

Evaluation of Special Purpose Field Pea Cultivars

Project #2000CR16

**Final Report
2003**

**Farming For the Future
On Farm Demonstration Project**

Alberta Pulse Growers Commission - Zone 2

Submitted by

Don Boles, President, APGC - Zone 2, Three Hills

Mark. A. Olson, AAFRD, Provincial Pulse Extension Specialist, Edmonton

Ken. J. Lopetinsky, AAFRD, Pulse Research Agronomist, Barrhead

Ed Zwambag, Ag-Quest (Alta) Inc., Lacombe

Table of Contents

I. Key Results And Conclusions.....	2
II. Background.....	3
III. Objectives.....	3
IV. Project Plan Or Method Used	
i) Treatments.....	3
ii) Replications.....	3
iii) Plot size/# annual per rep.....	4
iv) Experimental design.....	4
v) Site directions.....	4
vi) Soil characteristics.....	4
vii) Herbicides applied.....	4
viii) Cropping history.....	5
ix) Climate information.....	5
V. Data Collected &Analysis.....	6
Table 1. Special Purpose Pea Trial – Lacombe.....	6
Table 2. Special Purpose Pea Trial – Three Hills.....	7
Table 3. Special Purpose Pea Trial – Provincial Yield Summary (1999-2003).....	8
VI. Discussion Of Results:.....	9
i) Special Purpose Pea Types And Market Potential.....	9
ii) Marketability And Price.....	11
Table 4. Price Matrix; % Yield Of Check Varieties And \$/Bushel Required.....	12
VII. Conclusions.....	12
VIII. Extension.....	13
IX. Recommendations/Acknowledgements.....	13
X. References.....	14
XI. Appendices.....	15
a) Special Purpose Pea Trial Summary of Agronomic Data – 2003 – Westlock.....	15
b) Special Purpose Pea Trial Summary of Agronomic Data – 2003 – Namao	16
c) Special Purpose Pea Trial – 2003 – Two Locations in Zone 3	17
d) Special Purpose Pea Trial (Partial Test) – 2003 – BRRG.....	18
e) Special Purpose Pea Trial (Partial Test) – 2003 – CARA.....	19
f) Evaluation of Special Purpose Field Pea Cultivars in Alberta: 1999-2003 Poster.....	20

Alberta Agricultural Research Institute
On-Farm Demonstration Program

Project Number: #2000CR16
Project Name: Evaluation of Special Purpose Field Pea Cultivars
Project Coordinator: Mark Olson, Provincial Pulse Extension Specialist
Project Cooperator: Alberta Pulse Growers Commission Zone 2
Date Submitted/Finalized: _____

Progress Report

Interim Report

Final Report

Year 3 of 3rd year project.

(1,2,3)

(1st, 2nd, 3rd)

I. Key Results and Conclusions

In 2003, sixteen (16) special purpose field pea cultivars and two common grain checks were grown at Lacombe and Three Hills. In addition, two near identical sites were grown at Westlock and Namao through Zone 3 of the Alberta Pulse Growers (see Appendices a and b). Last, two smaller, partial tests were conducted at Castor – Battle River Research Group (BRRG) and Hanna – Chinook Applied Research Association (CARA). All additional sites results are included in the appendices for information purposes.

Yields at Lacombe and Three Hills ranged 52% to 130% of the check cultivar Espace. Environmental conditions at the two sites differed slightly, and as a result, so did the performance of the special purpose cultivars. The cultivars CDC Maple (107%), and Black eye yellow (112%) yielded higher than the check variety Espace in Lacombe. At the Three Hills location, CDC Maple (130%), Black eye yellow (108%), CDC Sonato (113%) and AC Nugget (108%) yielded higher than the check, Espace. Of note for the 2003 growing season, is that many of the high yielding varieties grown under dry conditions are more indeterminate and taller varieties than the check cultivar Espace.

Although yield, a lot of the time, determines whether a cultivar is worth growing, general plant characteristics can be equally important for farmers assessing which variety to grow. In the case of special purpose pea varieties, quality is critical for many of the niche markets that the product is being sold into. Other agronomic traits assessed in this project were plant emergence, 1st flower (days-1st Flower (Days) represents the number of days from seeding when 50% of the plants per plot have one open flower), plant height, maturity, standability, and seed size).

The only changes in experimental design for the year was the fact that some cultivars of special purpose pea were not available in 2003, therefore there were fewer cultivars tested. Zone 3 of the Alberta Pulse Growers also tested special purpose pea and the full hard copy of this report is available at the Alberta Agriculture Research Institute (AARI) through Joan Unger.

