagai adat sahaja. Boleh-lah di-katakan pekerjaan itu tidak di-lakukan dengan sa-penoh hati. Dengan perkataan ini penulis maksudkan bahawa hasil dari ladang-nya sahaja tidak menchukupi untok menampong kehidupan dan keperluan sa-hari2. Mithal-nya kebanyakan penanam padi kita mendapati hasil padi-nya tidak chukup untok di-gunakan sampai akhir tahun manakala keluarga-nya sa-makin bertambah. Jadi terpaksa-lah ia membeli beras yang di-impot oleh kerajaan dari luar negeri. Walau bagaimana pun kebanyakkan petani kita mempunya unsor2 lain bagi menambahkan sara hidup, sama ada dengan bertanam getah, kelapa dan dusun, menjadi nelayan atau berkuli.

Bagi gulongan kedua pula, mereka ada-lah orang2 yang mendapat sa-dikit sa-banyak pelajaran berkenaan pertanian sa-umpama menggunakan jentarek besar dan kechil, teknik2 pertanian yang baik, iktisad2 pertanian dan urusan ladang, juga lawatan2 ka-sana sini dan sa-bagai-nya. Mereka ini-lah yang di-harapkan untok membimbing petani2 kita ka-arah kejayaan, dan terpulang-lah kapada mereka menyumbangkan derma bakti demi kepentingan bangsa, nusa dan ugama.

Jika kita perhatikan dengan teliti kedua2 gulongan tadi mempunyai pertalian erat. Mithal-nya, sejak beberapa tahun dulu, mereka telah menubohkan **Persatuan2 Peladang dan Sharikat Kerjasama**. Dengan chara ini dapat-lah mereka berkompol pada masa2 tertentu untok mendengar sharahan, cheramah2 dari pegawai yang terlateh dan dari orang2 yang berpengalaman, mengikuti kurusus2, membuat ranchangan gotong-royong dan juga mengadakan lawatan2 ka-sana sini bagi meluaskan lagi pengalaman mereka. Sekarang dapat-lah mereka membuka mata hati dengan sa-luas-nya sambil melepaskan diri dari kongkongan 'tempurong' yang sa-belum-nya menyelubongi hidup mereka. Pertandingan bertani dan berternak dapat juga di-adakan melalui persatuan demi menggalakkan lagi pertanian kita.

Walau bagaimana pun maseh terdapat juga lagi kongkongan dari sa-suatu pehak dalam persatuan ini. Saperti mana yang di-ketahui mereka ada-lah di-bawah kuasa Jabatan Pertanian dan dengan tidak sa-chara langsong melibatkan kerajaan pula. Memandangkan kapada perkembangan2 yang berlaku di-tanah ayer kita sa-lepas merdeka, rasa-nya sudah-lah sampai masa-nya pehak2 berkenaan melepaskan persatuan2 tersebut berdiri dai-atas kaki sendiri.

Juga sudah-lah sampai ketika yang baik supaya di-satukan sakalian pertubohan petani dari sa-genap cherok rantau, di-bawah satu persatuan yang berchorak kebangsaan. Mungkin dengan chara ini dapat-lah persatuan tersebut bergiat lebeh pesat lagi. Segala urusan dapat-lah di-salorkan dengan sempurna dan buah2 kemajuan-nya

dapat-lah di-rasakan oleh sa-tiap ahli dari semua chabang dan ranting. Namun demikian kerajaan hendak-lah juga membantu mereka jika perlu, lebeh2 lagi dalam so'al kewangan dan teknik kerana wang ada-lah tangkal untok menambahkan semangat dan kemajuan.

Hasrat kerajaan hendak nemambahkan **mata pelajaran pertanian di-sekolah2 menengah** amat-lah bijak sa-kali. Kanak2, di-samping lain2 pelajaran, mesti-lah di-asoh juga dalam hal2 pertanian. Kata orangtua2, 'melentor biar-lah dari rebong'. Apabila mereka faham sadikit sa-banyak dari segi theory dan praktikal-nya, lama kelamaan kechenderongan mereka akan bertambah mendalam, maalum sahaja-lah, belakang parang di-asah akan tajam juga. Dengan demikian, kelak bertambah-lah lagi ahli2 pertanian kita yang terlateh.

Harus ada orang akan bertanya ada-kah semua orang mesti menjadi petani atau peladang apakala besar kelak? Tidak, sa-kali2 tidak. Sa-saorang itu bebas memileh chara hidup-nya. Kechenderongan-nya di-kala muda boleh-lah di-katakan satu lagi chara untok membaiki pertanian, dan menjadikan satu alam pertanian yang sentiasa bergerak ka-arah kemajuan di-negara kita ini khas-nya.

Kursus2 pendek yang di-jalankan di-pusat2 pertanian dan ternakan telah pun mendatangkan beberapa kesan kapada pertanian di-negara kita ini. Menerusi penerangan2 dari kursus2 tersebut dapat-lah petani2 memahami tujuan pertanian yang sa-benar-nya ia-itu bermutlamatkan hasil yang memuaskan dari sa-suatu usaha. Kursus2 bagi wanita juga harus di-galakkan lagi terutama di-peringkat2 sekolah, kolej dan universiti2 dengan memberikan banyak lagi biasiswa2. Jika ramai petani2 perempuan yang terlateh, maka sudah pasti kaum lelaki pun akan berlumba2 kahadapan agar tidak di-tinggalkan oleh kaum wanita. Di-samping berbakti di-ladang, wanita juga dapat menyumbangkan tenaga menolong ibu2 menguruskan rumah tangga mereka dengan lebeh sempurna.

Pemuda pemudi patut sa-kali menunjokkan chara2 hidup ber**gotong royong** dan bekerjasama dalam melaksanakan sa-suatu tugas. Namun begitu, tidak-lah sa-saorang itu perlu hanya bekerja kuat dan tekun sahaja tetapi hendak-lah biasa menggunakan inisiatif, berperatoran, berjiwa kemasharakatan dan juga kebangsaan. Dalam perhubongan sa-hari2, mereka akan mempelajari berbagai2 rupa masharakat dan dapat menambahkan lagi kechenderongan kapada memperbaiki nilai diri, keluarga, bangsa dan nusa.

Apabila alam pertanian kita bertambah maju, petani2 pula terdiri dari mereka2 yang mendapat didekan jasmani dan rohani, kanak mempunyai kechenderongan dalam soal ini, maka boleh-lah kita fikirkan masa'alah menubohkan satu kelab atau persatuan untok anak2 pula. Kelab2 saperti ini telah pun berkembang di negara2 yang maju saperti Amerika Sharikat dan Filipina. Nama kelab tersebut ia-lah '4-H Kelab'. Kelab2 tersebut mempunyai empat tujuan yang besar yang boleh di-artikan:

a) Berkerja
d) Berkhidmat
c) Belajar
d) Bersatu.

Jadi boleh-lah kita namakan kelab itu dalam bahasa kita **'4-B Kelab'**. Ini-lah satu chara menggalakkan lagi pertanian dalam jiwa anak2 kita, menanamkan semangat chinta kapada kampong, dan di-samping itu menahan setengah2 daripada mereka lari ke-bandar2 untok menchari pekerjaan. Mereka akan di-ajar chara2 mendapatkan keuntongan yang tinggi dari kerja mereka sambil menchatitkan ma'alumat2 yang penting untok faedah masa depan. Juga, mereka akan di-lateh memperchayai kebolehan sendiri dan saling hormat menghormati akan hak masing2. Oleh yang demikian mereka akan menjadi warga negara yang berguna pada masa hadapan kelak.

Berpandukan kapada faktor2 di-atas, nyata-lah bahawa kemajuan sa-suatu lapangan itu tergantong kapada pemuda pemudi yang mempunyai pelajaran moral, teknik, kewangan, persatuan dan sa-bagai-nya. Petani2 kita sudah pasti akan mempunyai kejayaan pesat jika mempunyai sharat2 tersebut. Iktisad negara akan menjadi kokoh kerana kekayaan tanah-nya di-gunakan dengan sa-luas2-nya. Ingat-lah, petani adalah tulang belakang negara. Miskin petani mundur-lah negara. Mundor negara rusak-lah bangsa. Rusak Bangsa musnah-lah ugama. Oleh itu mari-lah kita menyingseng tangan berganding bahu membangunkan satu rumpun bangsa yang beriktisad tinggi dan berjiwa suchi di-alam ini dan sambut-lah seruan ini,

Some observations on the feeding behaviour of local goats of Malaya

Introduction:

THE goat is a valuable animal to the small farmer in Malaysia in subsistance agriculture. It provides meat, milk and also a reliable source of income for the farmer. Its importance to the farmer is also emphasised by the fact that it is used as a sacrifical animal during certain religious festivals.

The FAO production year book (1962) shows that one quarter of the world's goat population of 132.4 million is found in Asia, where it forms a major source of animal protein. This indicates in part the success of the goats to conditions in this part of the world. In Malaya, the population of goat in 1964 is about seven times the population of sheep, and suggests that between the two, goat production is more important. It also indicates that goats are more hardy animals than sheep to withstand in Malayan conditions.

Many studies have been conducted to understand more fully its importance and behaviour in agricultural system. These studies indicate the controversial issue as to whether the goat is beneficial or detrimental to agriculture.

Maher (1945) has dealt with this controversy in some detail and concluded that the goat as an animal should be regarded w th no more disfavour than the cattle. In the foreword of the East African Agricultural Journal (1944), it was stated that the investigations carried out by the Mpwapwa workers emphasised the potentialities of the hardy beast as provider of meat and milk.

The second school of thought come from research workers who agreed that many real problems of goat keeping arose out of the special difficulty involved in keeping them under control. To substantiate this statement, Sir Daniel Hall (1936) obese ved that "the greatest danger, however, lies in the fact that overgrazing may so destroy the vegetation and bare the surface, that soil erosion sets in. Of all livestock, the goats are the worst offender. They graze more closely on bushes as well as on the grass, thereby never allowing forest growth to regenerate from seedling. Within historic times, they have been the chief agents in the deforestation of lands."

In the midst of such controversy, it is only natural to find other research workers doing a much closer study on the actual behaviour and feeding habits of the goat.

One of the earlier workers (Edwards, 1948) observed that goats preferred to eat the leaves of plants rather than grass. During the period of leaf flush, goats were found to neglect the grass entirely and concentrate their attention on the young leaves; and during leaf fall only on one occasion were the goats observed to be grazing grasses.

Wilson (1957) found different results in his studies on the browsing behaviour of the East African dwarf goats. He found that goats did show a liking for grass, even though in small proportions compared to trees and bushes. Further, he also observed that the goats were quite selective in that the chief parts of grass eaten were the inflorescence and the growing shoots, whereas the growing part near the ground were left untouched.

Similarly Staples el al (1942) found out that, as long as there were bushes and herbs on which to browse, the goats nibbled contentedly at it and left the grass almost alone. To support this Jordan (1957) reported that, given a choice of pastures and browse, the goat invariably took the browse. Then, there is also the neutral view by Oats that the goats had the ability to graze and browse and was quite indifferent and not selective in what it consumned.

Knight (1965) made observations that were quite similar to Wilson's, but differ slightly in that his goats consumned much larger quantities and certainly grazed low into the heart, even to the extent of doing considerable damage to the pastures.

Most of the above reports and observations were obtained from African workers, and virtually no such work has ever been known to be carried out here in Malaya. However there is evidence that goats do damage young shoots of rubber trees and the bark of adult trees. Then it is only proper that some kind of observation be made concerning our local goats.

Objective

Observations were made at the bamboo area in College of Agriculture, Malaya with a view to determine the feeding behaviour of local goats under semi-intensive conditions. Five local goats were maintained under extensive condition in a 0.8 acre paddock and observations were made every Thursday for 12 hours from 7 a.m. to 7 p.m. for thirteen consecutive weeks. During these periods records were kept on the feeding behaviour in relation to grazing and browsing.

Results

It was found that the goats browsed as well as grazed, but they spent more time in the latter. The browsing time was 31.8 minutes or 4.4% per 12 hour observation. 352.5 minutes or 49.1% of the 12 hour reading time were spent on grazing. The goats ruminated for 333 minutes or 46.4%

Discussion

The fact that the animals spent more time to graze than browse suggests that the goats are grazing animals. However, it is important to note this was probably due to the presence of more grasses then browising plants in the paddock. In other words, the presence of more grasses would have influenced their feeding habits to the extent that they grazed more than they browsed. Furthermore the palatability of the shrubs and bushes in the paddock was of inferior quality and this would also have contributed to the goats preferring grasses. Bearing in mind that the goats also did spent more of their feeding time in browsing (4.4%) it would follow that goats can both graze and browse. This conclusion conforms to the findings of Wilson (1957) and Knight (1965).

The ruminating period of the goats was only about one-third of the observation period, while the feeding time occupied about two-third of the period. This fact suggests that the goats masticated their food taken in the day well into the night and preferred to do as much feeding during the day as they possibly can.

It was found that goats drank very little water during the day; this may be the result of the shady condition of the pasture. It may also be related to the feed-water intake from the area since the shade prevents excessive evaporation. A third possibility is that the goats are hardy animals and drink very little water in the course of their feeding.

Summary

1. A paper is presented on the studies of the behaviour and feeding habits of local goats under semi-intensive conditions. The observations were recorded once a week during a twelve hour day light period between 7 a.m. to 7 p.m. for thirteen consecutive weeks.

2. During the 12 hour period it was found that most of the time was spent on eating 49.1% the time was spent on grazing. The remaining 46.4% of the time was spent on ruminating. The time spent on ruminating was made up of 40 pauses, each pause varying from half minute to one hour.

3. It was also observed that the goats did not pause to drink any water over the 13 weeks of observations.

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Project Report,
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INSECTS

What is an insect? To be more concise, insect is an arthropod, body being bi-laterally symmetrical, and segmented into head, thorax, and abdomen. It not only possesses two pairs of wings for locomotion but also three pairs of legs. As for the head, it has a pair of compound eyes and a pair of feelers called antennae.

Among arthropods, insects have reached the highest evolutionary status because of many factors. No one of these factors can contribute to the success but a combination of the various factors to sum up a good result of evolution.

Firstly, there is the frame work called the skeleton which, being light and strong, gives a large area of internal attachment to the muscles and also an excellent way of evaporation control from the body. Besides that, the vital organs are highly protected from external injury by the hard exoskeleton.

Their adaptability and resistance to climatic conditions are highly developed weapons for their survival. In the cold climate, insects modify themselves and pass through this stage of resting as inactive stage called hibernation. Mating takes place when the climate permits and during the unfavourable season insects pass through this stage in the egg or larva form. As for those which live under stress of high temperature, they undergo a stage called aestivation whereby growth is in a state of dormancy. They not only adapt themselves as external parasites against temperature and humidity but also as internal parasites in the higher animals. The intake of food is rather small compared to other animals and they can place themselves in conditions where there is limited amount of food which is negligible to other animals.

Insects are found in cracks and holes and this is accounted for by their relative small size. In houses where insecticides are used against bugs or termites, failure of eradication of these pests is all because of the abundance of crevices which are hidding places or homes of these minute and some microscopic insects.

All insects undergo metamorphosis which is one of their characteristic features whereby they pass through a series of stages — egg, larva, pupa and adult. Because of the different stages of development, they can live in totally different climatic and environmental conditions. The larvae may pass their stage in places where they have maximum amount of food, the pupae live in places where there is air while the adults live under conditions best suited for fertilization.

Insects lay abundance of eggs to ensure a high reproductive rate. This is clearly shown in insect like aphids, where they are capable of laying eggs without being fertilized, and this process of reproduction is called pathenogensis. There are other insects which are capable of reproducing when they have not reached maturity and this is called pedogenesis. This high fecundity in insects is indirectly a competition of survival challenged by other predators and insecticides.

Economic Importance

The survival of insects leads to many economic importance in commercial and agricultural aspects. The structure of the soil is improved by the channelling of the soil as the insects burrow into the ground and in a way they help in the aeration of the soil and thus encourage crop production. Certain insects make their nests by pushing the sub-soil to the surface.

Another aspect of insects economic importance is the transmission of pollen grains from the stamens to the stigma of the flower and this causes the fussion of the gametes and induces the formation of zygote. Without these insects, we would have no beans, peas, and seeds of other insect-pollinated plant. Some insects like praying mantis are predators on insect pests and they control or lower the occurance of pest attack by destroying them.

Generally most insects are scavengers and they remove the organic matter left in compounds and houses as their food. A good example is termite which by its strong jaw, slowly chews and bites away the timber and eventually remove the debris away. The left over of sugar cubes is also consumed by ants.

Many will be surprised that certain insects are edible. In primitive countries, some insects are food for the natives but one will be surprised that even in the more advanced countries in Asia, certain fractions of the remote communities regard these insects as delicacy, an example of which is the locust. The Chinese utilize the Cicacla for medicnal purposes. Honey which is from the nectar of flower is found in beehives and is a food for man.

Commercially, insect like the silk worm in sericulture, produces a high cash return and the silk that we wear are all the products of a certain important species of silkworm called the Bomby mori. Shellac as varnish is also derived from the lac insect. The young nymphs of the insect hatch out, disperse and seek for food from the young juicy twigs and in turn begin to exude a transparent varnish. This transparent varnish is taken, melted, filtered, and finally become shellac for commercial use. Cochineal, a product of dried insects yeilding scarlet colour, is a dye commercially used in the textile industry.

In agriculture, many destructive insects are pests and by their serious attack may reduce the yield of crop. Many of us have not felt the pinch caused by insect attack on plants, but if one has a plot of land, then one will begin to apprehend the confrontation of insect pests on the merciless farmers. Everyone knows that there is a rapid increase of population which will ultimately lead to enlargement of crop production. This increase of crop production will unknowingly be an additional host for insects, and thus increasing their population. Death of plants caused by insect pest to an amateur may mean bad luck, but to an agriculturist, it means a war and struggle for survival between man and insect. Man is then faced with this challenge to resort to research for better and more effective insecticides.

It is difficult to introduce an insectiicide on a commercial basis until it is proved good. Man's effort to combat destructive insects and control beneficial ones has been successful through many long years of laborious research. This ultimately leads to the discovery of effective insecticides which are on sale in the market.

NG HUANG KEAT
Final Year
1965/66.

WIND POWER FOR DIRECT WATER PUMPING

By

ZAINOL RASHID B. MOHD. DAUD

Introduction

Whenever 'windmill' is mentioned straight away our mind will picture Holland — The Land Of Windmill. If we care to ponder a little deeply we would realise the importance of wind propeller. Windmill is rarely heard of in Malaysia. As wind on the coastal areas of Malaysia is fairly strong, especially in the dry season, it is, therefore, worthwhile to erect a mill to harnass the wind to do water pumping. The purpose of using this machine is only for mere economic reasons. Windmill would do work far cheaper than fuel-powered or electrically-operated machines. On the other hand, the availability of power is unreliable.

Thus, from this there is a possibility of irrigating cultivated land. The rice bowl of Malaysia lying on the coastal areas of Kedah and Perlis, covering hundreds of square miles of padi land, is left untouched during the month of draught, from January to May, could be watered. These lands or fields can then be grown with off-season high-yielding short term crops. Besides, the question of crop failures as what happened in the season 1962/63 in Kedah/Perlis would had been partly presented. No doubt double-cropping would be carried out here soon as one of the government development projects for agricultural expansion, windmill would still play an important part in irrigation or drainage in these areas in order to lower the costs of production of padi in the double-cropping areas.

The major portion of this article was based from seven months work on windmill by the writer. Before I touch on other aspects of windmill, it would be appropriate for me to discuss the characteristics of wind in relation to the planning and designing of windmill.

Characteristics of Wind Flow

Natural wind occurs when wind is in the state of motion. These air streams are caused by the variation of atmospheric pressure. The differences in the atmospheric pressure are attributed to the temperature which causes the corresponding variations in the density of air. Air moves from areas of high pressure to those of low ones and the speed of the wind depends on the magnitude of the pressure differences. Thus, low speeds exist when the difference in the levels of pressure at two points is narrow. On the other hand high speed results from wide differences. 'The actual velocities of wind, in magnitude and direction, comes from a combination of the pressure-induced speed and that due to the rotation of the earth's surface which carries air, adjacent to the surfaces, round with it.' The surface speed of the earth is variable depending on the latitudes of the earth. The speed changes from 1,000 mph (miles per hour) at the equator to that of 0 mph at the poles. This surface speed of the earth has a considerable influence on the wind velocity. Its influence on the resultant wind velocity would vary considerably with the latitude.

So the important characteristics of wind is the variability of speed which falls from 125 mph to 0 mph. When speed registers 125 mph at certain time it does not necessarily mean that a steady stream of air is blowing constantly at that given speed, but changes within seconds. Similarly, on coastal areas especially, we have practically no wind at night but steadily increases to maximum soon after midday. Towards evening there would be a subsequent falling in speed. This variation, known as Diurnal Variation, is very common on Malaysian coastal areas. We have seasonal variation too. In the coastal areas

of northern Malaysia, such as the coastal areas of Province Wellesly, Kedah, Perlis and Perak on the west, while Kelantan, Trengganu and Pahang on the east, higher wind velocities occur during the months of late November to January. The rest of the months are not so high. The yearly speed of wind is in the range of 9.9 mph and 12.2 mph for temperate countries. Tropical countries would experience much lower and monthly variation from the yearly mean is usually within $\pm$ 2 mph. Of course, there are variable from locality to locality, e.g. in Ramallah (Jorden) is +4.1 mph to −2.6 mph, while at Victoria Point (Burma) the flunctuation is little more than $\pm$ 1 mph.

How does this variation influence the construction, planning and designing of windmill?

As an answer to the above question the following points has to be considered — the effect of variations in the wind velocity.

Effect of Wind Speed Variation

The variation in the speed of wind has an important bearing on the construction of windmill used to harness wind for useful work. The designing, construction and installation of windmill will have to depend on three factors as listed below:

(a) Short period wind speed variation,
(b) Hourly mean wind speed variation, and duration of calmness,
(c) Seasonal variation.

Windmill will have to be designed and constructed of a given size and of known operating characteristics. Thus, the mill can then be of a structure that can withstand the extreme force of wind. The recording of the variations from the mean wind speed would enable a farmer to have a rough estimation as to the gross energy available from his machine. This will also guide him as to the question of provision of energy storage facilities or of a stand-by plant.

Feature of Windmill for Direct Water Pumping

'The planning of windmill water pumping installation is, somewhat more complicated than that of a wind-driven electric generator. It is not a simple engineering operation but demand knowledge of the geological and geomorphological conditions in the area concerned,' remarked Mr. Golding in "The Farm Power Bulletin". It is a combined efforts amongst the engineers and scientists as well as those associated with ground water hydrology. Only through the united efforts of these people concerned can a successful planning of the mill be made.

There are large variations regarding the maximum output of power from a windmill. No windmill can extract more than 59.3% of the power from the wind. On the other hand it is pointless to install a mill in an area where the water flow in the ground is slow. If the machine's potential rate of pumping is appreciably greater than that of the inflow of water to the well, then, the efficiency of the machine is affected as the output from the machine is lowered.

Types of Machine

Windmill can conveniently be classified into two types:

(a) Post-type — mounted on a turn-table,
(b) Tower-type — using a rotatable type head on the top of the stationary tower.

Each of these can be further sub-divided into two classes again. It can be a slow-running multi-bladed wheel driving a piston pump. This is the most commonly used type. It can also be of high speed driving a propeller pump or a centrifugal pump — a modern development. In olden days the common type is of a turn-table type or post-type having a multi-bladed wheel, commonly

a slow-running. In the modern development a windmill is made to drive a compreswer providing — compressed air for pumping water. This possibility is being studied at the Russian Wind Power Research Station at Istra, near Moscow.

Method of Construction

The method involved in the construction of this windmill is slightly difficult in the sense that not all the parts can be constructed all at the same time as this is not a mass production where every parts are already made. So I have to divide the whole structure into six components, namely:

(a) Differential shaft and Cross Bars,
(b) Sails,
(c) Tail Fin,
(d) Platform,
(e) Transmission Mechanism, and
(f) Pump proper.

(a) *Differential Shaft and Cross Bars*

The differential shaft of an old car was used for the purpose as the transmission shaft conveys the power from the engine to the rear axle of a car perpendicularly to the axle. So this is a suitable component I could lay my hand on. Eight cross bars of one-inch mild steel bar one-sixteenth of an inch thick each measuring four feet and a half in length are welded at 45° to each other and evenly spaced on the brake-drum, thus giving a firm attachment for the sail blades later. Figure 2 illustrate the arrangement.

