

SOY BEAN YIELDS IN THE LOWLANDS OF NEW GUINEA

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ABSTRACT.

Four varieties of soy beans NG 4661 Batavian Yellow, NG 4662, SHE 30, and Mission were grown in the wet Lowlands at Bubia near Lae. The three best varieties yielded more than 1,500 lb. of beans per acre. The mean protein content of the beans was 43.0 per cent. and the mean oil content 17.4 per cent for all varieties. Yields compare favourably with those reported from the Highlands.

INTRODUCTION.

Because of its high protein content for stock and human nutrition, the possible importance of soy bean (*Glycine max*) for the Territory was discussed by Kimber in 1968.

For many years, farmers in the Markham Valley have been seeking a suitable crop to incorporate into a rotation or as an alternative crop to replace peanuts in the monoculture currently practised on most farms.

In 1964, two trials in the Markham Valley to assess soy bean varieties in the wet lowlands failed because of poor seed germination (Anon 1966). In 1968, a further trial using four soy bean varieties was planted at Bubia Agricultural Experiment Centre, near Lae, to evaluate the potential of this legume in the wet lowlands.

MATERIALS AND METHODS.

Four varieties selected on the basis of their results in yield trials in the Highlands were sown on 7th November, 1968. The varieties were NG 4661 Batavian Yellow, NG 4662, SHE 30 and Mission.

The trial was randomized block design with four replicates. Five rows 2 ft. apart were sown

in each plot at a seeding rate calculated to give a within row spacing of 2 in. between plants. The total area of each plot was 43.5 ft. x 10 ft.

Seed had been obtained from Aiyura in August, 1968, and prior to planting was stored in a domestic refrigerator to prevent loss of viability. At planting, all seed was inoculated with *Rhizobium* strain CB 1809.

RESULTS AND DISCUSSION.

Progress of Trial.

All varieties germinated well and initial growth was excellent. 'Mission' was pale green by comparison with the other varieties under test. This appeared to be a varietal characteristic, because two months after planting, nodulation was equally effective in all varieties. 'Mission' was also shorter, and was first to flower and mature.

Harvesting of Mission began in early February and continued to the end of the month. The other three varieties were harvested between the end of February and mid March.

Rainfall, mean maximum and minimum temperatures, and average hours of sunshine for the period of the trial are shown in Table 1.

Pests and Diseases.

There was little evidence of attack by insect pests or plant pathogens. In particular it was noted that pods were not attacked by insects. Such attack is quite common with legumes in

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Table 1.—Meterological Data, Bubia, November, 1968-March, 1969.

				Month.					
				Nov.	Dec.	Jan.	Feb.	Mar.	Mean.
Rainfall, inches	....	....	....	4.34	12.79	6.42	4.79	12.68	8.20
Mean Maximum, Degrees F.	....	....	....	89.7	90.7	91.5	92.5	88.4	90.6
Mean Minimum, Degrees F.	....	....	....	71.2	72.0	71.7	73.2	73.3	72.3
Hours Sun, Average	....	....	....	6.0	6.9	6.3	5.1	5.8	6.0

Table 2.—Yield of Soy Beans, Crude Protein and Oil, Bubia.

Variety.	Beans lb./acre.	CP per cent.	CP lb./acre.	Oil per cent.	Oil lb./acre.
NG 4661	1,509	41.2	622	18.1	273
NG 4662	1,694	43.1	730	18.8	318
SHE 32	1,529	41.0	627	14.6	223
Mission	1,035	46.9	485	18.3	189
Mean	1,442	43.0	616	17.4	251

the lowlands and the freedom from attack in the soy beans may have been due to their hairy exterior. Retention of seed by all varieties was excellent.

Harvesting.

As each variety matured, the two guard rows of the plots were discarded as well as 21 in. at each end. Harvested pods were sun-dried and hulled to record seed yields. From each bulked variety a subsample was removed and ground for crude protein and oil determinations. The mean seed yield, and the yields of oil and protein for all varieties are shown in Table 2.

A Duncan multiple range test was performed on the yield data and the results are shown in Table 3.

Table 3.—Variety.

	NG 4662.	SHE 32.	NG 4661.	Mission.
Mean Yield lb./acre	1,694	1,529	1,509	1,035

SIGNIFICANCE : Any two means not underlined by the same line are different at the 5 per cent. level.

The three top varieties did not differ significantly from each other but Mission was clearly inferior to them all.

CONCLUSIONS.

These yields compare favourably with those quoted by Kimber (1968) for trials in the highlands. It would appear that soy beans can be grown in the lowlands and produce satisfactory yields. An advisable precaution would be to store seed for lowland plantings in a cool room store or send it to the highlands for storage between seasons.

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