II. Background

The Alberta Pulse Growers Commission Zone 2 is very interested in new pea types to further pulse diversification in south central Alberta. The opportunity to diversify is based on the cyclical nature of commodity prices. AAFRD has focused on crop diversification as an integral component of the further development of agriculture within the province. Field pea is well suited to the region, but presently only yellow and green peas are grown. Other pea types are grown in parts of Western Canada and around the world. Marrowfat, white and orange cotyledon types, maples, black-eyed pea and others are available, but may not yield as high. This project was designed to assess special purpose pea cultivars, and generate information on relative performance to standard yellow and green cultivars to provide niche opportunities.

III. Objectives

The following objectives were set out for this project:

- 1) Establish a special purpose field pea trial at two locations in co-operation with various interested companies. A maximum of 20 niche varieties were included.
- 2) Evaluate the performance and agronomic characteristics and compare to well-adapted, high yielding yellow and green check cultivars.
- 3) Assess potential returns and required price for these niche-type cultivars compared to the check cultivars.
- 4) Evaluate marketing potential of these new cultivars and possible tonnage requirements.

The ultimate objective was to find niche type special purpose cultivars to further expand the market ability and diversification of the pulse industry in the Zone 2 area.

IV. Project Plan or Method Used

i) Treatments

A total of 16 special purpose pea cultivars, and a green and yellow common grain check cultivars, were seeded at the Lacombe and Three Hills sites. The check varieties were Espace (green) and Integra (yellow).

ii) Replications

The project was conducted as a four replicate randomized complete block design (RCBD) in order to statistically analyze yield results. Other agronomic characteristics monitored were emergence (%), 1st flower (days), plant height (cm), maturity, standability, and seed size.

The varieties were seeded according to proper agronomic practices including 30 lbs/acre of 11-52-0 applied with the seed, use of granular inoculant, as well as proper weed control.

iii) Plot Size/# Annual Per Rep

Each sub plot was six rows (1.2m) with a plot length of 5.5 m (18 feet), row spacing 22 cm (8.5”) and a harvested area of 6.6 m². The variety Samson had mechanical damage and poor germination and lower plant emergence %.

iv) Experimental Design

A four replicate randomized complete block design.

v) Site location:

Lacombe – NE-34-40-27-W4

Three Hills – NW-23-32-24-W4

vi) Soil Characteristics

Site	Soil Order	Soil Series & Texture	Description
Lacombe	Grey wooded and Degraded Black soil	<ul style="list-style-type: none"> ▪ Falun loam (75%) and Breton loam (25%) - gravelly phase. ▪ Sand 24%, silt 51.9%, clay 24.1% 	<ul style="list-style-type: none"> ▪ Soils developed on glacial till ▪ Hilly ▪ Stones
Three Hills	Dark brown	<ul style="list-style-type: none"> ▪ Silty clay, sand 17.6%, silt 40.6%, clay 41.8% 	<ul style="list-style-type: none"> ▪ Transported uniform deposition, medium to heavy texture ▪ Stones few to rare (lacustrine or eolian) ▪ Non saline ▪ Fairly good to good drainage

2003 Estimated Nutrients Available (lbs/acre) 0-6" depth

Site	Nitrogen	Phosphorus	Potassium	Sulfur	O.M.% 0-6"	pH 0-6"	E.C. 0-6"
Lacombe	38	>120	>1200	26	3.9	6.0	0.18
Three Hills	94	54	997	60	5.5	6.7	1.28

Applied 11-52-0 at 30 lbs/acre of product with the seed. LiphaTec Nitragin granular inoculant was mixed with the fertilizer and applied at 10 lbs/acre with the seed.

vii) Herbicides Applied

The herbicides applied varied somewhat across the sites depending on the cooperators’ practices and weed spectrum present. All sites had a pre-seeding burndown, a practice commonly used in direct seeding. The objective was to ensure that weed competition did not affect yield.

Site	Pre-Seeding Herbicides Applied	Post -Emergent Herbicide Applied
Lacombe	Edge spring applied (May 1 st),	Select (June 6 th)
Three Hills	Edge fall applied, TransOrb (post seeding-May 20 th)	Odyssey (June 26 th)

Note: unless indicated, the herbicide products had been applied as per the manufacturers recommended rate.

viii) Cropping History

Lacombe - previous crop barley

-seeded on May 12th, Reglone applied on August 19th, harvested on August 22nd.