(b) *Sail Structure*

The outer end of the cross bars are held on to the outer rim by welding on to a half-inch width mild steel bar one-sixteenth of an inch thick. The inner rim is of one-inch mild steel bar of the same thickness, measuring twenty feet in length. It was found later that the sail blades do not stand out neatly with eight cross bars. So extra cross bars need to be added. These are only fixed between the inner and the outer rims, made up of $\frac{1}{4}$-inch diameter mild steel rods.

(c) *Sail Construction*

This consists of cutting out sail blades from galvanised iron sheet size 26 (G.I. No: 26). Two sheets measuring three feet by eight feet are used, giving sixteen sail blades of dimensions shown in figure 3 (a). These sail blades are later fixed up on to the cross bars and inclined at an angle of 30° to 60°. Thus holes are bored using three-sixteenth of an inch diameter drill for fixing the sail blades which are bolted up using three-sixteenth of an inch diameter machine bolts with washers. The blades are bolted on to the cross bars at three points as shown in fig. 3 (a).

The tilting mechanism is of a half-inch mild steel bar of thickness one-sixteenth inch. These bars are cut at six and seven inches long for inner and outer rims respectively. To make the tilting mechanism adjustable four holes, spaced out an inch apart, are bored. By this means the sail blades can be tilted at any desired tilt thus the degrees of inclination can be varied to obtain maximum rotating power. There are in all 32 tilting bars. The inner and outer tilting mechanisms have the following measurements:

	SHORT BAR	LONG BAR
Length	6 in.	7 in.
No. of holes	4	5

	SHORT BAR	LONG BAR
Min. inclination	40°	30°
Max. inclination	60°	40°

These tilting bars are fixed on to the sails as well as the inner and the outer rims. Three-sixteenth of an inch machine bolts are used for the purpose.

(d) *Tail Fin*

This structure is found at the other end of the differential axle. It functions as a steering mechanism to steer the sail in the direction of the wind, always facing it. The tail fin is of one-sixteenth of an inch aluminium sheet measuring 3 ft. 9 in. in breadth and 4 ft. in length. It is bolted on to a one-inch mild steel angled-iron, 7 ft. 9 in. in length, by means of five bolts and washers. The centre of the fin to the mid point of the differential shaft is 7 ft. 9 in. The fin is detachable and is fixed to the axle by boltings.

Platform and Rear Axle Support

It is pointless to have the sail facing in one direction only as wind changes direction from time to time. It is therefore necessary to have the sail facing the wind at all time in order to ensure maximum output of power. It is impossible to turn the sail and at the same time keeping the axle in position. To facilate this free movement and at the same time reduces friction, which will result in the reduction of power, the axle is welded on to a support which rotates on five bearings fixed to the platform.

(i) *The Platform*

The platform is of one-sixteenth of an inch mild steel sheet four feet in diameter and has a central hole four inches in diameter forming the seat for the transmission shaft. Five bearings an inch and a half in diameter are fixed on to the platform. The bearings form a circle of diameter a foot and a half. They are constructed in such a way that the bearings can be detached when required for replacement.

(ii) *Axle Support*

The supporting plate for the axle or axle support is a disc one-sixteenth of an inch mild steel sheet radius 9 inches and a central hole 4 inches in diameter forming the seat for the transmission shaft. The axle is supported on the plate by means of four $\frac{1}{2}$-inch angled-iron of mild steel, evenly spaced out and welded on to the plate as well as the axle. This forms a secure support for the axle. To reduce the chances of slipping off the bearings underneath during rotation, while changing direction, a 'brim' is added to the edge of the supporting plate. This brim is of one-inch mild steel bar.

Transmission mechanism

This mechanism is made up of the following parts:

(i) Transmission shaft,
(ii) Gear-box,
(iii) Crankshaft, and
(iv) Reciprocating rod and piston.

The aim of introducing the transmission mechanism is to convert the rotary motion of the sail to linear motion of the piston. The transmission shaft consists of an iron pipe one end of which is fixed to a universal joint while the other a coupling unit. The universal joint is attached to the rear axle protrusion which is the transmission union. Thus the rotary motion of the brake-drum is transmitted on to the transmission shaft. This shaft operates the crankshaft of the gear-box when the coupling unit is engaged. The presence of the gear-box is merely to transmit the vertical rotary force into a horizontal rotary motion. Thus the inclusion of the reciprocating shaft and piston led to the production of linear motion. The inclusion of a pump and a storage tank would finalise the work.

Cost of Construction

As my concern is only with the construction of the mill excluding the pump, tower, and the storage tank, my figures on the cost is only on the materials I have used and the labour involved. The materials alone cost $261.29 cts. while the labour is $105.00 cts.

Costs of materials	$261.29 cts.
Labour charge	$105.00 cts.
TOTAL	$366.29 cts.

Horsepower of the Mill

Under Serdang condition the windmill whose sail diameter is nine feet could give a horsepower ranging from 0 to 0.17 hp. as the wind velocity varies from 0 mph. to 7.5 mph. Higher wind velocity occurs during the hotter part of the day. This agrees with the general observation for the higher the temperature the stronger will be the convection current set up. In actual fact stronger wind could be felt if Serdang is not over-shadowed by hills.

Conclusion

Windmill was constructed with materials locally obtainable. Falling back on the objectives of constructing the mill worded as follows:

(a) To determine the possibility of using a low-cost windmill in Malaysian farming;

(b) To determine the performance of the windmill with a view of determining the possibility of introducing the mill to Malaysian farmers on a wide scale.

It would be dangerous and faulty at this stage to say anything concrete regarding the introduction of this machine on a wide scale. But I have a strong feeling that it will contribute to Malaysian farming as a whole. This is based on my observations I had made at The College of Agriculture, Serdang.

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"The heights by great men reached and kept
Were not attained by sudden flight,
But they, while their companions slept,
Were toiling upward in the night."

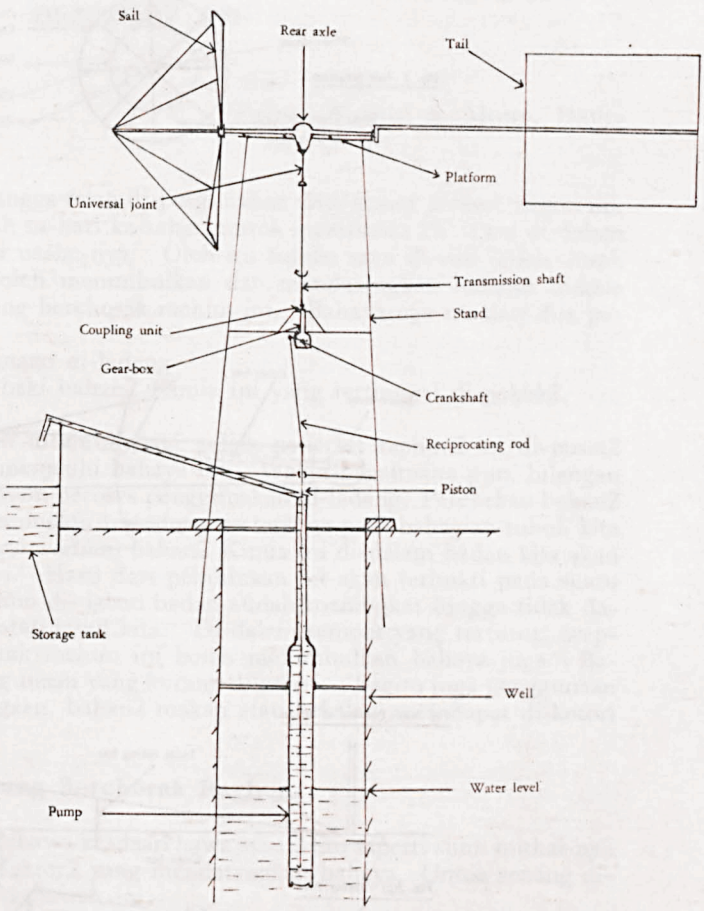
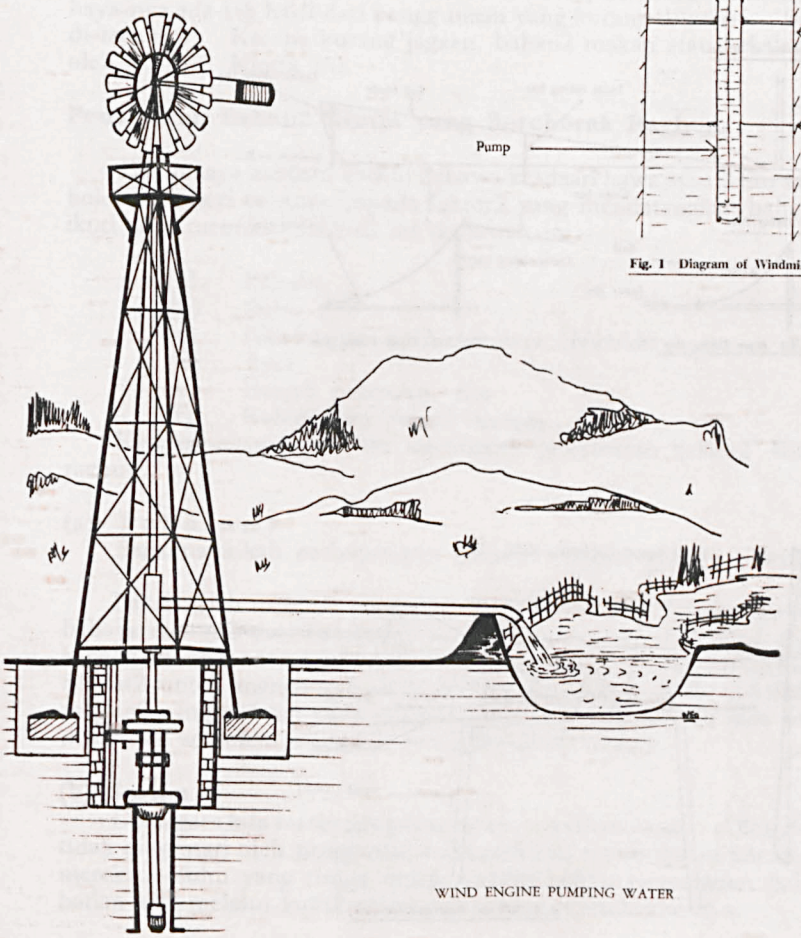


Fig. 1 Diagram of Windmill



WIND ENGINE PUMPING WATER

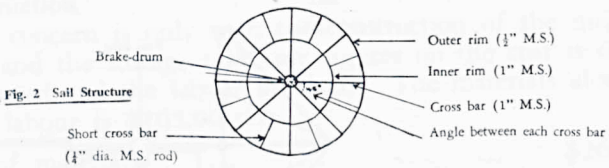


Fig. 2 Sail Structure

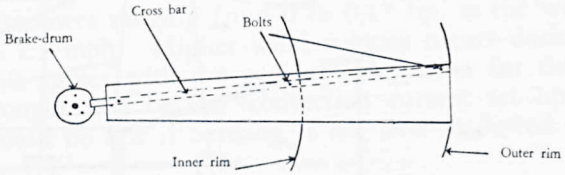


Fig. 3(a) Position of Blade

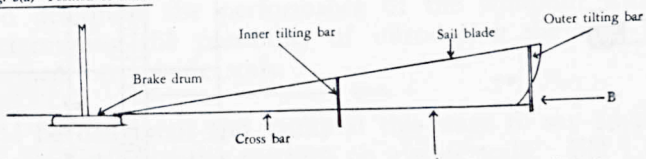


Fig. 3(b) Tilting Bars

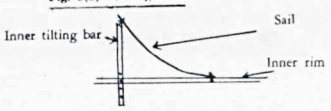


Fig. 3(c) Inner Tilting Bar

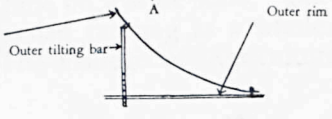


Fig. 3(d) Outer Tilting Bar

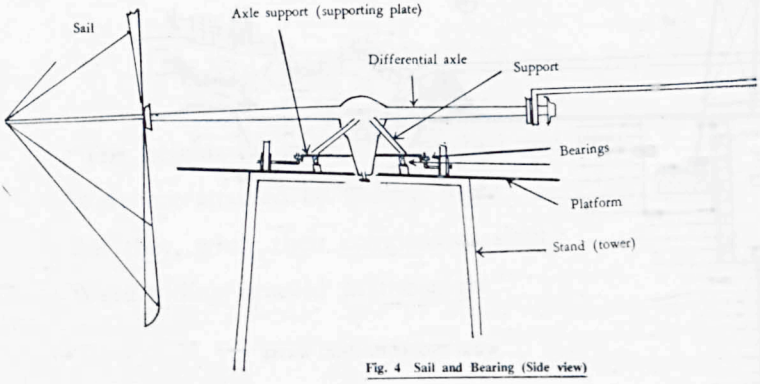


Fig. 4 Sail and Bearing (Side view)

KEGUNAAN RACHUN2 RUMPAI DAN SERENGGA DI-NEGERI INI

oleh:
ZAINAL RASHID B. MOHD. DAUD.

RACHUN2 rumpai dan serangga telah di-pergunakan di-segenap pelusok negeri ini. Penggunaan-nya akan bertambah sa-hari ka-sahari untok membantu Pa' Tani di-dalam kegiatan meninggikan hasil dari usaha-nya. Oleh itu tujuan saya di-sini ia-lah untok menerangkan langkah2 yang boleh menimbulkan dan mendatangkan bahawa di-kala menggunakan bahan2 Kimia yang berchosak rachun ini. Bahaya-nya itu dari dua peringkat:-

(1) Bahaya dari kegunaan di-ladang
(2) Bahaya dari saki-baki bahan2 Kimia ini yang tertinggal di-pokok2.

Berbagai langkah telah pun di-ambil bagi pehak penerbit rachun2 ini di-pusat2 perchubaan dan kilang2 untok menjauhi bahaya ini. Walau bagaimana pun, bilangan manusia terkena rachun ini di-dalam peroses penggunakan di-ladang. Perchekan bahan2 Kimia yang berchorak rachun mungkin tersedut atau terkena pada bahagian tuboh kita yang terdedah. Pembinaan (*accumulation*) bahan2 Kimia ini di-dalam badan kita akan bertambah dari sa-hari ka-sahari. Hasil dari pembinaan ini akan terbukti pada suatu masa nanti apabila kekuatan rachun di-dalam badan sudah meningkat hingga tidak dapat di-tandaskan lagi oleh kekuatan jasad kita. Di-dalam tempat yang tertutup, wap-wap bahan Kimia yang terchorak rachun ini boleh menimbulkan bahaya juga. Bahaya-nya ada-lah hasil dari penggunaan yang kurang di-awasi. Bagitu juga penggunaan di-ladang2 . Kerana kurang jagaan, bahan2 makan atau bekalan ayer dapat di-kotori oleh bahan2 Kimia ini.

Penyibaran Bahan2 Kimia yang Berchorak Rachun

Dapat saya katakan di-sini bahawa keadaan hawa atau iklim saperti suhu mithal-nya boleh memberi bantuan kapada faktor2 yang mendatangkan bahaya. Untok senang di-ikuti saya turunkan faktor2 ini di-bawah ini:-

(a) Pakaian
(b) Suhu
(c) Kandongan ayer di-udara (*Humidity*)
(d) Ayer
(e) Darjah pelajaran, dan
(f) Kebersehan rumah tangga.

Keenam-enam faktor ini membantu penyibaran bahan2 Kimia yang berchorak rachun.

(a) **Pakaian:**
Bagaimana-kah perhubongan pakaian dengan peroses penyibaran rachun ini?

Pakaian-lah menjadi salah satu chara untok menchegah atau menjauhi dari terkena bahaya rachun2 dari bahan Kimia. Pakaian yang tebal boleh memberi perlindongan kapada tuboh badan kita supaya tidak terdedah kapada perchekan bahan2 Kimia ini. Sharat2 untok menchegah dari timbul-nya bahaya telah di-kuatkuasakan. Saki-baki rachun2 yang terlekat pada pakaian itu mungkin tersentoh pula pada kulit2 tuboh manusia dan sentohan ini boleh mengakitbatkan bahaya.

(b) **Suhu:**
Di-negara kita ini sangat panas hawa-nya iklim panas. Oleh itu pakaian yang tebal2 tidak di-gemari oleh pengguna2 bahawa kimia ini di-dalam peroses menjalankan kerja2 mereka. Suhu yang tinggi boleh menchepatkan penyerapan bahan2 kimia ka-dalam badan kita melalui kulit2 sakira-nya terkena perchekan-nya.

(c) **Kandongan ayer di-udara (Udara lembab)**

Ini akan mempengarohi tabiat manusia, sakira-nya udara terlalu lembab peloh di-badan ta'akan kering dan lenyap ka-udara, tetapi berkumpul menjadi titekan yang besar. Oleh itu udara yang lembab dapat melebehkan badan manusia. Mereka kurang memerhatikan hal sekeliling. Bagitu-lah juga pekerja2 yang menggunakan bahan2 kimia yang berchorak rachun ini tidak-lah lagi memperdulikan sharat2 atau peratoran yang memberi langkah2 untok menjauhi diri dari terkena rachun2 di-kala melakukan semboran rachun2 rampai atau serangga.

(d) **Ayer:**

Ayer amat perlu untok memberikan kemudahan membersehkan tuboh badan dan pakaian pengguna rachun2 rampai atau serangga. Sekira-nya kemudahan2 ini tidak di-beri markah mungkin pengguna bahan2 kimia ini tidak mengindahkan perkara 'kebersehan' sama ada pakaian mahu pun tangan2 mereka. Tangan yang kotor boleh memindahkan rachun dari tangan ka-benda makanan dan sa-terus-nya ka-dalam perut dan mendatangkan bahaya.

(e) **Darjah Pelajaran:**

Kita dapati keterangan2 di-atas chara2 menggunakan bahan2 kimia yang berchorak rachun itu di-chatetkan di-dalam beberapa bahasa sa-lain dari bahasa Inggeris atau pun jika tidak di-gunakan lain2 bahasa, bahasa Inggeris selalu di-gunakan-nya. Sunggoh pun bagitu keterangan ini kurang di-fahami mungkin kerana buta huruf atau mungkin kerana bahasa-nya perlu di-ingatkan rachun2 serangga, yang brchorak rachun dan dapat mendatangkan bahaya kapada manusia, hendak-lah jangan di-gunakan pada sayor-sayoran apabila hampir hendak di-pungut. Di-samping itu juga, sayor2an yang di-beli dari pasar hendak-lah di-basoh dengan chermat baharu-lah di-masakan.

(f) **Kebersehan Rumah-tangga:**

Darjah kebersehan di-negara teropika tidak-lah bagitu tinggi. Bagitu-lah juga kebersehan rumah-tangga. Kita selalu tersua dengan tin2 atau kotak2 kosong terbuang di-dalam dan di-luar rumah. Tin2 atau kotak2 ini mungkin bekas mengisi bahan2 kimia yang berchorak rachun. Oleh itu kanak2 selalu sahaja terkena bahan2 kimia ini apabila mereka tersentoh benda2 tersebut ini. Saperti mana yang kita ketahui tabiat kanak2, mereka selalu gemar mengumpulkan alat2 ini untok permainan. Kanak2 mereka selalu gemar mengumpulkan alat ini untok permainan. Kanak2 yang tidak berdosa mendapat bahaya dari kechuaian kita yang berakal. Bagitu-lah juga pekerja2 ladang (buroh estate) tidak ubah saperti kanak2 atau tin2. Mereka amat gembira mendapat kotak2 atau tin2 kosong untok di-pergunakan di-rumah mereka. Tidak mereka sedari mungkin tong2 atau kotak2 ini bekas mengisi bahan2 kimia yang berchorak rachun dan boleh mendatangkan bahaya.

Bagaimana-kah bahan2 kimia ini boleh menjalar ka-dalam badan manusia?

Serapan rachun ka-dalam badan

Ada tiga saloran bagaimana bahan2 ini menjalar ka-dalam tuboh manusia, ia-itu dengan melalui:

(a) mulut,
(b) kulit tuboh, dan
(c) hidong.

Supaya dapat di-ikuti dengan mudah biar-lah saya terangkan satu demi satu.

(a) **Mulut:**

Bahaya bahan2 kimia boleh timbul apabila bahan2 kimia ini dapat menjalar di-dalam sel2 tuboh badan kita. Bahan2 ini tiba ka-sel2 badan manusia melalui mulut. Mulut menjadi sebab satu saloran. Bahaya melalui saloran ini hasil dari kechurigaan pehak pengguna bahan2 kimia ini. Mereka kurang awasi dan tidak menuruti keterangan2 yang di-beri bersama-sama bungkusan2 benda2 itu. Tambahan lagi darjah kebersehan yang rendah timbul dari kekurangan kemudahan bahan menchuchi dan boleh

memburokkan lagi keadaan ini. Tin2 kosong, bekas pengisi bahan2 Kimia ini, di-champak berselerak di-kawasan rumah. Mungkin kanak2 tersentoh bekas2 ini. Apa-bila bahagian2 tuboh-nya yang tersentoh tadi, saperti tapak tangan yang kurang berseh mithal-nya, terkena pada makanan, rachun ini di-telan bersama2 makanan.

(b) **Kulit Tuboh:**

Ini amat merbahaya kerana kita tidak sedari yang bahagian kulit tuboh kita tersen-toh rachun. Bahan2 kimia ini menyerap ka-dalam badan melalui kulit2 tuboh kita. Chepat atau lambat-nya persoses penyerapan ini terpulang-lah kapada kekuatan bahan2 kimia tadi. Saperti mana yang saya katakan tadi penyerapan bahan2 kimia ini ada-lah melalui kulit. Ini dapat di-jauhi jika bahagian tuboh kita beralas dengan menggunakan pakaian yang tebal di-kala melakukan semboran rachun2 serangga atau rumpai.

(c) **H i d o n g :**

Di-dalam peroses merachun rumpai2 atau serangga, perchekan yang halus atau tepong2 dapat di-sedut bersama-sama udara di-dalam peroses pernafasan. Perlu di-awasi apabila menggunakan salah satu daripada jenis rachun2 ini — sama ada ayer sem-boran atau pun tepong — di-kawasan yang tertutup. Di-kala menggunakan bahan2 rachun ini perlu menurut arah angin. Jangan sekali-kali menchanggah angin.

Ketiga-tiga saloran ini mempengarohi penyerapan rachun ka-dalam sel2 atau rong-ga-ronga sel dan kemudian-nya membinasakan sel2 di-dalam tuboh manusia. Chepat atau lambat-nya peroses serapan ini terpulang-lah kapada sifat2 kimia bahan2 ini. Jika peroses ini chepat, mungkin jiwa melayang sa-belum mendapat rawatan dan sekira-nya lambat, pengguna bahan2 rachun ini mungkin tidak sedar akan bahaya-nya. Pem-binaan rachun di-dalam badan manusia dengan chara, peroses serapan yang lambat dan sedikit2 boleh membaktikan bahaya-nya di-satu masa nanti. Sekira-nya pembinaan rachun ini memunchat kuat-nya pengguna rachun ini mendapat sakit. Sunggoh pun begitu tidak tersabit pada akal yang kesakitan-nya itu ada kaitan dengan penggunaan rachun pada beberapa minggu yang lalu.

Banyak bahan2 kimia berchorak rachun yang di-gunakan di-dalam pertanian da-tang di-dalam berbagai jenis — ayer atau pun tepong. Satu2 jenis berlainan dari yang lain jika di-teliti dari segi sifat2 kimia-nya. Bagitu juga darjah bahaya rachun-nya. Jenis ayer, mithal-nya, boleh mempengarohi peroses penyerapan kulit (*dermal absorp-tion*). Memandangkan hal ini beberapa langkah perlu di-ambil untok menjauhkan diri dari terkena rachun akibat kegunaan bahan2 kimia ini. Rachun rumpai saperti 'Dow-pon' mithal-nya, mengandongi 85% garam sodiam (*sodium*) asid 2,2-dichloripropionika boleh mendatangkan bahaya pada kulit tuboh badan manusia. Kita di-nasihatkan su-paya jauhi dari tersentoh pada bahagian mata, kulit badan atau pakaian. Bagitu-lah juga rachun serangga saperti 'Malathion 50%'. Bahan ini tidak di-anggapkan rachun tetapi merbahaya juga kapada manusia jika terkena perchekan dan di-biar tidak di-basohkan.

