

## PADDY CULTIVATION IN SIAM

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*(Published by the Courtesy of H.R.H. the Minister of  
Commerce and Communications, Siam)*

**T**HE Kingdom of Siam is a territory of 200,149 square miles. It is one of the three great exporting countries that supply the rest of the world with rice. Siam and Indo-China together export an amount not quite equal to that from India including Burma. The latter country is rapidly increasing its production and the amount available for export, and is now more than ever a serious rival of Siam.

Rice is the chief product of Siam and accounts for 85 per cent. of the exports and, moreover, is the staple cereal of the people. The well-being of the whole country depends on the rice crop and all branches of the community follow anxiously the progress of the crop from the time it is sown until it is safely harvested. The Kingdom of Siam is divided into fourteen circles for administrative purposes, and rice is grown extensively in each of these. The major portion of the rice that is available for export is grown in the plains and delta between the large rivers that empty themselves into the Gulf of Siam. This area lies in the seven inner circles of Krungdeb (Bangkok), Ayuthia, Nagor Chaisri, Rajaburi, Nagor Svarga, and Bisnulok.

On these plains and deltaic tracts there are many intercommunicating canals, serving the double purpose of supplying the rice fields with water from the rivers, and with the help of locks and sluices, forming a system of irrigation by inundation which, supplementing the rainfall, greatly helps in the production of rice. These canals are also very important in providing, by boat, a cheap means of transport for the grain.

The natural means of supply of water for rice cultivation in the Great Central Plain of Siam are (a) rainfall and (b) a rise in the rivers to inundation level, so that the fields will be supplied with the water necessary for the growth of the crops.

The average annual rainfall is from 1,000-1,500 mm., and experience has shown that to mature a full rice crop 1,800 mm. is required.

After one or two failures, or partial failures of the rice crop, the Siamese Government seriously took up the question of irrigation in 1913.

Sir Thomas Ward came out to Siam in 1913, and after a year of tours and inspection, made a report embodying various irrigation schemes to ensure that the rice crop in the chief paddy-growing areas of the Great Central Plain of Siam should never fail. The first of these works, the South Prasak Canal, was completed in 1924, and has already justified its existence.

Complementary to the South Prasak Irrigation System is the Jiengrak and Bang Hia Drainage Scheme.

An interesting feature of this project is the construction of a main drainage canal with level and tidal sluices along the shore of the Gulf of Siam between Paktalong and Bang Hia—a distance of 60 Km. with a view to preventing the periodic tidal inundations from the sea, which formerly rendered fertile lands in the southern portion of the area covered by the Drainage Project, unsuitable for the cultivation of staple crops.

By means of the sluices and fresh water canals the saline water from which these areas have suffered hitherto will be replaced by fresh water, and the area of rice-producing land will be added to very considerably.

#### **THE VARIETIES OF PADDY IN SIAM**

There are a vast number of named varieties of paddy, but these may be classified into two main groups, viz., Glutinous Rice and Non-Glutinous Rice. The Glutinous Rice derives its name from the fact that it is sticky when cooked. Those varieties of Glutinous Rice, with coarse, large, red, purple, or blackish grain, form the staple food of the people in north and north-eastern Siam, while the Non-Glutinous grain constitutes the staple food of the rest of the Kingdom, as well as the principal article of export from Siam.

The classification of paddy is a very complicated question as the divisions into which it is possible to group the different varieties overlap one another and one variety may be known by many different names.

#### **HILL PADDY**

This is known as Kao Rai or Kao Pa and is usually grown for the cultivator's own consumption. It is not necessarily planted on hills, but generally freshly cut jungle clearings are utilised. The cultivator cuts down large and small forest trees; roughly clears the land, dibbles in groups of paddy grains and sits and watches the result.

The crop is entirely dependent on rainfall. The soil from this virgin forest land is as a rule well provided with organic matter and possesses a good retentive capacity for water, but no water remains on the field.

Maize is often grown in between the paddy and neither crop is ever very productive. The fallen trunks and irregular mounds of soil from deserted anthills provide excellent cover for vermin of all sorts and rats are particularly destructive of the crops in all stages of growth. The cultivator finds after two or three seasons or often after only one season that his land is losing fertility and becoming infested with weeds, so moves on to another area, which he exploits in similar fashion.

This method of cultivation is extremely wasteful and should be discouraged as much as possible.

