

Farming for the Future Application for Special Crops

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Abstract

Ninety-seven different special crops were established or overwintered on a site at the Alberta Agriculture Research Farm near Fairview in 2000. This was the third year for this site that is being maintained over a five year period to determine growth, adaptability and survivability of various new crops in the Peace Region of Alberta. Three-quarters of each of the plots were mulched in the fall of 1999 to assess winter survivability of the various species in this region. Of the 45 perennials seeded or transplanted in 1999, 32 survived the winter and grew in 2000. Mulching had no effect on overwintering survival. A number of agronomic factors such as time of flowering, canopy height and seed set were recorded. Various amounts of seed, plant biomass and roots were harvested from some of the plants.

A hemp trial was established on a site near Rycroft. Eight varieties were evaluated for their performance in the Peace Region. A defoliation and silage trial with 3 varieties and a seeding rate trial with 3 varieties and 4 seeding rates was also grown. FIN 314 was the variety with the highest seed yield at 463 lbs/ac and Kompolti provided the highest biomass dry matter yield at 8835.3 lbs/ac.

The seeding rate trial showed no statistical differences between the four seeding rates for all three varieties.

The silage defoliation trial resulted in the highest dry matter yield of 1259 kg/ha of Kompolti when defoliated at 50 cm in height and 3447 kg/ha of Kompolti when defoliated at 100 cm. Kompolti also gave the highest biomass dry matter yield of 9396 kg/ha when cut at 2 weeks after flowering.

Materials and Methods

Fairview Site:

The Fairview site was located on NW5-82-3 W6, Alberta Agriculture, Food And Rural Development's research farm located 3 km west and 1.5 km north of the town of Fairview. The new crops site was established in 1998. Parts of the site were worked up with a rototiller prior to seeding on May 11. Nineteen of the new crops were seeded directly into the field on May 11, a row of milk thistle on May 26 and 2 rows of buckwheat on June 8. Eighty-seven of the new crops were seeded in a greenhouse in April

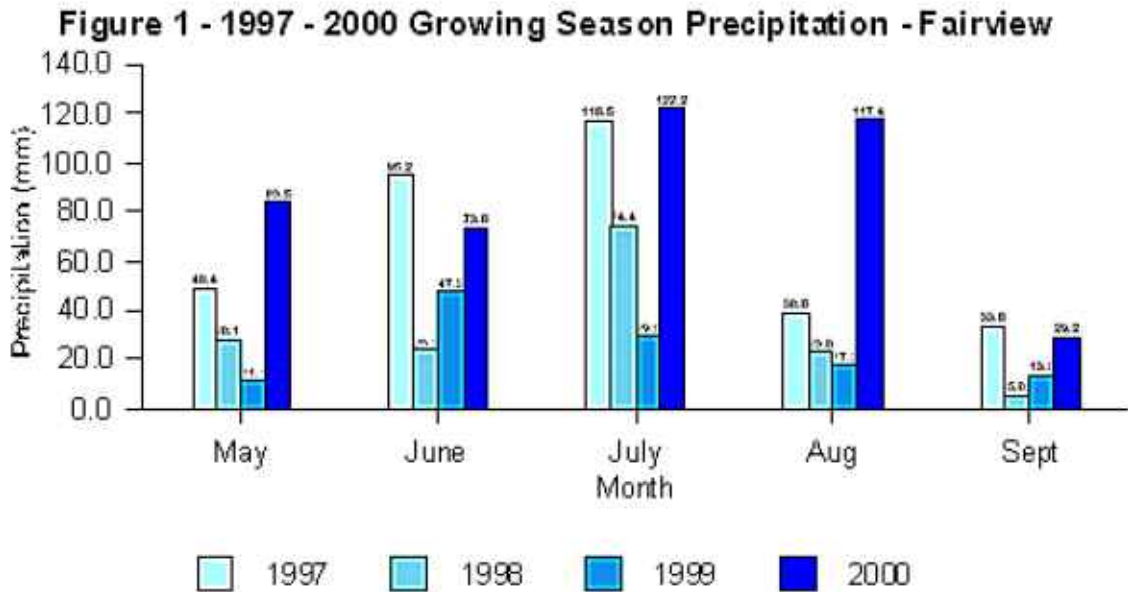
and transplanted into the field on June 1. Mono-ammonium phosphate fertilizer (11-51-0) was deep banded with direct seeded crops. Plot size varied between crops.