Memandang kapada keterangan ini Pa' Tani kita harus merasai gentar hendak meng-gunakan rachun2 rumpai dan serangga ini. Bagaimana-kah dapat kita mengelakkan dari terkena bahaya?

Chara2 Menjauhi Bahaya

Untok panduan pada Pa' Tani kita saya turunkan beberapa chara berjaga-jaga sa-belum terkena, saya terangkan saperti berikut:

1) **P a k a i a n :**

Di-dalam peroses menchamporkan rachun2 serangga atau rumpai atau pun lain2 jenis bahan2 kimia yang mengandongi rachun, chuba jauhi dari terkena sentoh pada ma-na-mana bahagian kulit badan kita. Gunakan-lah alas saperti sarong tangan getah. Bersehkan alat2 pengisi bahan2 kimia ini jika terkena perchekan dan sa-lepas di-guna.

2) **Menjaga Kebersehan:**

Sakira-nya tersentoh dengan rachun2 ini, sama ada pekat atau chai-, hendak-lah di-bersehkan dengan ayer dan sabun. Chuchikan tangan baik2 sa-belum menyentoh makanan sa-telah siap kerja di-ladang. Pakaian yang di-gunakan di-waktu merachun rumpai atau serangga itu perlu di-basoh baik2 sa-telah siap kerja. Jauhi dari meng-gunakan pakaian yang tidak di-bersehkan kerana ini akan mempengarohi peroses pem-

binaan (*accumulation*) rachun di-dalam tuboh manusia, apabila bahan ini menyerap ka-dalam badan melalui kulit tuboh kita.

3) **Menyimpan rachun**

Bahan2 kimia yang mengandongi rachun hendak-lah di-simpan baik2 dan di-kunchi. Dengan perbuatan ini bahan2 ini tidak terchapai oleh kanak2 atau tidak terkena pada binatang ternakan. Bekas2 pengisi saperti tin2 atau kotak2 perlu di-bersehkan baik dengan ayer kemudian di-musnahkan atau di-tanam. Rachun2 yang di-simpan di-dalam bekas yang bochor perlu di-salin ka-dalam bekas yang baik. Basohkan rachun2 yang terchichir ka-lantai.

Awasi di-kala menggunakan rachun. Alat2 penyembor di-bersehkan sa-telah siap kerja. Jauhi dari menyentoh joran penyembor dengan mulut.

Peratoran2 ini jika di-ikuti dapat-lah bahaya rachun ini di-hindarkan . Bagitu juga arahan2 yang tertampal di-botol2, kotak2 bungkusan perlu di-turuti dengan teliti. Dengan perbuatan kita yang demikian, rachun2 ini tidak lagi menyusahkan kita bahkan memberi faedah yang berlipat ganda.

LUPAKAN KESAH SEMALAM

Gurau, senyum dan tawa semalam tinggal semalam;
Ia sudah dilupa.
Bahagia, nikmat dan shurga di hari ini di reguk sekali;
Enak tiada jemu hingga selama.
Dan diantara gurau semalam dengan bahagia hari ini
Bersileh ganti kesah chinta.

Semalam:
Ku umpama gadis genit pujaan kalbuku,
Hati meledak rasa chinta suchi murni.
Kupujuk rayu agar chinta berbalas sendu,
Ah, hampa. Sijelita menghilang disebalek tabir pagi.

Dengan jantungku mati
Rohku sama pergi.
Darah merah membeku,
Meninggalkan jasad kaku.

Tapi itu kesah semalam, yang hanya buat semalam.
Dan, hari ini kesah lain pula menjelang.

Harini:
Pagi tadi sorang gadis genit lalu ketikaku duduk dijendela.
Gadis beri senyum simpul, senyuman terbalas mesra.
Kini chinta berbalas chinta;
Ah, biar-lah mesra sampai selama.

Kesah semalam biar tinggal semalam;
Kesah hari ini biar direguk penoh nikmat
Kerna besok entah apa pula kesah kan tiba;
Entah sendu, entah suka, entah nestapa.

OTHMAN HASSANI
1*st* *Year.*

FISH BREEDING STATION, TAPAH

The purpose of the Fishery Station is to breed fish fry for distribution to the local fish farmers. The fish fry is distributed at no cost so as to encourage the rearing of more fresh water fish for local consumption.

In this country, there are only three fishery stations namely at:

1. Bukit Tinggi in Pahang
2. Enggor in Perak; and
3. Tapah Fish Breeding Station in Perak.

Fish breeding in this country is still backward as compared to other countries. The breeding work here is mainly done in accordance to information from journals on fish breeding, published in other countries.

In fish breeding, the bigger the pond is the better will be the result. The average area capacity of one fish should be about 5 square metre. 400 fish for one acre in therefore recommended but looking from a commercial point of view, the stocking rate is 2000 fish. It is not wise to keep the fish for longer than one year because the growth of the fish is greatest at the first year and decreases at subsequent years.

In the execution of a fish breeding programme on a commercial scale one must consider the site, the soil and the water conditions before constructing the pond. It is not advisable to put too much money on constructing the pond. The pond should be about 4 feet deep to ensure the penetration of sunlight to the bottom of the pond. In deeper ponds, the bottom surface is normally covered with rubbish and the accumulation of this can cause the production and release of hydrogen sulphide gas and other toxic gases which are detrimental to the growth of fish. As regards to pond size, it varies from farm to farm with maximum about 3 acres and minimum 100 by 50 feet.

There are a lot of natural enemies of fish, mostly mammalian fish eaters. They can be prevented from doing harm by fencing the pond or putting up snares. The kingfisher bird is also a prominent fish eater. Precautionary measures are also taken against the breeding of the predatory insects in the pond by applying soap emulsion. The small fry after reaching the length of about 2-3 inches is more resistant to insect attach.

Diseases of fish

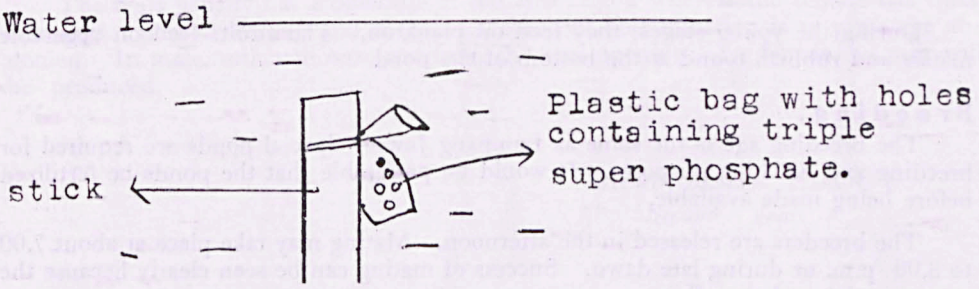
A common disease is the White Spot caused by parasities. These parasites are unicellular and have a life-history covering about 5 weeks . This disease, which causes pimple like projections is very common on young Lampang Jawa.

Fertilizing the pond.

Chemical treatment is not easy because too much of it will be a waste and tend to be harmful to the fish. Triple super phosphate is applied at the rate of 300 lb. acre/ annum. The application is usually divided into three amounts and applied three times a year.

Method of Application.

Too much phosphorus will acidise the pond. The ideal range of ph of the pond for fish breeding is between 7.5 — 8.5 The fish will die if the ph is below 3.



Well rotted cattle manure is also a source for fetilizing. Chinese fish breeders erect pig sties or poulty sheds beside the pond. The droppings of these animals are used for fertilizing the pond. Supplementary feeding of the fish includes the use of bean powder, groundnut cake and oat flake. These supplementary feeds also encourage plankton growth. Planktons are the unicellular and multicellular plant organism present in the pond. They constitute the main source of food for fish. Planktons could include spirogyra and unicellular algae.

Predator fish is not recommended owing to the difficulty in finding food material. Fish such as Haruan and Catfish must be bred as separate individual groups because if mixed, they will devour each other.

The five recommended varieties are Lampang Jawa, Kaloi, Temakang and Tilapia mussanbica and Lee Koh.

Lampang Jawa. Technical name: Puntius javanicus.

This fish originated from Jawa where they bred during the monsoon months from April to June. In this country they breed throughout the year.

During the young stage, they breed by feeding on planktons. After six months they feed on vegetable matter in the pond. The average weight for Lampang Jawa breed in a pond is $2\frac{1}{2}$ katis in one year.

In Perak River this fish have grown to four katis. The fish was let loose in Perak River with the hope of propagating them.

Breeding

The male for breeding should be 1 year old or more. Likewise, the female should be 2 years old or above. The ratio for breeding males and females is 3:1.

Breeding consists of the male called the milter and the female known as the spawner. In a good milter, the milt ejected is thick. A good spawner has the characteristic of a swollen abdomen with a broad shape.

A Lampang Jawa breeder of 2 katis can produce 50,000 young ones in one spawning. In breeding the Lampang, a separate spawning pond is used. Before spawning, it should be thoroughly cleaned and limed. Having seen to that, the male and female are then let loose in the pond. If a separate ond is not available, the male and the female fish should be segregated first.

Mating occurs after midnight. The climax of mating is shown by the action of the female splashing her body to release her eggs. The fertilization is external, after which the fertilised eggs sink to the bottom of the pond. The eggs hatch out after 48 hours. The next morning the bottom of the pond is disturbed and the breeder can then confirm mating by the presence of eggs deposits. A sample of the water is also taken to detect the presence of fry.

Lee Koh or Chinese Curp: Cypirnus cirpio.

The fish originated from China and presently, this fish has a widespread population. This fish has the habit of nibbling at the bunds of the pond and causes the water to turn muddy.

During the young stages, they feed on plankton. The adults feed on vegetable matter and rubbish found at the bottom of the pond.

Breeding.

The breeding age is the same as Lampang Jawa. Special ponds are required for breeding and hatching purposes. It would be preferable that the ponds be fertilized before being made available.

The breeders are released in the afternoon. Mating may take place at about 7.00 to 8.00 p.m. or during late dawn. Success of mating can be seen clearly because the eggs are stick and they float.

The ratio for breeding is 4 males: 10 females. A 3 katis breeder can produce about one million young ones. The eggs are collected by the use of kakaban, a structure made from kabong leaves 4 feet by 1 foot in dimension. The eggs are then transferred to the hatching pond.

Tilapia mussanbica.

The fish orginated from Africa. It is a prolific breeder. The fish is introduced to this country from Thailand. At one time, a decrease in reproduction rate was reported. This was due mainly to many predators and besides, the pond was small (10ft. by 5ft.).

The fish incubate their eggs in the female's mouths for 2 weeks. In the meantime, the female is completely cut off from food. This type of breeding habit is known as mouth-breeding . Tilapia is a hardy fish and can withstand salt, fresh and bracky water. Recently, a cross hybrid has been made between the local female Tilapia and the male from Zanzibar. The offspring is the Tilapia hybrid and it can grow up to 2 lb. in six months.

Kaloi or Giant Goraimi: Osthromenus goramy.

It is a river fish and a slow grower reaching $1\frac{1}{4}$ to $1\frac{1}{2}$ kati in one year in a good and well-established pond. The adult feeds mainly on keladi.

Breeding.

Breeders are from the age of above 3 years. The breeding ratio is 1 male: 4 females. The parent fish builds nests which resemble a bird's nest about 5 inches in diameter. The fish then mates under the nest. The female is reponsible for collecting the eggs and placing them in the nest. The nest is then sealed to avoid disturbance. Eggs hatch out after one week.

One female can produce about 7,000 young ones. Young Kaloi are weak and do not mix with the other fishes. They feed on the decaying nest material.

Temakang or Kissing Goramy: Helostome temminacki.

It is a local fish and is not so popular as the rest. It strictly confines its feed to phytoplankton. As such the pond should be well fertilised to encourage rapid growth. A transfer of the fish to other pond or change in env ronment will induce the Temakai to mate. The ratio for breeding is 1: 1:. They mature in 7 months.

All the above mentioned fishes can be mixed in one pond. The ratio should be 50% Lampang Jawa and rest of which is made up of Lee Koh, Tilapia mussanbica, Kaloi and Temakang in the ratio of 2: 1: 1: 1:.

Lampang Jawa should not be bred in padi fields. This fish is a vegetative feeder In an experiment carried out, they wiped out the padi plants and caused severe damage Other species are more harmless.

Determination of sex.

The male usually has 2 openings at the anal region whereas the female has three openings. A more certain and accepted method of determination is to press the abdomen. In male, milt will ooze out from the anal opening. In female no milt will be produced.

MOHD SALLEH HARUN
Second Year.

MENYANTUM GETAH

SEBELUM mengkaji sedikit sebanyak berkenaan dengan menyantum getah lebeh baik sekira-nya di-ketahui dengan rengkas di-atas perbezaan antara getah baka chantum (ia-itu pokok2 getah yang di-besarkan dari biji2 getah dari pokok chantum yang di-akui baik.)

(a) Getah chantum mempunyai batang yang hampir sama besar dari pangkal hingga beberapa kaki ka-atas, ini membolehkan pokok itu di-turis lebeh tinggi dari pokok getah yang tidak berchantum. Ini juga bermaana pokok getah chantum itu mempunyai lebeh banyak kulit yang boleh di-turis dan ini memberi masa kulit baru, semboh dengan sempurna-nya.

(b) Lazim-nya, getah chantum mengeluarkan lebeh banyak susu daripada getah yang tidak berchantum, kerana baka2 getah ini telah teruji dan terpileh. Ini akan melebehkan pendapatan, sekira-nya di-bandingkan dengan hasil getah yang tidak berchantum.

Memandang dari segi kebaikan getah chantum, maka amat-lah baik sekira-nya penanam2 getah, terutama pekebun2 kechil dapat menanam getah chantum.

Menyantum getah ia-lah mengambil satu mata tunas dari baka getah yang di-akui baik dan di-hidupkan kapada anak getah yang lain. Pokok yang hendak di-chantum di-namakan pokok penanti dan pokok getah yang akan tumboh itu di-namakan pokok getah chantum.

Kayu Tunas

Kayu tunas ada-lah mengambil peranan yang mustahak di-atas kejayaan menyantum getah dan juga mata tunas akan menentukan pokok getah yang di-tanam. Kayu tunas hendak-lah di-ambil dari baka yang di-akui baik, ia-itu pokok yang mengeluarkan susu yang banyak dan mempunyai perangai yang baik. Mithal-nya pokok tidak mudah kena kerosakan angin, mempunyai kulit ganti yang baik dan tidak mudah di-serang penyakit. Di-antara baka2 yang baik ia-lah saperti baka RRIM 623, Tjir 1 dan lain2. Kayu tunas hendak-lah di-potong beberapa jam sebelum di-gunakan. Lebeh lekas di-gunakan lebeh baik. Kayu tunas yang baik di-pakai ia-lah daripada pokok yang mempunyai kulit yang perang. Tiap2 satu kayu tunas di-kerat lebeh kurang 1 ela supaya senang mengambil mata tunas-nya. Sekira-nya mata tunas lambat hendak digunakan paras keratan hendak-lah di-chelopkan dengan lilin. Sekira-nya hendak disimpan hingga ka-esok-nya, kayu tunas itu hendak-lah di-chelopkan pangkal-nya kadalam ayer sa-dalam dua inchi. Kayu tunas ini hendak-lah di-simpan di-tempat yang tedoh.

Pokok penanti.

Mata tunas yang di-ambil dari baka getah yang baik itu di-biarkan tumboh kapada getah yang berumor lebeh kurang 12 ka-18 bulan. Pokok ini di-namakan pokok penanti. Pokok penanti ini hendak-lah di-jaga baik2 dan di-baja supaya pokok2 itu subor dan lekas dapat di-chantumkan ia-itu apabila lilitan pokok itu $1\frac{3}{4}$ inchi di-ukor 4″ dari parasan tanah. Pokok penanti ini tidak boleh di-baja 4 bulan sa-belum di-chantum dan 4 bulan sa-telah di-chantum.

Masa Menyantum

Menyantum pokok getah boleh-lah di-jalankan bila2 masa sahaja tetapi patut di-ingat bahawa sekira-nya musim terlalu panas dan juga sekira-nya hujan terlalu lebat sepanjang hari maka kejayaan mungkin kurang, kerana masa panas akan mengeringkan kulit kayu chantuman dan juga di-musim panas mata tunas dan pokok penanti tidak hidup dengan subor. Juga sekira-nya mata tunas telah tumboh ia akan mati di-sebabkan oleh panas. Musim menchantum yang elok ia-lah masa pokok2 getah tidak berpuchok baru, kerana pada masa itu kulit anak getah senang di-kelengsetkan. Masa yang baik menyantum pokok getah ia-lah di-sebelah pagi atau petang.

Perkakas.

Perkakas2 yang di-kehendaki untok menyantum pokok getah ia-lah:-

1. Sa-bilah pisau penyantum yang tajam.
2. Sa-bilah pisau belati tajam yang mempunyai mata lebeh kurang 8 inchi untok mengambil mata tunas.
3. Satu kotak yang mempunyai ukoran 12"x6"x6" untok menyimpan dan merepang mata tunas.
4. Tali guni.
5. Daun kelapa panjang lebeh kurang 4 inchi.

CHARA MENYANTUM.

(a) **Mengambil mata tunas.**

Mata tunas hendak-lah di-ambil dari kayu mata tunas yang telah di-kerat sapanjang 1 ela. Dengan menggunakan pisau belati, mata tunas boleh-lah di-ambil dan panjang-nya tiap2 satu potongan ia-lah 3 atau 4 inchi sahaja. Lebar mata tunas $\frac{3}{4}$ inchi dan jangan di-potong kayu terlalu tebal sebab susah hendak menchekah kulit mata tunas dari kayu mata tunas nanti. Mata tunas hendak-lah di-simpan di-dalam peti kotak supaya jangan kering.

(b) **Menyantum**

1. Dengan menggunakan kain burok, pangkal pokok penanti itu hendak-lah di-bersehkan dan kemudian dengan pisau penyantum, buat dua barisan selari sepanjang 3 atau 4 inchi panjang dan $\frac{3}{4}$ inchi lebar lebeh kurang 3 inchi dari tanah.

2. Kayu mata tunas yang lebar $\frac{3}{4}$ inchi tadi hendak-lah di-repang supaya ia-nya lebeh kechil daripada repangan yang di-buat di-pokok penanti. Setelah siap di-repang hendak-lah di-pisahkan atau di-chekah kulit dari kayu mata tunas. Menchekah hendak-lah di-buat dengan chara menggigit kayu mata tunas dan kulit mata tunas di-luruskan serta ibu jari menolak agar kulit dan kayu terpisah. Kerja ini hendak-lah di-buat dengan sa-berapa chepat agar tidak kering kachang di-kulit sa-belah dalam. Kulit sapanjang 3 atau 4 inchi itu di-potong kira2 dua inchi panjang.

3. Dengan menggunakan tandok pisau, kulit repangan yang di-pokok penanti hendak-lah di-kelensitkan dan mata tunas hendak-lah di-masokan dengan berhati2 agar ia-nya tidak bergeser dengan kulit manis pokok penanti. Setelah itu kulit kayu penanti di-tutup kembali dan dengan beralasan daun kelapa, chantuman itu hendak-lah di-ikat erat2 supaya tidak masok ayer. Jikalau menyantumkan pokok di-ladang chantoman itu hendak-lah di-tutup dengan daun getah sabanyak dua helai. Ini akan menjauhkan chahaya mata hari. Ini tidak perlu sekira-nya menyantum di-tapak semaiyan.

4. Lebeh kurang 2 atau 3 minggu kemudian, chantuman itu boleh-lah di-buka dan kulit perepangan pokok penanti di-kerat dan di-buang. Sekira-nya kulit yang di-chantumkan tadi berwarna hijau, bermaana chantuman itu berjaya dan hendak-lah di-tutup kembali dengan daun getah sahaja. Seminggu kemudian dari pemeriksaan yang pertama chantuman2 itu di-periksa lagi sekali, Sekira-nya hijau juga bekas chantuman itu boleh-lah di-potong pokok penanti itu.

(c) **Chara Memotong.**

Lebeh kurang 4 inchi dari bekas chantuman pokok penanti itu di-potong dan churaman potongan itu misti-lah membelakangkan bekas chantuman supaya ayer tidak mengalir terus kapada mata tunas yang baru di-chantumkan itu.

Ladzim-nya apabila 70% atau lebeh daripada pokok2 telah di-chantumkan itu berjaya baru boleh di-potong supaya pokok2 itu sama2 besar kelak. Mata tunas yang di-chantumkan tidak akan tumboh selagi pokok penanti tidak di-potong.

(d) **Menjaga Pokok Chantuman**

Apabila chantoman2 telah tumboh maka ia-nya hendak-lah di-jaga supaya hidup dengan subor. Tunas2 lain daripada tunas chantuman hendak-lah di-buang kalau tidak akan menggagalkan kesuboran tunas chantoman itu.

Apabila tunas chantuman itu berumor lebeh kurang sa-bulan, belahan buloh misti-lah di-chachakkan di-hadapan tunas itu neschaya bila besar pokok2 itu akan lurus dan terselamat daripada di-langgar oleh binatang2. Jangan sa-kali2 di-biarkan pokok chantuman itu berchabang dari bawah lagi.

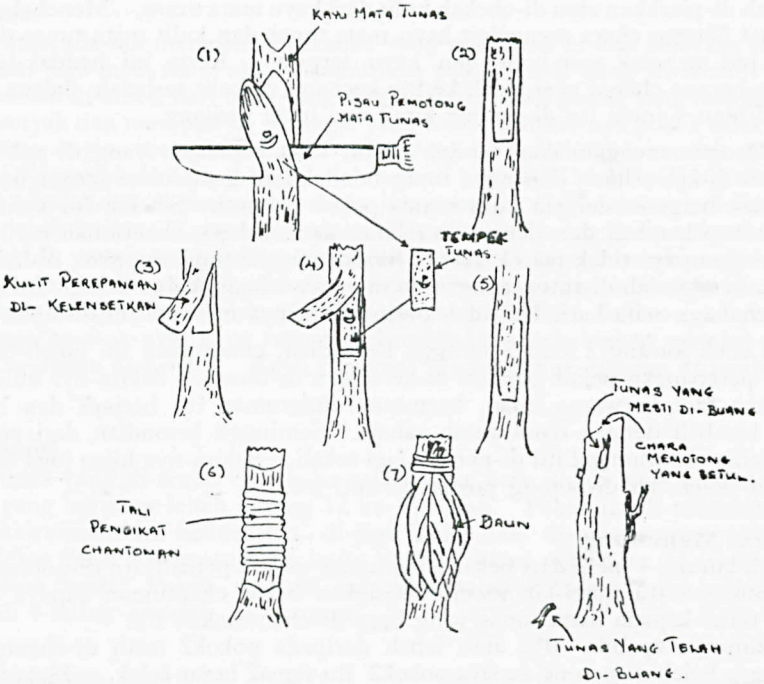
Kejayaan menyantum getah bergantong kapada perkara2 yang di-bawah ini:—

1. Pokok penanti jangan berpuchok muda sebab biasa-nya pokok yang demikian susah hendak di-kopekkan kulit-nya.

2. Kayu tunas patut di-simpan di-tempat tedoh dan jangan di-simpan terlalu lama.
3. Perkakas2 yang di-gunakan mesti-lah tajam dan berseh.
4. Pekerjaan menyantum perlu di-lakukan dengan pantas.
5. Apabila memasokkan mata tunas ka-dalam repangan pokok penanti jangan sekali2 di-geserkan dengan kayu penanti sebab ini akan merosakkan mata tunas.
6. Chantuman mesti di-ikat kuat2 supaya jangan masok ayer.
7. Kulit manis pokok penanti dan tempek tunas jangan-lah kotor atau kena ayer.

Walaupun begitu, kejayaan menyantumkan juga tergantong kapada kemahiran sa-saorang itu di-dalam pekerjaan tersebut.

Untok mendapat pendapatan yang lebeh dan yang memberi jaminan hidup pekebun2 kechil pada masa yang akan datang, TANAM-LAH GETAH CHANTUM.



Problems of Dairying and Dairy Cattle Improvement in Malaya

By

C. DEVENDRA*

Introduction

Every year many millions of dollars are spent to meet the increasing demand for dairy products. In 1964 the total value of milk and milk by-products imported into Malaya was about 85 million dollars. This is a serious drain on foreign reserves and justifies the need for increased production from the dairy cattle in Malaya.

The basic objective in dairy cattle breeding is to produce an early maturing animal capable of maximum milk production at an economic level. This objective must be supported by a suitable environment, since, only if the animal is adaptable to the environment can its performance be accurately reflected in its ability to grow, reproduce and produce milk. A fluctuating environment and poor nutritive status for example can impair production and limit animal improvement. Furthermore, any genetic improvements would only be of value provided the supporting environment enables the inherited potentialities to be fully expressed.

