THE RESULTS OF RICE RESEARCH IN THE EAST SEPIK PROVINCE

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INTRODUCTION

The two major problems which are preventing an increase in rice production in the East Sepik Province are:

1. Poor cultural and management practices.
2. Low prices, which discourage the farmers from growing rice.

Rice research in the East Sepik Province has been aimed at improving the first of these problems. The research has included trials on introduced varieties which may give better yields.

This article outlines the trials on rice which have been carried out in the East Sepik Province since 1970. As a result of these trials, some recommendations have been made which should help farmers improve rice production.

THE RICE RESEARCH PROGRAMME

Rice research started in the Maprik District of the East Sepik Province in 1970. In the late 1970's the research work was moved to Saramandi in the Angoram District when a new research centre was established there, as a part of the East Sepik Rural Development Programme.

Variety trials

One of the main aims of the rice research programme in the East Sepik Province was to replace the commonly grown rice variety E1. Variety E1 was originally introduced from Indonesia in the 1940's.

From the results of advance yield trials at Bubia Agricultural Centre, a few higher yielding varieties were selected for regional yield trials in the East Sepik Province. As well as higher yields, the experimenters were also looking for: early maturity, resistance to drought; resistance to insects and diseases; good milling and eating quality.

The results of experiments which compared various varieties are given in Table 1.

The successful trials (trials 1, 3 and 6 in Table 1) showed that the introduced varieties yielded 1 - 2 tonnes per ha more than E1, in the main rice growing areas of the East Sepik Province.

At the end of the 1975-76 wet season, the variety NG6637 was recommended to replace variety E1. NG6637 is a high tillering variety, whereas E1 is low tillering. Tillers are the shoots which grow from near the base of the main stem. Each tiller can bear a panicle (an ear of grains). As a high tillering variety, NG6637 puts out a reasonable number of tillers, even under poorer conditions. Enough tillers bear panicles to give an acceptable yield. On the other hand, E1 produces only a few tillers, even in the best conditions.

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TABLE 1. SUMMARY OF 10 RICE VARIETY EXPERIMENTS IN THE EAST SEPIK PROVINCE 1971-1980

Year	Details of trial	Results and comments
1. 1970 - 71	9 introduced varieties were compared with E1 at 10 sites in E. and W. Sepik Provinces.	Data collected from 4 sites only, with best yields at Burui. 3 varieties yielded much better than E1.
2. 1971 - 72	no useful results obtained	
3. 1972 - 73	11 introduced varieties were compared with E1 at 3 sites.	Results at the 2 grassland sites were affected by *Leptocoriza*. At Drekikier, 5 varieties, including NG6637 yielded much better than E1.
4. 1973 - 74	no useful results obtained	- lack of staff.
5. 1974 - 75	no useful results obtained	- lack of staff.
6. 1975 - 76	7 introduced varieties compared with E1 at 3 sites, Aupik, Yangit and Yap.	NG6637 yielded the best at all 3 sites and E1 yielded lower than all the other varieties.
NG6637 RECOMMENDED FOR EAST SEPIK PROVINCE AT THE END OF THIS SEASON		
7. 1976 - 77	15 varieties planted at 6 sites.	Good results from Bainyik only. NG6637 was not included, therefore varieties could not be assessed. Yields were all quite low. 5 varieties were selected for possible future trials.
8. 1977 - 78	15 varieties sown at 4 sites	Results from Bainyik and Yangoru only. 6 varieties yielded much higher than NG6637 and should be selected for further trials.
9. 1978 - 79	no useful results obtained	
10 1979 - 80	6 selected varieties planted at Bainyik and Gavien. Fertilizer was applied and pests controlled to give high yields.	At Bainyik 3 varieties yielded much higher than NG6637. 2 of these were selected for further trials.

The rice variety on the left is E1, and the variety on the right is Senis (the purified strain of NG6637).

The variety E1 is a tall variety and lodges (falls over) easily, as shown on the right. Senis, on the left, is shorter and stays upright.

The rice variety 'Senis' which is now distributed to farmers is the same as NG6637. In 1978 NG6637 was found to be mixed with other strains, so work was carried out at Bubia to purify it (remove the unwanted strains). The purified seed obtained was released under the new name 'Senis'.

More recently, other varieties have been shown to produce up to 1.7 tonnes per ha more than NG6637. However, some of these varieties have disadvantages. For example:

- Some lodge at harvest time. 'Lodging' means that the rice stalks fall over and are difficult to harvest.
- Some produce poor grains which break easily.
- Some do not taste good.

Varieties NG7430 and 8158 are promising varieties for future trials.

The trials were carried out at various places, and on various kinds of soil. Rice

grown in areas of recently cleared forest gave higher yields than rice grown on the grasslands of the Sepik plain. Damage from the rice insect, *Leptocoriza* spp., was found to be greater in the grassland areas of the Maprik District in the East Sepik Province.

