

## XII SEED TREATMENT TRIAL

**Objective:** Evaluate the impact of new seed treatments on seedling diseases and insect control for canola as it relates to yield, quality and contribution margins.

**Background:** The most widespread canola production problem is stand establishment. Poor stand establishment may be caused by a seedling disease complex including pathogens such as *Rhizoctonia solani*, along with *Fusarium* and *Pythium* species. Seed treatment fungicides are used extensively in canola production as a first line of defense to control seedling diseases. In addition, some new products are being evaluated for extended flea beetle control.

**Methodology:** The seed treatment trial included some or all of the following treatments:

1. Check (Foundation Lite) (fungicide only)
2. Foundation Lite (fungicide only) + Sevin (foliar insecticide)
3. Foundation Premium
4. Gaucho CS
5. Gaucho Platinum
6. Prosper
7. Helix
8. Tribune (fungicide only) + Matador (foliar insecticide)

The following flea beetle damage guide was used to estimate the percentage of (shot hole) damage to leaf area using the following scale:

- 0 = No leaf damage
- 1 = Less than 10% leaf damage
- 2 = 11 to 25% leaf damage
- 3 = 26 to 50% leaf damage
- 4 = 51 to 75% leaf damage
- 5 = 76 to 100% leaf damage

For assistance in estimating percent damage, the Flea Beetle Damage Guide (BASF) was used.

All other agronomic practices remained the same.

**Western Canadian Summary:**

CPC Location	Selkirk, MB		Yorkton, SK		Lethbridge (Irr), AB		Dawson Creek B.C.	
	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD
<b>SEED TREATMENT TRIAL</b>								
Foundation Premium	27.5	N/A	23.4	N/A	45.2	N/A	36.4	N/A
Foundation Lite + Sevin	-	-	23.4	90	45.1	270	38.1	231
Foundation Lite (check)	29.9	157	17.8	45	45.0	274	36.7	225
Gaicho CS	30.2	N/A	23.4	N/A	49.3	N/A	34.8	N/A
Gaicho Platinum	-	-	-	-	49.1	N/A	40.4	N/A
Prosper	29.2	N/A	27.5	N/A	44.3	N/A	40.7	N/A
Tribune + Matador	29.8	N/A	-	-	48.5	N/A	35.3	N/A
Helix	29.7	150	27.4	126	48.9	306	33.1	192
LSD	1.69		4.19		4.09		5.22	
CV%	4.9		14.2		7.2		11.6	

Note: NYD - Net Yield Data (bu/ac), CMD - Contribution Margin Data (\$/ac)  
 N/A – At time of writing, no cost figures were supplied for these seed treatments.  
 The Foundation Lite (check) treatments would normally have been sprayed with a foliar insecticide for flea beetle control. In these trials, a foliar insecticide was not applied.

**Discussion:**

At all locations, canola treated with fungicide-only seed treatments experienced greater levels of flea beetle damage than treatments containing insecticides. This tended to reduce yields although the losses were not always significant. There were no clear trends among the seed treatments containing insecticides. The treatments containing insecticide require flea beetles to feed on the leaves to obtain control; therefore, growers can expect to see some minor feeding damage on the leaves. Results with foliar insecticides were variable. Foliar insecticides can be an effective rescue treatment when damage exceeds action thresholds, provided conditions allow for timely applications.

## SELKIRK

### **Methodology:**

Seeding of this trial took place on May 23. The seed was placed at a depth of ¾" into excellent moisture. Weed control included an in-crop application of Vantage Plus (0.5 L/ac) at the 5 to 6-leaf stage of the canola. Swathing was delayed until the crop reached between 40 and 50% seed colour change to minimize potential for green seed problems.

### **Observations:**

Emergence of the canola took place just over one week after seeding, and was excellent for all treatments. All treatments were stressed early in the season by excess moisture from heavy rains in June. These rains also delayed the herbicide application, which resulted in intense weed competition, particularly from wild mustard and Lady's thumb. Weed control was quite good in spite of the high density and advanced stage of some of the weeds. Flea beetle damage approached action threshold levels of 25% leaf area damaged in the fungicide only treatments (Foundation Lite and Tribune), but no foliar insecticide applications were required. Timely rains slowed the flea beetle activity and allowed the crop to outgrow the damage. No other visible differences were noted among the treatments through the remainder of the season.

