Field Pea Varieties

Tony Leoforte, VIDA (DNRE, Horsham)

Aim: The aim of the Victorian Field Pea Program is to develop improved cultivars of field peas for all regions in southern Australia. New cultivars should have superior yield potential and stability of yield. They should be agronomically acceptable, with emphasis on harvestability. Resistance to Ascochyta Blight is highly desirable. New cultivars should be capable of producing grain of marketable quality.

The white seeded pea Laura performed well and is expected to replace Wirrega in most Victorian regions. Pedigree seed production will continue of the pea lines PSG10, PSG11, PSH3, PSH4, PSH8 and PSH10 as potential cultivar releases. Pedigree seed production will commence in 1997 with PSI5, PSI6 and PSI7. Seed production of the Victorian line PSE23 is being managed by NSW Agriculture, as this line is being considered for release in NSW as a feed grain, forage or hay type pea.

Summary of potential releases for Victoria

PSG10 and PSG11

PSG10 and PSG11 are semi-leafless, semi-dwarf peas with dun type grain. PSG10 and PSG11 are selections from the cross Dinkum x NZ2 made at VIDA. The parent line NZ2 (recently released as the cultivar Mega) is a pea developed by DSIR / Crop and Food Research, New Zealand. Both lines have been evaluated in the Victorian advanced field pea variety testing program and the interstate pea variety trials since 1992. PSG10 and PSG11 have out yielded Dundale by 11% and 5% respectively, in the Wimmera and by 17% and 16 % in the Mallee. They have not shown a yield advantage in the northern, north eastern or south western regions of Victoria.

PSH series (blue and white peas)

The PSH series is comprised of short stature, semi-leafless peas. They are significantly taller and have significantly better standing ability than Bluey. Their good standing ability has attracted considerable interest in Victoria and interstate. The PSH series was developed from crosses made at VIDA with parental lines obtained from public-domain germplasm or developed at VIDA. These lines have been tested in Victorian advanced variety comparisons since 1993.

The blue peas, PSH3 and PSH4, have green splits and are sister lines selected from a complex crossing program, with the final cross made in 1985. PSH3 and PSH4 have out yielded the cultivar Dundale in the Wimmera trials by an average of 9% and 8% respectively and by an average of 13% and 11% in the Mallee.

PSH8 and PSH10 are white seeded (yellow split) peas. They are sister lines selected from a complex crossing program conducted at VIDA, with the final cross made in 1986. PSH8 and PSH10 have out yielded the cultivar Dundale by an average of 4% and 9% respectively in the Wimmera and by an average 13% and 11% respectively in the Mallee.

PSI series

The PSI series is made up of PSI5, PSI6, PSI7. They are also white seeded (yellow split) types. They are sister lines and are also selected from the same cross as PSH8 and PSH10. The PSI series of lines have shown to have particularly good standing ability in Victorian and interstate trials. The PSI lines have been evaluated in the Victorian advanced field pea variety testing since 1994. Their average yields have been superior compared to Dundale (5-6%) in the Wimmera, Mallee (7-12%), north-east Victoria (7-11%) and north Victoria (15-33%).

Quality Evaluations

Quality evaluations were undertaken in collaboration with AFISC and SARDI in South Australia using 1995 seed samples from the Victorian Advanced Field Pea Variety Program. Evaluations for cooking time, crude fibre, de-hulling efficiency, hard seed percentage, hydration capacity, protein content, seed size and tannin concentration revealed no negative quality factors associated with any of the PSG, PSH or PSI lines proposed here for commercial release.

Seed supply
Nucleus seed of the PSG and PSH series was produced by pedigree production procedures. The multiplication rows were tested and found to be free of pea seed borne mosaic virus. Seed multiplication will continue with the view of releasing one or more of each pea type for commercialisation in 1998. Pedigree seed production of the PSI series commenced in 1997.