Three Hills -previous crop barley

-seeded on May 14th, Reglone applied on August 25th, harvested on September 12th.

ix) Climate Information:

Growing Season Precipitation (mm)** <i>April 1 to August 3, 2003</i>		
	Total	30 Year (Average)
Lacombe	194.0	253.0
Three Hills	162.0	198.0

Growing Degree-Days Above 5°C** <i>April 1 to August 3, 2003</i>		
	Total	30 Year (Average)
Lacombe	860.0	816.0
Three Hills	966.0	892.0

** Unverified preliminary data from Environment Canada. This information does not reflect environmental conditions prior to seeding and post harvest. The spring of 2003 was by all accounts a very dry spring in Alberta. The total growing season precipitation was 77% of the 30-year average for Lacombe and 82 % of the 30-year average for Three Hills. The growing degree-days for Lacombe were 105% of the 30 year average. The growing degree-days at Three Hills were 108% of the 30-year average.

V. Data Collected & Analysis

The data collected is summarized in Tables 1, 2, and 3. Table 3 is a yield comparison of all special purpose field pea cultivar sites in the province in 2003, as well as across all years.

**Table 1. 2003 Special Purpose Pea Trial - Lacombe
Summary of Agronomic Data
Co-operator: AgQuest**

Type	Emergence (% Stand)	1 st Flower (Days) ³	Height (cm)	Maturity Rating	Standability (1-9) ⁴	Kernel Weight g/1000	Yield lbs/acre ⁵
Black eye green	93	53	47	medium	6	226	1642 cde ¹
Black eye yellow	96	53	63	med-early	5	182	2213 a
CDC Maple	98	63	54	medium	6	178	2122 a
CDC Sonato	92	60	73	med-late	6	267	1630 cde
Ceb 1487	75	57	50	med-early	6	239	1407 e
AC Nugget	81	59	69	Late	3	-	1024 f
Courier	93	60	62	med-early	8	225	1721 bcd
Espace	96	58	58	med-early	3	197	1973 ab
Integra	94	57	73	med-early	3	257	1744 bc
Perf 4010	94	63	101	Late	8	144	1477 de
QAS 1478	97	56	62	med-early	3	235	1812 bc
Racer	96	52	53	medium	6	203	1694 cd
Samson ²	38	59	57	medium	5	380	390 g
SDS Orange	91	56	56	med-early	5	270	1771 bc
Solido	90	52	66	med-early	5	345	1389 e
U30 orange	96	58	63	early	3	233	1868 bc
U33	81	57	64	med-early	5	162	1760 bc
White pea	93	57	53	medium	5	269	1832 bc
Site Ave.							
LSD							233.0
C.V.%							10.05

¹-a,b...- yields followed by the same letter are not statistically different.

²- Samson GMF had 47% mechanical seed damage. As a result, emergence, plant stand and yield were poor.

³- 1st Flower (Days) represents # of days from seeding when 50% of the plants per plot have one open flower.

⁴- Standability scale (1-9) 1 = perfectly upright, 9 = flat.

⁵- Yield, lbs/acre is adjusted to 16% moisture

Table 2.

2003 Special Purpose Pea Trial – Three Hills
Summary of Agronomic Data
Co-operator: Don Boles

Type	Emergence (% Stand)	1 st Flower (Days) ³	Height (cm)	Maturity Rating	Standability (1-9) ⁴	Kernel Weight g/1000	Yield lbs/acre ⁵
Black eye green	93	58	57	medium	5	272	1853 cde ¹
Black eye yellow	95	56	67	med-early	5	218	2271 b
CDC Maple	91	64	64	medium	5	186	2734 a
CDC Sonato	93	64	84	med-late	7	281	2370 b
Ceb 1487	94	57	60	med-early	4	287	2088 bc
AC Nugget	91	63	91	Late	7	160	2277 b
Courier	90	63	62	med-early	6	253	1999 bcd
Espace	93	58	71	med-early	2	239	2102 bc
Integra	95	58	72	med-early	2	280	1699 de
Perf 4010	91	64	102	Late	8	161	1815 cde
QAS 1478	93	59	69	med-early	2	270	1683 de
Racer	86	57	59	medium	5	250	927 f
Samson ²	71	60	67	Medium	5	349	718 f
SDS Orange	94	58	60	med-early	5	288	1788 cde
Solido	94	54	65	med-early	3	334	1540 e
U30 orange	94	59	69	early	2	278	1748 cde
U33	83	58	64	med-early	5	162	1604 e
White pea	93	57	51	medium	4	293	1628 de
Site Ave.							
LSD							335.0
C.V.%							13.0

¹ -a,b... - yields followed by the same letter are not statistically different.

² - Samson GMF had 47% mechanical seed damage. As a result, emergence, plant stand and yield were poor.

³ - 1st Flower (Days) represents # of days from seeding when 50% of the plants per plot have one open flower.

⁴ - Standability scale (1-9) 1 = perfectly upright, 9 = flat.