### **Results:**

**Table 1. Average number of emerged plants/m<sup>2</sup>**

Treatment	7 DAE	14 DAE	21 DAE
Foundation Premium	126	130	129
Foundation Lite (check)	127	127	123
Gaicho CS	120	131	126
Prosper	141	148	160
Tribune	121	124	133
Helix	148	145	155

DAE = Days After Emergence

**Table 2. Flea beetle damage assessment (% of leaf area damaged)**

Treatment	7 DAE	14 DAE	21 DAE
Foundation Premium	0-10	0-10	0-10
Foundation Lite (check)	10-25	0-10	0-10
Gaicho CS	0-10	0-10	0-10
Prosper	0-10	0-10	0-10
Tribune	10-25	10-25	0-10
Helix	0-10	0-10	0-10

DAE = Days After Emergence

**Table 3. Yield and quality data**

<b>SEED TREATMENT TRIAL</b>			
<b>Selkirk, MB</b>			
<b>Treatment</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>
Foundation Premium	27.5	N/A	46.8
Foundation Lite (check)	29.9	157.32	46.8
Gaicho CS	30.2	N/A	46.8
Prosper	29.2	N/A	47.2
Tribune	29.8	N/A	46.8
Helix	29.7	149.60	47.1
LSD	1.69		0.30
CV%	4.9		0.6

Note: N/A - At time of writing, no cost figures were supplied for these seed treatments.

**Discussion:**

Plant counts at 7, 14 and 21 days after emergence indicated a slight advantage for Helix and Prosper treatments, but all treatments had more than adequate plant stands. Flea beetle damage ratings were slightly higher for Foundation Lite and Tribune as compared to all the treatments containing an insecticide, but no rescue treatment was required. Yield results indicated no significant differences as compared to the check (Foundation Lite), with the exception of Foundation Premium. Prosper provided the highest oil content, and the advantage was significant over all but the Helix treatment.

**YORKTON**

**Methodology:**

Seeding took place on May 10. DKL 34-55 was seeded at 6.2 lb/ac. A fertilizer blend of 7-30-10-0 (actual) was seed-placed for all treatments. Roundup Transorb (0.5 L/ac) was applied at the 2 to 3-leaf stage of the crop. Two applications of Matador (0.034 L/ac), a foliar insecticide, were required to control flea beetles.

**Observations:**

Cool and dry growing conditions resulted in slow and uneven emergence (see *Site Information - Comments*). It was estimated that emergence reached 70% by May 24. Flea beetle pressure was high (5 to 7 flea beetles/plant) to extreme (11 to 14 flea beetles/plant) in many areas of the trial during early plant development. Leaf damage had reached action thresholds (25 % leaf area damage) for spraying in the Foundation Lite + Sevin treatment within five days of emergence. Sevin XLR was applied to these plots on May 29. The insecticide worked well in terms of contact control on actively feeding flea beetles.

By June 5<sup>th</sup> (13 days after emergence) all treatments had reached or exceeded the action threshold for spraying. An application (June 5) of

Matador was required for all treatments at this time. A second application of Matador was required for all treatments on June 13 due to continued flea beetle damage. Treatments with no insecticide protection had the most damage. Treatments with mid range protection were also badly damaged in many areas. There was some mortality, but the remaining plants were able to recover due to improved growing conditions and good control from the applications of Matador. Herbicide efficacy was generally very good. However, there was a second flush of grassy weeds due to reduced plant stands in Foundation Lite and Foundation Lite + Sevin treatments.

Missing pods on the main stem at swathing confirmed the effects of flower blast in all treatments. The flower blasting was observed during high temperatures at flowering among treatments. Maturity also varied greatly due to severe flea beetle damage and reduced plants stands.

