VINING PEA CULTIVARS IN HAWKES BAY 1976-77 to 1978-79

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ABSTRACT

Seven cultivars were grown in all trials sown three times per season at Hastings Horticultural Research Station in the 1976-77, 1977-78 and 1978-79 seasons. The cultivars Puke (6.89 t/ha) and Pania (6.85 t/ha) yielded highest overall followed by Ag 2 (6.43 t/ha), C 39 (6.23 t/ha), Patea (6.16 t/ha), Kuru (6.04 t/ha), and Swift Cross 1 (6.00 t/ha). Ag 2 (7.48 t/ha) was the highest yielding cultivar in early season sowings; Pania (7.49 t/ha) and Puke (7.38 t/ha) mid-season; and Puke (6.93 t/ha), Patea (6.72 t/ha and Swift Cross 1 (6.65 t/ha) late season. The cultivars S102P, WNMA 707, D9407 (Pedago), Arcturus and Aorangi, grown for one or two seasons, showed promise in these trials.

At Takapau, 65 km south of Hastings, the highest yielding cultivars in 1976-77 were Pania (7.21 t/ha), C 39 (6.14 t/ha), Patea (5.71 t/ha) and Puke (5.68 t/ha).

INTRODUCTION

This paper reports testing of cultivars and advanced breeding lines of vining peas in Hawkes Bay in the past three seasons (1976-7 to 1978-9). It is a continuation of work started at Hastings Horticultural Research Station in 1972 and reported by Wraight (1976). The cultivars and advanced breeding lines tested in the past three seasons have been the most suitable from earlier work and new material submitted from various sources.

The earlier work reported by Wraight (1976) was carried out entirely at the Hastings Horticultural Research Station. In order to gain some knowledge of cultivar performance in other vining pea producing areas in Hawkes Bay, testing has also been carried out at Takapau in southern Hawkes Bay. The programme at Takapau was, however, abbreviated compared with the programme at Hastings H.R.S. and only carried out for one season, because of difficulties in conducting work so far from a suitable base.

Testing in earlier years involved sowing both five replicate main trials three times during the season and two replicate observation trials twice during the season (Wraight 1976), which allowed many cultivars and advanced breeding lines to be surveyed quickly. The amount of potentially suitable material available for testing decreased during this present series of trials, so two replicate observation trials were discontinued after the 1976-7 season.

MATERIALS AND METHODS

(a) Hastings H.R.S. Trials

Seven cultivars – Puke, Pania, Ag 2, Canterbury 39, Patea, Kuru (Mosaic Resistant Victory Freezer) and Swift Cross 1 – were sown in all five replicate main cultivar trials in 1976-7, 1977-8 and 1978-9. With the exception of Swift Cross 1, all cultivars have now been grown commercially. Swift Cross 1 was included as a promising quick maturing cultivar which flowered at the 10th node. Additional cultivars were grown for one or two of the three seasons in these main trials (appendix 1). The main trials comprised 14, 19 and 17 cultivars in 1976-7, 1977-8 and 1978-9 respectively.

The two replicates 1976-7 observation trials comprised 23 cultivars, sown in one or both sowings (appendix 2).

All trials were grown on Hastings clay loam soil with rotation being ex 2 year old ryegrass/white clover pasture.

Plots 11 m long and 2.1 m wide were sown using a Stanhay drill with rows 15 cm apart and seeds spaced 5.7 cm apart in the rows. A plant population at harvest of approx. 100 plants/m^2 in cultivars with standard sized seed was aimed for. Methabenzthiazuron applied post emergence was used for weed control.

At harvest vines from the inside 8 m x 1.2 m of each plot were pulled by hand and run through a continuous flow miniature viner. The vined peas were then cleaned, weighed, their tenderometer readings recorded and yield corrected to tenderometer reading (TR) 105 in the manner described by Wraight (1976).

Most plots were harvested between TR 100 and 110. Samples of all cultivars were quick frozen and later evaluated by taste panels of process factory staff.

(b) Takapau Trial

Eight cultivars were grown in the 1976-7 season with two sowings, the first between the early and mid sowing and the second between the mid and late sowing time at Hastings H.R.S., in the season. There were five replicates of each cultivar arranged in a randomised block design for each sowing. Sowing methods, crop management and harvesting methods were the same as at Hastings H.R.S. Plot size (11 m x 1.5 m) differed slightly from Hasting H.R.S.

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TABLE 1: Mean yields (t/ha) from each sowing time for cultivars grown in 1976-7 to 1978-9 at Hastings H.R.S. Days to maturity relative to cv. Pania.

Cultivar	Early Sown	Mid Sown	Late Sown	Mean	Maturity
Puke	6.37	7.38	6.93	6.89 a[1]	- 2
Pania	6.81	7.49	6.25	6.85 a	0
Ag 2	7.48	5.74	6.06	6.43 b	+3
Canterbury 39	6.26	6.25	6.18	6.23 bc	+1
Patea	5.21	6.54	6.72	6.16 bc	- 4
Kuru	5.62	6.62	5.87	6.04 c	- 2
Swift Cross 1	4.92	6.42	6.65	6.00 c	- 6
Mean	6.10 c	6.63 a	6.37 b		

MSD (5%) cultivars x sowing times = 0.54.
[1] Duncans lettering refers to each group of means separately.