#### CULTIVATOR'S CLASSIFICATION OF IRRIGATED PADDY.

The cultivator groups his irrigated paddy into three divisions according to their life periods, the Early, Medium, and Late ripening. There is no hard-and-fast line to be drawn between these groups. A Kao Nak in one part of the country may be known as Kao Klang Pi in another part and vice versa. As far as the Central Plain is concerned the classification is:

Early Kao Bao (Light rice)	2½ to 3½ months.
Medium Kao Klang Pi (Mid year rice)	3½ to 4½ months.
Late Kao Nak (Heavy)	5 to 6½ months.

These paddies can be planted by either of the two methods: broadcasting and transplanting.

*Broadcasting (Na Wan).*—As soon as the rains of May or early June have softened the soil sufficiently the land is ploughed and harrowed. The weeds and grasses are removed if excessively abundant.

The seed is then scattered broadcast over the surface of the soil which is given another harrowing to cover up the seed as far as possible, and nature is then left to do the rest.

In some areas the field is furrowed at regular distances (6-12 feet.) These furrows serve as drainage channels in case of too abundant rainfall during the germination period.

In Ayuthia and Klong Rang Sit and similar districts large areas are devoted to Kao Wan, which area, in addition to the rainfall, benefit by the inundation from the rivers and canals (Klongs) when they rise to flood level.

The paddy from broadcasted areas is known to the rice miller as Na Muang or field rice and is generally of poorer quality than transplanted rice, which the miller calls Kao Na Suan or garden rice.

*Floating Rice or Creeping Rice.*—A variety of Na Muang is the floating rice sometimes known as Kao Khun Nam (the rice that rises on the water). There are certain areas in Siam where

at the end of the wet season the water in the fields rises to a great height. The rice planted in these fields is able to keep pace with the rising water except in the case of an abnormally rapid inundation. The growing tips of the plant always remain above the surface and the stem shoots off roots at the nodes that are submerged. This enables the plant to extract mineral material for its growth from the water in addition to the main roots in the soil, which act as an anchor.

Some varieties of floating rice have only the one set of roots in the soil until the water starts to recede and then they send out rootlets from the upper nodes into the muddy water. The plant becomes a big leafy mass as the tillering increases, and finally resembles a small island of paddy floating on the surface of the water. When the water subsides the roots fix themselves in the mud, and the tops of the stalks break off at the nodes and form separate plants.

The stems of floating paddy sometimes reach the amazing length of six metres or more. Harvesting is done from boats and followed by a final gleaning after the flood has subsided, and the mud has begun to dry.

*Transplanting (Na Dam).*—The fields intended for transplanted paddy are divided from one another by small bunds (Kun Na) according to the contour of the land. In the Great Central Plain of Siam these bunds are almost straight, and the fields approximately rectangular. All through the dry season these fields are sunbaked wastes with little or no grass growing in them. The soil is hard, and cracked to a depth of 20 inches or more, and often they look more like the dried up bed of muddy rivers than potentially fertile fields.

After the first rains the dried up grass changes from brown to green, the cracks disappear, and when the rains have softened the soil sufficiently the land is ploughed. The cultivator usually selects a low-lying portion of his holding, and turns it into a nursery. The nursery is ploughed and weeded, after which buffalo or cattle manure is sometimes incorporated with the soil. If a canal is handy water is pumped on to the field, which is then allowed to soak for several days, subsequently the land is ploughed, and harrowed while still under water. This has the effect of producing a soft sticky mud of gruel-like consistency, which should be 20-30 cm. in depth.

The grain for planting is put in sacks or baskets soaked in water overnight, and put aside for three days until germination is well advanced, and the germinated seed is sown in the mud of the nursery. The grain does not sink into the mud, but lies on the surface, giving the nurseries an appearance of having been

dusted with sand. After 5-7 days the nursery is covered with a bright green carpet of paddy seedlings that quickly grow to sturdy young plants, and after a month or six weeks are ready for transplanting.

Nurseries treated with phosphatic fertilisers grow more rapidly, and apparently the paddy is ready for transplanting earlier, but nevertheless it should be left there for the usual time to give it the advantage of starting in the field as healthier and sturdier plants.

When the fields have been prepared in a manner somewhat similar to the nursery, water is run on if necessary to flood the fields to a depth of 10 cm. or more. The seedlings are pulled up from their muddy home, the excess of mud is knocked off by the cultivator banging a bundle of them on his or her foot, and the bundle is then shaken into shape by dumping its roots downwards on to a little platform or table fixed in the nursery. The bundle is then laid on the table, and a considerable length of the stem is cut off with one blow of a knife. The bundles are then put aside with their roots in water until they are required for use.