Flowering dates were recorded and plants were harvested as they reached the appropriate growth stage. Harvest weights were recorded for plants harvested. Due to the excellent moisture conditions this year, none of the plots were irrigated over the summer. Weed control was done by working between rows with a rototiller or by hoeing and hand pulling of weeds.

All perennial crops were mulched with wheat straw on October 25. Approximately 1/4 of each plot was left unmulched to see how plants will survive the winter without mulch.

2000 Growing Season Weather:

Precipitation was above average for 2000 at the Fairview site which was very welcome given the extremely dry conditions of 1999. Growing season precipitation from 1997 - 2000 is presented in Table 1.



Results and Discussion:

Of the 45 perennial crops that were in the plots in 1999, 32 overwintered and 13 did not. Survival of the various perennials is listed in Table 1.

Table 1: Overwintering survival of perennial crops in Fairview plots

Crops which overwintered from 1999 to 2000	Crops which did not overwinter
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Peppermint	Anise Hyssop
Spearmint	Plainleaf Parsley
Queen Anne's Lace	African Blue Sage
Garden Sage	Chinese Wolfberry
Munstead Lavender	Clary
Valerian	Red Bergamot
English & Wild Thyme	Pennyroyal
Common Comfrey	Blessed Thistle
Elecampagne	Annato
Curled Dock	Garlic Chives
Mullein	Greek Oregano
Motherwort	Chinese Licorice
Echinacea angustifolia	Lemongrass
Skullcap	Korean Mint
Tansy	
Common Marjoram	
Hyssop	
Yarrow	
Chinese Milkvetch	
Feverfew	
Basil Thyme	
Caraway	
St. John's Wort	
Lovage	
Painted Daisy Pyrethrum	
Garden Sorrel	
Honesty	
Soapwort	
Bergamot	
Catnip	
Lemon Catnip	

Table 2: Agronomic Data for New Crops at Fairview Site - 2000

Common Name	Scientific Name	Growth Habit	Seeding Date	Transplant Date	Canopy Height (cm)	Start Bloom	Seed Set	Flower Colour	Harvest Date	Herbage or Root Yield (g)
<i>African Blue Sage</i>	<i>Salvia auretia</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>51</i>	<i>n/a</i>	<i>N</i>	<i>blue</i>		
<i>American Arnica</i>	<i>Arnica montana</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>30</i>	<i>Aug 9</i>	<i>Y</i>	<i>yellow</i>	<i>Aug 16</i>	<i>3.0</i>
<i>Applemint</i>	<i>Mentha suaveolens</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>n/a</i>	<i>n/a</i>	<i>N</i>	<i>n/a</i>		
<i>Ashwagandha</i>	<i>Withania somnifera</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>13</i>	<i>n/a</i>	<i>N</i>	<i>n/a</i>		
<i>Austrian Winterpea</i>	<i>Pisum arvense</i>	<i>a</i>	<i>May 14</i>	<i>n/a</i>	<i>n/a</i>	<i>July 22</i>	<i>Y</i>	<i>purple</i>		
<i>Basil - Green Globe*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>11</i>	<i>Aug 24</i>	<i>Y</i>	<i>white</i>		
<i>Basil - Mammoth*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>23</i>	<i>Aug 18</i>	<i>Y</i>	<i>white</i>		
<i>Basil - Osmin*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>18</i>	<i>Aug 11</i>	<i>Y</i>	<i>purple</i>		
<i>Basil - Purple Ruffles*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>20</i>	<i>Aug 3</i>	<i>Y</i>	<i>white</i>		
<i>Basil - Rubin*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>11</i>	<i>Aug 11</i>	<i>N</i>	<i>n/a</i>		
<i>Basil - Spice*</i>	<i>Ocimum sp.</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>20</i>	<i>July 11</i>	<i>Y</i>	<i>purple</i>		
<i>Basil - Spicy Globe*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>8</i>	<i>July 13</i>	<i>Y</i>	<i>white</i>		
<i>Basil - Sweet*</i>	<i>Ocimum basilicum</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>26</i>	<i>Aug 11</i>	<i>Y</i>	<i>white</i>		
<i>Basil - Thai*</i>	<i>Ocimum sp.</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>9</i>	<i>Aug 9</i>	<i>Y</i>	<i>purple</i>		
<i>Basil - Thai Siam*</i>	<i>Ocimum sp.</i>	<i>a</i>	<i>n/a</i>	<i>June 1</i>	<i>7</i>	<i>Aug 9</i>	<i>Y</i>	<i>purple</i>		
<i>Bergamot</i>	<i>Monarda didyma</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>22</i>	<i>Aug 3</i>	<i>N</i>	<i>n/a</i>	<i>Aug 18</i>	<i>533.2</i>
<i>Black Cohosh</i>	<i>Cimicifuga racemosa</i>	<i>p</i>	<i>Aug 22</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>		
<i>Borage</i>	<i>Borago officinalis</i>	<i>a</i>	<i>May 14</i>	<i>n/a</i>	<i>45</i>	<i>July 16</i>	<i>Y</i>	<i>blue</i>		
<i>Buckwheat</i>	<i>Fagopyrum sagittatum</i>	<i>a</i>	<i>May 14</i>	<i>n/a</i>	<i>72</i>	<i>July 14</i>	<i>Y</i>	<i>white</i>		
<i>Burdock</i>	<i>Arctium lappa</i>	<i>b</i>	<i>n/a</i>	<i>June 2</i>	<i>142</i>	<i>Aug 5</i>	<i>Y</i>	<i>purple</i>		
<i>Calendula</i>	<i>Calendula officinalis</i>	<i>a</i>	<i>n/a</i>	<i>June 2</i>	<i>47</i>	<i>July 24</i>	<i>Y</i>	<i>yellow</i>	<i>Aug 16</i>	<i>110.1</i>
<i>Canaryseed</i>	<i>Phalaris canariensis</i>	<i>a</i>	<i>May 14</i>	<i>n/a</i>	<i>63</i>	<i>July 13</i>	<i>Y</i>	<i>n/a</i>		

