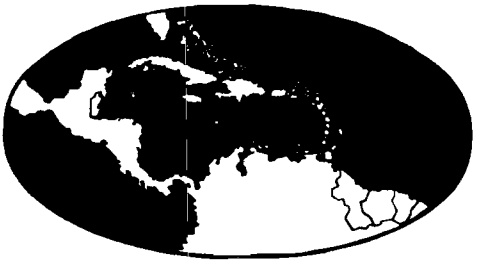
CARIBBEAN FOOD CROPS SOCIETY



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MUNG BEAN - POTENTIAL FOR CULTIVATION IN TRINIDAD AND TOBAGO

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SUMMARY

The Mung Bean *Phaseolus aureus* Roxb. is an important legume in Tropical Asia, W. Africa and to some extent Tropical America. The bean has many uses including the production of sprouts.

In Trinidad a spacing of 22.5 cm between rows and 2.5 cm within row gave the highest yields. At this spacing yields averaged 2180 kg/ha.

Harvesting with a side-mounted mower proved to be the most successful to date. The possibilities of intercropping was considered. The greatest potential for production is as a short term crop to follow rice but before dry season vegetables are planted.

The Mung Bean *Phaseolus aureus* Roxb. is an important crop in India where it is 'esteemed as the most wholesome among the pulses, free from the heaviness and tendency to flatulence' which is associated with other pulses. The dried beans are boiled and eaten whole or after splitting into dhal. They are parched and ground into flour after removal of the testa, the flour being used in various Indian and Chinese dishes. This removal of the seed coat does not affect the nutritive value of the bean (Singh *et al.*, 1968) as the colytedons contain a well balanced supply of minerals and protein. The green pods are also eaten as a vegetable. In China and the United States, it is used for bean sprouts. One kilogram of dry beans gives 6 - 8 kilograms of sprouts. The haulms are used as fodder and the husks and split beans are a useful livestock food. The crop is also grown for hay, green manure and as a cover crop (Purseglove, 1968).

The dry seeds contain about 9.7 percent water, 23.5 percent protein, 1.2 percent fat, 58.2 percent carbohydrates, 3.3 percent fibre and 4.0 percent ash (Purseglove, 1968).

The plant is an erect, deep-rooted much branched annual herb 0.5 - 1.3 M tall. The pods are grey or brownish when mature, long and slender 5-10 x 0.4-0.6 cm, with short hairs, 10 - 15 seeded. The seeds are small, globular and green in colour. The weight of 100 seeds is 3 - 4 g (Purseglove, 1968).

The flowers are fully self-fertile and are almost entirely self-pollinated.

IMPORTANCE

The Mung bean is of ancient cultivation in India. *P. aureus* was an early introduction in Southern China, Indo-China and Java. Within comparatively recent times it has been introduced into East and Central Africa, the West Indies and the United States (Purseglove, 1968).

The crop does best on a loam with a well distributed rainfall of 75 - 85 cm. It is drought resistant and susceptible to water logging, though (Choudhury and Bhatra, 1971) have shown that under water logged conditions, planting on ridges gave a 58.8% yield increase compared to growing the crop on the flat.

In India, a new variety developed by the Indian Agricultural Research Institute, matures in 65 days and has a seed potential of one ton per hectare (Indian Farming 1972) and has a low water requirement. This is a most suitable crop for multi-cropping systems. *P. aureus* is a very versatile crop. It is intercropped with maize in India (Indian Farming 1966) where it resulted in higher total yields. It was also intercropped with hybrid maize for use as a green manure without affecting the maize yield and giving about 800 kg dry matter per hectare (Guatam *et al.*, 1964).

In Taiwan (Tse and Shiue, 1965) it was the most profitable crop to intercrop with sugar cane. In Australia, it was tried as a cover in cane growing regions (Chapman and Garioch, 1966).

In Central Oklahoma Mung follows wheat in a double cropping system (Tomlinson and Plaxico, 1962). The seed is used primarily for production of bean sprouts.

In the Congo (Hecq and Lefebire, 1961) it is used in rotation with maize and root crops. In Suriname it is being considered among the pulses to follow rice (Ter Herst, 1961).

MUNG BEANS UNDER TRINIDAD CONDITIONS

The Mung bean is not new to Trinidad. It was a popular crop in the Caroni and Oropuche lagoon areas prior to the late 1950's, where it was cultivated after the rice crop was removed. However, with a gradual decline in the acreages under rice and a lowering of the water table in these areas in the early dry season, brought about by physical drainage programmes in these areas, production of Mung beans as well as some of the other dried beans was reduced to a very small acreage.