Further progress in breeding
Selection in the breeding program is continuing for improved yield potential, early flowering, prolonged flowering duration, greater biomass, resistance to Ascochyta Blight and marketability of the grain. Increased emphasis is also being placed on improving resistance to Bacterial Blight, Powdery Mildew and Septoria. A series of 13 superior lines has been identified in multi-location preliminary yield trials in 1996, which have been promoted to the 1997 advanced variety comparisons. Five of these promotions have resistance to pod shattering, a valuable trait in most Victorian pea growing areas.

Summary of potential releases from South Australia
M257.2.1 is a large seeded, semi-leafless white pea (23.5g/100 seeds) is of medium plant height and has good lodging resistance. It is a sister line of M257.7.2, is completely resistant to powdery mildew, is late maturing (similar to Alma and Dun) and has yielded significantly better than Glenroy, Alma and Laura in South Australia. The tentative year of release is 1999. Although a sister line to M257.2.1, **M257.7.2** is a large seeded (22.5g/100 seeds), late maturing blue pea. It has good seed colour retention at harvest and has some resemblance to Jupiter or Progreta, which are tare leafed varieties. M257.7.2 is of medium plant height, has distinct serrated stipules and leaflets and 3 to 5 sets of leaflets (compared to 2 to 2.5 on most normal leafed peas). It appears to have good Ascochyta resistance. Very long, sickle shaped pod and good lodging resistance also make it stand out. It has yielded significantly above Alma, Bluey and Jupiter in South Australia. Its release may be in 1999. With maturity earlier than Dundale and wide adaptation in South Australia, **N20.5** has yielded significantly higher than Alma, Dundale and Dun in South Australia. This dun type has grain size of 25.7g/100 seeds. Increased nodulation and root development were selection criteria. The hopeful time of release is 1999. **P503.3.4** is a large (25g/100 seeds), dun seeded normal leafed tall variety. It matures in mid season, like Dundale, and has yielded significantly higher than Alma, Dundale and Dun in South Australia, which account for 97% of sowings there. The possible release date is 1999.

Results:

1996 and 1997 Birchip Advanced Field Pea Trial Yields (t/ha and % of cultivar Dundale).

	1996 (Warne)		1997 (Birchip)	
	yield	**% Dundale**	**yield**	**% Dundale**
Commercial Line				
Bluey	1.29	67	0.50	140
Bonzer	1.39	72	0.50	140
Dundale	1.94	100	0.36	100
Jupiter	1.42	73		
Laura	2.36	122	0.50	140
Bohatyr			0.50	140
DSIR128.5 (Magnet)			0.47	132
SA lines to be commercialised				
M257.2.1	1.86	96	0.44	124
M257.7.2	1.98	102	0.33	93
N20.5	1.73	89	0.50	139
P503.3.4	1.80	93	0.43	120
Victorian lines to be commercialised				
PSE23 (NSWAG)	-		0.40	112
PSG10	2.00	103	0.63	175
PSG11	1.76	91	0.45	125
PSH 3	1.67	86	0.62	172
PSH 4	1.25	65	0.57	157
PSH 8	1.32	68	0.52	145
PSH10	1.64	85	0.53	147
PSI 5	1.76	91	0.58	162
PSI 6	1.89	97	0.71	197
PSI 7	1.93	100	0.55	154
Advanced breeding lines				
PSJ 1	1.51	78	0.48	133
PSJ 2	1.62	84	0.46	129
P350.2.7	2.33	120	0.45	126
P480.3.4	1.40	72	0.39	109
LSD (P=0.05)	**0.45**		**0.19**	

Birchip Field Day - Wednesday 16 September 1998

Mallee Advanced Field Pea Long Term Comparisons Yields (% Dundale & t/ha) (1990-1996)