Caraway	<i>Carum carvi</i>	b	n/a	1998	80	July 11	Y	white		
Catnip	<i>Nepeta cataria</i>	p	n/a	June 2	54	July 27	Y	purple	Aug 18	2910.1
Catnip - Faasen's	<i>Nepeta faasennii</i>	p	n/a	June 1	n/a	July 19	Y	purple	Aug 18	1696.2
Catnip - Lemon	<i>Nepeta cataria ssp. citriodora</i>	p	n/a	1998	92	Aug 3	Y	white	Aug 18	2459.9
Catnip - Lemon	<i>Nepeta cataria ssp. citriodora</i>	p	n/a	2000	92	July 14	Y	white		
Catnip - Japanese	<i>Schizonepeta tenuifolia</i>	a	n/a	June 1	94	n/a	Y	purple	Sept 6	2542.2
Chickpeas	<i>Cicer arictinum</i>	a	May 14	n/a	25	July 17	Y	white		
Chinese Broadbeans	<i>Vicia faba var. major</i>	a	May 14	n/a	39	July 11	Y	white		
Chinese Licorice	<i>Glycyrrhiza uralensis</i>	p	n/a	June 2	12	n/a	N	n/a		
Chinese Milkvetch	<i>Astragalus membranaceus</i>	p	n/a	June 1	n/a	Aug 15	N	n/a		
Cilantro	<i>Coriandrum sativum</i>	a	May 14	n/a	60	July 24	Y	white		
Common Comfrey	<i>Symphytum officinale</i>	p	n/a	1998	92	July 11	Y	yellow		
Common Marjoram	<i>Origanum vulgare</i>	p	n/a	June 2	22	July 13	Y	purple	Aug 21	1879.8
Coreopsis	<i>Coreopsis tinctoria</i>	a	n/a	June 2	72	July 14	Y	yel, red	Aug 16	48.1
Coriander	<i>Coriandrum sativum</i>	a	May 14	n/a	n/a	July 13	Y	n/a		
Curled Dock	<i>Rumex crispus</i>	p	n/a	June 2	5	July 11	N	n/a		
Curled Dock	<i>Rumex crispus</i>	p	n/a	1998	100	July 11	Y	red		
Dill	<i>Anethum graveolens</i>	a	n/a	June 2	79	July 30	Y	yellow		
Echinacea	<i>Echinacea angustifolia</i>	p	n/a	1998	45	July 24	Y	pink, pur	Oct 10	7382.1
Elecampane	<i>Inula helenium</i>	p	n/a	1998	111	Aug 4	Y	yellow	Aug 16	109.7
Elecampane	<i>Inula helenium</i>	p	n/a	June 2	5	Aug 4	N	n/a		
Fababeans	<i>Vicia faba</i>	a	May 14	n/a	34	July 11	Y	white		
Fenugreek	<i>Trigonella foenum-graecum</i>	a	May 14	n/a	45	July 13	Y	yellow		
Feverfew	<i>Tanacetum</i>	p	n/a	1998	47	July	Y	daisy	Aug 21	1866.8