Standards of living are rising rapidly in Malaya and there is an increasing demand for fresh milk and milk by-products. What then are the methods that can be used to increase dairy production in Malaya? These are increasing the yield per cow, improving existing methods of production, expanding the dairy cattle population and the introduction of suitable European cattle.

Increasing the average yield per cow

This is probably the chief avenue through which dairy production can be significantly increased in Malaya. In studies on heritability and repeatability estimates of dairy cattle in Malaya, Anuwar bin Mahmud (1965) found that the average yield per cow in the first lactation for Local Indian Dairy cattle was 1,952.6 lb. with an average lactation period of 60 to 398 days. In the rural areas the average yield per cow is much less than the above figures. The chief limiting factor operating against high milk yields in local dairy herds is a lack of a sufficient quantity of good quality grass, and possibly also the use of limited or no concentrates to sustain high milk yields.

Cattle in Malaya are usually managed by a system of wayside grazing and rough grazing land, with very little fodder being grown to be cut and fed to cattle. However, handcutting of rough and uncultivated fodders for feeding cattle is quite common. This feature is particularly common during periods of dry spells and feed shortage, since although no part of Malaya has a definite regular dry season, all parts are liable to periodic dry spells of variable length (Dale, 1960). A sufficient quantity of grass is thus not made available to cows, and there is a strong possibility that the quality is below the requirements for milk production.

It is essential therefore that a good supply of high quality grass is readily available to ensure optimal production. Unfortunately, both pasture and

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fodder production are expensive enterprises. Both have to be hand planted and hand cut and contribute toward a serious liability in the balance sheet. The best *Axonopus* pastures in the country have a production of 11 to 15 tons of grass per acre and support at the most 2 cows per acre. In contrast, fodder grasses like Guinea grass (*Panicum maximim*) and Napier grass (*Pennisetum purpureum*) produce an average of 30-40 and 60-80 tons per acre per year respectively and support about twice as many cows. Another grass of comparable production to these two fodder grasses (40 to 45 tons per acre per year) is Signal grass (*Brachiaria brizantha*) which is a useful dual purpose grass (pasture and fodder). Until the dairy farmer can see the wisdom of maximum production from unit area of land through fodder grasses, and realises at the same time that this will lead to higher per cow yields, the present poor yields of cows will continue.

Together with the need for providing quality grass in sufficient amounts, consideration must also be given to the use of balanced concentrates. The use of concentrates is almost entirely limited by economic considerations. The local producer is as a rule unable to feed his cattle with purchased concentrates. It is possible however that supplementary feeding with concentrates during lactation is more economical than is realised. Increased persistency and higher milk yields could easily result up and above the existing low per cow yields. Where improvement of local Zebu cattle by European animals is envisaged, the use of limited concentrates is particularly important. European animals hail from a high plane nutritional environment and unless this can be sustained in the new environment, their performance and adaptation can be considerably limited to result in their failure. In this respect the use of concentrates becomes important to meet limitations in the nutritional environment, as well as ensure optimal and possibly economic milk yield per cow.

It can be argued however that in Zebu cows which yield about or over a gallon of milk per day, such animals are more economic than high-grade or European cattle which need far more nutrients and therefore higher maintenance costs. There is a strong possibility that a relatively lower yield and lesser cost of production could well be more economic than higher yields and increased costs from keeping European cattle. This point has been proven in the cost of butter fat production in Zebu and European cattle in the Sudan (Bayoumi, 1964). This argument may be related to the possibility of Zebu cattle having lower maintenance requirements, and greater powers of adaptation to the environment (Philips, 1960). Under such circumstances the superior milking cows should be retained for selective breeding, especially since it has been shown by Anuwar bin Mahmud (1965), that the heritability estimates in Local Indian Dairy cattle for the first and second lactations were 0.2905 and 0.4708 respectively. These relatively high heritability estimates in comparison to estimates for dairy cattle in temperate countries indicate the high genetic variability among the local cattle that can respond to strong selection pressure.

The justification for supplementary feeding with or without concentrates must depend on careful costing compatible with economic milk yields. It is from a careful analysis of imputs, aimed at improved nutrition of dairy cattle that large and immediate increases in productivity must eventually come. Ample supplies of water are equally important since the animal is affected directly and indirectly by it. In areas where the concentration of cattle is high as in the states of Perak, Selangor, Negri Sembilan and Kedah, conservation of feed may be necessary to help meet the requirements of the animal during droughts. In this context padi straw, and even surplus growth being stored as hay will be useful.

Improving standards of dairy management

Increasing the average yield per cow is also largely dependent on good standards of dairy management. The current standards of poor dairy management in practice is partly due to the problem of "maternal instinct" in Zebu cattle. Cows will only let down all their milk if suckled by the calf, and in many instances very little milk is actually available after suckling by the calf. Whether this problem can be overcome by patient handling of the animal, and whether hand stimulation of the udder alone at milking is adequate, remain unknown. There is also the probability that in Zebu cattle capable of giving relatively high yields, hand stimulation alone is adequate. Overcoming this problem in association with weaning the calf from the mother at birth will have an important bearing on production.

Inherent in the patient handling of the cow to overcome this problem is the need for a better understanding of the whole process of milking. What is essential is a sympathetic understanding of the different needs and temperaments of individual cows, and indeed, of farm livestock as a whole. The whole process of milking is a co-ordinated mechanism involving the cow, the milker and the sights and sounds associated with the process. Milk secretion in the upper part of the udder is a continuous process and to be made available to the calf or the milker, it has to be released from the alveoli in which it is secreted to the "milk sinus". The "let down" or release of milk is created by the action of a hormone oxytocin in the blood stream acting on the muscular wall of the alveoli. The important point is that oxytocin will only be secreted by the pituitiary gland if the correct stimuli (touch, sight, smell and sound) favourable to milking are conveyed to the brain.

In short, cows will only let down their milk provided the overall process of milking is favourable and normal. Anything unusual in the normal process and inefficient prolonged milking lead to reduced milk yields. While these rules appear extremely elementary, the importance of efficiently executing them and the implications of not doing so are inadequately understood or unknown.

Expanding the dairy cattle population

There are about 95,000 dairy cattle in Malaya today. It has been estimated by the International Bank for Reconstruction and Development on the Economic Development of Malaya (1955) that with existing pasturage, fodders and food residues, Malaya could support a total population of 350,000 cattle. The population of cattle in 1964 of 81,140 dairy cattle and 224,620 agricultural and draught cattle thus suggests that a far greater number of dairy cattle can be carried than is realised. Progress in this direction has been generally slow and there is in proportion a steady increase in the imports of milk and milk substitutes from overseas. What then are the reasons which discourage dairy farming in the country?

The primary reason is the very high production costs associated with dairy farming and the poor returns that can be expected, particularly in comparison to pig production or poultry keeping. Availability of grazing land, the need for good quality fodders to satisfy bulk, relatively high labour inputs and capital investment are the factors contributing to this. A real reason is the preciousness of land for other economic enterprises. Where land can be got, the high cost of grass establishment and maintenance, together with limited agronomic knowledge about the potential production of herbage under local conditions further discourage dairy farming.

Competition with canned and well-marketed milk and milk substitutes is another reason which discourages dairy farming. Milk is at the moment

sold by vendors to consumers with very little check on its quality. The actual handling and temporary storage of milk in milk bottles leaves much room for improvement and from known herds, the only consolation perhaps is that they may have been tuberculosis tested. Otherwise, the housewife overcomes discrepencies in milk quality by boiling the milk before it is consumed. A closer check on methods of handling milk, marketing and its distribution can go a long way to stimulate increased production. From a distribution point of view, use of cartons, sterilised packing and a vigorous campaign to boost the sales of milk would be invaluable. The creation of a milk marketing board present in dairying countries like New Zealand and the United Kingdom could considerably help by distributing milk on a non-profit basis.

Introduction of exotic cattle

The introduction of exotic dairy cattle into Malaya is one of two categories, cattle from India and cattle of European (*Bos taurus*) origin. Many dairy cattle of Indian origin have been introduced and these include the Sahiwal or Montgomery breed, Nellore or Ongole breed, Hariana breed, and recently the Sindhi breed. The Local Indian Dairy breed of Malaya, which is the breed used for dairying in the country today is the product of at least three Indian breeds, namely, the Hallikar, Kangayam, Nellore or Ongole and possibly also the Red Sindhi. In contrast, the European breeds which have been introduced are the Friesian, Jersey, and the Guernsey. The first cattle of European origin arrived in the country as early as 1929 (Marsh, 1930) and were maintained in the highlands of Maxwell Hill, Fraser's Hill and Cameron Highlands.

Some fundamental remarks about the heat-regulatory mechanism and body reactions, particularly in the tropics may be useful. Kleiber and Regan (1935), Rhoad (1936) and French (1940) showed that the respiratory frequency in cows increased with the high environmental temperatures. As Rhoad (1936) has pointed out, marked increases in the respiratory rate is indicative of an increased metabolic rate and results in a considerable loss of energy through increased muscular activity and increased blood flow. This increased metabolic rate interferes with the heat-regulatory mechanism and under adverse conditions can lead to a collapse of the mechanism. Inability of the animal to minimise these energy losses leads to a poor production performance within that environment. A point of interest to note is that heat tolerance increases with age, and the higher the heat tolerance coefficient of an animal during the first year, the more effective is the use such an animal would make of the feed conditions of the environment and grow better (Bonsma, 1949).

Whereas the productivity of *Bos taurus* cattle is impaired at temperatures above 27°, *Bos indicus* cattle can tolerate temperatures up to 35°C. These limits indicate the high heat tolerance qualities that European cattle must possess to perform successfully in the tropics. The severe physiological limitations to high milk production have contributed to considerable failure of *Bos taurus* and grade cows having a high percentage of European blood in various parts of the tropics (Tothill, 1954; Payne and Hancock, 1957; Mahadevan and Marples, 1961; Anderson, 1961). To this list can also be included the failure, particularly of Friesians in Malaya. The most recent introduction of Friesians were maintained at Bukit Besi in Trengganu and the entire project was a failure due to a combination of poor heat tolerance and tick infestation.

There appears to be considerable uncertainty at the moment about the choice of European cattle for use as dairy animals and the improvement of the indigenous cattle in Malaya. Some appreciation of the failures of the past are essential since the failure of exotic animals within a new environment must serve to demonstrate the need for a better understanding of the animal within

that environment, rather than to accelerate the supply of other exotic breeds to rectify the fault (Devendra, 1964).

The Friesian is perhaps the least fit for the super humid tropical climate of Malaya. Compared to the Jersey its powers of heat tolerance are poor, and added to this is the disadvantage that it is slow maturing and is a much bigger animal, with proportionately higher maintenance and production costs. The superiority of the Jersey in heat tolerance is a fact noted by many research workers and according to Maule (1961), this fact should favour the Jersey in any future plans directed towards the choice of a European breed for the tropics. In Allahbad in North India, a cross-bred between the Jersey and the Sindhi containing approximately 50 per cent blood of each breed and called the Jersind, has been reported to be successful. Earlier calving at 25 months age and an average first lactation yield of 400 gallons have been recorded. In Jamaica attempts to breed an improved dairy animal initially involved crossing of most British breeds with local Zebus. It was found that although FI Friesian-Zebu crosses gave higher yields, they were slower maturing and less well adapted than Jersey-Zebu crosses. The outstanding result of this concerted attempt was the evolution of the famous Jamaica Hope (Arnold, 1952), which contains about 75 per cent Jersey blood and some Sahiwal blood. Maule (1961) has also reported that this breed now average 700-800 gallons per lactation in government farms and 400-500 gallons in private farms.

The Jersey breed was introduced as early as 1951 into Malaya and maintained at the Government farm in Fraser's Hill about 2,000 feet above sea level. The project was quite successful and a few members of the original stock which were bought by the College of Agriculture at Serdang are still performing satisfactorily (Fig. I). Table I presents the mean lactation data of three pure-bred Jersey cows which were maintained at Fraser's Hill.

Table I. Lactation data of Jsersey cows kept at Fraser's Hall.

	Production (*gallons*)	Duration (*days*)	Production per day (*gallons*)
1st lactation	221	294	0.75
2nd lactation	289	340	0.85
3rd lactation	400	345	1.16

With reference to the mean lactation yields for first and second lactations recorded by Anuwar bin Mahmud (1965), the figures in table I are much higher.

The future of dairy cattle improvement in Malaya

It has been pointed out by Mahadevan (1965) that in East Africa, it is extremely difficult to come by superior genotypes by selective breeding within indigenous stock to increase milk production to an economically worthwhile level. Bearing in mind that dairy development is far more advanced there than in Malaya and since Zebu cattle are common to both countries, it seems likely that this is also true of Malaya. Since high milk production is the basic determinant of profitable returns, the need for certainty about the choice of a suitable breed is therefore essential, and the value of the Jersey breed in this connection and its suitability to Malayan conditions merits special consideration.

What is really needed is a careful long term study on the performance of suitable pure-breds as well as cross-breds having varying levels of Europe blood in them. The latter should eventually lead to a breed suitable to the

environment and compatible with maximum milk yields. Such a programme has been undertaken in various parts of the tropics and in Tanganyika, Mahadevan and Hutchison (1964), found that replacement of *Bos indicus* genes by 25 per cent *Bos taurus* genes resulted in a substantial increase of 62 per cent in the average milk yield, and half-breds gave a further 21 per cent increase to average 420 gallons of milk. Beyond this there was no further increase in milk yield. It is also this pattern of events which led to the evolution of the Jamaica Hope in Jamaica, Santa Gertrudis for beef production in Texas and many such others which are described by Williamson and Payne (1960).

Artificial insemination (A.I.) has already made its mark in Malaya and can help considerably to step up the rate of improvement, particularly since rising production achievements from farm livestock in countries like Denmark, Israel and New Zealand have basically resulted from a concurrent evaluation of quality stock and the use of artificial insemination.

The introduction and successful performance of European cattle also depends largely on management and disease control. Of particular importance in this connection is the need for the provision of adequate shade cover in pastures, whose significance Wilson (1961) has shown in comparing the behaviour of Zebu (Nellore) and cross-bred Zebu x Holstein cattle containing between $\frac{1}{2}$ and $\frac{7}{8}$ *Bos taurus* blood in the West Indies. Eradication of ticks is essential since tick infestation and tick-borne diseases are serious limiting factors of the successful adaptation of European cattle in Malaya. Regular use of an acaricide to kill the ticks and control of the movement of stock are important in this respect.

Summary

1) A paper is presented discussing problems of dairying and dairy cattle improvement in Malaya. In view of rising standards of living, the increasing demand for fresh milk and the very high expenditure in 1964 of 85 million dollars of milk and milk by-products imported, increasing dairy production is essential. The methods of achieving this are increasing the yield per cow, improving the existing methods of production, expanding the dairy cattle population and the introduction of suitable European (*Bos taurus*) cattle.

2) The need for increasing the supply of good quality grass, the importance of the use of concentrates and the need for an improved management are mentioned. Of related importance is the need for efficient marketing of milk and vigorous publicity to sell milk.

3) Attention is drawn to the value of Jersey cattle having superior powers of heat tolerance in comparison to other temperate breeds of cattle. In comparison to selective breeding within *Bos indicus* cattle to increase milk production to an economically worthwhile level, it is suggested that selection within varying levels of *Bos taurus* x local Zebu cattle would give more favourable results.

Fig. 1. A Jersey Cow at the College of Agriculture.

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CAPONISATION

A capon is a male bird with the reproductive system (organ) removed. It bears the same relation to, a cockerel as steer does to a bull, a wether to a ram, or gelding to a stallion.

There are two main reasons for caponising namely,

1. Done for financial gain, to increase the quantity of flesh, which under normal conditions would coarsen when sexual organ reaches maturity, in a minimum period of time for the market.

2. Enables the poultryman to hold the birds for table use for a considerable period, with less trouble and expense than if they were not caponised.

Caponising the birds can be carried out by one of two ways i.e. either by surgical operation or hormonizing. The former is rather complicated and slow but has proved to be quite successful. Ordinarily, a skilled person will make only a small percentage of slips, thus mortality is likely to average 5% with experts and with amatuers it may considerably be higher. Surgical operation is not popular here probably due to the lack of skilled labour as well as extra labour cost involved. It cost approximately 50 cts. to caponise each bird. Hormonizing bird using the Di-ethylstilbestrol has shown to give a 10% increase in liveweight. Usually this is done four to six week before marketing. Mr. Lee at Sg. Besi broiler farm, however, caponised his birds at 14th week and disposed them at 16th. week.

Objective :

To determine the optimal time for caponising the birds and their optimal disposal time on the market.

Procedure :

The project is made up of 2 stages, viz.,

1. Trial on Canton-New Hampshire cross

2. Project proper.

Trial on Canton-New Hampshire cross

The results observed on the effects of caponisation at the different age and feed intake in relation to the live weight gained wll act as a guide in materialising the project proper. 132 birds were used.

The average weight of the whole birds is taken at the beginning of caponisation.

3. Records the av.wt. of birds at each caponising time.

4. Equal distribution of cockerels & pullets in the 1st. & 3rd experiment.

5. Caponisation of each batch of birds is done at one week interval. Two hexoestrol are used per bird.

The results are as folows:

Particulars	*Treatment* 1 Cocks.	Pullets	*Treatment* 2 Cocks.	Pullets	*Treatment* 3 Cocks.	Pullets	*Treatment* 4 Cocks.	Pullets
No. of birds started	20	20	10	20	15	15	22	10
Final no. of birds	20	20	9	18	14	15	22	10
Age upto when data obtained	17 weeks		17 weeks		17 weeks		17 weeks	
Initial total weight	44.5	36.0	28.5	28.75	46.0	32.75		
Final total weight	70.25	60.5	38.5	56.125	56.5	44.5	76.5	25.5
Initial av. Wt.	2.225	1.8	2.85	2.1375	3.066	2.182		
Final av. wt.	3.512	3.025	4.278	3.117	4.036	2.967	3.477	2.55
av. livewt. increase	1.287	1.225	1.428	0.9795	0.97	0.785		

Note: All the weights are recorded in pounds.

Project proper:

Two breeds namely Golden sex-links and Goto M are used.

2. The procedure is the same as the trial. Except for one batch of birds from both Golden sex links and Goto M, which have to be caponised at one week interval due to age, the rest are caponised at 2 week interval.

The results are as follows.

1. Golden sex-links

Particulars	*Treatment* 1 Cockerels	*Treatment* 2 Cockerels	*Treatment* 3 Cockerels	*Treatment* 4 Cockerels	Remarks
No. of birds started	40	40	40	31	No pullets are used
No. of birds ended	39	39	39	30	
Age upto when data obtained	16 weeks	16 weeks	16 weeks	16 weeks	
Initial total weight	106.5	132	151.25	82	All the wt. are recorded in pound
Final total wt.	166.75	180	179.25	132.75	
Initial average weight	2.665	3.30	3.781	2.645	
Final average weight	4.276	4.615	4.594	4.418	
Average live-wt. increased	1.611	1.315	0.813	1.773	

2. GOTO M

Particulars	*Treatment* 1 Cockerels	Pullets	*Treatment* 2 Cockerels	Pullets	*Treatment* 3 Cockerels	Pullets	*Treatment* 4 Cockerels	Pullets	*Control* Cockerels	Pullets
No. of birds started	20	20	20	20	30	—	30	10	20	20
Final no. of birds	20	18	20	20	30	—	29	10	20	20
Age upto when data obtained	15 weeks		15 weeks		15 weeks		15 weeks		15 weeks	
Initial total weight	31.75	26	53.75	40.5	84.25	—	89.75	24.75	34.5	29.75
Final total weight	78.0	55.75	81.25	58.5	109.5	—	102.5	29.0	74.0	54.875
Initial average weight	1.587	1.3	2.675	2.025	2.808	—	2.992	2.475	1.725	1.487
Final average weight	3.9	3.097	4.062	2.925	3.550	—	3.525	2.9	3.7	2.743
Av. liveweight increase	2.313	1.797	1.387	0.9	0.742	—	0.533	0.425	1.975	1.256

**Note* :
All the weights are recorded in pounds

Observation :

A. *Feeding habitr & Wastage* :

The birds ate well but always very eager to get at the fresh feed. They also exhibited preference for the coarser particles. Heaps of the mash were gathered with the beak and this would have been thrown over had not the troughs being only 2/3 filled. Even that feed spilting did occur.

Attempts were made to collect and weigh the little feed scattered over the troughs and on the floor but due to the dung and litter nothing could be done.

B. *Feed consumption & conversion ratio* :

There is a steady rise of the feed consumption from the time of the caponisation until the fourth week the quantity consumed decrease & the curve make a downward turn in the case of the treatetd birds. Besides the caponised birds consumed more feed than the control birds. In both cases, however, the cockerels consumed more than the pullets.

The different breeds have different efficiency of the feed conversion with the Brown-leghorn being the poorest amongst the 3 breeds of birds caponised.

The pullets have better conversion ratio than the cockerels within the course of 3 weeks after caponisation, after which the latter have better efficiency of conversion. Likewise is the case with the Brown-leghorn.

C. *Diseases, Casulties & Mortality* :

Coccidiosis was the worst disease but confining to the deep-litter. Suphamezathine and sulfaquixinoline were used with great success in the drinking water. About 10% mentioned due to the mentioned disease occured with the Golden sex links.

Cannibalism and other vices occured when the birds were kept in cages and was first notice with the Golden sex links. This was mainly due to the overcrowding. Pick-Rim was applied to the injured birds and those seriously effected were removed.

Neck-blister was found with a few of the Golden sex links due to the abrasion. Their droppings were watery. The effect of caponisation and high water consumption attribute to this. Frequent cleaning of the dung was therefore essential to prevent the maggot present from spreading, thus encouraging a condition suitable for the outbreak of diseases. The blistered birds were treated with the Pick-Rim to prevent or reduce cannibalism.

General :

The different breeds should be caponised at different time.

The Kampong birds caponised 4 weeks before marketing give the highest percentage of the liveweight gained over the control.

	Cockerels	*Pullets*
Caponised birds (av. weight/bird)	4.278 lbs	3.117 lbs
Control birds (av. weight/bird)	3.477 lbs	2.550 lbs
Different in weight	0.801 lbs	0.567 lbs
Percentage of liveweight gained	23.04 %	22.23 %

b) *Golden sex links*: Should be caponised 3 weeks before marketing

Caponised (av. weight/bird)	4.615 lbs
Control (av. weight/bird)	4.418 lbs
Different in weight	0.197 lbs
Percentage of live-weight gained	4.46 %

Note*

The different in the floor spacing per bird between the control and the treated birds effect the ease of movement, efficiency of the feed conversion, thus the average live-weight gained. In the case of control only 15 birds were allocated in a 2½' x 6' cage, giving a floor space of 1 sq. ft/bird, a 0.25 sq. ft higher than the caponised birds.

c) *Goto M*: Should be caponised at 4 weeks before marketing

	Cockerels	*Pullets*
Caponised (av. weight/bird)	4.062 lbs	2.975 lbs
Control (av. weight/bird)	3.700 lbs	2.743 lbs
Different in weight	0.362 lbs	0.232 lbs
Percentage of live weight gained	9.78 %	8.46 %

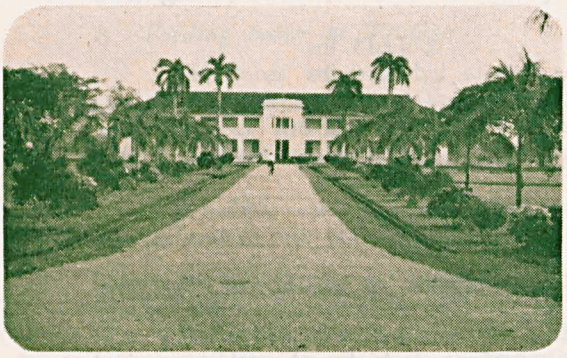
Conclusions:

Capons grow faster than the untreated birds. Undoubtedly the addition gain in liveweight of capons is offset by increase feeding or in other words returns from additional liveweight gained is offset by the increase cost of feeding, capons still give an overall better profit than the untreated birds. It therefore pay to caponise the birds but it must done at the proper time.

