

AN ASSESSMENT OF NEW VINING PEA CULTIVARS IN SOUTH CANTERBURY

C. T. Mortlock and S. H. Manning*
Dalgety AgResearch
Dalgety New Zealand Ltd.,
P.O. Box 622
Timaru

ABSTRACT

Results from vining pea cultivar trials in South Canterbury are reviewed. Many overseas cultivars have proved unsuited to New Zealand conditions. Several cultivars both overseas and New Zealand bred have exhibited some characteristics superior to the standard cultivar Victory Freezer. Of these only four are likely to play a significant part in commercial vining pea plantings in South Canterbury.

INTRODUCTION

Dalgety N.Z. Ltd., have a substantial interest in the production of garden pea seed for sale to processors both in New Zealand and overseas. The cultivar Victory Freezer, of USA origin has been the standard pea used for canning and freezing in New Zealand for many years. It has proved a widely adapted cultivar very suitable for processors requirements although with the increasing intensification of land use in pea growing areas some diseases have affected yields. More sophisticated market requirements have led also to a search for improved ornoleptic characteristics.

In recent years a large number of new cultivars have become available to the pea seed industry. In order to ensure that processor clients are aware, and can make use, of suitable new cultivars we implemented a continuing trial programme to screen and field test likely material. Although the trial results are directly related to South Canterbury conditions, a region growing approximately 15% of New Zealand's process peas, some indication of cultivar performance in other New Zealand regions has been obtained.

Particular emphasis was placed on cultivar resistance to disease, green pea yield and size. Diseases of major concern were pea top yellows virus (PTYV), pea mosaic virus (PMV), downy mildew (*Peronospora viciae*) and powdery mildew (*Erysiphe polygoni*). Yield of green peas was of major concern both from the point of view of economic returns to growers and of efficient utilisation of harvest machinery. Processors have shown increasing interest in smaller, sweeter, green peas which attract a premium on the market. Much effort has therefore been directed to finding cultivars with smaller peas without the normal sacrifice in potential yield.

MATERIALS AND METHODS

Results discussed are from a number of trials conducted by Dalgety AgResearch at Seadown, South Canterbury, over the past five seasons. In this time trial procedures have altered in sample size and number of replications, however the basic framework has remained unchanged. Previously untested material

enters the 'preliminary plot trial,' and if satisfactory results are obtained advances to the 'main plot trial' with greater replication. The final test is the 'block trial' where half hectare blocks of each cultivar are sown and harvested with standard field machinery and processed through a normal factory line.

Management of plots and blocks from sowing to harvest followed standard procedures for the district. Harvest was when each cultivar reached the freezing stage in terms of a tenderometer reading (TR) of 95 - 105. At harvest plants from a predetermined area in each plot were hand pulled and shelled to obtain yield data. Detailed agronomic analysis of each cultivar was determined from plants randomly selected from each plot.

Representative samples of shelled peas of each cultivar were graded to determine sieve grade based on US Department of Agriculture standards.

0 - 1	pass through	7.1	mm
2		7.9	
3		8.7	
4		9.5	
5		10.3	
6		11.1	

Further samples of shelled peas of each cultivar were blanched, frozen and stored for quality assessments. Each sample was assessed for the following factors and scored as below:-

Colour		
1 = poor		10 = excellent
Flavour		
1 = poor		5 = excellent
Sweetness		
1 = poor		5 = excellent.

A quality index figure on a 1 - 20 scale was calculated by adding the scores.

* now Yates Cooper NZ Ltd, Christchurch

RESULTS

Preliminary Trials

Over the five seasons 54 different vining pea cultivars have been entered into preliminary trial. Of these 23 have advanced to main trials. Table 1 depicts average results for those cultivars continued with in main trial and those discarded. Apart from yield, the

averages are very similar, although the range of values obtained tend to differ. Cultivars were rejected from further tests for many reasons among which were; poor yield, short vine length, large sieve size, low quality index or disease susceptibility.