⁵ -Yield, lbs/acre is adjusted to 16% moisture

**Table 3. Special Purpose Pea Trial – Provincial Yield Summary (1999 – 2003)
Data -Overall Comparison Between Special Purpose Pea Yields
(As a Percent of Espace) - Various Locations Throughout Alberta**

Treatment Name	Previous Years				2003 Site Data				
	1999 Average% (2 sites)	2000 Average% (5 sites)	2001 Average % (8 sites)	2002 Average % (2 sites)	Westlock%	Namao %	Three Hills %	Lacombe %	2003 Average % (4 sites)
AC Nugget	n/a	n/a	n/a	n/a	n/a	n/a	108	52	80
Big Daddy	n/a	n/a	n/a	n/a	94	85	n/a	n/a	90
Black Eye Green	98	93	84	90	109	115	88	83	99
Black Eye Yellow	94	83	81	101	102	108	108	112	108
Brown Marrowfat	97	93	80	88	102	104	73	70	87
Canseed – 1	64	48	73	n/a	n/a	n/a	n/a	n/a	n/a
CDC Maple	n/a	n/a	88	107	87	114	130	108	110
CDC Sonata	n/a	n/a	84	89	93	110	113	83	100
Ceb 1224	84	80	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ceb 1487 Orange	n/a	n/a	92	90	98	129	99	71	99
Courier	72	80	87	93	76	108	95	87	92
Espace	100	100	100	100	100	100	100	100	100
Integra	84	95	91	85	101	100	81	88	93
Orange pea	65	87	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Perf 4010	n/a	n/a	78	90	79	92	86	75	83
QAS Orange – 1478	n/a	n/a	96	103	102	106	80	92	95
Racer	85	80	66	98	67	110	44	86	77
Sampson	n/a	75	81	77	89	96	34	20	60
SDS Orange	n/a	n/a	85	89	95	114	85	90	96
U18 GMF	n/a	61	66	n/a	n/a	n/a	n/a	n/a	n/a
U28 GMF	n/a	74	78	n/a	n/a	n/a	n/a	n/a	n/a
U30 Orange	n/a	101	100	102	110	110	83	95	100
U33 Green	n/a	n/a	50	63	70	65	76	89	75
U36 GMF	n/a	75	83	n/a	n/a	n/a	n/a	n/a	n/a
White Pea	97	101	103	103	103	118	77	93	98
n/a-variety not available for specific year or site									

VI. Discussion of Results

i) Special Purpose Pea Types and Market Potential

Following is a brief discussion of the pea cultivars tested in 2003. The market use descriptions for the special purpose pea cultivars are based on discussions with exporters. Most of these cultivars are NOT REGISTERED to date and require production contracts. The author of this report would like to acknowledge Ken Lopetinsky, provincial pulse agronomist, for the following varietal descriptions of the special purpose field pea cultivars.

Espace (Check)

A medium small green pea (215 g/1,000 seeds) with excellent standability and good yield potential. Formerly the check cultivar for green pea Regional Test Program(1999-2001). Contact company is Cebeco Seeds, Vlijmen, Netherlands.

Integra (Check)

A large yellow pea (280 g/1,000 seeds) with excellent standability and good yield potential. Contact company is Cebeco Seeds, Vlijmen, Netherlands.

QAS Orange 1478

A medium sized (269g/1,000 seeds) cultivar with an orange cotyledon. Seeds are smooth and round, the variety has potential as a substitute in or to extend markets using split red lentil. Contact company is Quality Assured Seeds.

CEB 1487 Orange

Yields 9% higher than Carneval, 2% higher than CDC Mozart and 2% lower than Carrera. This semi-leafless orange cotyledon pea has a 243 g/1,000 seed weight and a similar maturity to Carrera. It is two days earlier than Carneval and three days earlier than CDC Mozart. Seeds are round and smooth. This variety tends to yield higher in wetter areas. The contact company is Walker Seeds.

SDS Orange

Semi-leafless, large sized (270 g/1,000 seeds) cultivar with an orange-red cotyledon. Potential as a substitute in or to extend markets using split red lentil. Cebeco Seeds, Vlijmen, Netherlands.

CDC Maple

This small seeded pea (143g/1,000 seeds) is a maple type pea cultivar. This variety is powdery mildew resistant and has recently been renamed **CDC Acer**. Contact company is Crop Development Center in Saskatoon.

CDC Sonata

A medium sized (220g/1,000 seeds) forage type pea cultivar. This variety has a medium to late maturity and it is also powdery mildew resistant. Contact company is Crop Development Center in Saskatoon.

Courier

A medium small seed size (200 g/1,000 seeds) maple type with potential for the pigeon market. Contact company is Canterra Seeds Ltd.