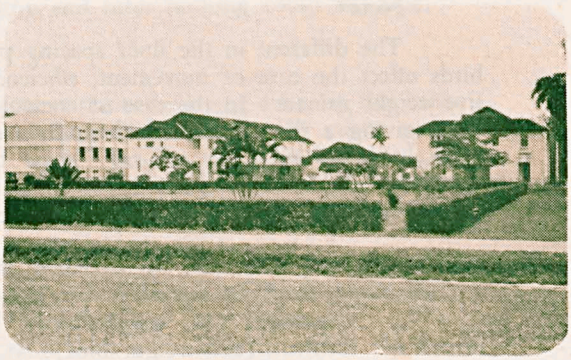
Caponisation should only be carried out on slow growing birds. The percentage of liveweight gained was highest in the Kampong birds, namely 23.04% and 22.23% for both the cockerels and pullets respectively. It is only 4.46% with the Golden sex links.

Summary of the project report by
ABDULLAH ISMAIL

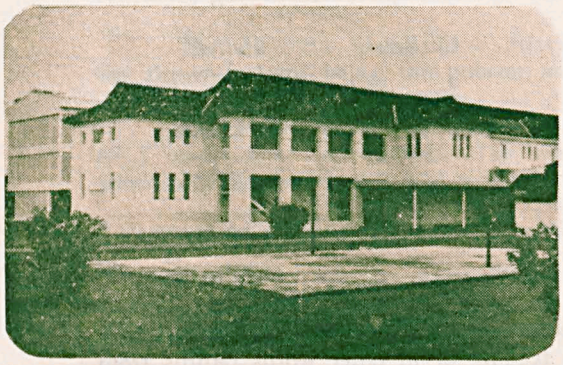
LOOKING AROUND THE CAMPUS



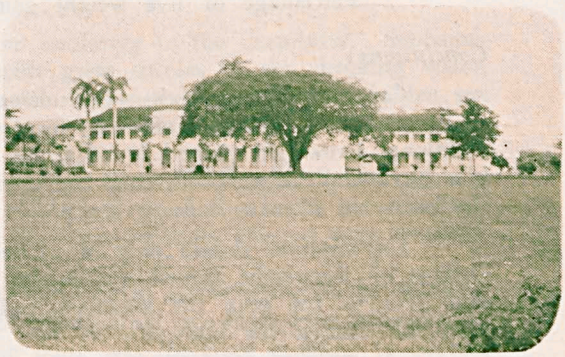
College Building



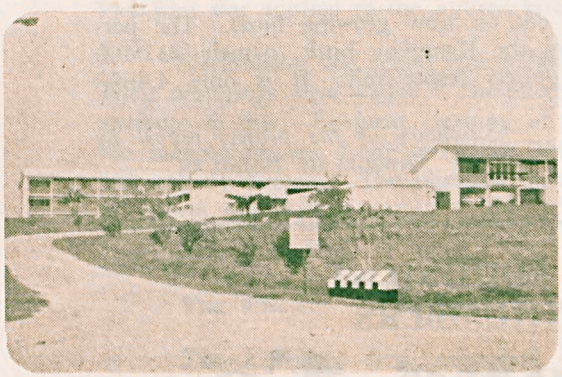
Side View



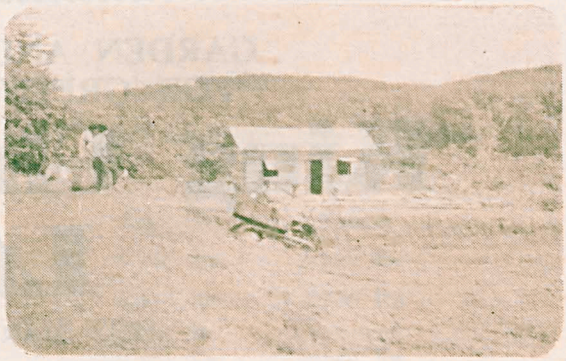
One Section



From Across The Field

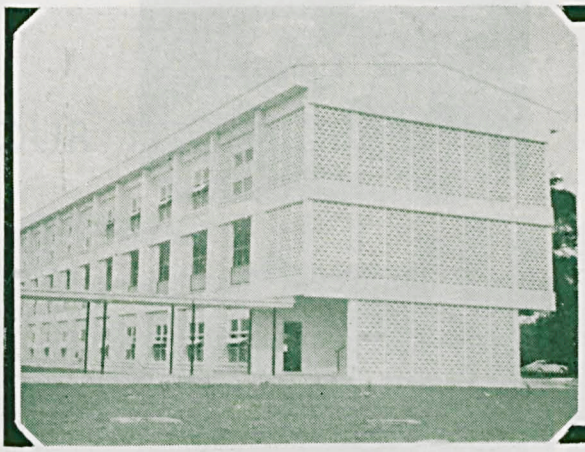


Hostel

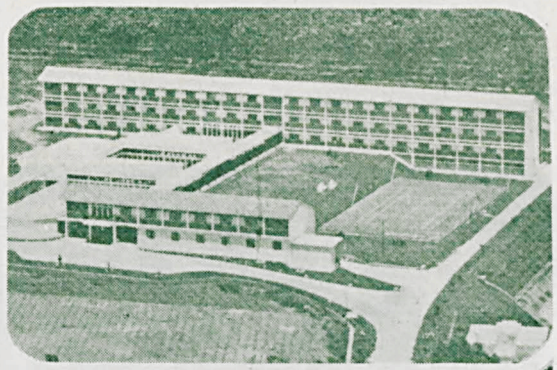


Construction For New Hostel

AROUND THE CAMPUS WE GLANCE



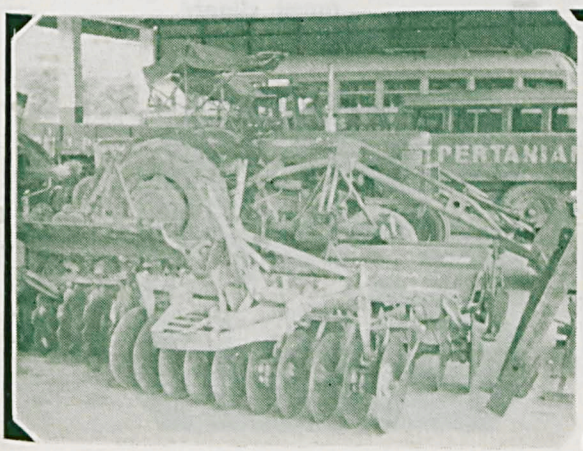
Laboratories



Hostel

College Hall

Poultry Broiler Unit



Mechanical Unit

Crop Muzeum

THE THIRD YEARS TOUR THE SOUTH

Oil Palm Seedlings

Field Nursery

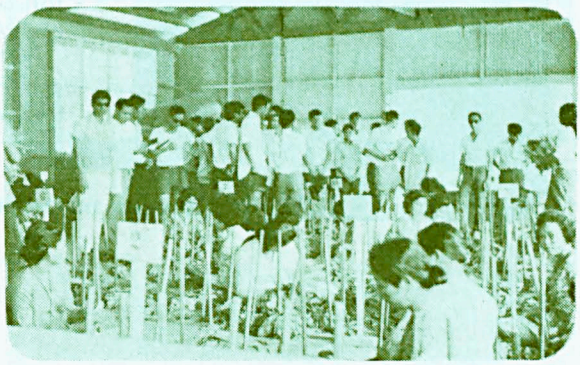
Look for the Nut

Voracious Feeders

At Home amongst cows

TOUR TO THE EAST

You need eyes!

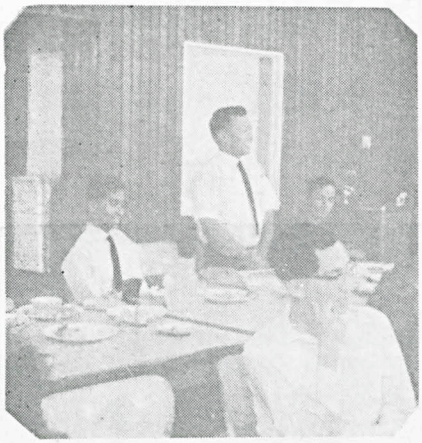


Tobacco grading

Manila hemp

F.L.D.A. Scheme

WE SHALL MISS-----



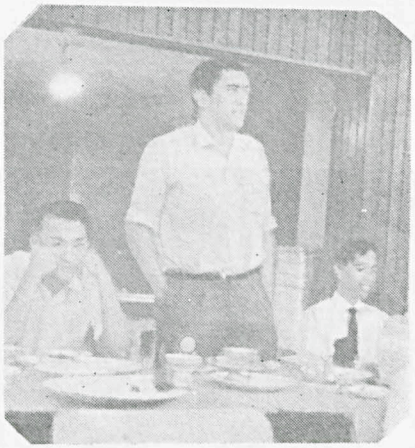
Mr. R.C. Bautista

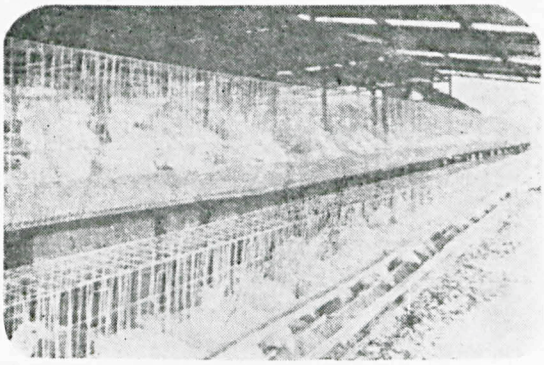
Working on four cylinders, he is easy to follow as regards his lectures on Mathematics and Agriculture Engineering.

He does well in basketball and never refuses to give tuition.

Mr. D.M. Ellison

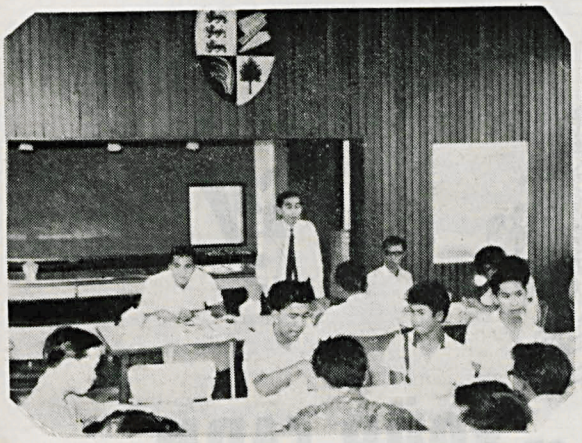
Known for his tremendous horse-power in the rugger field, he is also not forgotten for his Farm Management and Economics lectures.

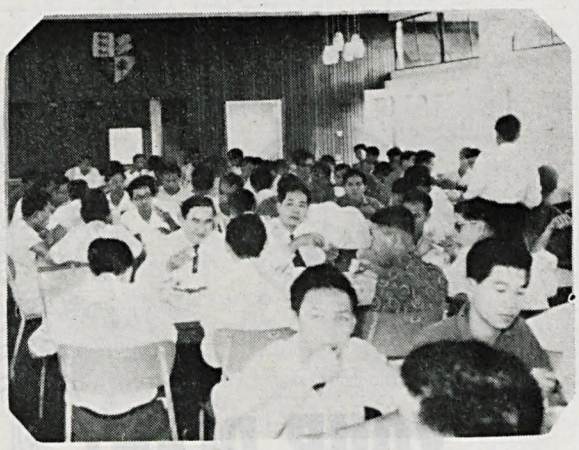




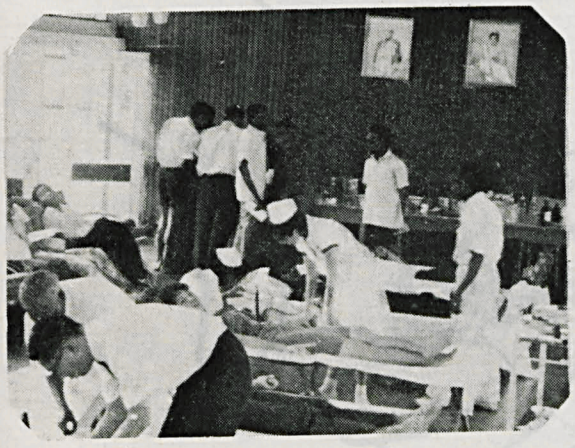
Poultry Layer Unit

Vegetable Garden





Staff welcoming students to a tea party



Blood Donation

Tractor Competition

Padi Planting

Easy Plouging

UNION ACTIVITIES.

FAREWELL MESSAGE OF THE PRESIDENT

Fellow CASUans:

May I extend my heartiest congragulations to the Publication Committee for having successfully poduced this magazine which closes yet another chapter of the Union activities of this College. This year is indeed a year of achievements for the Publication Committee. Not only have they brought out the "Serdang Sun" and the "Tembusu" but they have also introduced "... Serdang", a monthly newsletter of the Students and in conformity with the policy of the 19th Students' Council, they have produced the Union ... which it is hoped will impart the necessary informations to the Secondary ... who are interested in joining the College after their school lives. These achievements are classic examples of how with the co-operation and help of the Committee members, much can be achieved.

Students' apathy is perhaps the foremost problem faced by all Students' Unions in this country. Sad to say, the College of Agriculture Students' Union is no exception and students' apathy has been the main obstacle to the progress of the Union. It is about time that we, the members, sit back and appraise ourselves and ask what we have done for the Union rather than always thinking of our privileges, rights and facilities enjoyed as Union members. For the Union to fail in its task, it is enough that her members remain indifferent to Union activities. Fortunately such despisable attitude exist only among a small section of the members. To them may I say, "Let us not be human parasites refusing to play our part for the Union which has existed primarily to safeguard our interest and rights. The least that you can do is to co-operate with the Students' Council."

What then is the responsibility of the members? For a Union to achieve its aims and objectives, there must be absolute solidarity amongst members. A Union divided cannot hope to achieve much neither can it stand. Unity — that is our responsibility......unity......irrespective of our colour, race or personal feelings......with the Union above all. Were we to fail in that responsibility, we would fail ourselves, we would fail the Union, the past and future members and ... we would fail our beloved country. If we the students, the future ... of this country cannot live together in so close a community as we ... here, how ... can we expect the people to live in harmony and peace throughout the country?

... is therefore ... the good name of the Union so that we can always be proud of her. Let us answer the call of the Union and so bear ourselves that in 10 or 20 years from now, should we return to this College and see the members living together sharing the same joys and sorrows, we can look back upon our College days and say with a sense of pride and nostalgia, "We have done our part." Shame to those who in the years to come, cannot with all sincerity and honesty, with conscience clear, claim that they have been loyal, faithful and true CASUans.

"BERTANI UNTOK BERBAKTI".

(Goh Tyau Soon)
President,
19th Students' Council
College of Agriculture Students' Union.

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Let us therefore uphold the good name of the Union so that we can always be proud of her. Let us answer the call of the Union and so bear ourselves that in 10 or 20 years from now, should we return to this College and see the members living together sharing the same joys and sorrows, we can look back upon our College days and say with a sense of pride and nostalgia, "We have done our part." Shame to those who in the years to come, cannot with all sincerity and honesty, with conscience clear, claim that they have been loyal, faithful and true CASUans.

"BERTANI UNTOK BERBAKTI".

(Goh Tyau Soon)
President,
19th Students' Council
College of Agriculture Students' Union.

SPORTS COMMITTEE 1965/66

Chairman: ..... Jamaluddin Ahmad

Secretary: ..... Yeo Sin Bin

Captains:

Body building:	Syed Farooq bin Syed Fadzil
Rugby:	Wong Ah Lim
Soccer:	Chew Soo Ton
Hockey:	Ang Boon Beng
Tennis:	Wang Jun Ngi
Badminton:	Lim Kim Enee
Volley ball:.....	Robert Ho
Sepak Raga.....	Sharifuddin Kadir
Basketball:	Lim Tian Soo
Indoor games:	T. Parameswary
Athletics:	Ng Lu Siong.

The 1965/66 Session has been a successful one with regards the sporting activities of the Union. To top the honours list, CASU is greatly honoured to become host to the 3rd Malaysian Student Games Carnival held from 24th-26th Sept. 1965. The Carnival was a great success and this was due to the very hard work put in by the members of the Organising Committee and the cooperation given by CASU members.

We have been equally fruitful in our venture to win back the Martin Trophy this year. I sincerely hope that the Trophy will be in the hands of CASU for many more years to come considering the fact that we are definitely going to have a greater enrolment next year and the subsequent years.

Rugby has been the major game played while other games like tennis, badminton, hockey, table-tennis, football, Sepak raga jaring, volleyball, the indoor games and basketball have been played also with equal enthusiasm.

CASU is now a member of the inter-College Sports Council and we took part in 2 games, namely Volley ball and Table-Tennis and we emerged as champions in the volley ball league. Bodybuilding is fast becoming a popular past time for the Students.

Rugby

Rugby this year has been played with greater enthusiasm and understanding and as a result we play clean, fast and robust rugby.

We have done well in the Selangor Rugby Union league. At the time of writing down this report, we are in the 3rd position in a list of 10 teams taking part. We are being able to be in the top three teams because of the great captainship by our Rugby Captain Wong Ah Lim, also by the good coaching of Mr. D.M. Ellison and last but not least by the great determination exhibited by our players.

Five of our players namely Ang Boon Beng, Goh Tyau Soon, Chin Kon Long, Wong Ah Lim and Yeo Bin Sin were selected to represent the Selangor under 23 team.

My thanks are also due to Mr. Wan Chee Keong, Mr. Tan See Yeok and Mr. Szeto Mun Yee for playing for our team.

Rugby results

League matches:

Opposition	*Venue*	*Results*	
Services 'B'	away	won	15-3
	Home	won	17-3
Services 'A	away	lost	3-15
	Home	lost	5-11
University	away	won	16-0
	Home	won	19-8
Tigers	away	lost	17-8
	Home	won	11-8
Selangor Malays	away	lost	5-8
	Home	won	16-3
V.I.O.B.A.	away	won	16-5
	Home	won	walkover
Klang	away	lost	3-6
	Home	won	20-0
Police	away	draw	13-13
	Home	won	16-14
Combined Colleges	away	won	walkover
	Home	won	walkover

Tennis

This is a very popular game judging from the everyday use of the court and the number of tins of tennis balls used. The Stardard of tennis has definitely risen and it will continue to rise.

Soccer:

Though we could form a very good Team this year, it is unfortunate that the players do not have the time to go down for practices more often. We had the one and only match against varsity. I hope that soccer would become a popular game next year and the years to come.

Badminton

This game is equally popular with the students and the standard of badminton has definitely risen due to the great interest shown.

Table-Tennis

With a new set of table, the students are enjoying this facility offered by the college. We look part in the Inter-College Sports Council league but we did not do too well.

Opposition	*Venue*	*Result*	
T.T.T.C.	T.T.T.C.	lost	0-5
S.T.T.I.	STTI	won	3-2
M.T.C., K.L.	CASU	won	walkover
L.I.	CASU	lost	0-5
Sekolah Alam Shah	SAS	won	5-0
D.T.C. (K.L.)	D.T.C.	lost	walkover.

Volley ball

We did extremely well in the ICSC league and emerged champions.

Oppositon	*Venue*	*Results*
T3C	T3C	won
STTI	STTI	won

MTC (K.L.)	CASU	won (walkover)
L.T.	CASU	won
Sekolah Alam Shah	SAS	lost
D.T.C.	D.T.C.	won

Basketball:

With the 2 Basketball boards being put up in the Tennis Court, there has been great response to the game. My thanks are due to Mr. R.C. Bautista for helping us to put up those 2 boards.

Hockey:

We have got the players to form a good team but very unfortunately, due to the lack of time and other unforseen circumstances we could not have any match with any of the colleges except for those matches played during the Games Carnival, the M.T.C. Penang and Technical College K.L.

3rd Malaysian Game Carnival

We managed to take part in only 3 games namely Hockey, Volleyball and Table-tennis. At table-tennis, we were out in the first round but where Hockey and Volley-ball were concerned we reached the semi finals before bowing out.

Martin's Trophy

This is an annual affair between CASU and UMAS . This session, we have been successful in getting back the Trophy and we hope to retain it for a few more years.

Games	*Venue*	*Results*
Badminton	CASU	won
Basketball	UMAS	lost
Volley ball	CASU	won
Hockey	CASU	won (walkover)
Football	UMAS	won.

Staff—Student Games

To strengthen the staff and student relationship, every year, a series of games is played. The students matches the Staff at Tug-of-war, Tennis, badminton and a few more of the games.

My utmost thanks go to all the members of the Staff, especially Mr. R.C. Bautista, Mr. D.M. Ellison, Mr. Wan Chee Keong, Che Hamid and every member of the Sports Committee who in one way or other has helped me to run the Committee. I take this opportunity also to thank every member of the student body for the great cooperation they have rendered me.

Conclusion

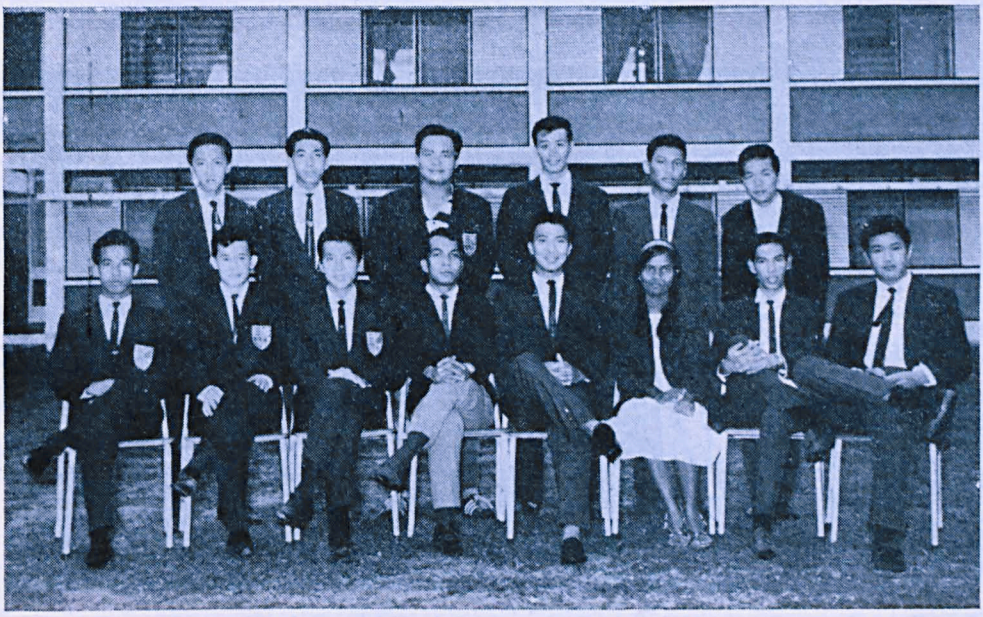
It is my most sincere hope, that next year, the sporting activities may take a new turn with a greater enrolment. Let us hope that with the coming years, greater interest and determination will be shown by the students.

It is also my hope that those students leaving the College this year will not let their sporting activities die with them. I look forward to see them participating and enjoying the games that they have played.

To those students in the 1st and 2nd year and to those new intakes, I would urge them to take an interest in games and bring up the name of CASU in the field of sports.

YEO SIN BIN
Sports Secretary.

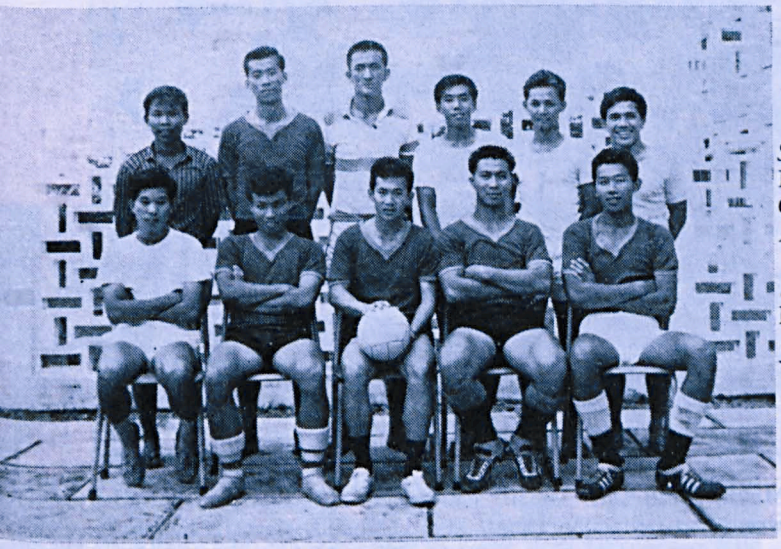
SPORTS COMMITTEE



Standing (L. to R.): Lim Kim Enee, Chew Soo Ton, Wong Ah Lim, Ang Boon Beng, Sharifudin Kadir Ng Kow Chai.

