POTATO SPACING TRIALS SOUTH CANTERBURY

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SUMMARY

In nine field experiments between 1962-72 close along the row planting of potatoes favoured higher seed and total yields with little reduction in the yield of table potatoes. Compared with table potatoes from wide along the row spacings, table potatoes from close planting were more even in size, had fewer malformed tubers and were usually commercially acceptable.

INTRODUCTION

In New Zealand potato growing areas, the bulk of the crop is planted at 75 cm spacing betweeen the rows with 30 to 35 cm spacing between seed tubers along the rows.

For many years when the cultivars Aucklander Short Top. Sebago and Ilam Hardy were the main varieities grown, this spacing was satisfactory for reasonable yields of table and seed potatoes. Table potatoes were sold for culinary purposes and the yield ratio of seed to table size was usually sufficient to provide enough seed for the next crop and reasonable quantities for sale.

In the early 1960's the release of new cultivars, such as Rua, upset the previously satisfactory table seed yield ratio. Rua, being a very vigorous variety, at 30 to 35 cm spacing quite frequently produces numerous, uneven, very large table potatoes and little seed. The problem became one of table potatoes which were too large and uneven for ideal use as a vegetable and a deficiency in quantity, size and quality of seed potatoes for planting the next year.

To overcome this problem potato growers began planting their crops closer along the row , spacing, for example, between 22.5 and 30 cm. This reduced the size and unevenness of the table potatoes and increased the yield and eveness of the seed.

During the last ten years, high freight charges and a reduction in coastal shipping have caused an upsurge in the production of table potatoes in the North Island. As a result a gradual change has taken place in the South Island, with growers placing greater emphasis on the production of high quality seed for sale to the North Island.

In recent years potato seed production has become more specialised, some growers concentrating solely on the production of seed. To do this some farmers plant their crops later than usual so that they are unable to reach large mature table size. Others plant at the normal time but reduce the incidence of table potatoes by burning off the haulms of crops with chemicals before crop maturity. Chemical burning off of tops to gain maximum seed production occurs particularly in the South Island and is standard practice in the northern districts of Canterbury and in the better seed areas. However, with cultivar Rua this can cause germination problems in the early harvested immature seed. It is not clear if this is due to the stage of burning off, the chemical action or, as is more likely, the abnormally long period the seed is stored. With regard to the latter the answer may be proper potato seed storage in well ventilated cool stores.

Some seed production specialists plant their crops as close as 17.5 cm along the rows to ensure that no large potatoes are grown.

This paper reviews the results of South Canterbury trials which compared the effect on table, seed and total yield of various along the row potato spacings.

METHODS AND MATERIALS

In two trials, 62/3316 at Orari and 62/3317 at Arowhenua, the cultivar Rua was sown at four spacings along the rows namely, 25, 35, 40 and 45 cm in non replicated blocks. At harvest the blocks were hand sampled using the techniques described by Lynch (1960).

In two trials, N(FT) 153/1 at Adair and N(FT) 153/5 also at Adair, three cultivars Ilam Hardy, Whitu and Wha were planted at two along the row spacings, 17.5 cm and 35 cm, in replicated randomised blocks. Each plot consisted of three rows 4.6 m long. At harvest, produce from the centre row was graded for size and weighed for yield.

In five trials, 62/3180 at Kerrytown, 63/3140 at Kerrytown, 64/3139 at Kerrytown, 64/3138 at Orari and FT 25/1 at Adair, the cultivar Rua was sown in single 6.5 m long row plots at along the row spacings of 22.5, 30, 37.5, 45, 52.5 cm. Replicated randomised block designs were used. At harvest whole plots were dug and the tubers graded for size and weighed for yield.

RESULTS

At Orari and Arowhenua Rua tended to give higher yields of table and seed potatoes where planted at the closer along the row spacings (Table 1).

TABLE 1: Table, seed and total tuber yields (t/ha) of Rua potatoes sown at four along the row spacings.

	62/3316 Orari			62/3317 Arowhenua		
Spacing	Table	Seed	Total	Table	Seed	Total
25cm	34.0	10.5	44.5	26.8	8.3	35.1
35cm	34.8	8.5	43.3	26.3	6.3	32.6
40cm	31.8	6.8	38.6	24.3	5.5	29.8
45cm	31.3	5.5	36.8	23.0	4.3	27.3

In the replicated trials, N(FT) 153/1 and N(FT) 153/5 at Adair, Ilam Hardy, Whitu and Wha gave higher mean seed and total tuber yields when planted at 17.5cm spacings along the rows. (Table 2).