**Results:**

**Table 1. Average number of emerged plants/m<sup>2</sup>**

Treatment	6 DAE	13 DAE	21 DAE
Foundation Lite (check)	111	37	33
Foundation Lite + Sevin	112	60	54
Foundation Premium	125	82	74
Gaicho CS	128	88	77
Prosper	134	135	132
Helix	138	134	130

DAE = Days After Emergence

**Table 2. Flea beetle damage assessment (% of leaf area damaged)**

Treatment	6DAE	11 DAE	13 DAE	21 DAE
Foundation Lite (check)	51-75	76-100	76-100	51-75
Foundation Lite + Sevin	51-75	26-50	76-100	51-75
Foundation Premium	1-10	26-50	51-75	26-50
Gaicho CS	1-10	11-25	51-75	26-50
Prosper	0	1-10	11-25	11-25
Helix	0	1-10	11-25	11-25

DAE = Days After Emergence  
Foliar Insecticide was applied at 13 and 21 DAE to all treatments

**Table 3. Yield and quality data**

<b>SEED TREATMENT TRIAL Yorkton, SK</b>			
<b>Treatment</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>
Foundation Lite (check)	17.8	44.92	46.1
Foundation Lite + Sevin	23.4	90.38	46.5
Foundation Premium	23.4	N/A	47.0
Gaicho CS	23.4	N/A	47.0
Prosper	27.5	N/A	46.5
Helix	27.4	126.34	47.3
LSD	4.19		0.84
CV%	14.2		1.6

Note: N/A - At time of writing, no cost figures were supplied for these seed treatments.

**Discussion:**

Plant counts at the 4 to 6-leaf stage (21 DAE) showed up to a 70% reduction from initial plant counts recorded at the cotyledon to 1-leaf stage (6 DAE) in some treatments. Flea beetle damage was heavy to extreme (over 76 %) in the Foundation Lite treatment. Even after three applications of an insecticide, many of the severely damaged plants did not recover from the sustained pressure. Reduced leaf area at early plant development from flea beetle damage, combined with increased weed competition resulted in a significantly lower yield for the Foundation Lite treatment.

Leaf area damage 13 days after emergence indicated that Foundation Lite + Sevin, Foundation Premium and Gaicho CS had sustained damage beyond the economic threshold (50%) for spraying. This contributed to lower yields than Helix and Prosper treatments, although not significant.

Maturity also varied by 19 days due to reduced plant stands. Oil content varied significantly among treatments. All treatments graded #1. Contribution margins reflected yield, insecticide application and seed treatment costs.

**LETHBRIDGE (IRRIGATION)**

**Methodology:**

All treatments were seeded the same day. An in-crop application of 0.5 L/ac of Roundup Transorb was used to control weeds. The trial was seeded at a rate of 4 lb/ac.

**Observations:**

Emergence was even but slow due to cool weather conditions. Flea beetle damage was observed in all treatments, but the treatments with an insecticide had the least damage. Spraying of the Foundation Lite + Sevin and Tribune + Matador treatments was warranted and applied seven days after emergence. Spray efficacy was excellent. Flea beetles continued to forage in the Foundation Lite check treatment until the heavy rains in June. The rain/snow and cold weather reduced flea beetle pressure. As harvest approached, the fungicide only treatments had more weeds and thinner plant stands due to flea beetle damage. A windstorm after swathing flipped the Foundation Lite, Foundation Lite + Sevin, and Tribune + Matador treatments even though the swaths were oriented into the wind. Foundation Lite, Foundation Lite + Sevin, and Tribune + Matador matured three days later than the other treatments which were equal in maturity.

**Results:**

**Table 1. Average number of emerged plants/m<sup>2</sup>**

Treatment	7 DAE	14 DAE	24 DAE
Foundation Premium	114	121	127
Foundation Lite + Sevin	123	126	128
Foundation Lite (check)	129	130	135
Gaicho CS	114	126	128
Gaicho Platinum	151	172	163
Prosper	130	129	135
Tribune + Matador	124	133	114
Helix	135	139	144

DAE = Days After Emergence

**Table 2. Flea beetle damage assessment (% of leaf area damaged)**

Treatment	6 DAE	14 DAE	24 DAE
Foundation Premium	0	0	1-10
Foundation Lite + Sevin	1-10	11-25	1-10
Foundation Lite (check)	1-10	11-25	11-25
Gaicho CS	0	0	1-10
Gaicho Platinum	0	0	0
Prosper	0	0	0
Tribune + Matador	1-10	11-25	1-10
Helix	0	0	0