Sitting (L. to R.): Syed Farooq, Robert Ho, Lim Tian Soo, Jamalludin Ahmad, Yeo Sin Bin, Parameswari (Miss), Wan Jun Ngi, Ng Lu Siong.

VOLLEYBALL



Standing (L. to R.): Sepuan Anu, Lien Kwen Min, Goh Tyau Soon, Chew Soo Ton, Yip Chee Peng, Anthony Najcd.

Sitting (L. to R.): Ang Yang Poh, Edmund Masudal, Robert Ho (Captain), Yeo Sin Bin, Johnny Yeo.

RUGBY

Standing (L. to R.): Abdullah Sepien, Mohd. Sidek, Goh Cheng Seng, Poh Syee Wah, Mokhtar Ismail, Edmund Masudal, Yip Chee Peng, Anthony Najod.
Sitting (L. to R.): Mr. Dan Ellison, Kugarajah, Chin Sah Kong, Ng Kow Chai, Goh Tyau Soon, Wong Ah Lim (Captain), Johnny Yeo, Yeo Sin Bin, Ang Boon Beng, Mr. Wan Chee Keong. *Sitting*: Ting Swee Keng.

HOCKEY

Standing (L. to R.): Mokhtar bin. Hj. Ismail, Chin Kee Fui, Edmund Masudal, Toh Keng Pong, Lien Kwen Mien, Sulaiman Daud, Mohd. Khalid, Kamal Chaudhury.
Sitting (L. to R.): Yeo Sin Bin, Abd. Kamal Shafii, Wan Mohamad, Ang Boon Beng (Captain), Johnny Yeo.

SOCCER

Standing (L. to R.): Ng Kow Chai, Wong Sch Har, Chew Soo Ton, (Captain), Poh Syee Wah, Ahmad Abdullah, Goh Tyau Soon, Yip Chee Peng, Abdullah Sepien, Anthony Najod.

Sitting (L. to R.): Chin Kee Fui, Edmund Masudal, Yeo Sin Bin, Kamal Shafii, Johnny Yeo, Sulaiman Daud, Khalid Md. Nor.

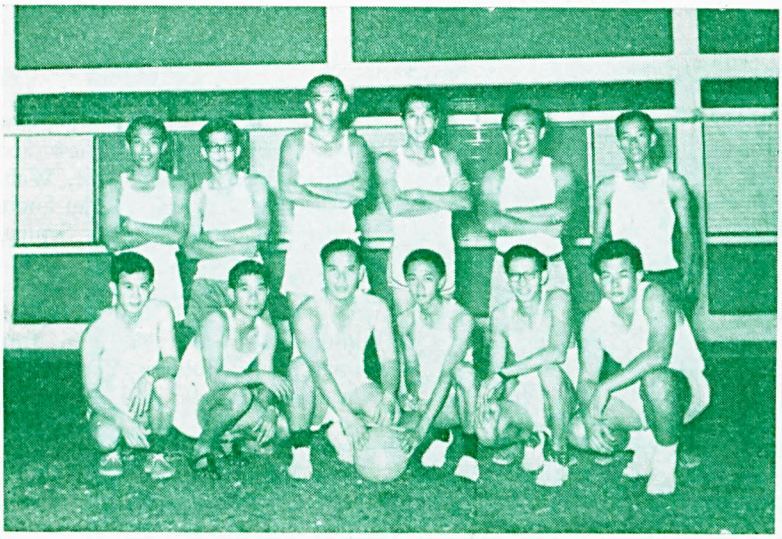
TABLE TENNIS

(L. to R.): Goh Tyau Soon, Khalid Md. Nor, Lim Kim Enee (Captain), Tong Chik Fong, Mokhtar, Johnny Yeo.

BADMINTON

(L. to R.): Lien Kwen Min, Chew Soo Tcn, Ng. Kow Chai (Captain), Johnny Yeo, Poh Syee Wah, Lim Kim Enee, S. Sivarajah.

BASKETBALL



Standing (L. to R.): Sepuan Anu, Khoo Su Chin, Goh Tyau Soon, Lim Tian Soo (Captain) Loh Kum Ying, Lee Swee Bin.

Squading (L. to R.) Robert Ho, Ang Yang Poh, Chin Sah Kong, Lim Kim Enee, Philip Yee, Chin Kee Fui.

SEPAK RAGA

Standing (L. to R.): Lim Kim Enee, Pheh Thean Teik, Sharifuddin Hamid, Yeo Sin Bin, Ahmad Abdullah, Ng Kow Chai.

Sitting (L. to R.) Sulaiman Daud, Khalid Md. Nor, Sharifuddin Kadir (Captain) Mohd. Kamal Shafii, Johnny Yeo.

TENNIS

(L. to R.): Johnny Yeo, Lien Kwen Min, Lee Swee Bin, Yeo Sin Bin, Wang Jun Ngi, (Capt.),

Squatting: (L. to R.) Ang Yang Poh, Robert Ho.

29th November, 1965.

The Literary and Social Committee Report 1965/66.

The Literary and Social Committee 1965/66 consisted of the following :-

Chairman	Inche Jamaludin Ahmad.
Literary & Social Secretary . .	Inche Habibur Rahman Ibrahim.
Assistant Lit. & Social Sectretary .	Inche Toh Keng Pong.
Librarian	Inche S. Kugarajah.
Members	Inche Chooi Lam Kong. Che' T. Parameswary.

Although much cannot be said about the achievements of the Committee during our term of Service, it should be noted, however, that we have tried to cultivate an interest for a better Social outlook among the members.

Excursions and outings were orgainsed whenever possible. A trip to port Dickson and another to the Lake Gardens to witness the Merdeka celebrations were organised in the Second Term. Another trip was organised to witness the MAHA show in Kuala Lumpur.

Films Shows were screened occasionally. A total of Seven films were shown during the first and second terms, but due to the unpromising response in the way of subscriptions the committee was unable to screen any more films during the third term.

The Common Room, being a place of recreation, was kept with the best possible facilities. The new radiogram was equipped with a wide selection of records. A total of ten long playing records and eighteen small records were purchased. Our collection this year is the biggest ever. To provide for further relaxation the college authorities donated a luxury television set.

The stocks of books in the library was increased with the donation of fifteen books by the former principal, Mr. Martin. All these facilities have made the common room a center of relaxation for members.

The committee also played their part in the running of the 3rd Malaysian Games Carnival which was a big success.

Nothing much can be said about dances, owing to unavoidable circumstances. This year the Committee organised only one dance. The Orientation Dance was held on occassion of the orientation of Freshman.

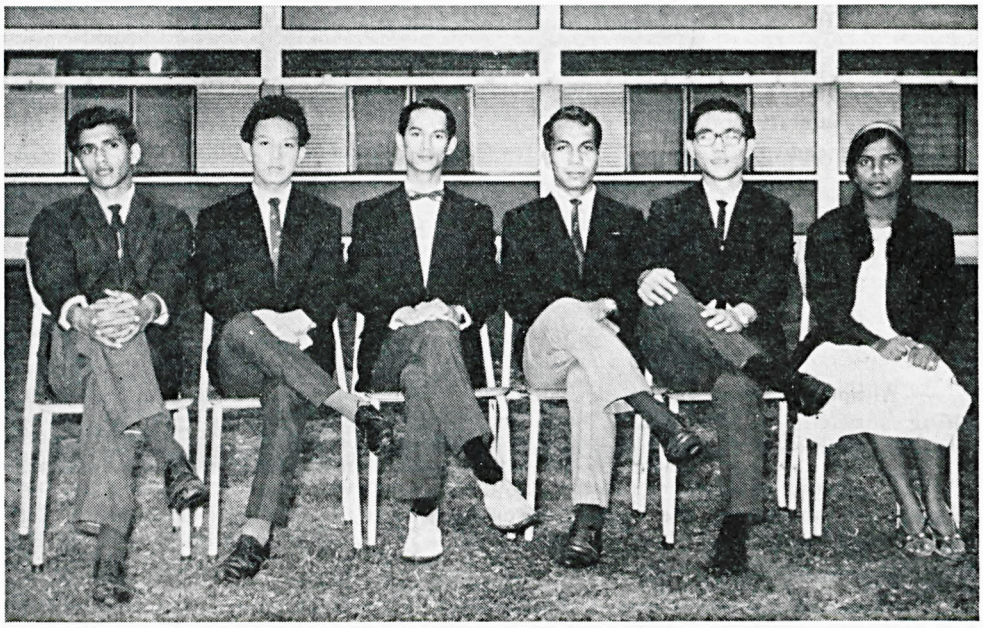
On the literary side the Committee has sponsored an interfloor debate. The ground floor won the debate. As a result of this, it was decided that the debate should be made an annual affair to cultativate an interest in public speaking, which is essential to all extension workers. For this, the Principal has kindly donated a challenge shield known as "The Rashdan's Trophy".

It is hoped that the future Social Committees will try to remedy the problems we faced his year, in trying a better interest in Social activities. This will make life in CASU more pleasant if not memorable.

Lastly the committee would like to express thanks and gratitude to Dr. Rashdan for donating his trophy and to the college administration for installing the television set. Last but not least we express our appreciation to all members who have co-operated in the running of the committee.

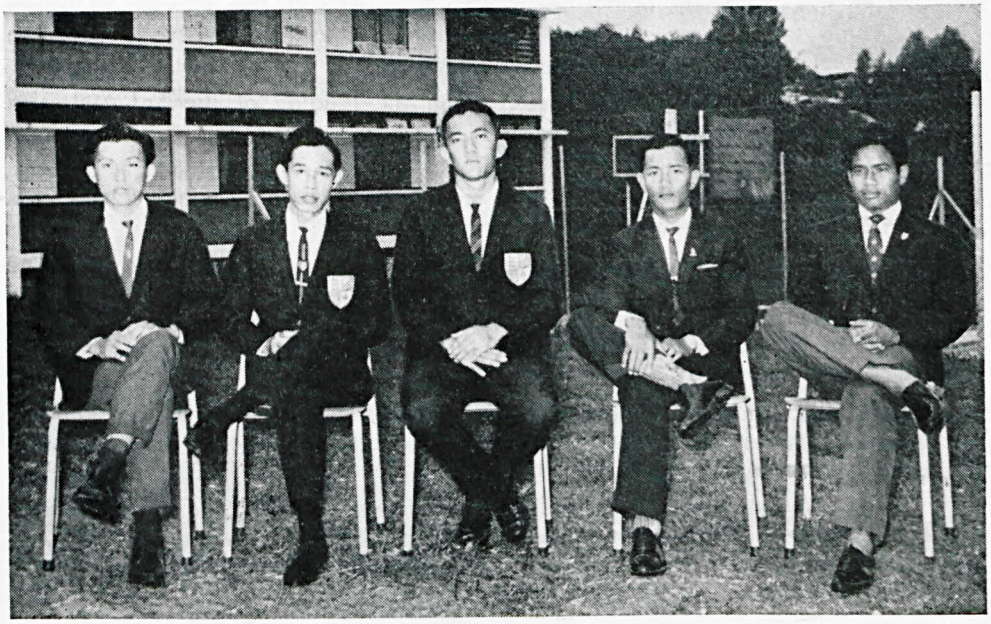
HABIBUR RAHMAN IBRAHIM.
Literary & Social Secretary.

LITERARY & SOCIAL COMMITTEE



(L. to R.): Kugarajah, Chooi Lam Khong, Habibur Rahman Ibrahim, Jamalludin Ahmad, Toh Keng Pong, Parameswari (Miss).

FINANCE COMMITTEE



(L. to R.): Lee King Watt, Ng Huang Keat, Goh Tyau Soon, Wan Mohamad, Mohd. Sidek.

REPORT OF THE FINANCIAL COMMITTEE 1965/66

The Financial Committee 1965/66 comprised the following:—

Chairman	—	Goh Tyau Soon.
Finance Secretary	—	Ng Huang Keat.
Members	—	Lee King Wat.
		Wan Mohamad bin Wan Othman.
		Mohd. Sidek bin Mohd. Din.

College Subsidy.

The expenditure of the Union was high due to the increasing number of students and the enormous number of projects carried out by the Students' Union. They were made possible and successful because a subsidy of $2,500/- was alloted to the Union by the College Council.

Donations.

During the course of the Financial Year, donations in the forms of 'fines', profits from the Coca-cola slog machine, and sales of kitchen swill helped to improve the financial standing of the Union. With larger number of students, the charge of the kitchen swill was increased by $11/- per month.

T.O.C. Reserved Fund.

A sum of $520/-, being the amount left-over by the Tour Organising Committee 1964/65, was handed to the Financial Committee. The Students' Union, encouraging subsequent external tours, agreed that the money should be spent only on tours outside Malaya.

Loans.

Loans were provided to the following Committees:—

i. Literary and Social Committee — For dance expenses, etc.

ii. Union Secretariat — For purchase of writing pads, tie pins, files, envelopes, travelling bags, etc.

Bank Account.

The Financial Committee, had come to the decision that the College of Agriculture Students' Union should have a bank account of her own instead of depositing the money with the College. Since this was brought into light towards the end of the Financial Year, the present Students' Council would make recommendations to the forth coming Students' Council on this matter.

The Auditorial Board comprised of two ordinary members and they were Messrs Tan Eow Huat and Sivarajah s/o Sinnathamby. Their duties were to scrutinise and audit all account and materials of various standing and ad-hoc committees.

At this juncture, I would like to thank the members of the Financial Committee and the honorary auditors for the help they had rendered to the Union.

NG HUANG KEAT
Financial Secretary

LAPORAN JAWATAN-KUASA KHAS BAHASA DAN KEBUDAYAAN

Pengerusi	Enche Jamaluddin Ahmad
Setia-usaha	Enche Kamal Shafi'i
Ahli2 Jawatan-kuasa	Tuan Syed Farooq bin Syed Fadzil
	Enche Chee Chuan Chai
	Enche Pheh Thean Teik
	Enche Sulaiman Daud (wakil P.P.I.K.P.).

JAWATAN-KUASA Khas Bahasa Dan Kebudayaan telah tiada dapat berjalan dengan lanchar-nya oleh kerana tiada mendapat sokongan, baik dari segi moral atau pun material, dari kebanyakan para ahli sekalian. Tujuan utama Jawatan-kuasa Khas ini ialah untok meluaskan lagi kegunaan Bahasa Kebangsaan, di-Kolej ini dan memperkembangkan tarian2 asli kapada ahli2 sekalian. Oleh kerana mendapat sokongan yang menyedehkan itu, tujuan Jawatan-kuasa Khas ini tinggal tujuan sahaja. Sunggoh pun begitu, kami telah berusaha dengan sa-daya upaya untok melaksanakan tujuan asal Jawatan-kuasa Khas ini. Di-penggal pertama dan ketiga, kami telah berjaya mengadakan beberapa ranchangan.

Malam Bahasa Kebangsaan.

Pada penggal pertama, kami telah berjaya mengadakan Malam Bahasa Kebangsaan dengan bantuan dari PPIKP. Achara-achara pada malam tersebut ada-lah saperti berikut:

1. Pertandingan Bahath dan Berbalas Pantun antara Kolej Pertanian dengan Sekolah Pertanian, Serdang.
2. Peraduan Membacha Sajak dan Bersharah (bagi penuntut2 Kolej Pertanian sahaja).

Dengan ada-nya penyertaan penuntut2 Sekolah Pertanian, kami berharap perhubongan antara penuntut2 Kolej dan Sekolah Pertanian akan bertambah rapat lagi. Sekolah Pertanian telah memenangi pertandingan berbalas pantun tetapi kalah di-pertandingan bahath. Bilangan peserta2 di-pertandingan membacha sajak dan bersharah sangat-lah menyedehkan.

Pertandingan Bahath.

Kami telah mengambil bahagian di-pertandingan bahath bagi menyambut Bulan Bahasa Kebangsaan yang lalu, di-perengkat dewasa bagi kawasan Kuala Lumpur dan kami telah di-kalahkan oleh Maktab Perguruan Malaya, Kuala Lumpur dengan 3 mata sahaja. Di-pertandingan bahath anjoran Maktab Perguruan Bahasa K L pula, kami telah di-kalahkan oleh Maktab Perguruan Khas Jalan Cheras dengan 7 mata sahaja. Pertandingan bahath antara tingkatan2 untok merebut Piala Puan Aishah Ghani telah di-batalkan.

Kelas Bahasa Kebangsaan.

Kelas Bahasa Kebangsaan bagi penuntut2 Sarawak dan Sabah, telah tergendala di-penggal pertama dan kedua kerana tiada guru yang layak untok mengajar mereka. Walau bagaimana pun, kelas ini telah di-mulakan di-penggal ketiga dan mendapat sambutan yang memuaskan.

Tarian2 Asli.

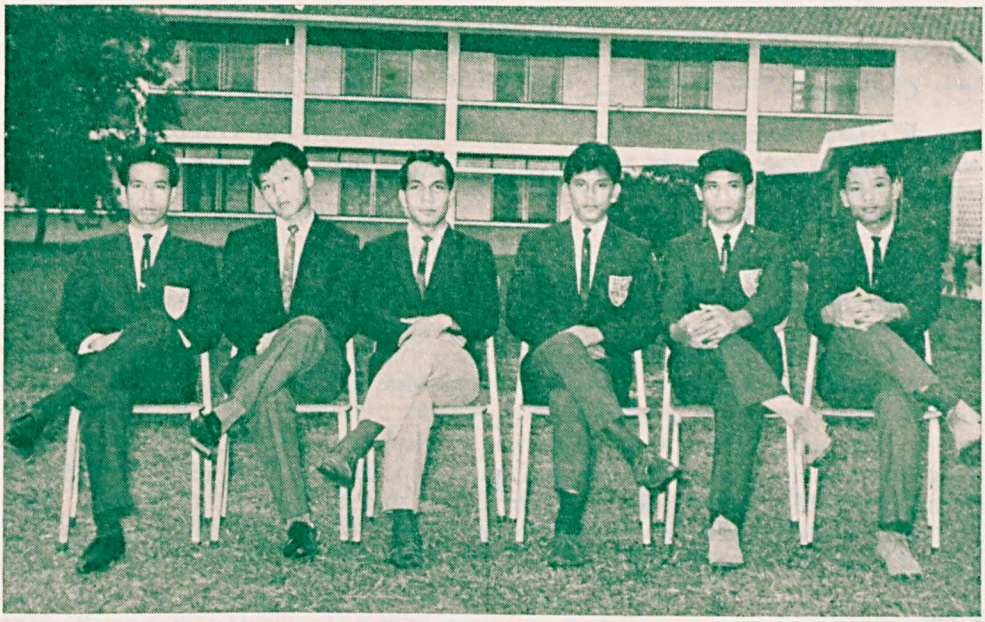
Kelas tarian2 asli telah pun tergendala di-penggal pertama dan kedua kerana tiada guru yang layak untok mengajar kami. Sunggoh pun begitu, Pejabat Penerangan telah menghantar sa-orang guru tari yang layak dan mahir, Che Puteh binte Said, untok mengajar kami pada penggal ketiga ini.

Lain2 Hal.

Surat khabar Berita Harian, Majallah Dewan Bahasa dan Dewan Mesharakat telah di-beli.

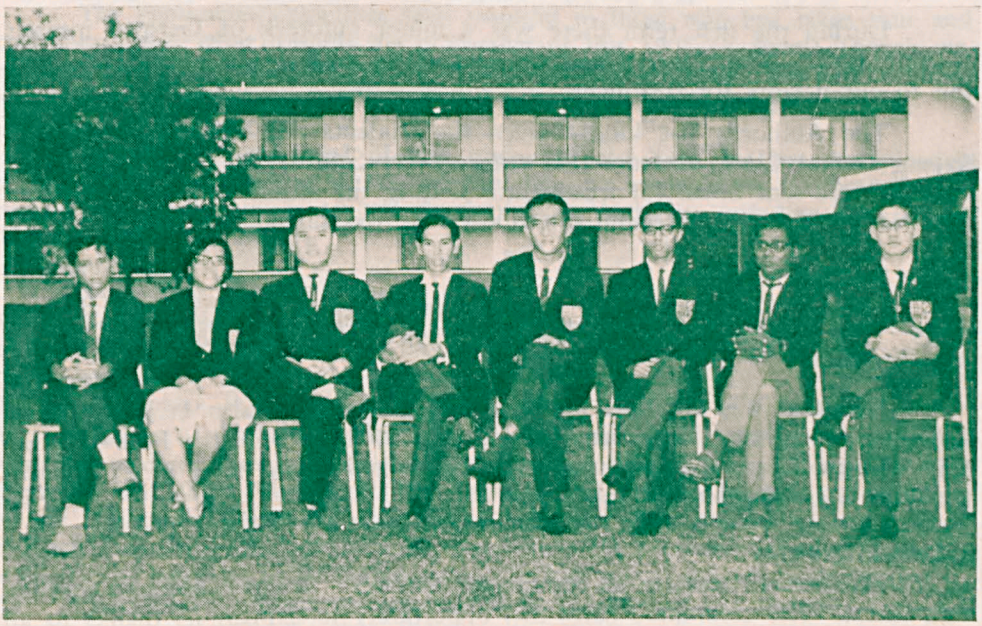
KAMAL SHAFI'I
Setia-usaha.

LANGUAGE & CULTURAL COMMITTEE



(L to R): Syed Farooq, Pheh Thean Tiek, Jamalludin Ahmad, Abd. Kamal Shafii, Sulaiman Daud, Chee Chuan Chai.

WELFARE COMMITTEE



(L. to R.): Sharifudin Hamid, Girlie Wong (Miss), Chin Sah Kong, Wang Jun Ngi, Goh Tyau Soon, Syed Aziz Othman, S. Sivarajah, Quah Chok Kee.

Report of the Welfare Committee — 1965/66

The Welfare Committee consists of the following members:—

Chairman	—	—	Goh Tyau Soon
Welfare Secretary	—	—	Syed Aziz bin Othman
Hostel Secretary	—	—	Wang Jun Ngi
Asst. Hostel Secretary	—	—	Quah Chok Kee
Ground Floor Rep.	—	—	Shariffudin bin Hamid
First Floor Rep.	—	—	Chin Sah Kong
Second Floor Rep.	—	—	S. Sivarajah
Girls Wing Rep.	—	—	Miss Girlie Wong

The policy of this Committee was to please as many students as possible. To please everybody in everything was quite impossible. This year, the Welfare Committee could safely pride itself in being able to achieve its policy. This has been made possible by the co-operation and encouragement given by the students, the Hostel Steward and lastly but not least the cooks themselves.

Food

As usual this was the sore point with the Welfare Committee. New dishes have been introduced and after some time it was withdrawn. There is still a lot of room for improvement as far as food is concerned.

Students Welfare

Students injuries were mainly obtained in the rugger field. They were of minor nature except for one case one of the rugger players was hospitalised as a result of broken ligaments.

During the first term there was a minor outbreak of German measels in the Hostel. About twelve students were down with this sickness. They were sent to our doctors for treatment.

The Authority has kindly given the students free dental treatment in Kajang Dental Clinic as from this year. Every Saturday morning a batch of students were sent down for treatment. During the second term all the members were given free anti-tetanus injection on the recommendation of our doctors.

Public Welfare Services

On 12th June 1965, 30 members of the students population donated blood. The members were very co-operative in coming forward to donate their blood.

Donation was not only in the form of blood but also in the form of cash was also given. To name a few examples, there were the Pure Life Society, Madam Chen, the family of a college labourer who died in an accident and East Coast flood relief fund.

Acknowledgements

My sincere thanks to all committee members. It was a pleasure working with them. The committee takes this opportunity to express its thanks to all the College Staff especially to the Principal and the Hostel Steward for their co-operation. Our thanks also to the cooks for their very understanding attitude.

Annual Report of the Publication Committee 1965/66.

The period of office of this committee for this year is indeed one of a steady stream of activities. Mainly through the understanding and co-operation of the committee members and the student body, could we be able then to carry out our activities.

Meetings :

Meetings are held almost once a month, the first of which was to draw up the programme of activities for the year, while subsequent ones are to review on the progress of work carried out since.

Berita Serdang :

This year saw the emergence of this Berita Serdang, a simple newsletter of our Union, circulated internally amongst our student body. It usually contained views of the members, their recommendations for some activities or certain events carried out by the Students' Council and the various committees. It also contained criticisms and suggestions from members on various union affairs. Through this newsletter, we hope to be able to develop in the members, a continous consciousness of our union's activities.

Handbook of the Union.