Cultural trials

Between 1972-73 and 1976-77, six cultural trials on rice were planted in the East Sepik Province. The first 4 of these were fertilizer experiments. Two gave useful results.

1. 1972 - 73 wet season. NG6637 was grown at 2 sites under 6 rates of nitrogen fertilizer treatment. *Leptocoriza* caused a lot of damage. However rice yields did appear to be affected by the fertilizer treatment. Insect damage was the least at Kwary School. Here rice yield increased with the amount of nitrogen up to 90 kg N per ha.

2. 1974 - 75 wet season. Five varieties were grown with 100 kg nitrogen per ha and without nitrogen at one site. Yields were very low. However with NG6637, nitrogen application increased the grain yield by over 50%.

Rice yields can be increased by improving existing cultural and management practices. Experiments since the 1974-75 season have been aimed at increasing rice grain yield by improving cultural practices, such as spacing, and even sowing. Low seed rate and uneven sowing were common causes of low yields. Therefore 2 experiments concerned spacing.

3. 1975 - 76 wet season. The varieties E1 and NG6637 were planted at various spacings. It was found that higher yields were obtained with spacings of 20 x 10 cm, 20 x 20 cm and 20 x 30 cm, compared with the traditional spacing (about 20 x 40 cm). The differences in yield between the wide and close spacings were greater with the improved variety NG6637, than with E1. This is shown in Table 3. The reason for this is that NG6637 produces more tillers than E1

4. 1976 - 77 wet season. The same spacing trial was repeated at two sites, Nuku (West Sepik) and Bainyik. Again the closer spacings gave the highest yields.

As a result of these cultural trials on rice in the East Sepik Province, the following recommendations are suggested:

TABLE 2. MEAN GRAIN YIELD OF TWO VARIETIES IN T/HA AT DIFFERENT SPACINGS IN THE 1975 - 76 WET SEASON.

Variety	Location	Yield (t/ha) Spacings: 20x10 cm	20x20 cm	20x30 cm	20x40 cm	20x50 cm	Traditional
E1	Bainyik	4.07	3.86	3.37	3.91	2.28	3.04
	Aupik	4.03	3.28	2.76	2.58	2.03	2.73
	Yangit	3.19	2.49	2.24	2.07	1.93	2.10
Mean		3.76	3.21	2.79	2.85	2.08	2.62
NG6637	Bainyik	4.29	4.46	3.64	3.51	3.36	2.36
	Aupik	5.55	5.24	4.18	3.89	3.86	2.77
	Yangit	4.52	5.52	4.01	3.38	3.19	2.69
Mean		4.79	5.07	3.94	3.59	3.47	2.61

A rice technician assessing germination and establishment rates in a regional field trial.

Collecting information on an experimental crop during the maximum tillering stage.

Harvesting rice plants within a marked area, to assess yield differences between varieties.

Harvested rice plants are gathered into bundles and marked with their plot numbers to check yield differences.

1. Fertilizer application of 100 kg nitrogen per ha for rice growing in the East Sepik Province.

2. For NG6637, a spacing of 20 x 20 cm is recommended - a much closer spacing than farmers have used previously.

Wide spacing will give low yields. Here the rice specialist is advising growers to plant with a closer spacing.

DISCUSSION

This outline of results of rice research in the East Sepik Province shows that before the 1975 - 76 wet season, the trials were often unsuccessful. One of the main reasons for this was that the Department did not have a specialist technician to maintain the plots and to record the data. Better results have been obtained since 1976, after trained staff were stationed in the Maprik District.

Despite the limited success of the experiments, some recommendations have been made. These are:

a. NG6637 was recommended to replace E1 in the East Sepik Province.

b. If fertilizer is used, the present recommended rate is 100 kg nitrogen per ha.

c. For NG6637 a spacing of 20 x 20 cm is recommended.

Further fertilizer experiments are needed to make recommendations for the wide range of soils in the province.

In recent experiments, some newly introduced varieties were found to yield higher than NG6637. More experiments are needed to find the most suitable varieties. NG6637, and its purified variety 'Senis', is now 10 years old. It needs to be replaced as the normal life of a variety in most rice growing countries is 5 years.

In the meantime rice yields can be increased with even sowing; weeding and pest management; and improved harvesting, threshing and winnowing techniques. A rice seed farm was established at Gavien in the late 1970's to multiply and distribute high quality seeds to farmers. The general recommendations for growing rice are outlined in an article in ***Harvest*** Volume 10, No. 4, and in Farming Note No. 6.

The 10 years of rice trials in the East Sepik Province, and the continuing programme of experiments, will only be worthwhile if there is a an extension effort to let farmers know about any new recommendations. Then the farmers need to be helped to put the recommendations into practice. This requires a well planned rice production programme with adequate funding from the Provincial Governments.

FURTHER READING

D.P.I. (1985). Farming Note No. 6. *Rice* (revised edition). D.P.I., Konedobu.

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