RESULTS AND DISCUSSION

(a) Hastings H.R.S. Trials

Yields and times of maturity relative to cv. Pania of the seven cultivars grown in all main cultivar trials are given in Table 1. The overall yield from Puke and Pania was significantly higher than the other cultivars. All seven cultivars gave good overall yields of 6 t/ha or higher. Ag 2 yielded significantly higher than any other cultivar in early season sowings; Pania and Puke were the highest yielding cultivars in mid season sowings; and Puke, Patea and Swift Cross 1 the highest in late season sowings. Combinations of these cultivars, as well as some with Pania sown early in the season, produced yields of over 7 t/ha. Ag 2, a Unilever cultivar, has restricted availability, so for high yields, Pania could be sown in early season sowings instead. Although the cultivars Patea and Swift Cross 1 did not yield as high as Puke and Pania overall, they do hold a place as quick maturing "catch up" cultivars, particularly in the later part of the season. The promise shown by the cultivar Kuru in earlier studies (Wraight 1976) was not realised in these trials.

Of the cultivars grown in the main cultivar trials for one or two seasons (appendix 1), a proportion gave yields not significantly different to Puke and Pania. The cultivars S102P, WNMA 707, D9407 (Pedago), Arcturus and Aorangi, the last two being multipodded cultivars, are considered sufficiently promising to warrant further consideration. Puget, which was also grown in earlier work (Wraight 1976), yielded inconsistently due to its susceptibility to infection with pea top yellows virus. It was, therefore, not grown in trials after 1977-8.

The cultivars grown in the 1976-7 observation trial (appendix 2) varied considerably. Further details of their performance are available on request.

(b) Takapau Trials

Yields and times of maturity of the eight cultivars grown at Takapau in 1976-7 relative to cv. Pania are given in Table 2. The mean H.R.S. yields of common cultivars for 1976-7 grown at Hastings are included for comparison. The highest yielding cultivars were nearly always the same at both sites. The effect on yield of pea top yellows virus in cv. Puget, which was seriously infected in both sowings at Takapau, can be seen in Table 2.

It is concluded that Puke, Pania and Ag 2, all of which have good processing qualities, are the most suitable vining pea cultivars at present available for Hawkes Bay. Patea and Swift Cross 1 have a place as quick maturing "catch up" cultivars. These five cultivars have resistance or tolerance to pea mosaic and pea top yellows viruses and *Fusarium solani* root rot.

Over the past six years Canterbury 39 and Puget have been widely grown in Hawkes Bay. These studies

TABLE 2: Yield (t/ha) from each sowing time at Takapau and mean for season at Hastings in 1976-7. Days to maturity relative to cv. Pania at Takapau.

Cultivar	Early Sown	Late Sown	Mean	Maturity	Hastings Yield
Pania	6.88	7.53	7.21 a[1]	0	7.47
Canterbury 39	5.99	6.29	6.14 b	+2	7.10
Patea	5.08	6.33	5.71 c	- 5	6.25
Puke	5.19	6.16	5.68 c	- 2	7.55
Early Freezer 61	4.33	5.43	4.88 d	- 7	–
Piri	3.88	5.64	4.76 d	- 1	–
Ajax	3.84	5.57	4.71 d	- 3	5.58
Puget	4.35	4.34	4.35 e	+3	6.63
Mean	4.94 b	5.91 a			

MSD (5%) cultivars x sowing times = 0.84.
[1] Duncans lettering refers to each group of means separately.

have shown that these cultivars are less reliable than Puke, Pania and Ag 2 because of susceptibility to root rot in Canterbury 39 and top yellows in Puget.

The similarity between the Hastings H.R.S. and Takapau trials, both in terms of yield and time of maturity, suggest that results from trials at Hastings H.R.S. could be applied with reasonable confidence throughout the Hawkes Bay process pea growing area.

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REFERENCE

Wraight, M. J. 1976. Assessment of new vining pea cultivars in Hawkes Bay. *Proceedings Agronomy Society of N.Z. 6:* 19-22.

APPENDIX 1: Cultivars and advanced breeding lines grown for one or two seasons in five replicate main cultivar trials.

(a) **Cultivars with yields not significantly different to Puke or Pania**

1976/7	1977/8	1978/9
Swift Cross 4	D9407 (Pedago)	WNMA 707
Elite Cross 3	S102P	Arcturus
Puget	Puget	Aorangi
		S102P
		Piri

(b) **Cultivars with yields lower than Puke or Pania**

1976/7	1977/8	1978/9
Elite Cross 1	D102	Iba Kwartella
Jof	M.S.F.	FP2
Ajax	D.S.F.	Almota
Piri	FP 1	Frila
	FP 2	Mitre
	FWV	
	Swift Cross 4	
	Waverex	
	Rurik	

APPENDIX 2: Cultivars and breeding lines grown in two replicate observation trials in 1976-7.

1. Galaxy
2. Small Sieve Freezer
3. Rurik
4. Cebeco 609
5. Fulmarn
6. Polaris
7. New Victory
8. Waverex
9. Poha
10. Victory Freezer
11. A45
12. 247/70
13. Canterbury 3
14. Puget
15. Ajax
16. Piri
17. Frizette
18. D5 x WM x VF x SSF
19. SSF x 102 x Pania x AFL
20. Karina
21. Vernon
22. Early Freezer 61
23. WM x VF x DSP x AFL