QAS GMF 1223(Samson)

This large seeded (350 g/1,000 seeds) marrowfat is high yielding and displays good lodging resistance. Samson is a variety with medium maturity that yields 8% higher than Guido and the semi-leafless nature of the plant ensures a quick and uniform dry down. This variety is in demand and can command an attractive selling price in the Asian roasted snack pea market. Contact company is Quality Assured Seeds.

Racer

Medium small seed size (180 g/1,000 seeds) maple type with potential in the pigeon pea market. Contact company is Cebeco Seeds, Vlijmen, Netherlands.

Black Eye Green

A small sized (150 g/1,000 seeds) semi-leafless white flowered type with green cotyledon and a black hylum. Potential as an addition with other pea types for parfait soup mixes and as a replacement for black eyed bean in various parfait mixes. Contact company is Cebeco Seeds, Vlijmen, Netherlands.

Black Eye Yellow

A medium small (215 g/1,000 seeds) semi-leafless white flowered type pea with a yellow cotyledon and a black hylum. Potential similar to black eye green. Contact company is Cebeco Seeds, Vlijmen, Netherlands.

White Pea

Large sized (280 g/1,000 seeds) semi-leafless white flowered type with high potential as a chickpea substitute in India and other countries. Mainly a whole pea market type that can be decorticated. Contact company is Cebeco Seeds, Vlijmen, Netherlands.

Solido (Brown Marrowfat)

A very large sized (340 g/1,000 seeds) semi-leafless brown marrowfat that has potential as a substitute for peanuts in peanut butter. Also has potential in the starch market. Contact company is Cebeco Seeds, Vlijmen, Netherlands.

Perf 4010

Small seeded (145g/1,000 seeds) silage type pea cultivar. This maple type is late maturing and has poorer standability compared to the common grain types. Contact company is Quality Assured Seeds.

Canseed – 1

A very small sized (110 g/1,000 seeds) normal leaf type; useful for biomass production for silage or plow down. Has potential in mixtures with cereals such as triticale. Contact company is Bill Leshner, Clive, Alberta.

Radke GMF

A large sized (286 g/1,000 seeds) semi-leafless green marrowfat with medium maturity. Large sized green marrowfats are primarily reconstituted (canned and used for mushy pea in England). They are also roasted and puffed for snack food. Contact company is Radke Seed Farms.

U18 GMF

A very large sized (342 g/1,000 seeds) normal leafed green marrowfat with medium maturity. Large sized green marrowfats are primarily reconstituted (canned and used for mushy pea in England). They are also roasted and puffed for snack food. Contact company is Klempnauer Seeds / Columbia Seeds Co. Ltd.

U28 GMF

A very large sized (356 g/1,000 seeds) semi-leafless green marrowfat with medium-late maturity. Large sized green marrowfats are primarily reconstituted (canned and used for mushy pea in England). They are also roasted and puffed for snack food. Contact company is Klempnauer Seeds / Columbia Seeds Co. Ltd.

U30 Orange

A large sized (260 g/1,000 seeds) semi-leafless white flowered pea cultivar with an orange cotyledon. Potential as a substitute in or to extend markets using split red lentil. Contact company is Klempnauer Seeds / Columbia Seeds Co. Ltd.

U36 GMF

A large sized (272 g/1,000 seeds) semi-leafless green marrowfat with medium maturity. Large sized green marrowfats are primarily reconstituted (canned and used for mushy pea in England). They are also roasted and puffed for snack food. Contact company is Klempnauer Seeds / Columbia Seeds Co. Ltd.

U33 Green

A small seeded (145g/1,000 seeds) processing pea cultivar. Seeds are wrinkled and blocky, with green cotyledon. Contact company is Klempnauer Seeds / Columbia Seeds Co. Ltd.

AC Nugget

A small seeded yellow silage pea. Developed by Agriculture and Agri-Food Canada.

ii) Marketability and Price

The 2003 trials suggest that the majority of the special field pea cultivars yield less than the green and yellow checks. To equal the returns of the standard yellow and green pea varieties currently grown in Western Canada, a premium for special purpose cultivars will be needed to entice farmers to grow these new types. Below is a price matrix based on conventional pea types – green and yellow. Farmers utilizing this matrix should be aware this is the price per bushel to equal returns for conventionally grown types (Table 4). A premium over and above the prices calculated in this matrix will be needed to offset risk of some cultivars due to poor standability, difficulty of harvest, late maturity, slower movement of product off the farm, and possibly later

payment for product. The author of this report would like to acknowledge Ken Lopetinsky, pulse research agronomist, for the development of this price matrix .