	1991-96		1993-96		1994-96	
	% Dundale	**t/ha** (27)*	**% Dundale**	**t/ha** (16)	**% Dundale**	**t/ha** (14)
Commercial lines						
Bonzer	95	2.08	94	1.91	89	1.91
Dundale	100	2.21	100	2.01	100	2.11
Bluey	100	2.16	102	2.02	96	2.01
Laura	105	2.36	101	2.07	107	2.29
Victorian lines to be commercialised						
PSG10			117	2.30	111 (13)	2.29 (13)
PSG11			116	2.30	111	2.34
PSH 3			113	2.24	108 (13)	2.25 (13)
PSH 4			110	2.18	104 (13)	2.18 (13)
PSH 5			112	2.22	108 (13)	2.26 (13)
PSH 8			106	2.14	105 (13)	2.20 (13)
PSH10			117	2.32	111 (13)	2.31 (13)
PSI 5					111 (12)	2.43 (12)
PSI 6					106 (12)	2.34 (12)
PSI 7					107 (12)	2.36 (12)

*=Number of sites

Mallee Advanced Field Pea Long Term Comparisons (1990-1996) Grain Weights (grams/100 seeds)

	Mean (90-96)	**1996** (6)*	**1995** (6)	**1994** (4)	**1993** (5)	**1992** (5)	**1991** (5)	**1990** (7)
Commercial lines								
Bluey	22.7	22.6	24.7	19.2	23.2	22.0	21.5	24.0
Bonzer	22.8	22.5	25.5	19.3	24.0	21.2	21.5	24.0
Dundale	20.9	19.9	23.1	17.4	20.2	21.3	21.0	22.1
Laura	16.4	15.6	18.3	13.4	15.5	16.5	17.2	17.9 (4)
Bohatyr	24.3	23.6 (4)	24.8					
Victorian lines to be commercialised								
PSG10	19.7	19.5	22.3	16.3	20.6	20.1 (1)	-	-
PSG11	20.9	20.3	23.4	17.0	22.1	20.3 (2)	-	-
PSH 3	21.7	22.1	24.3	18.2	20.3 (3)	-	-	-
PSH 4	21.6	22.4	23.8	18.4	20.0 (3)	-	-	-
PSH 5	21.3	22.1	23.4	18.7	19.7 (3)	-	-	-
PSH 8	19.8	19.7	22.0	16.8	19.8 (3)	-	-	-
PSH10	19.5	20.0	21.2	16.0	20.1 (3)	-	-	-
PSI 5	21.0	21.2	21.2	18.2 (1)	-	-	-	-
PSI 6	20.8	20.3	21.8	18.5 (1)	-	-	-	-
PSI 7	20.4	20.0	21.2	17.6 (1)	-	-	-	-

***=**Number of trials

Wimmera Advanced Long Term Yields (% Dundale & t/ha) and Grain weights (grams/100 seeds)

	1991-96		1993-96		1994-96		Grain weight long term
	%Dundale	t/ha (31)*	%Dundale	t/ha (21)	%Dundale	t/ha (16)	g/100 seeds (38)
Commercial Lines							
Alma	102	2.65	103	2.41	101	2.44	20.5
Bonzer	93	2.41	95	2.24	95	2.30	23.4
Dun	105	2.74	104	2.44	103	2.47	21.0
Dundale	100	2.61	100	2.36	100	2.43	20.6
Wirrega	94	2.51	93	2.19	94	2.27	16.0
Bluey	98	2.56	99	2.34	99	2.43	22.4
Laura	106	2.79	105	2.46	106	2.57	16.4 (37)
Victorian lines to be commercialised							
PSG10			113	2.67	110	2.69	19.8 (28)
PSG11			-	-	-	-	22.6 (17)
PSH 3			111	2.68	111	2.72	21.4 (22)
PSH 4			110	2.65	109	2.66	21.6 (22)
PSH 8			106	2.53	105	2.56	20.0 (22)
PSH10			110	2.66	109	2.68	19.7 (22)
PSI 5					107	2.66	21.6 (15)
PSI 6					104	2.59	21.6 (15)
PSI 7					108	2.70	20.7 (15)

*****=Number of sites