	<i>parthenium</i>					17				
Feverfew - Golden	<i>Tanacetum parthenium</i> 'Aureum'	<i>p</i>	<i>n/a</i>	June 1	<i>n/a</i>	July 17	Y	daisy		
Gai Lohn	<i>Brassica oleracea</i>	<i>a</i>	<i>n/a</i>	June 1	<i>n/a</i>	July 11	Y	yellow		
Garden Sage	<i>Salvia officinalis</i>	<i>p</i>	<i>n/a</i>	June 2	23	July 11	N	<i>n/a</i>	Aug 21	1677.1
Garden Sorrel	<i>Rumex acetosa</i>	<i>p</i>	<i>n/a</i>	June 2	26	July 11	Y	white		
Garlic Chives	<i>Allium tuberosum</i>	<i>p</i>	<i>n/a</i>	June 2	12	<i>n/a</i>	N	<i>n/a</i>		
German Chamomile	<i>Matricaria recutita</i>	<i>a</i>	<i>n/a</i>	June 1	<i>n/a</i>	July 11	Y	daisy	Aug 18	5251.7
Gobo (Japanese Burdock)	<i>Arctium lappa</i>	<i>b</i>	<i>n/a</i>	June 1	<i>n/a</i>	<i>n/a</i>	N	<i>n/a</i>		
Honesty	<i>Lunaria annua</i>	<i>b</i>	<i>n/a</i>	2000	14	July 11	N	<i>n/a</i>		
Hyssop	<i>Hyssopus officinalis</i>	<i>p</i>	<i>n/a</i>	1999	<i>n/a</i>	July 13	Y	purple	Aug 21	2803.8
Indian Psyllium	<i>Plantago ovata</i>	<i>a</i>	<i>n/a</i>	June 1	<i>n/a</i>	July 27	Y	white		
Lathyrus	<i>Lathyrus sativum</i>	<i>a</i>	May 14	<i>n/a</i>	60	July 11	Y	white		
Lentils - Green	<i>Lens culinaris</i>	<i>a</i>	May 14	<i>n/a</i>	20	July 13	Y	white		
Lentils - Red	<i>Lens culinaris</i>	<i>a</i>	May 14	<i>n/a</i>	20	July 13	Y	white		
Licorice	<i>Glycyrrhiza glabra</i>	<i>p</i>	<i>n/a</i>	June 1	<i>n/a</i>	<i>n/a</i>	N	<i>n/a</i>		
Lobelia	<i>Lobelia inflata</i>	<i>a</i>	<i>n/a</i>	June 1	<i>n/a</i>	July 17	Y	blue/purple		
Lovage	<i>Levisticum officinale</i>	<i>p</i>	<i>n/a</i>	1998	110	July 11	Y	yellow		
Marigold - Lemon Gem	<i>Tagetes tenuifolia</i>	<i>a</i>	<i>n/a</i>	June 2	23	July 13	Y	yellow	Sept 6	2928.9
Marshmallow	<i>Althaea officinalis</i>	<i>p</i>	<i>n/a</i>	June 1	<i>n/a</i>	<i>n/a</i>	N	<i>n/a</i>		
Milk Thistle	<i>Silybum marianum</i>	<i>a</i>	<i>n/a</i>	June 2	90	Aug 14	Y	purple	Oct 25	64.3
Motherwort	<i>Leonurus cardiaca</i>	<i>p</i>	<i>n/a</i>	June 2	10	July 22	N	<i>n/a</i>	Aug 23	6231.4
Mullein	<i>Verbascum thapsus</i>	<i>b</i>	<i>n/a</i>	June 2	10	Aug 4	N	<i>n/a</i>	Sept 6	11094.1
Munstead Lavender	<i>Lavandula angustifolia</i>	<i>p</i>	<i>n/a</i>	June 2	18	<i>n/a</i>	N	<i>n/a</i>		