Table 4. Price Matrix; % Yield of Check Varieties and \$/Bushel Required

	Green and Yellow Field Pea Prices							
		\$7.50	\$7.00	\$6.50	\$6.00	\$5.50	\$5.00	\$4.50
% Yield of Check Varieties	50	15.00	14.00	13.00	12.00	11.00	10.00	9.00
	55	13.63	12.72	11.82	10.91	10.00	9.09	8.18
	60	12.50	11.66	10.83	10.00	9.17	8.33	7.50
	65	11.53	10.76	10.00	9.23	8.46	7.69	6.92
	70	10.71	10.00	9.29	8.57	7.86	7.14	6.43
	75	10.00	9.33	8.67	8.00	7.33	6.67	6.00
	80	9.37	8.75	8.13	7.50	6.88	6.25	5.63
	85	8.82	8.23	7.65	7.06	6.47	5.88	5.29
	90	8.33	7.77	7.22	6.67	6.11	5.56	5.00
	95	7.89	7.37	6.84	6.32	5.79	5.26	4.74

Adapted from K.J. Lopetinsky 2000.

VII. Conclusion

This year concludes research testing of special purpose field pea in Alberta. Special purpose pea cultivars continue to have limited acreage in Alberta. Currently, Mountain Meadow Foods uses the brown marrowfat (Solido) to produce allergy free pea butter (substitute for peanut butter). The green marrowfats are also utilized by Alberta companies in snack foods (similar to roasted hot(wasabi) green peas, or coated green pea). Marrowfats may be also exported for mushy pea as an accompaniment to fish and chips in England.

The quality of the crop when growing special purpose pea is paramount. There were (21) site years of special purpose pea grown from 1999-2003. Cultivar response, a lot of the times, was linked closely to the environmental conditions. For example, under the dry conditions of the last few years, the late more indeterminate types (silage pea) performed well.

There were a number of cultivars that performed consistently over the years in term of yield; white pea (93-103%), U30 Orange(100-102%) and Orange 1478(95-103%) compared to the check Espace.

VIII. Extension Activities

The 2003 field days and /or plot tours were:

- ✓ Three Hills -Alberta Pulse Growers (Zone 2) on July 2, (30) farmers.
- ✓ Hanna –CARA’s annual field day on July 16, (30) farmers.
- ✓ Castor-BRRG on August 6, (12) farmers.

The OFD projects, including this project “Evaluation of special purpose field peas in south central Alberta”, were discussed at the APGC Zone 2 annual meeting held at Three Hills on December 3, 2003.

A scientific poster developed by Ken Lopetinsky and Sheryl Strydhorst was updated with 2003 data and displayed at the; APGC Zone 2 and 3 Annual Meetings held at Three Hills and Westlock on December 3 and 1, respectively, Saskatchewan Crop Week (Saskatoon, Jan 11-13), Agronomy Update (Red Deer, Jan 13-14), FarmTech 2004(Edmonton, Jan 27-30), and Peace Country Agronomy Update (Fairview, March 24).

There continues to be requests for this OFD report by pulse growers.

IX. Recommendations/Acknowledgments

It is recommended that when growers are approached by companies for contract production of special purpose pea they investigate the cultivar(s) thoroughly and push the company representative for as much information as possible. A premium compensation to the farmer for growing these varieties is absolutely necessary, as many special purpose pea have weaker agronomic attributes which require a higher level of management. Poor standability and disease resistance (ie. no powdery mildew resistance) make obtaining the high quality demanded by the processor more difficult than growing a conventional grain variety. The lower yields of these cultivars, in many instances, make for poor economics for average to below average field pea growers. Farmers must not only obtain the equivalent price as conventional grain varieties based on the lower yield (see price matrix Table 4), but be compensated for the extra effort above and beyond.

Alberta Pulse Growers Commission Zone 2 would like to acknowledge Ed Zwambag and the AgQuest crew for their efforts in making a successful 2003 research season. Good data taking, although tedious at times, is an extremely important component of research, and without it, there would be no meaningful results.

Thank you to Ken Lopetinsky, AAFRD pulse research agronomist, for taking the leadership role in this research on special purpose field pea cultivars. Ken and his technical staff did the seed set up for the six locations in 2003. He was also responsible for Table 3, the multiple locations site summary across the province, and development of the price matrix Table 4.

The directors of APGC Zone 2 and the project coordinator, Mark Olson, would like to thank the Alberta Agricultural Research Institute (AARI), in particular Alan Hall, for renewing this project to allow for its completion.

A big thank you to Don Boles, the cooperater, for providing his land for the trial at Three Hills. Also, our gratitude to AgQuest for providing land at their research station just west of Lacombe.

X. References

Battle River Research Group.2003. Annual Report. 2003. pp. 16-21.

Buss, T. and Bjorklund, R.. 2000. Evaluation of niche market field pea cultivars. Project #2000NE07 Farming for the Future, On Farm Demonstration Year 1 progress report.