The process of transplanting is done by taking three to five of the decapitated rice plants in the hand and plunging them through the water into the soft mud beneath. (Hence the word "Dam" meaning "dive"). The planting distance varies from 20-40 cm.; the greater distance is exceeded in parts of the Peninsula of Siam and other places where the soil is particularly rich.

The only attention now required is occasional weeding and irrigation in times of low rainfall. If the water in the fields shows signs of stagnation it should be run off and replaced, but this practice is seldom followed.

In the Seven Inner Circles planting begins in May and continues to October; in the North and East it begins in June and continues till October, while in Southern Siam it extends from July to December. Harvesting takes place in the first named part of the country from September to January, in the second from November to February, and in the third from January to May. Harvesting is done with a sickle applied low down on the stems of the plant, except in the South where the Malay habit of cutting each ear off separately is followed.

In the Central Plain a farmer will plant a certain area with Kao Bao or Kao Klang Pi, usually broadcasted, then the main crop of Kao Nak, generally transplanted, and finally Kao Bao again as long as the weather is propitious. He never gets more than one crop annually off the same field. However, in Bang Bua Tong district of Nandaburi there is an enlightened cultivator who is planting his fields with Kao Nak after taking from

them a crop of Kao Bao. It remains to be seen what the effect of this will be on the soil, but it is certain that this continuous cropping will not be possible without treatment of the soil with lime and fertilisers.

The rice miller divides his paddy thus:

*Kao Na Suan* (Garden Rice) the best quality, a long thin grain full of fat, strong and well matured, and with a thin husk—giving a small percentage of broken rice. It may be a mixture of all three groups recognised by the cultivator.

*Kao Na Muang* (Field Rice) is the lowest quality. The grain is short and broad, wanting in fat, and inclined to be brittle. The husk is coarse and thick. This is derived mostly from Kao Nak broadcasted upon lands subject to heavy floods. The typical Na Muang is derived from the floating rice and is reaped from boats. A considerable portion of the husked grain is red in colour.

*Kao Sam Ruang* (Three-Eared Rice) is rather superior in quality to Kao Na Muang. It contains a greater proportion of long grain and fewer red kernels. Always derived from broadcasted paddy.

*Kao Bao* (Light Rice) is better in quality than Sam Ruang.

*Kao Nio* (Glutinous Rice) consisting of the superfine varieties of glutinous rice grown in small quantities in various districts of the Inner Circles and its price is usually on a par with the best Na Suan rice.

#### AREA UNDER RICE CULTIVATION IN SIAM

Year	Acres	Tons
1921-22	6,489,600	4,198,658
1922-23	6,318,200	4,306,015
1923-24	6,716,500	4,364,211
1924-25	6,942,400	4,902,354
1925-26	6,716,500	4,159,824
1926-27	7,236,712	5,184,560
1927-28	7,319,376	4,527,873
1928-29	7,123,828	3,851,354
1929-30	7,589,660	3,842,891

#### YIELD OF PADDY PER ACRE

According to the statistics the average yield of paddy over the whole Kingdom ranges from 1330 to 1660 lb. per acre, these estimates being based on the total crop harvested and the total area under cultivation. The highest yields recorded without the use of fertilisers are:

- (a) 3,562 lb. per acre in some fields near Bangkok, the variety sown being known as Kao Samue.
- (b) 2,900 lb. per acre in a district in the province of Nakor Chaisri, the variety sown being called Kao Lukon.

The yield of the same paddy varies considerably in different districts and in some swampy areas adjacent fields show very big divergencies. These are partly due to variation in the depth of water, dissimilar aeration of the water, and the proportion of saline constituents of the soil. The life periods of the various classes of paddy vary from 75-210 days. As a general rule, the other circumstances being equal, the longer-lived variety gives the higher yield.

#### EXPORTS OF RICE FROM SIAM

*(Prepared by the Adviser, Ministry of Commerce and Communications, Siam)*

Year	Quantity in piculs (= 133 1/3 lb.)	Value in Bahts (= 1s. 10 d.)
1915-16	18,785,985	87,702,290
1916-17	19,784,592	99,965,372
1917-18	18,745,144	97,861,658
1918-19	14,201,434	132,096,385
1919-20	7,409,453	123,082,698
1920-21	4,660,487	28,975,860
1921-22	21,000,584	138,231,324
1922-23	21,424,556	128,210,665
1923-24	22,249,294	143,835,554
1924-25	19,389,040	139,627,629
1925-26	22,929,114	167,409,359
1926-27	21,799,541	165,226,234
1927-28	28,670,654	201,156,349
1928-29	24,667,309	175,123,781
1929-30	18,860,087	139,087,390
1930-31	13,241,984	87,381,393