TABLE 1: Preliminary trial results comparing the average of pea cultivars subsequently included in main trials with those discarded

	Vine length cm	Sieve size USDA	Quality index 1-20	Yield as % of standard Victory Freezer
Victory Freezer	53	5.5	13	100
Cultivars included in main trial	54 (42 - 78)	4.6 (3.3 - 5.6)	14 (11 - 18)	137 (86 - 194)
Cultivars discarded	52 (33 - 78)	4.6 (3.1 - 6.2)	13 (9 - 17)	109 (30 - 178)

Range of values obtained are indicated in parentheses

Main Trials

Yields and agronomic comparisons of 14 of the 23 cultivars included in main trials are presented in Table 2. It can be seen that eight cultivars outyielded

Victory Freezer. All but one cultivar was smaller in size than Victory Freezer and the quality index figures were generally comparable.

TABLE 2: Comparison of yield, quality, size and vine length of different pea cultivars in main trials

Cultivar	Number of seasons tested	Vine length cm	Sieve size USDA	Quality index 1-20	Yield as % of standard Victory Freezer
Green Arrow	3	50	5.0	15	131
Vernon	2	65	4.8	14	126
Greenfeast	4	50	5.5	13	122
Puget	5	52	4.4	15	120
Small Sieve Freezer Freezer	1	47	5.0	15	116
CRD 502	2	60	4.6	16	107
Mosaic Resistant Victory Freezer	1	55	5.4	12	104
PI 441	2	45	3.7	14	103
Victory Freezer	5	53	5.5	14	100
Puke	1	46	5.4	14	99
Pania	1	39	5.0	13	87
Poha	1	41	4.7	14	83
Piri	1	53	5.4	15	80
Patea	1	50	5.1	14	78
Others (9)		50	4.7	15	92

Block Trials

Comparisons of the eleven cultivars included are shown in Table 3. Six cultivars outyielded Victory Freezer and these also exhibited satisfactory sieve size

and quality. The poor result obtained with Green Arrow in contrast to its performance in the main trial is due to the difficulty experienced in threshing the crop.

TABLE 3: Comparison of yield, quality and size of different pea cultivars in block trials

Cultivar	Number of seasons tested	Sieve size USDA	Quality index 1-20	Yield as a % of standard Victory Freezer
Vernon	1	4.2	13	169
Puke	1	5.4	15	154
Patea	1	5.2	15	154
Puget	4	4.3	14	146
Greenfeast	2	4.9	13	126
CRD 502	1	5.0	14	117
Victory Freezer	5	5.6	14	100
Green Arrow	2	5.0	14	97
Small Sieve Freezer	1	5.1	14	83
Poha	1	5.0	15	72
Piri	1	5.5	14	72

DISCUSSION

While the screening process continues, the results obtained to date indicate four new cultivars have a place in the vining pea area in South Canterbury. Puget, a cultivar of USA origin has over four seasons shown a consistent yield advantage over Victory Freezer, combined with satisfactory quality factors. However, this cultivar is susceptible to PTYV and severe infection levels in the 1975/76 season have introduced a caution in its use. The cultivar Vernon also of USA origin has given exceptional yields and looks most promising as a commercial vining pea. Quality of this cultivar is at present its only drawback due to its tendency to pale coloured peas. Further selection and breeding work with this cultivar should adequately overcome this problem. The remaining two cultivars showing promise are Puke and Patea, recently released by Crop Research Division, DSIR. Both cultivars show excellent disease resistance, yield potential, and satisfactory quality and agronomic features. As seed becomes available they will most probably play an important role in South Canterbury.

Of the other cultivars tested some have not yet reached the stage of block field tests and recommendations as to their likely potential cannot yet be adequately forecast. These include such promising cultivars as Mosaic Resistant Victory Freezer, PI 441, and Pania.

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