In 1970, interest in this crop was again renewed in view of its importance in certain local dishes. Seeds of an unkown cultivar were introduced from Taiwan screened and bulked. Thereafter, some experiments were conducted along the following lines:

1. Spacing and fertilizer responses on the soil types at St. Augustine and El Carmen, Centeno.

Spacing treatments were 22.5 cm., 30 cm and 37 cm between rows and 2.5 cm in the row. Fertilizer treatments were N at 0.55 and 110 kg/ha, P_2O_5 at 0.55 and 110 kg/ha and K_2O at 0.55 and 110 kg/ha.

The results of these experiments invariably showed that:

(a) The narrow inter-row spacing of 22.5 cm gave the highest yields of dried beans. At this spacing, yields averaged 2180 kg/ha while that at 30 cm averaged 1090 kg/ha with the 37 cm spacing averaging 654 to 700 kg/ha.

(b) Weed growth at 22.5 cm spacing was negligible during the crop.

(c) There was a response to Nitrogen in all treatments with the response being marked at the highest levels of phosphorus. The response to Potassium was moderate.

2. Mechanisation

Several crops of sizes ranging from one to three acres (0.40 to 1.25 hectares) were tested to determine the possibility of mechanising the entire crop on small acreages. Land preparation was done by wheeled tractors, sowing was done by a planet junior seed drill and fertilising with a planet junior fertilizer drill. Weed control was affected by the use of chemicals. Two machines were used in harvesting, a side-mounted mower on a wheel tractor and an Allen Scythe. The side-mounted mower had the effect of cutting and windrowing. However, the Allen Scythe could only cut the plants which it later trampled. The cut whole plants were then transported out of the field by tractor drawn trailer to a central point outside the field, where a self powered small Japanese made rice thresher was used to thresh the material. This machine did a good job of threshing. However, it could not separate the grain from all chaff with a mixture of shelled grain and some chaff being the end result. This presented very little problem since the chaff was easily removed by drying the mass and winnowing. Another non-mechanical method of threshing was tried where the cut whole plants were stacked about 0.5 metres high on polyethylene sheets and sunned

for about four days when there was shattering of most of the pods. The remaining unshattered pods were then flailed by a piece of stick which removed most of the pods. The chaff was then shaken out of the heaps and the remaining pods and beans collected in trays and dried for another three to four days when all pods would have shattered. Winnowing was then done. This method works well in dry weather but would present problems in wet weather in that the stacked mass tends to become mouldy fast.

3. Intercropping with Mung Beans

Intercropping exercises using Mung and other dried beans in ginger, hot peppers and yams showed that Mung fits in well in an intercropping schedule with these crops. It has the distinct advantage of fast early growth which is a good characteristic in that it reduces weed competition in the early stages. Secondly, it is of very short duration (does not exceed 63 days from seeding to harvest) and thus presents very little problems with the main crop.

POSSIBILITIES FOR MUNG BEAN PRODUCTION

In addition to the work done as mentioned above, Mung has been tried on a limited extent on rice lands after the rice crop has been harvested. By a system of adjusting land preparation operations, this crop proves to be a quick filler crop prior to cultivating vegetables in the dry season. In view of an accelerated rice programme in Trinidad, it is envisaged that more rice farmers would be encouraged to produce Mung beans in addition to some of the other dried beans such as blackeye, gub-gub and bodi as was previously done.

Secondly, Mung has proved to be advantageous over blackeye and red kidney beans in wet season production in that the crop is not subject to disease problems both of the plant and of the pods as is the case with the others mentioned so that it can be cultivated as a dried bean on most food gardens in the rainy season.

Because of its short duration, relatively good yields and its adaptability to being mechanised by adaptations to simple machines, it could fit well into intercropping systems in newly planted sugarcane fields which yearly amounts to about 20 percent of the total acreages in sugarcane in Trinidad. It could fit easily into an intercropping system for coconuts and newly planted plantains and bananas.

On a pure-stand basis, there exists the possibility of producing three crops in a normal rainy season extending into the early dry season with some adjustments in soil management practices since there are no known problems, especially disease problems, in the crop at present.

Other than the possibilities of production of dried beans, Mung is a quick maturing green manure crop which could be turned in at about five to six weeks ago. It could prove to be beneficial as a green manure in lands cleared by heavy tractors and intended for food crop production. It is a cheap and easy method of adding organic matter to these areas.

Finally, besides being a good crop for food for human consumption the possibilities of using Mung Bean for livestock production under local conditions is yet to be exploited.

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