

NEW CULTIVARS AND THEIR CONTRIBUTION TO MAXIMUM WHEAT PRODUCTION

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INTRODUCTION

How long does a cultivar stay 'new'? At least until it has been on the market long enough for any farmer to be able to buy seed, and until its main advantages and disadvantages have been discovered. On both counts the cultivars Rongotea and Oroua are new, because there is not enough seed this season, and because experience in growing them is limited. Their release was announced by D.S.I.R. staff at last year's Farmers' Conference, and Rongotea has recently been granted Plant Selectors' Rights.

Even newer than these are Konini, a purple-grained wheat that we had on display recently, and Tiritea, which is a sister selection of Rongotea, from Palmerston North. Neither of these has yet been recommended for release by the Wheat Research Committee, but the Acceptable Cultivar Committee has recommended that Konini should be placed on the New Zealand List. Rights have been applied for.

KONINI AND TIRITEA

As the contribution of Konini and Tiritea to our wheat

production has not yet begun. I shall describe their performance briefly.

Konini is expected to be grown on a limited area to meet some of the demands of millers producing wholemeal flour for specialty loaves. We believe it will yield a little more than Kopara.

Tiritea has been tested as a rather mixed bulk line, yielding less than Rongotea in the North Island and when autumn sown in Canterbury, but outyielding all other wheats under spring sowing throughout the South Island.

The reselection being tested this season in official listing trials has outyielded Rongotea in last season's autumn-sown trials in North Canterbury, and in the spring-sown trials in South Otago - Southland.

TABLE 1. NEW ZEALAND WHEAT YIELDS IN TRIALS

	<i>North Island</i>	<i>Canterbury</i>		<i>South Otago - Southland</i>
		<i>Autumn sown</i>	<i>Spring sown</i>	
Karamu	5.51	5.26	5.02	-
Kopara	-	4.76	4.32	6.90
Oroua	4.96	5.02	4.94	6.75
Rongotea	5.30	5.34	4.87	7.21
Takahe	-	-	-	6.88
Tiritea	5.04	5.04	5.17	7.45
Total trials	26	63	17	16
Standard error	0.09	-	0.10	0.16

(In general, differences larger than three times the standard error are considered significant.)

PRODUCTION FROM NEW CULTIVARS

The overall picture on new wheats compared with the present leading cultivars, based on trials by MAF and Crop Research Division, is shown in Table 1. There were 80 trials in Canterbury in the last five seasons, so it did not seem necessary to include the local trials run by the private breeders.

Except for Tiritea the first two columns are based on five seasons' trials and the others on four seasons, and the standard errors of the means are from cultivar by season analyses. The autumn(-winter) sown trials are discussed in more detail below.

For the North Island Gamenya could have been included, at 4.2 t/ha, from three seasons of trials. Comparing Karamu with Oroua and Rongotea, Karamu was highest in yield in four of the five seasons, and Oroua was lowest in four out of five. The average return from Karamu with the 1981 discount of 7½% would be slightly less than from Oroua. The reselection from Tiritea yielded as well as Rongotea in the 1980 harvest, but only as well as Oroua the year before.

As we are working south, it should be mentioned that there have been no trials recently in Nelson - Marlborough. From the latest Wheat Review (harvests of 1976 - 78), on page 59 the Department of Statistics shows Kopara as easily the top yielder, but on next season's prices Karamu would be predicted to return 7% more than Hilgendorf. I do not claim this is a fair comparison, however, because of differences in times of sowing.

For spring sowing in Canterbury we have three early wheats

compared with the later Kopara, and although Kopara was close to the others after the dry spring of 1977 it was clearly inferior given a good moisture supply. However Kopara would return more than Karamu on average. The bulk line of Tiritea was the highest in yield in the dry season, but the selected line was close to Rongotea last harvest.