TABLE 2: Mean table, seed, pig and total tuber yields (t/ha) of Ilam Hardy, Whitu and Wha potatoes at 17.5 and 35cm along the row spacings.

	N(FT) 153/1 Adair				N(FT) 153/5 Adair			
Spacing	Table	Seed	Pig	Total	Table	Seed	Pig	Total
17.5cm	31.3a	7.5a	5.0a	43.8a	15.3aB	8.0aA	8.3aA	31.6
35.0cm	31.3a	6.3a	4.0a	41.6a	17.3aA	6.0bB	6.0bB	29.3
CV%	12.4	30.6	29.6	10.3	10.6	18.9	16.0	7.3

The cultivar Rua in five trials frequently gave higher yields of seed and total tuber yields when sown closely in the rows. (Table 3)

TABLE 3: Table, seed pig and total tuber yields (t/ha) of Rua potatoes sown at five along the row spacings.

Trial and Locality	Spacing (cm)	Table	Seed	Pig	Total
62/3180	22.5	32.5a	14.0 abAB	–	46.5 abAB
	30.0	33.0a	15.5 aA	–	48.5 aA
Kerrytown	37.5	33.8a	11.0 bcBC	–	44.8 abcAB
	45.0	33.3a	8.8 cdC	–	42.1 bcAB
	52.5	33.8a	6.8 dC	–	40.6 cB
CV%			22.8		8.6
63/3140	22.5	8.2a	5.5 aA	4.1 aA	17.8 a
	30.0	9.3a	5.0 abAB	2.8 bB	17.1 a
Kerrytown	37.5	10.1a	5.0 abAB	2.7 bcB	17.8 a
	45.0	10.7a	4.0 bcAB	2.3 bcB	17.0 a
	52.5	10.9a	3.4 cB	1.7 cB	16.0 a
CV%		26.1	25.4	28.9	18.9
64/3139	22.5	37.0a	10.0 a	–	47.0 aA
	30.0	32.8a	10.0 a	–	42.8 abA
Kerrytown	37.5	32.5a	8.3 a	–	40.8 abA
	45.0	32.3a	6.8 a	–	39.1 bA
	52.5	31.3a	6.8 a	–	38.1 bA
CV%		29.0	14.0	–	13.0
64/3138	22.5	37.3a	10.0 aA	–	47.3 a
	30.0	38.5a	7.0 bB	–	45.5 a
Orari	37.5	39.5a	5.8 bB	–	45.3 a
	45.0	39.5a	5.0 bB	–	44.5 a
	52.5	40.0a	4.8 bB	–	44.8 a
CV%		12.6	26.4	–	12.2
FT 25/1	22.5	30.8 aA	10.0 aA	3.5 aA	44.3 aA
	30.0	30.3 aA	7.3 bAB	2.8 abA	40.4 aA
Adair	37.5	31.8 aA	6.8 bB	2.5 abA	41.1 aA
	45.0	25.0 bAB	5.8 bB	2.3 abA	33.1 bB
	52.5	23.3 bB	5.5 bB	2.0 bA	30.8 bB
CV%		14.3	23.4	39.6	11.9

TABLE 4: From Table 3 mean table, seed and total yields (t/ha) of Rua potatoes sown at five along the row spacings.

Spacing	Table	Seed	Total
22.5cm	29.1 a	9.9 aA	39.0 aA
30.0cm	28.8 a	9.0 bAB	37.8 bAB
37.5cm	29.5 a	7.4 bcBC	36.9 bAB
45.0cm	28.1 a	6.1 cdC	34.2 bcB
52.5cm	27.8 a	5.4 dC	33.2 cB
CV%	16.6	18.7	11.0

DISCUSSION

In general the trials showed that potatoes could be planted at narrow spacings without any reduction in table or total yields. In addition, table potatoes from close spacing treatments were often smaller, of more even size and with fewer malformed tubers than potatoes from wider plantings. This made them more commercially acceptable. By planting at more than 37.5cm spacing, particularly with a vigorous variety such as Rua, there was the distinct danger of producing more undesirably large tubers.

Closer spacing usually resulted in more seed potatoes. From the results it did appear that 22.5 to 30cm spacing could be used to advantage when seed production was the main objective as in the case with potato lines of high certification standard.

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REFERENCE

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