The Handbook was the first publication of this kind undertaken by this Publication Committee. It contained a full account of the machinery, function and activities of the Union, together with a brief description of the College too. We hope through this publication to be able to convey as much information on the activities of the students here, both on the academic and Student Union aspects. The production of this Handbook fulfills too, one of the policies of our present 19th. Students' Council.

The Tembusu : *Union Newsletter.*

The Tembusu is a self supporting publication, and we were able to produce this in late November this year. Though it is self-supporting, we did manage to obtain a small profit. We sent out the Union newsletter to schools and organisations, as with the other publications too. This year saw an improvement of the magazine and an increase of its pages too. This is due to the generousity of our advertisers.

The Serdang Sun 1965/66 : *Annual magazine of the Union.*

The Publication Committee feels thankful to those who had taken time and contributed their effort towards the production of this 1965/66 issue. Though we, as usual face the constant setback of articles from our members, this had not been an obstacle to the proper functioning and production of this magazine.

Miscellanous activities :

The constitutional need of this committee also calls for the dessimination of agricultural interests and to keep to this duty, we managed to distribute a large number of our magazines to schools throughout Malaysia, including the Borneo Territories too, and Brunei.

Acknowledgement :

We express our hearty thanks to :-

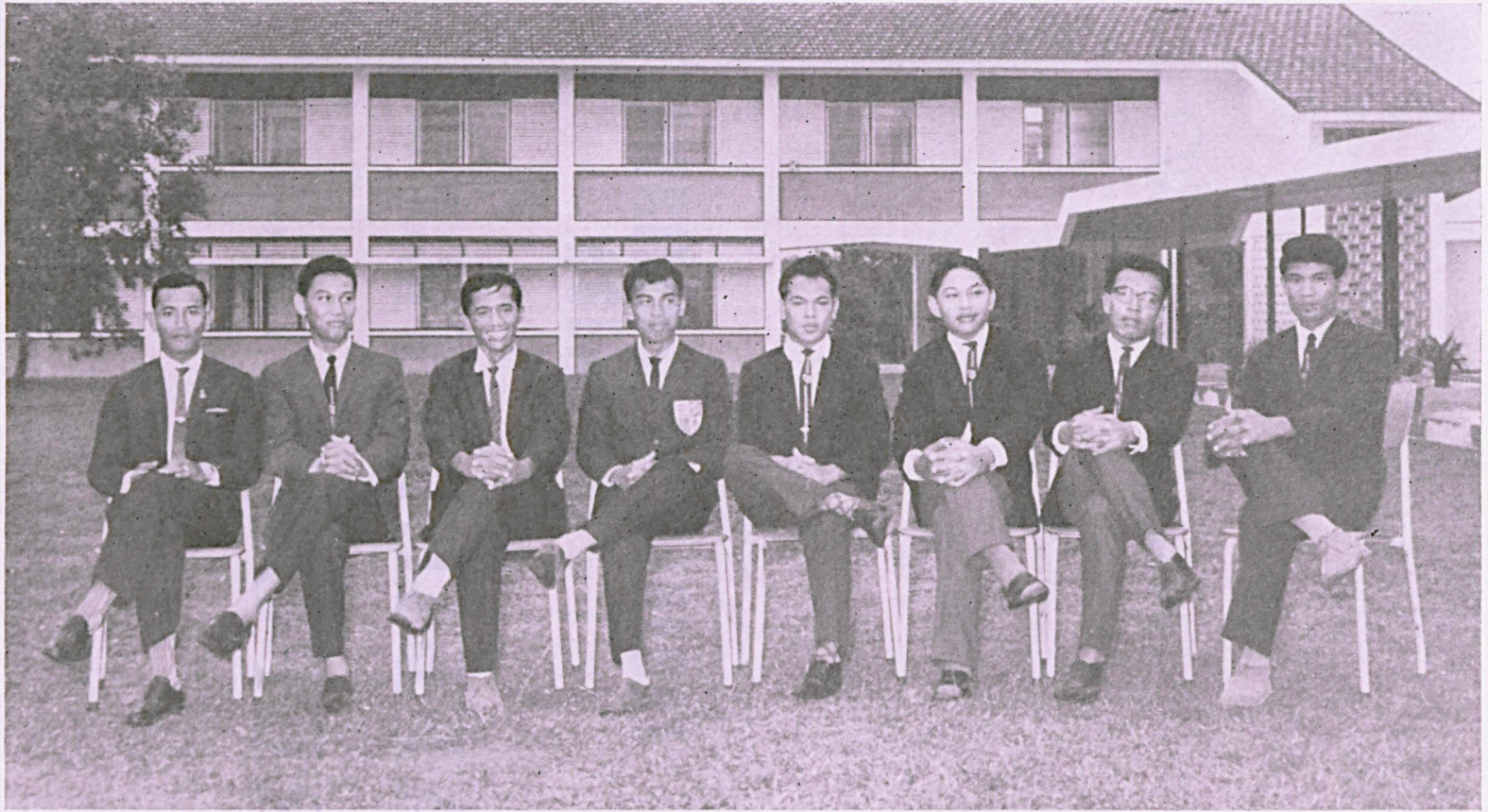
1. The Minister of Agriculture and Co-operatives, the Chairman of the Council of the College of Agriculture and the Principal of the College of Agriculture, for their messages.
2. Our regular and generous advertisers.
3. Members of the Staff of the College of Agricultaral, our contributers and those who had rendered their kind help and co-operation towards the production of this magazine, our Union Newsletter : the Tembusu and the Handbook. The members of the Publication Committee will indeed miss Mr. R.C. Bautista of the College Staff who had always rendered his help, especially in the acquisation of advertisements; as he will be returning to Phillipines soon. To him we express our sincere thanks.

I also wish to express my gratefullness to members of my committee for their promptness in accomplishing their duties.

NEO ENG SOON.
Publication Secretary.

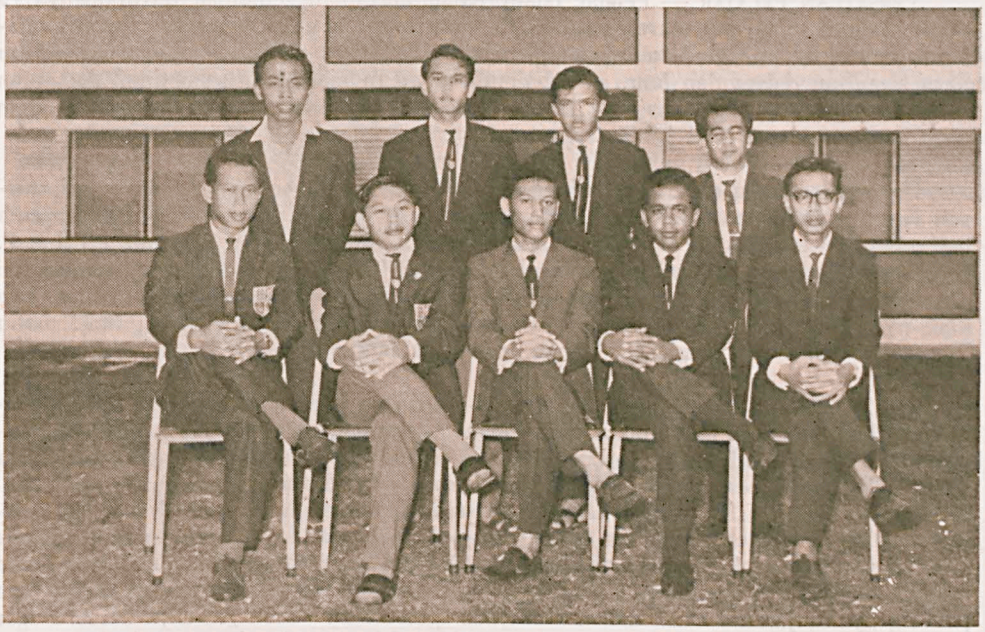
AFFILIATE REPORT

MAJLIS PELAJAR-PELAJAR ISLAM 1965/66



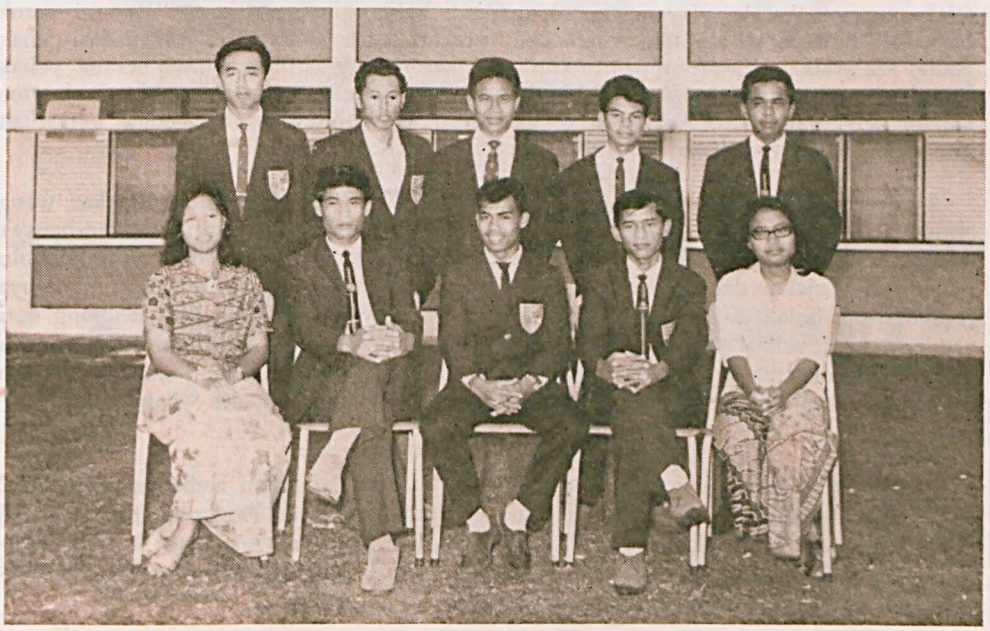
(L. to R.): Wan Mohd. Othman, Sharifudin Kadir, Sharifudin Hamid, Khalid Mohd. Nor, Mohd. Ismail, Othman Hassani, Mohd. Salleh Harun, Sulaiman Daud.

Ahli2 Jawatan kuasa Tadbir Rencham dan Persuratan dan Kebudayaan



Standing (L. to R.): Sepuan Anu, Ghazali Ahmad, Nik Abdullah, Mohd. Tahir.
Sitting (L. to R.): Shaaran Tafri, Othman Hassani, Sharifudin Kadir, Ahmad Abdullah, Roslie Madani.

Ahli2 Jawatan kuasa Tadbir Penerbitan dan Agama



Standing (L. to R.): Abang Naruddin, Zainal Abidin Isa, Mohd. Sidek, Sha'ari, Ahmad Abdullah.
Sitting (L. to R.): Salbi Ranting (Che), Sulaiman Daud, Mohd. Khalid Nor, Sharifudin Hamid, Zaharah bte. Abdul Rahman (Che).

UNTOK TATAPAN AHLI2 PPIKP-PTM (1965/1966)

PERSATUAN PELAJAR — Pelajar Islam Kolej Pertanian semenjak tertuboh-nya 15 tahun dahulu telah dan maseh dan sudah tentu akan menghadapi segala bentok chabaran dalam aneka segi — menghadapi ragam pertukaran teraju — mengalami Seribu Satu kesulitan dalam dan luar, sa-bagaimana yang menjadi kebiasaan tiap2 persatuan yang dinamis dan "ingin-maju". Namun begitu PPIKP ta'mungkin lumpoh bahkan terus maju.

Semangat, ia-itu dasar yang ulong menyebabkan tertuboh-nya persatuan ini, maseh lagi menjadi teras P.P.I.K.P. Semangat yang menyelubongi P.P.I.K.P. maseh lagi tebal dan ta'mungkin di-kikis — semangat ada-lah sebahagian daripada P.P.I.K.P. Chuma di-harapkan muga2 pancharan "semangat" yang menjadi pati persatuan ini akan terus meresap di-segenap urat sarap ahli2 semua demi kemajuan persatuan kita khas-nya dan untok kepentingan bersama 'am-nya kerana kita tentu ta' mahu "semangat" kita di-kuborkan. Tanpa semangat tanpa kemajuan.

Ahli2 P.P.I.K.P. memang sedar betapa penting-nya kerjasama mereka dalam mengendalikan beberapa usaha atau ranchangan2 persatuan, oleh itu saya sangat-lah bersesar hati kerana pada tahun ini pehak ahli2 semua telah pun menunjokkan kerjasama yang baik hingga berjaya-nya ranchangan2 dan usaha2 yang telah pun di-jalankan. Namun begitu P.P.I.K.P. mengharapkan perpaduan kerjasama yang lebeh erat lagi daripada ahli2-nya untok kemajuan tahun yang akan menjelang. Penting-nya kerjasama ahli2 persatuan untok menjayakan satu2 ranchangan dan usaha tentu dapat sama2 kita nilaikan sendiri. Kalau minyak itu penting untok menjalankan satu2 jentera begitu juga penting-nya kerjasama ahli2 dalam kemajuan persatuan. Oleh itu saya berseru agar ahli2 sekalian memberi kerjasama yang lebeh bersefahaman dan berkesan lagi di-masa2 hadapan.

Walaupun ranchangan 'BERTANI UNTOK BERBAKTI' tidak lagi bergema di-udara sa-bagaimana di-tahun yang kebelakangan di-mana pehak Radio Malaysia telah memberi satu ranchangan khas untok persatuan tapi pehak persatuan maseh lagi chergas dan kita telah pun merakamkan foram2 untok menjadi bahan siaran. Siaran "Bertani untok berbakti" ta'dapat di-lanjutkan oleh sebab perkara2 yang ta'dapat di-elakan dari pehak Radio Malaysia. Walaupun begitu kita uchapkan sa-tinggi2 terima kaseh kerana pehak Ranchangan Luar Bandar — Radio Malaysia telah pun memberi peluang dan kerjasama kapada persatuan. Dan kita harap ini akan terus berlanjutan dan bagi pehak persatuan kita akan terus menghulor sumbangan satakat terdaya.

Untok menyahut seruan negara, pehak P.P.I.K.P. telah pun menggunakan wang simpanan Tabong Derma untok membeli "Bon Pertahanan" dengan jumlah sa-banyak $650/-. Kutipan wang Tabong Derma yang telah di-lancharkan dua tahun dahulu telah pun berjalan dengan lichin-nya. Chuma kita menunggu masa terkumpul-nya jumlah yang boleh di-pergunakan untok chita2 kita yang murni ia-itu menolong dari segi kewangan pelajar2 Islam yang tidak begitu bernasib baik. Muga2 chita2 kita akan terlaksana dan tentu P.P.I.K.P. sangat2 terhutang budi kapada semua ahli2 yang telah menchapai kata sepakat untok menderma $10/- tiap2 tahun kapada "Tabong Derma" ini.

Tidak kita lupa badan gabongan P.P.I.K.P. ia-itu Persatuan Kebangsaan Pelajar2 Islam Malaysia yang telah juga memberi kerjasama. Kapada Persatuan Pelajar Kolej Pertanian (CASU) pehak P.P.I.K.P. menguchapkan ribuan terima kaseh kerana kerjasama CASU dalam serba jurusan dan perasaan muhibah yang begini harus di-perkokohkan lagi untok kepentingan bersama.

Pada tahun ini juga Tuan Haji Mohd. Khir Johari telah pun bermurah hati untok membebankan diri beliau sa-bagai Penaung Persatuan Pelajar2 Islam Kolej Pertanian. Kapada Penaung P.P.I.K.P. kita uchapkan terima kaseh dan selamat bertugas.

Juga P.P.I.K.P. ta' lupa menguchapkan ribuan terima kaseh kapada kedua dua penasihat kehormat ia-itu Tuan Haji Mohd. Din dan Enche Rashid Ahmad kerana telah memberi kerjasama dan perhatian yang istimewa kapada P.P.I.K.P. sa-bagai penasihat2 sumbangan mereka P.P.I.K.P. junjung tinggi.

Pehak berkuasa Kolej Pertanian telah juga memberi beberapa kerjasama kapada P.P.I.K.P. saperti membenarkan Dewan Besar Kolej untok di-gunakan sa-bagai tempat pertandingan Kor'an dan banyak lagi kemudahan2 yang di-hulorkan kapada P.P.I.K.P. dari pehak yang berkuasa. Oleh itu saya bagi pehak P.P.I.K.P. menguchapkan terima kaseh kapada Pengetua Kolej Pertanian, Dr. Mohd Rashdan Baba atas kerjasama beliau dan murah hati beliau membenarkan kemudahan2 tersebut. Saya harap muga2 bentok kerjasama yang sa-macham ini dari pehak yang berkuasa Kolej akan di-teruskan.

Kapada ahli2 sakalian saya uchapkan selamat maju jaya dan selamat belajar.

Terima kaseh dan wassalam.

yang ikhlas:
MOHD KHALID B. MOHD NOR.
b/p *Yang di-Pertua P.P.P.I.K.P.-PTM*
1965/1966.

PERSATUAN PELAJAR2 ISLAM KOLEJ PERTANIAN PERSEKUTUAN TANAH MELAYU

PENYATA TAHUNAN 1965/66.

Pendahuluan

Persatuan ini sunggoh pun kechil, ada-lah merupakan satu persatuan tertua yang berdaftar dalam negara kita. Ia-nya di-tubohkan 15 tahun yang silam ia-itu pada 15 haribulan Disember 1950. Nama singkat-nya ia-lah PPIKP/PTM.

Dalam tiap2 tahun pengajian, beberapa peristiwa di-alami, berbagai masa'alah dan halangan di-atasi dan satiap kali pada persatuan ini membaharui azam dan tekad untok melangkah sa-tapak lagi kehadapan, ka-arah kemajuan. Sa-tiap langkah di-tujukan sa-mata2 untok:

a) Meninggi dan menjaga kepentingan ugama, kebudayaan dan kebajikan Pelajar2 Muslim di-Maktab ini.
b) Mengembangkan lagi ilmu pertanian di-kalangan masharakat kita.
c) Memegang dasar tidak akan melibatkan diri dalam sebarang akviti yang berchorak siasah.

Ahli2

Jumlah ahli pada tahun ini ia-lah 37 orang. Dengan bangga-nya kami mengalu2-kan kedatangan 15 orang penuntut baharu termasok 4 orang dari Sarawak, 1 Sabah dan sa-orang lagi pelajar wanita dari Kedah. Mudah2an ramai lagi rakan2 kita, laki2 dan perempuan sudi mencheborkan diri ka-Kolej ini pada tahun2 yang akan datang.

Kewangan

Ahli2 baharu di-kenakan bayaran $3/- untok menjadi ahli persatuan dan $4/- bagi yuran penggalan. Wang ini-lah di-gunakan untok menjayakan segala ranchangan2 dan pergerakan. Di-samping itu pehak pentadbir Kolej Pertanian, melalui Persatuan Pelajar2, bermurah hati menyumbang bantuan dan derma bakti demi melichinkan lagi perjalanan persatuan ini.

Pentadbiran

Pada tiap2 Meshuarat Agong Tahunan, Majlis Pelajar2 Islam (MPI) yang baru, di-lantek dan di-mandatkan untok mentadbir persatuan ini. Mereka2 yang telah di-pileh ia-lah:

Yang Di-Pertua	Sdr. Abdullah Ismail
Naib Yang Di-Pertua	Sdr. Khalid Mohd. Nor
Setia-usaha Agong	Sdr. Mohd Ismail
Penolong Setia-usaha Agong	Sdr. Mohd Salleh Haron
Setia-usaha Ugama	Sdr. Othman Hasani
Setia-usaha Rencham	Sdr. Sharifuddin Hamid
S/Usaha Persuratan & Kebudayaan	Sdr. Sulaiman Daud
Setia-usaha Penerbitan	Sdr. Sharifuddin Kadir
Bendahari	Sdr. Wan Mohd Othman.

Ahli2 juga, di-dalam Meshuarat Agong tersebut telah melantek: 2 orang pemereksa kira2. Mereka ia-lah:

1) Sdr. Jusoh Sulaiman
2) Sdr. Shahran Tafri.

2 orang Penasehat Kehormat yang di-pileh terdiri daripada:

1) Tuan Haji Mohd Din Ali P.J.K.
S/U Perbandaran Kuala Lumpur,
(Barrister of Law Lincoln's Inn)
(Diploma of Arts Raffles College.)

2) Che'gu Mohd Rashid bin Ahmad,
Pengarah Ladang Kolej Pertanian Malaya,
Serdang.

Namun demikian, sa-belum perlantekan ahli2 MPI baru, Persatuan ini telah di-selenggarakan oleh MPI Sementara kerana menggantikan kerusi yang di-kosongkan oleh pelajar2 tahun ketiga yang telah keluar. MPI Sementara terdiri daripada:

Yang di-Pertua	Sdr. Abdullah Ismail
Naib Yang di-Pertua	Sdr. Khalid Md. Nor
Setia-usaha Agong	Sdr. Mohd Ismail
Penolong Setia-usaha Agong	Sdri. Salbi bte. Ranting
Setia-usaha Ugama	Sdr. Shaiifudin Kadir
S/U Persuratan & Kebudayaan	Sdr. Sharifudin Hj. Hamid
Setia-usaha Rencham	Sdr. Wan Mohd. Othman
Setia-usaha Penerbitan	Sdr. Jamzari Mohd Jamli
Bendahari	Sdr. Hamid Takher.

Meshuarat

Sa-hingga laporan ini di-chatetkan, hanya satu Meshuarat Agong sahaja telah di-adakan ia-itu pada 14hb. Jun 1965. Jawatan-kuasa2 Kechil bermeshuarat sakurang2-nya sakali tiap2 penggal dan MPI bertemu sa-bulan sakali.

Jawatan-kuasa Tadbir PPIKPPTM 1965/66.

1) **Jawatan-kuasa Tadbir Ugama.**

Pengerusi.....	Sdr. Abdullah Ismail
Setia-usaha.....	Sdr. Othman Hasani
Ahli2 Jawatan-kuasa.....	Sdr. Nik Abdullah Mahmud
	Sdr. Sepuan Anu
	Sdr. Mahmud Tahir
	Sdr. Ghazali Ahmad.

Ranchangan2 yang telah di-jalankan:-

1) **Peraduan membacha Kur'an**

Peraduan tersebut di-adakan pada 3hb. Sept. 1965. Gelanggang pertandingan telah di-bukakan kapada pelajar2 Sekolah Pertanian dan Masharakat Islam Pusat Perchubaan Serdang. Tujuan utama peraduan ini ia-lah untok merapatkan lagi perkenalan, persefahaman dan persahabatan di-antara pelajar2 kolej dan masharakat umum di-daerah ini. Enche' Mohd. Nor Hj. Salleh dari Pusat Perchubaan, Serdang, telah memenangi piala pusingan sumbangan dari Sdr. Zainol Rashid Daud, bekas Yang d-Pertua 1964/65.

2) **Sharahan Ugama**

Pada malam tersebut juga, tuan Haji Arshad Masjuri, Kadhi Daerah K.L. telah memberikan sharahan bertajok 'Chara memperkembangkan ugama Islam di-negeri kita.'

3) **Risalah2 dan buku ugama**

Sa-banyak empat risalah ugama di-edarkan untok tatapan ahli2, dan khutub khanah surau di-tambah lagi dengan beberapa buah kitab ugama yang baharu di-beli.

2) **Jawatan-kuasa Tadbir Rencham**

Pengerusi	Sdr. Khalid Mohd. Nor
Setia-usaha.....	Sdr. Sharifudin Hj. Hamid
Ahli2	1) Sdr. Sidek Md. Din
	2) Sdri. Zaharah Ab. Rahman
	3) Sdri. Salbi bte Ranting.

Ranchangan2 yang telah di-jayakan sa-hingga ini:

1) Perkelahan di-Templar Park dan Batu Caves.
2) Jamuan meraiikan kedatangan pelajar2 baharu.
3) Jamuan menyambut bulan Puasa.

3) **Jawatan-kuasa Persuratan dan Kebudayaan**

Pengerusi	Sdr. Mohd Khalid Md. Nor
Setia-usaha	Sdr. Sulaiman Daud
Penjaga Khutub-khanah dan Piring Hitam	Sdr. Zainal Abidin Isa
Ahli2	1) Sdr. Abang Nurudin Zainudin
	2) Sdr. Shaari Hj. Hamid
	3) Sdr. Ahmad Abdullah.