Buss, T. and Bjorklund, R. 2001. Evaluation of niche market field pea cultivars. Project #2000NE07 Farming for the Future, On Farm Demonstration Year 2 progress report.

Chinook Applied Research Association Annual Report. 2003. Annual Report. pp. 58-65.

Lopetinsky, K. J. 1999. Evaluation of special purpose field pea cultivars. Project # NW01. Farming for the Future, On Farm Demonstration Year 1 report.

Lopetinsky, K. J. 2000. Evaluation of special purpose field pea cultivars. Project # NW01. Farming for the Future, On Farm Demonstration Year 2 report.

Lopetinsky, K. J. 2001. Evaluation of special purpose field pea cultivars. Project # NW01. Farming for the Future, On Farm Demonstration final report.

Lopetinsky, K. J. 2002. Evaluation of special purpose field pea cultivars. Project # NW01. Farming for the Future, On Farm Demonstration final report.

Lopetinsky, K. J. 2003. Alberta Pulse Grower Zone 3 Research and Demonstrations Summary. pp. 18-27.

Olson, M, A. 2001. Evaluation of special purpose field pea cultivars. Project # 2000CR16. Farming for the Future, On Farm Demonstration Year 1 report.

Olson, M, A. 2002. Evaluation of special purpose field pea cultivars. Project # 2000CR16. Farming for the Future, On Farm Demonstration Year 2 report.

XI. Appendices

a) Special Purpose Pea Trial Summary of Agronomic Data – 2003 -Westlock,

Co-operator: Wes Latimer

Variety	Days to Flower (Days)	Plant Height (cm)	Days to Maturity ³ (Days)	Standability (1-9) ²	1000 KWT g/1000 seeds	Yield (kg/ha)
	Average of 4 Replications					
Black Eye Green	53	66	95	7	248 fg	4965 a ¹
Black Eye Yellow	53	80	95	6	222 h	4641 b
CDC Maple	62	81	98	6	160 j	3953 f
CDC Sonata	59	99	97	6	254 f	4212 def
Ceb 1487 Orange	52	66	94	6	243 g	4441 bcd
Ceb GMF (Big Daddy)	58	90	98	5	312 c	4250 de
Courier	61	75	98	6	228 h	3447 g
Espace	55	74	95	6	226 h	4542 bc
Integra	52	84	93	4	267 e	4591 b
Perf 4010	61	123	98	5	145 k	3592 g
QAS Orange – 1478	56	82	95	5	264 e	4626 b
Racer	51	65	97	7	202 i	3053 h
Sampson	55	75	98	7	376 a	4042 ef
SDS Orange	52	61	94	7	289 d	4300 cde
Solido	45	81	94	5	344 b	4647 b
U30 Orange	55	77	95	5	265 e	4980 a
U33 Green	54	70	95	7	129 l	3166 h
White Pea	54	65	96	6	290 d	4692 b
Site Average	55	79	96	6	248	4230
LSD					6.53	255.88
C.V.%					3.94	9.04

¹ - a,b... -yields followed by the same letter are not statistically different

² - Standability scale: 1=perfectly upright, 9=flat (measured 103 days after seeding)

³ -Days to flower-10% of plants have a first flower fully opened

**b) Special Purpose Pea Trial Summary of Agronomic Data – 2003 - Namao
Co-operator: Doug Craig**

Variety	Days to Flower (Days)	Plant Height (cm)	Days to Maturity (Days)	Standability (1-9) ²	1000 KWT (g/1000 seeds)	Yield (kg/ha)
	Average of 4 Replications					
Black Eye Green	52	55	95	6	277 fg	5064 bc ¹
Black Eye Yellow	52	66	93	7	225 i	4730 ef
CDC Maple	61	66	97	7	161 l	4995 bcd
CDC Sonata	55	78	98	7	245 h	4845 cde
Ceb 1487 Orange	52	57	94	5	274 g	5659 a
Ceb GMF (Big Daddy)	55	69	98	4	338 c	3754 j
Courier	58	62	97	5	245 h	4753 ef
Espace	54	59	94	5	246 h	4395 gh
Integra	53	65	93	4	283 f	4393 gh
Perf 4010	59	108	98	4	171 k	4027 i
QAS Orange - 1478	55	60	94	4	282 f	4678 ef
Racer	49	54	96	6	205 j	4814 de
Sampson	55	60	98	7	388 a	4202 hi
SDS Orange	52	59	94	6	294 e	5027 bcd
Solido	46	62	95	5	376 b	4572 fg
U30 Orange	55	57	95	4	293 e	4842 cde
U33 Green	55	51	97	6	153 m	2874 k
White Pea	54	57	95	4	309 d	5181 b
Site Average	54	64	96	5	264	4600
LSD					5.98	206.23
C.V.%					3.38	6.70

