

Advice on Rice

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Dryland rice was grown commercially in the Markham Valley during the years 1950-1955, but it was not successful. The climate and soil conditions were quite satisfactory, but two other problems arose. Firstly, the varieties of rice used were not suitable for the conditions, and secondly the seed used was contaminated with serious amounts of red rice (a weed rice species).

In the past ten years, great progress has been made in the development of suitable high-yielding rice varieties for the tropics, so the agronomists at Bubia reconsidered the idea of growing dryland rice in the Markham Valley.

Varieties

TWO varieties were tried in the 1967-1968 season, Milfor (Plant Introduction No. NG6009) and B5580 (Plant Introduction No. NG6010). The results were most encouraging. Both varieties yielded well (2,800 lb grain per acre) and they both showed complete resistance to lodging (falling over at the heading stage).

Climate and Soil Conditions

The trials were then extended to other areas, with different climatic and soil conditions. Seven sites were selected in the Markham and Ramu River Valleys. The two varieties, Milfor and B5580 were planted with a sod seeder in both fertilized and unfertilized blocks. In addition, two variety trials were established testing five varieties including Milfor and B5580.

The yields obtained varied from 4,375 lb per acre on a fertilized block at Gusap to 77 lb per acre on a fertilized plot at Erap, where long dry periods delayed flowering and seriously affected yield.

Too much rain may harm rice by washing out the nutrients from the soil. Too much rain usually means too little sun, and this also will reduce the yield. Furthermore, continuous cloud cover may be associated with the occurrence of leaf spot and glume blotch.

Planting

Forty pounds of fully viable seed should be planted per acre at the onset of the wet season (December in the Markham Valley) as soon as there has been enough rain to

moisten the soil thoroughly. Prior to planting, the seed should be treated with Agrosan or Ceresan as mentioned below.

Disease Caused by Fungi

Leaf spot and glume blotch caused by the fungus *Helminthosporium* may cause serious problems. The disease is transmitted with the seeds, but when it is established in a growing crop, it is spread by the wind rapidly and extensively.

Seed dressing with Agrosan or Ceresan is recommended and thorough mixing is needed so that the seed is well covered with the fungicide. A concrete mixer would achieve the best mixing.

Weed Control

The first weed control trial showed that propanil (Stam F34) would be suitable. It is important to notice, however, that propanil must be applied while the weeds are still young (within three weeks of planting). As the weeds get bigger and stronger, propanil is less effective.

Insect Control

Although 33 species of rice insect pests have been recorded in the Markham Valley, the main pest is the Rice Bug (*Leptocoris* spp.) which damages the rice by sucking the milky juice of developing grains, thus preventing grain formation. The adults live for 24 to 120 days. They breed all year round and seven or eight overlapping generations may be expected per year. Recommendations for *Leptocoris* control must at present be based on



Plate I.—Experimental rice block at Gusap with variety B 5580 on the right and Milfor on the left. Yields from the small plots harvested in B 5580 were equivalent to 4,300 lb of paddy rice to the acre

overseas results. Application of carbaryl or lindane (1 lb of active ingredient per acre) is recommended.

Purple Stem-Borer (*Sesamia inferens*) is another serious pest. This borer also breeds all the year round, and a new generation is produced about every eight weeks. Control measures are crop rotation, stubble destruction and application of diazinon granules. Recommended rate of application is 1 lb active ingredient per acre every three weeks during the rice growing stage.

Rice Leaf Rollers and Rice Leafhoppers are also serious pests in the Markham Valley. Control is achieved by eradication of wild grasses in the vicinity of the crop and the application of carbaryl or diazinon (1 lb active ingredient per acre).

Harvesting

Under ideal conditions B5580 will be ready to harvest 110 days from planting, while Milfor may take another 20 to 30 days to mature.

Although the grain in these varieties is held firmly on the head, it is better to harvest earlier than later. Owing to expansion and contrac-

tion pressures that are set up in the grain following rain, the longer it stays on the stalk after maturity (the greater is the possibility of grain crack (or suncheck) occurring. Such cracking gives a sample that breaks easily in the milling stage and so is down-graded in quality.

Overseas recommendations are to harvest rice at a moisture content of 18 to 22 per cent (measured with a moisture meter). It should then be dried slowly (three days) with a blower system. Rapid drying (three hours) leads to cracking of the grain, so is to be avoided.

A moisture content of 13.5 per cent is ideal for milling purposes, but at levels of 13 per cent and below, there seems to be less insect activity and less chance of the development of mustiness in the grain due to fungal growth.

On a village scale it would probably be advisable to harvest at 17 per cent and sun-dry to 13 to 14 per cent before storage.

In a mechanised industry, rice is harvested with a header which cuts, threshes and winnows the grain before augering it into a truck



Plate II.—Bad lodging following heavy rain in a crop of E 1 at the flowering stage. The melon in the foreground is resting on the ground

which transports the rice to the storage shed. Machines used for this operation vary in price from \$1600 to \$16,000; naturally the capability of the machine varies with the price.

Milling Qualities

Samples of all varieties of rice grown were sent to the Administration rice mill at Madang.

Percentages of brown rice recovered ranged from 66 to 78 per cent with an average for all varieties of 72 per cent. White rice ranged from 62 per cent to 70 per cent with an average for all varieties of 65 per cent.

On the whole, the hulling process was quite satisfactory as there was no grain breakage for any variety. Grain breakage did occur in the pearlizing operation, especially in IR8.

Acceptability Trials

Acceptability trials were conducted at Igam Barracks near Lae. The soldiers were given small samples of nine different varieties of brown rice, cooked in the usual way (small water volume). The consensus of opinion was that the newly introduced varieties were neither better nor worse than the rice bought at a local store.



Plate III.—Helminthosporium leaf spotting on leaves of IR 8 rice variety