Ranchangan2 yang telah di-laksanakan:

1) Menyediakan buku2 cherita, majallah dan piring hitam.
2) Perbahasan persahabatan dengan MARA atas tajok 'Pembangunan luar bandar menguntongkan orang2 Melayu' telah di-adakan di-MARA. Pehak persatuan gagal untok mempertahankan tajok tersebut.
3) Satu majlis cheramah 'Chorak Kebudayaan yang kita ka-hendakki' oleh Tuan Haji Mohd Din Ali telah di-adakan.
4) Jawatan-kuasa ini berkerjasama dengan Persatuan Pelajar2 Kolej Pertanian menjayakan Malam Bahasa dan juga Kelas Tarian Nasional. Guru tari ia-lah Che' Puteh bte Saad dari Jabatan Penerangan.

4) **Jawatan-kuasa Tadbir Penerbitan**

Pengerusi	Sdr. Abdullah Ismail
Setia-usaha	Sdr. Sharifuddin Kadir.
Ahli2 Jawatan-kuasa	Sdr. Ahmad Abdullah
	Sdr. Ghazali Ahmad
	Sdr. Shaharan Tafri
	Sdr. Rosli Madani

Sehingga laporan ini terchatit belum ada lagi ranchangan telah di-jayakan. Walau bagaimana pun ada ura2 hendak menerbitkan majallah lidah resmi Persatuan ia-itu "Agraria" dan kad selamat Hari Raya maseh dalam perchetakan.

Lain2 Hal.

1) **Tabong Derma**

Ahli Jawatan-kuasa Khas Tabong Derma

Pengerusi	Sdr. Abdullah Ismail
Setia-usaha	Sdr. Shaharan Tafri
Bendahari	Sdr. Hamid Takher
Ahli2 Jawatan-kuasa	Sdr. Jusoh Sulaiman
	Sdr. Rosli Madani
	Sdr. Nik Abdullah.

$650/- daripada wang yang terkumpul telah di-belikan "Bon Pertahanan" demi menyahut seruan kerajaan untok mempertahankan negara. Dengan ada-nya derma dari penuntut2 dan dari unsor2 yang lain juga, muga terchapai-lah chita2 asal kita ia-itu menolong merengankan beban penuntut2 yang kurang bernasib baik terutama dalam so'al kewangan apabila belajar di-kolej ini kelak.

2) **Kelas Perchuma**

Oleh kerana sambutan-nya dingin sahaja maka ranchangan ini di-berhentikan dahulu buat sementara waktu.

3) **Siaran Radio**

Dua rakaman telah di-buat pada penggal pertama untok meneruskan siaran "Berbakti menerusi Pertanian". Dengan ada-nya siaran "Pembangunan Desa", ran-

changan kami terpaksa di-berhentikan. Walau bagaimana pun pehak Radio Malaysia telah memberi peluang untok menyertai dua Foram yang bertajok:

1) Tanaman di-luar musim
2) Peranan pemuda pemudi dalam memperkembangkan Pertanian.

4) **Meshuarat Agong PKPIM.** (30-31hb August 1965)

Dalam meshuarat tersebut beberapa resolusi dari pehak kami telah di-terima oleh majlis untok di-bawa ka-meja perundingan dengan pehak berkenaan. Resolusi2 yang telah di-terima ia-lah:

1) Menambahkan lagi bilangan2 penuntut2 Islam di-Kolej2 dan Universiti2 sa-kurang2-nya 50%.

2) Menambahkan lagi biasiswa atau derma siswa di-Kolej2 dan Universiti2.

Wakil2 dari PPIKP/PTM terdiri daripada:

Ketua perwakilan	Sdr. Abdullah Ismail
Ahli2 Perwakilan	Sdr. Mohd. Ismail
	Sdr. Mohd Salleh Haron
	Sdr. Sharifudin Hamid
	Sdr. Sharifudin Kadir.
Pemerhati2 terdiri daripada	Sdr. Othman Hasani
	Sdr. Shaharan Tafri
	Sdr. Kamal Shafii
	Sdr. Sulaiman Daud
	Sdr. Abang Nurudin Zainudin.

Penghargaan

Jaya-nya Persatuan ini ia-lah dengan ada-nya kerjasama dari pehak ahli, MPI dan juga pehak Persatuan Pelajar2 Kolej Pertanian. Kapada mereka persatuan menguchapkan terima kaseh.

Pehak Pentadbir Kolej Pertanian juga banyak menyumbangkan bantuan dan kerjasama yang tidak ternilai. Oleh itu Persatuan melafazkan sa-tinggi penghargaan.

Dengan panduan dan nasehat dari Penasehat Kehormat maka persatuan dapat-lah di-tadbir dengan lichin-nya. Jasa baik penasehat, kami iringi dengan do'a restu.

Tidak ketinggalan, persatuan menguchapkan sa-tinggi terima kaseh kapada Jabatan Radio Malaysia yang telah membenarkan kami bersama2 di-udara. Juga penghormatan kami kapada Jabatan Penerangan atas bantuan sa-orang guru tari. Dengan itu dapat-lah kami mengembangkan lagi kebudayaan kita.

Penghargaan yang tidak terhingga kami lafazkan atas jasa baik Yang Berhormat Che' Mohd. Khir Johari kerana bersetuju menaungi persatuan ini. Mudah2an gemilang-lah lagi chahaya persatuan di-masa hadapan.

Sekian-lah. Terima kaseh.

"BERTANI UNTOK BERBAKTI"

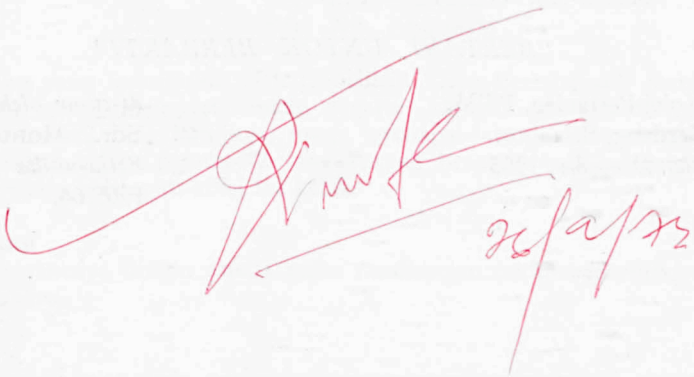
Kolej Pertanian, PTM.
Serdang, Selangor.
9*hb. Disember*, 1965

di-susun oleh:
Sdr. Mohd Ismail,
Setia-usaha Agong PPIKP/PTM.
1965/66.

Before you leave dear friends have this to remember-----

THE 'ELEVENTH' COMMANDMENT

Thou shalt inherit the holy earth as a faithful steward, conserving its resources and productivity from generation to generation. Thou shalt safeguard thy fields from soil erosion, thy waters from drying up, forests from desolation, and protect thy hills from overgazing by the herds, so that thy descendants may have abundance forever. If any shall fail in this stewardship of the land thy fruitful fields shall become sterile, stony ground and wasting gullies, and thy descendants shall decrease and live in poverty or be destroyed from off the face of the earth.'

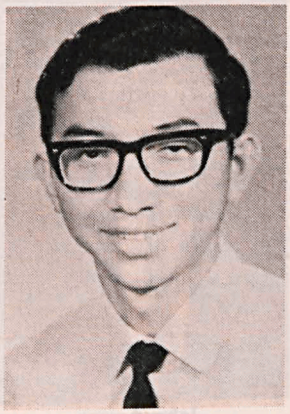


FINAL YEAR STUDENTS

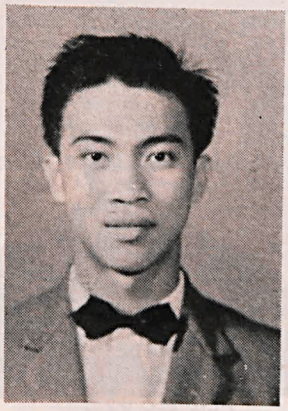
Jamalludin Ahmad
Fed. Agricultural Scholar

Syed Aziz Othman
Private Scholar

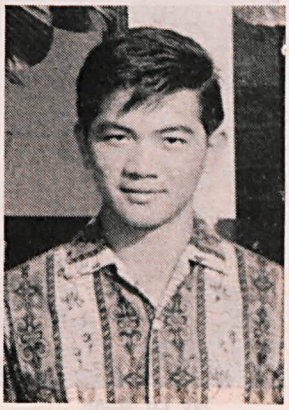
Lee Swee Bin
Private Scholar



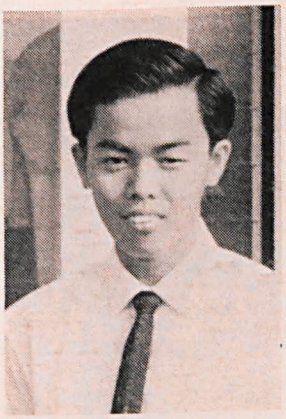
Ong Chin Lee
Private Scholar



Yeo Sin Bin
R.I.R.B. Scholar

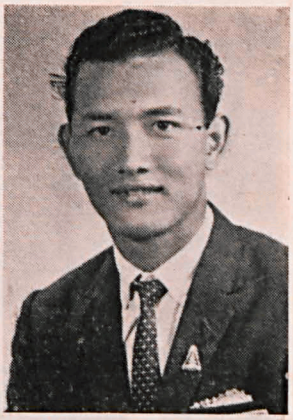


Tin Swee Kheng
Fed. Agricultural Scholar

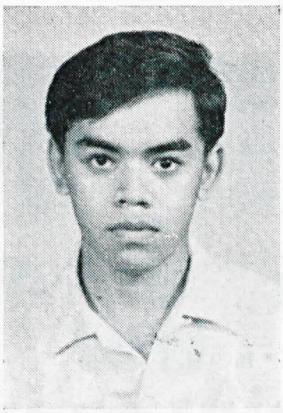


Goh Cheng Seng
Fed. Agricutural Scholar

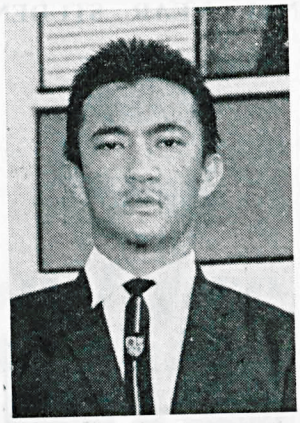
Mokthar Lazim
Fed. Agricultural Scholar



Wan Mohd. Othman
R.R.I. Scholar

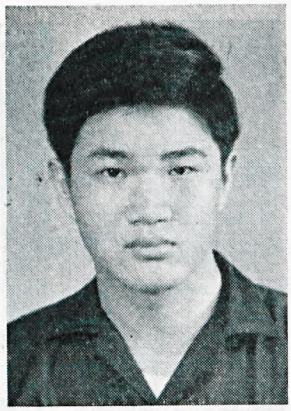


Mohd. Zaki Saleh
Fed. Agricultural Scholar

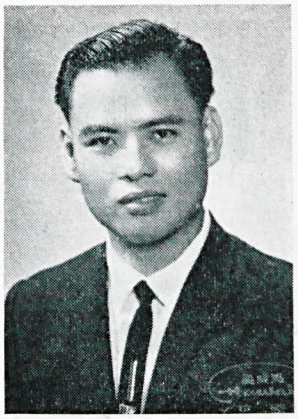


Goh Tyau Soon
Private Scholar

Wong Ah Lim
F.L.D.A. Scholar

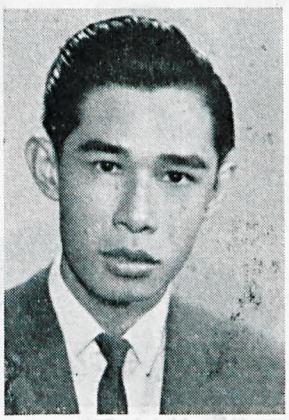


Ng Lu Siong
Private Scholar



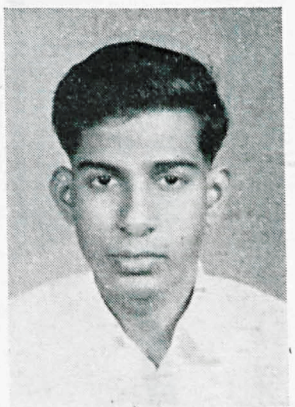
Chin Sah Kong
R.R.I. Scholar

John Awang
Vist. Student (Sark.)

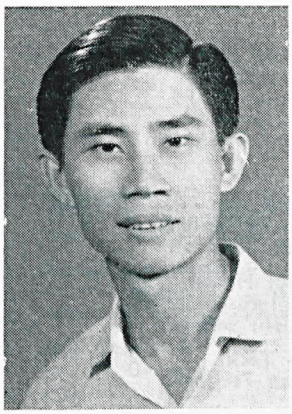


Ng Huang Keat
R.R.I. Scholar

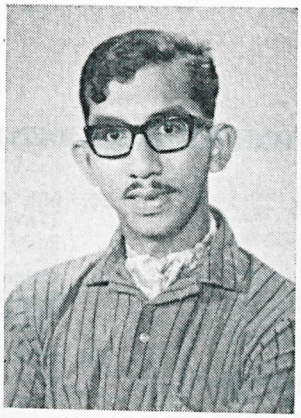
Willie Seah
Private Scholar



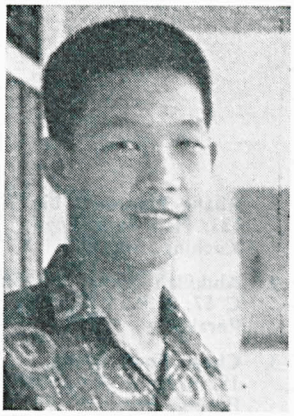
S. Makeswaran
Fed. Agricultural Scholar



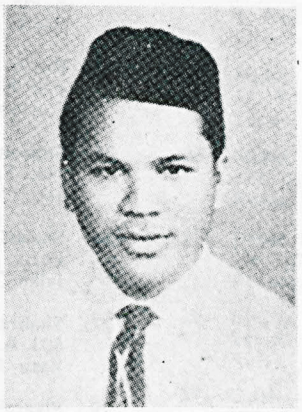
Tey Puat Hwee
College Bursary



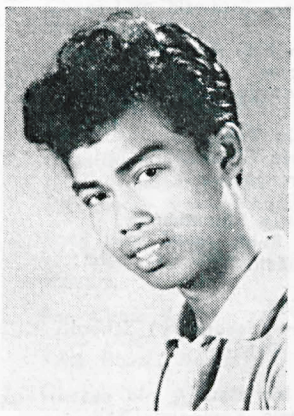
Abdullah Ismail
Fed. Agricultural Scholar



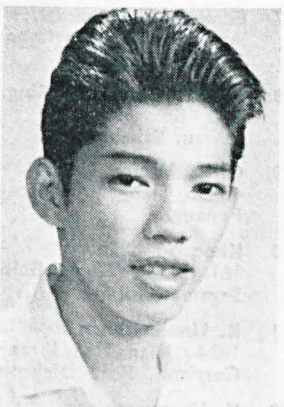
Wong Soh Har
Private Scholar



Zainol Rashid bin Mohd. Daud
Fed. Agricultural Scholar



Khalid Md. Nor
Fed. Agricultural Scholar



Wong Sai Kow
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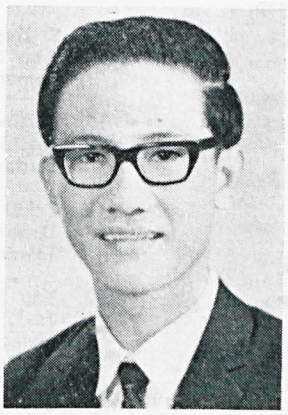

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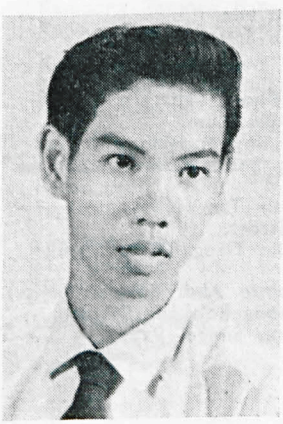
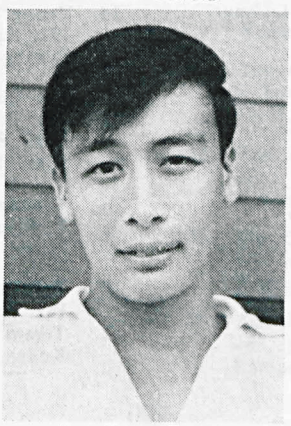


Wang Jun Ngi
College Bursary



Ang Boon Beng
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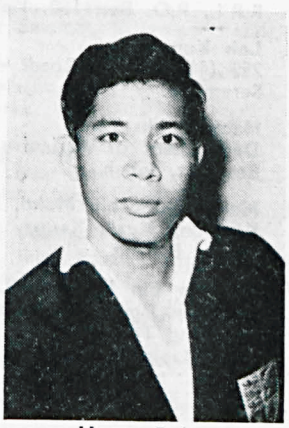

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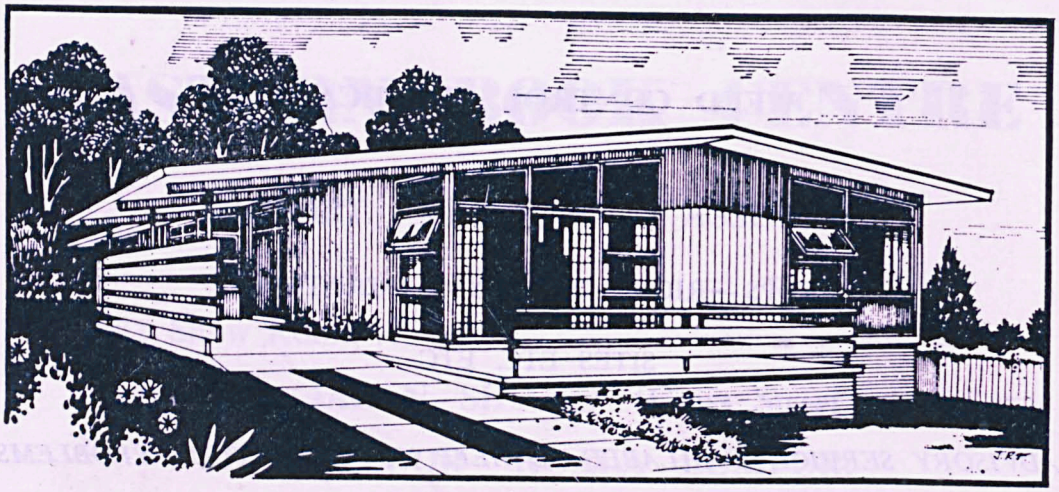

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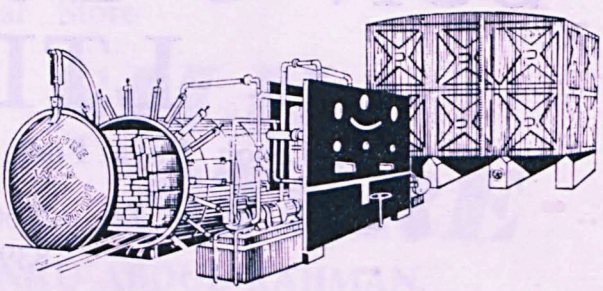

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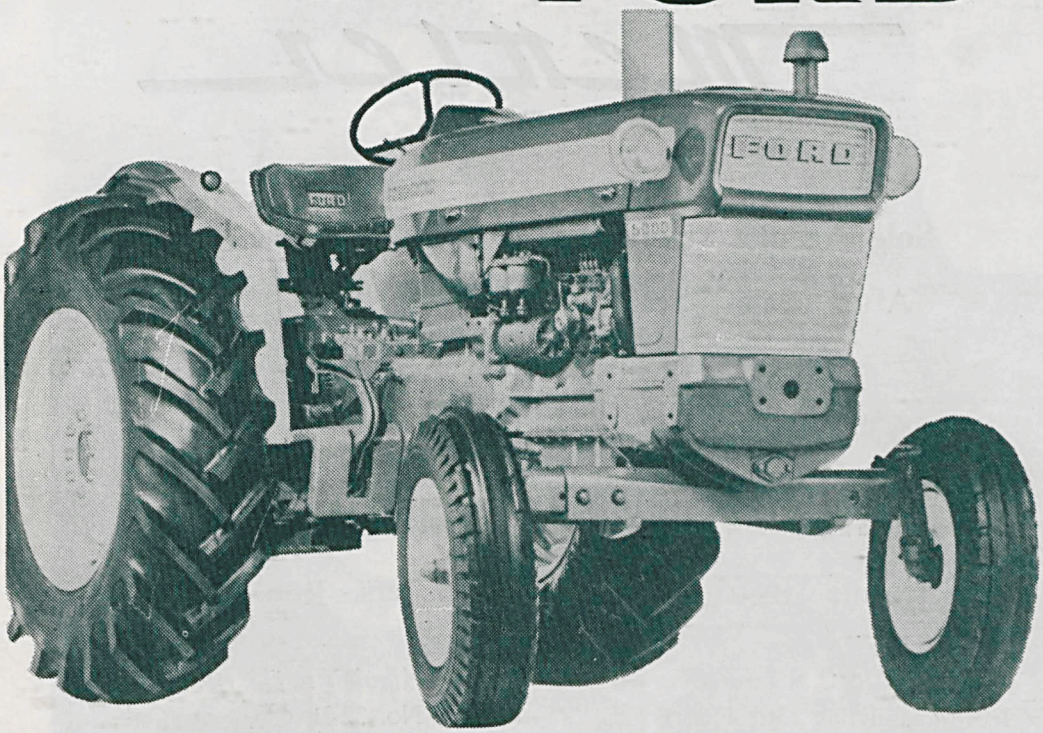

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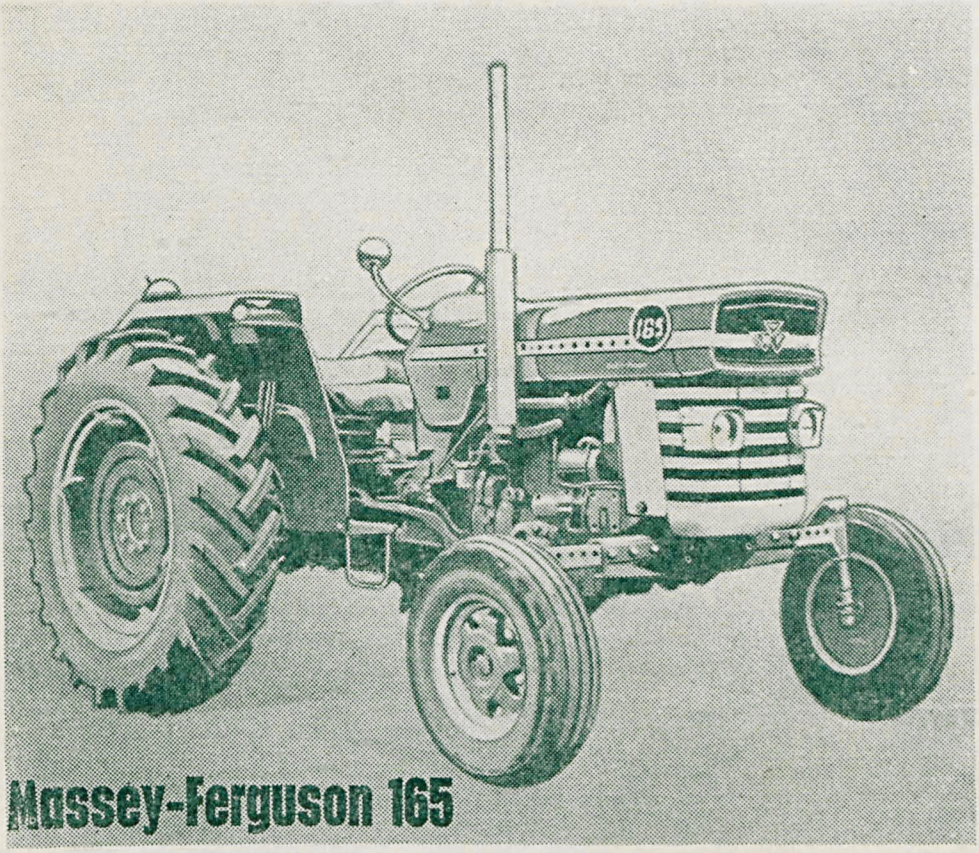

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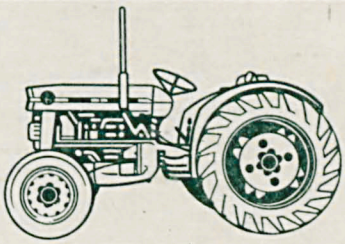

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