In the South Otago - Southland region the table shows Oroua fairly definitely below Rongotea, and Tiritea very promising. The highest yields achieved in any of the 16 trials ranged from 9.5 (Karamu) to 9.9 t/ha for the first five cultivars (Karamu was in some trials each season), with Tiritea at 10.3 t/ha. Although Kopara, Oroua and Takahe were close in average yield, Kopara out-yielded each of the others in 10 trials, and Oroua out-yielded Takahe in nine trials. The largest differences, Kopara minus Takahe, ranged from 1.7 t/ha in a Tapanui trial to -2.1 t/ha at Outram.

We know that generally Kopara is more susceptible to crown rot and eyespot than Takahe, and is not recommended for second-crop wheat in Southland, but a detailed interpretation of trial-to-trial variation in relative yields is over to the MAF regional research officers, who have the relevant information on soil type, cropping history and disease attack from their trials. The final cultivar recommendations depend on this deeper understanding of yield variation, or else we must learn by experience in large-scale production.

To get a fuller perspective we can usefully go to the last Wheat Review (p.65). The small area of Karamu gave the highest yield in 1976 and 1977, but the Scots are not

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to be fooled! For one thing most of the Karamu was grown in the high-yield counties Clutha and Southland, and for another the return from Takahe or Kopara would have been greater than from Karamu on average, even in these counties. The Karamu area was already down to 170 ha by 1978. In the reliable county comparisons in the Wheat Review, Takahe has a slight edge over Kopara, but we have no commercial results on the 'first crop versus second or third crop' aspect of the comparison. There was a respectable area of Hilgendorf in three of the counties, and over the whole region it gave the highest average return in each of the three seasons.

That both ways of looking at cultivar adaptation, from trials and commercial experience, may be necessary is shown by a closer examination of the autumn and winter-sown trials in Canterbury - North Otago (Table 2). Here each cultivar was in four or five seasons' trials in each region (Mid Canterbury is Ashburton County), except for Tiritea.

TABLE 2. AUTUMN-SOWN TRIALS IN CANTERBURY

	<i>North</i>	<i>Mid</i>	<i>South</i>	<i>Average</i>
Karamu	4.96	5.13	5.60	5.23
Kopara	4.49	4.65	5.13	4.76
Oroua	4.43	4.90	5.72	5.02
Rongotea	4.89	4.99	6.14	5.34
Tiritea	4.60	4.99	5.54	5.04
Total trials	27	18	18	63
Standard error	0.09	0.10	0.26	0.11

In Table 2 the standard errors of cultivar means for each region are from cultivar by season analyses, as in Table 1, but under 'Average' is the standard error derived from the figures in Table 2 itself. Obviously Rongotea is the best choice for the near future, though a Tiritea reselection may ultimately prove to be better. With a 15% discount, Karamu would be the least profitable in each part of Canterbury.

However we need to look more closely at the comparison of Rongotea with Kopara, because the statistics are still concealing some vital information. In Table 3 the figures, still in t/ha, show how much higher the Rongotea average yield was than the Kopara yield, in the autumn and winter-sown trials each season.

TABLE 3. YIELD ADVANTAGE OF RONGOTEA OVER
KOPARA IN CANTERBURY - NORTH OTAGO

	1976	1977	1978	1979	1980
North	0.67	0.33	0.00	0.65	0.35
Mid	0.24	-0.11	-0.12	0.70	1.00
South	-	0.26	0.01	1.92	1.83

The yield differences make reasonable sense in relation to two factors - speckled leaf blotch and spring rainfall.

CONCLUSION

- * Kopara is more susceptible to leaf blotch than it was in 1976.

- * The early summer drought of 1977 made Kopara at least equal to Rongotea in the 1978 harvest (a typical Canterbury season).
- * There was ample spring-early summer rainfall in the other four seasons, and heavy leaf blotch infection.
- * Rongotea is resistant to leaf blotch but did not yield very well in north Canterbury, in the past two seasons.
- * In mid Canterbury, Kopara gave its best yield in 1980.