Mustard - Black	<i>Brassica nigra</i>	a	n/a	June 1	n/a	July 11	Y	yellow		
Mustard - White	<i>Brassica hirta</i>	a	n/a	June 1	n/a	July 11	Y	yellow		
Nepitella	<i>Calamintha nepeta</i>	p	n/a	June 1	n/a	July 18	Y	white	Aug 23	780.5
Opium Poppy	<i>Papaver somniferum</i>	a	July 17	n/a	n/a	Aug 23	Y	white		
Oxknee	<i>Achyranthes bidentata</i>	p	n/a	June 1	n/a	n/a	N	n/a		
Painted Daisy Pyrethrum	<i>Tanacetum coccineum</i>	p	n/a	June 2	9	July 11	N	n/a		
Peppermint	<i>Mentha piperita</i>	p	n/a	June 2	28	Aug 4	Y	purple	Sept 12	4726.6
Queen Anne's Lace	<i>Daucus carota</i>	b	n/a	June 2	72	July 27	Y	white		
Ribgrass Plantain	<i>Plantago lanceolata</i>	a	n/a	June 2	46	July 19	Y	n/a	Aug 21	7025.2
Safflower	<i>Carthamus tinctorius</i>	a	May 14	n/a	51	Aug 23	Y	or, yel		
Scotch Spearmint	<i>Mentha gentiles</i>	p	n/a	June 2	48	Aug 3	Y	purple	Sept 12	22412.9
Sheep Sorrel	<i>Rumex acetosella</i>	p	n/a	June 1	n/a	July 27	Y	white		
Skullcap	<i>Scutellaria lateriflora</i>	p	n/a	1998	19	July 13	N	purple	Aug 21	616
Soapwort	<i>Saponaria officinalis</i>	p	n/a	1998	75	Aug 23	Y	white		
Soybeans	<i>Glycine max</i>	a	May 14	n/a	46	n/a	N	white		
St. John's Wort	<i>Hypericum perforatum</i>	p	n/a	1998	52	July 24	Y	yellow	Aug 18	739.8
Summer Savory	<i>Satureja hortensis</i>	a	n/a	June 2	33	n/a	Y	purple		
Sunola	<i>Helianthus annuus</i>	a	May 14	n/a	68	July 24	Y	yellow		
Sunwheat	<i>Helianthus annuus</i>	a	May 14	n/a	94	Aug 3	Y	yellow		
Sweet Wormwood	<i>Artemisia absinthium</i>	a	n/a	June 1	n/a	n/a	N	n/a		
Tansy	<i>Tanacetum vulgare</i>	p	n/a	1998	110	July 17	Y	yellow	Aug 21	29332.3
Thyme - Basil	<i>Calamintha nepeta</i>	p	n/a	1998	6	July 11	Y	wh, purp	Aug 21	2054.6
Thyme - English	<i>Thymus vulgaris</i>	p	n/a	June 2	17	July 11	N	purple	Aug 21	245.2

<i>Thyme - Wild</i>	<i>Thymus pulegioides</i>	<i>p</i>	<i>n/a</i>	<i>June 2</i>	<i>12</i>	<i>July 11</i>	<i>Y</i>	<i>purple</i>	<i>Aug 21</i>	<i>2496.4</i>
<i>Turkish Rhubarb</i>	<i>Rheum palmatum</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>n/a</i>	<i>n/a</i>	<i>N</i>	<i>n/a</i>		
<i>Valerian - Anthos</i>	<i>Valeriana officinalis</i>	<i>p</i>	<i>n/a</i>	<i>2000</i>	<i>120</i>	<i>July 11</i>	<i>N</i>	<i>n/a</i>		
<i>Wild Cranesbill</i>	<i>Geranium maculatum</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>n/a</i>	<i>n/a</i>	<i>N</i>	<i>n/a</i>		
<i>Willow Herb</i>	<i>Epilobium parviflorum</i>	<i>p</i>	<i>n/a</i>	<i>June 1</i>	<i>n/a</i>	<i>July 11</i>	<i>Y</i>	<i>purple</i>	<i>Aug 23</i>	<i>970</i>
<i>Yarrow</i>	<i>Achillea millefolium</i>	<i>p</i>	<i>n/a</i>	<i>June 2</i>	<i>42</i>	<i>July 11</i>	<i>Y</i>	<i>white</i>	<i>Aug 23</i>	<i>4591.1</i>

Yields are only given to show that production of some of these crops is possible and may not reflect actual yields in the field.

Extension Activities

The Fairview special crops site was part of a workshop on new crops held at the research farm on June 21, the MD of Fairview's tour on July 20 and an AESA provincial tour on August 9. In all, it is estimated that 150 people viewed the plots on these various tours.

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