¹ -a,b,... - yields followed by the same letter are not statistically different

² - Standability scale: 1=perfectly upright, 9=flat (measured 103 days after seeding)

**c) Special Purpose Pea Trial – 2003 – Two Locations in Zone 3, Alberta
Overall Comparison of Agronomic Data (As a Percent of Espace)**

Variety	Days to Flower (# Days)	Plant Height (cm)	Days to Maturity (# Days)	Standability (1-9) ²	1000 kwt (g/1000 seeds)	Yield (kg/ha)	Yield as % of Espace
Average of Westlock and Namao Sites							
Black Eye Green	53	61	95	7	263	5015	112%
Black Eye Yellow	53	73	94	7	224	4686	105%
CDC Maple	62	74	98	7	161	4474	100%
CDC Sonata	57	89	98	7	250	4529	101%
Ceb 1487 Orange	52	62	94	6	259	5050	113%
Ceb GMF new	57	80	98	5	325	4002	90%
Courier	60	69	98	6	237	4100	92%
Espace	55	67	95	6	236	4469	100%
Integra	53	75	93	4	275	4492	101%
Perf 4010	60	116	98	5	158	3810	85%
Qas Orange-1478	56	71	95	5	258	4652	104%
Racer	50	60	97	7	204	3934	88%
Sampson	55	68	98	7	382	4122	92%
SDS Orange	52	60	94	7	292	4664	104%
Solido	46	72	95	5	360	4610	103%
U30 Orange	55	67	95	5	279	4911	110%
U33 Green	55	61	96	7	141	3020	68%
White Pea	54	61	96	5	300	4937	110%
Overall Average	54	71	96	6	256	4415	99%

¹ - a,b ...-yields followed by the same letter are not statistically different

² - Standability scale: 1=perfectly upright, 9=flat

³ -Days to flower-10% of plants have a first flower fully opened

**d) Special Purpose Pea Trial (Partial test) 2003 – BRRG
Summary of Agronomic Data
Castor (Battle River Research Group)^{3,4}**

Type	Yield (bu/acre)	Plant Height (cm)	Canopy Height (cm)	Standability (1-9) ¹	Kernel Weight g/1000
CDC Maple	30.7 a	39.2	28.2	1.8	156
AC Nugget	29.6 ab	46.0	28.2	3.5	145
Solido	29.3 abc	50.0	37.7	1.0	312
White pea	29.2 abc	40.2	34.5	1.5	239
Perf 4010	28.1 abc	66.7	26.5	5.3	141
Black eyed yellow	28.0 abcd	46.8	30.2	2.8	177
Espace	27.0 bcde	51.2	45.2	1.0	191
Orange pea	26.5 cde	48.3	41.3	1.0	230
Integra	25.9 de	47.2	38.5	1.3	240
Black eyed green	25.1 e	37.7	33.5	2.0	225
Racer	24.5 e	46.2	34.0	2.5	193
Samson ²	15.8 f	46.0	35.0	3.8	338
Site Ave.					
LSD	2.9				
C.V.%	7.6				

¹ - Standability scale: 1= perfectly upright, 9=flat

² -Samson GMF had 47% mechanical seed damage. As a result, emergence, plant stand and yield were poor.

³ - Growing season precipitation in 2003 at Hanna was 11.2 "(May-August)

⁴ - See BRRG's 2003 Annual Report (pp 16-21) for additional information.

**e) Special Purpose Pea Trial (Partial test) 2003 – CARA
Summary of Agronomic Data 2003
Hanna (Chinook Applied Research Association)^{3, 4}**

Variety	Yield (lbs/acre)	Yield (bu/acre)	Plant Height (cm)	Standability (1-9) ¹
Perf 4010	1538	26	34	8
Black Eye Yellow	1459	24	37	3
Orange pea	1427	24	35	2
White pea	1413	24	29	1
AC Nugget	1382	23	32	4
CDC Maple	1339	22	33	1
Solido	1296	22	34	1
Integra	1281	21	37	1
Black Eye Green	1215	20	30	3
Espace	1199	20	38	1
Racer	663	11	31	2
Samson ²	562	9	32	1
Site Average	1231	21	33	2
LSD	143	2		
C.V.%	14			

¹ - Standability scale: 1= perfectly upright, 9=flat

² - Samson GMF had 47% mechanical seed damage. As a result, emergence, plant stand and yield were poor.

³ - Growing season precipitation in 2003 at Hanna was 3.5”(May-August)

⁴ - See CARA's 2003 Annual Report (pp 58-65) for additional information.