DAE = Days After Emergence

**Table 3. Lygus Bug/Cabbage seedpod weevil #'s (per 10 sweeps)**

Treatment	Lygus Bugs		Cabbage Seedpod Weevil	
	July 5	July 12	July 5	July 12
Foundation Premium	2	2	1	2
Foundation Lite + Sevin	2	2	2	2
Foundation Lite (check)	1	1	1	2
Gaucha CS	0	1	0	0
Gaucha Platinum	1	1	0	0
Prosper	1	1	1	0
Tribune + Matador	1	1	1	2
Helix	0	1	0	0

**Table 4. Yield and quality data**

SEED TREATMENT TRIAL Lethbridge, AB (Irrigation)				
Treatment	Yield (bu/ac)	Contribution Margin (\$/ac)	Ground Cover % (July 2)	Oil (%)
Foundation Premium	45.2	N/A	100	45.2
Foundation Lite + Sevin	45.1	270.08	85	45.1
Foundation Lite (check)	45.0	274.38	82	45.3
Gaucha CS	49.3	N/A	100	45.3
Gaucha Platinum	49.1	N/A	100	45.5
Prosper	44.3	N/A	100	45.2
Tribune + Matador	48.5	N/A	74	45.0
Helix	48.9	306.24	100	45.5
<b>LSD</b>	<b>4.09</b>			<b>0.54</b>
<b>CV%</b>	<b>7.2</b>			<b>1.0</b>

Note: N/A - At time of writing, no cost figures were supplied for these seed treatments.

**Discussion:** Differences in yield of 4.09 bu/ac are significant. Contribution margins were a reflection of yield, seed treatment and foliar insecticide application costs. There were no significant differences in oil content.

## DAWSON CREEK

**Methodology:** Wet and cool conditions delayed seeding until May 25. A fertilizer blend of 25-25-15-20 (actual) was seed-placed. In-crop weed removal was achieved using Roundup Transorb (0.5 L/ac). Due to the lack of availability of Sevin XLR, Decis 5EC was substituted. Matador was not applied to the Tribune + Matador treatment.

**Observations:** Excellent moisture conditions allowed for rapid plant emergence. Flea beetle damage occurred on fungicide only treatments. However, only the Foundation Lite treatment was sprayed for flea beetles. The Tribune treatment managed to out grow the flea beetle damage. No differences in maturity were observed among the treatments throughout the season.

**Results:** **Table 1. Average number of emerged plants/m<sup>2</sup>**

Treatment	7 DAE	14 DAE	21 DAE
Foundation Premium	62	91	76
Foundation Lite + Decis 5EC	39	85	82
Foundation Lite (check)	38	89	71
Gaicho CS	69	109	83
Gaicho Platinum	99	100	80
Prosper	43	78	64
Tribune	49	87	78
Helix	61	88	82

DAE = Days After Emergence

**Table 2. Flea beetle damage assessment (% of leaf area damaged)**

Treatment	7 DAE	14 DAE	21 DAE
Foundation Premium	0	0	1-10
Foundation Lite + Decis 5EC	0	0	11-25
Foundation Lite (check)	0	0	11-25
Gaicho CS	0	0	1-10
Gaicho Platinum	0	0	1-10
Prosper	0	0	1-10
Tribune	0	0	11-25
Helix	0	0	1-10

DAE = Days After Emergence

**Table 3. Yield and quality data**

<b>SEED TREATMENT TRIAL Dawson Creek, B.C.</b>			
<b>Treatment</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>
Foundation Premium	36.4	N/A	43.0
Foundation Lite + Decis 5EC	38.1	230.86	42.8
Foundation Lite (check)	36.7	225.15	42.5
Gaucho CS	34.8	N/A	43.8
Gaucho Platinum	40.4	N/A	43.1
Prosper	40.7	N/A	42.9
Tribune	35.3	N/A	42.7
Helix	33.1	191.50	43.2
LSD	5.22		
CV%	11.6		

Note: N/A - At time of writing, no cost figures were supplied for these seed treatments.

**Discussion:**

Differences in yield greater than 5.22 bu/ac are significant. Contribution margins were a reflection of yield, seed treatment and foliar insecticide application costs. Seed treatments containing insecticide were effective in limiting flea beetle damage.