

## XVI SEED BULKING (PRECISE) TRIAL

**Objective:** To investigate the use of Precise granular elemental sulphur as a seed bulking agent in assisting in reducing seeding rates of canola.

**Background:** One of the ways of increasing a crop's ability to fight disease while reducing lodging and overall crop height is to decrease plant population.

Over the past three years the agronomy unit of Alberta Agriculture has done preliminary research that has investigated the possibility of utilizing agronomic rates (10 to 30 lb/ac) of seed-sized elemental sulphur fertilizer to reduce canola seeding rates. By blending seed-sized sulphur with canola seed, seeding can be reduced without compromising an even stand. Many farmers are using seeding rates of 5 to 7 lb/ac, which often translates to 200 or more plants per meter square. By harvest, canola stands seldom contain half of this number. Respectable yields can be obtained from stands as low as 20 plants/meter square with proper management. However, achieving low (below 5 lb/ac) seeding rates with commercial seeding equipment is often difficult.

**Methodology:** Precise at 20 lb/ac was applied with canola seed at 3 lb/ac as an additional treatment within the canopy manipulation trial. This treatment was compared with a normal seeding rate. Measurements taken were the same as those used in the canopy manipulation trial.

### Western Canadian Summary:

CPC Location	Selkirk MB		Naicam SK		N. Battleford SK		Lethbridge (Irr) AB		Rolla BC	
	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD
<b>SEED BULKING (PRECISE) TRIAL</b>										
Seed rate @ 3lb/ac + Precise @ 20lb/ac	25.6	69	22.5	28	25.5	52	30.1	42	-	-
Seed rate @ 3.0 lb/ac	27.4	92	30.8	93	24.6	56	31.2	59	-	-
Seed rate @ 5lb/ac (check)	25.7	73	26.9	61	24.5	48	30.3	53	47.2	199
Seed rate @ 5lb/ac + Precise @ 20lb/ac	-	-	-	-	-	-	-	-	49.0	203
Seed rate @ 8lb/ac (check)	-	-	-	-	-	-	-	-	47.2	190

Note: NYD - Net Yield Data (bu/ac), CMD - Contribution Margin Data (\$/ac)  
 (-) Indicates treatment not conducted.

### SELKIRK

**Methodology:** The plots were seeded on May 22 into excellent moisture conditions. The variety used was InVigor 2153. In-crop herbicide applications included a single application of Liberty (1.35 L/ac). No fungicide was applied to this trial. All other agronomic practices were conducted as described in the *Site Information*.

**Observations:** Emergence was very good for all treatments. Wild oats provided the majority of the weed pressure, but a scattering of various broadleaf weeds were also present. Weed control from the herbicide application was very good. The Precise treatment appeared to flower slightly earlier, but the advantage disappeared by swathing. Warm and humid conditions throughout the summer led to high levels of sclerotinia in these plots.

**Results: (a) Plant stand measurements**

<b>SEED BULKING (PRECISE) TRIAL</b>						
<b>Selkirk, MB</b>						
<b>Treatment</b>	<b>Emergence Counts (plants/m<sup>2</sup>)</b>	<b>Plant Height (cm)</b>	<b>Lodging Ratio (%)</b>	<b># Primary Branches</b>	<b># Secondary Branches</b>	<b>Harvest Counts (plants/m<sup>2</sup>)</b>
3 lb/ac + Precise	65	145	61	3	1	47
3 lb/ac	82	141	66	3	1	42
5 lb/ac (check)	141	131	61	2	0	77

**Results: (b) Yield and quality data**

<b>SEED BULKING (PRECISE) TRIAL</b>							
<b>Selkirk, MB</b>							
<b>Treatment</b>	<b>Yield (%)</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>	<b>1000 Kernel Weight (g)</b>	<b>Growing Degree Days</b>	<b>Days To Maturity</b>
3 lb/ac + Precise	100	25.6	69.40	41.0	5.1	1052	82
3 lb/ac	107	27.4	91.95	41.6	4.2	1052	82
5 lb/ac (check)	100	25.7	72.68	41.9	4.3	1052	82
LSD		1.17		1.26	0.83		
CV%		3.6		2.4	15.6		

**Discussion:** Plant counts were higher for the 5 lb/ac seeding rate treatment than either of the other two treatments, which had similar plant stands. This appeared to translate into reduced branching and shorter plant heights. Lodging was similar for all treatments.

The 3 lb/ac seeding rate treatment significantly out yielded both the 5 lb/ac rate treatment and the Precise treatment. All treatments graded #1, so contribution margins were a reflection of yield, seed cost and the cost of the Precise. Oil contents were similar for all treatments, as was the maturity.

**NAICAM**

**Methodology:** This trial was seeded May 15. The variety InVigor 2153 was seeded at 3.0 and 5.0 lb/ac. Corn cob grit was used as a seed bulking agent to

better regulate the 3.0 lb/ac seeding rate. The 3.0 lb/ac seeding rate was calculated on a 5.0 lb/ac total product basis. Precise (20 lb/ac) was blended with 3.0 lb of InVigor 2153 and seeded at 23 lb/ac of total product. A fertilizer blend of 7-20-10-5 (actual) was seed-placed for all treatments. All treatments were sprayed at the 2 to 3-leaf stage of the crop with a tank mix of Liberty (1.35 L/ac or 10 ac/jug) and Select (0.025 L/ac or 120 ac/case).

**Observations:**

Seedbed moisture was marginal at time of seeding. Precipitation one day after seeding resulted in rapid emergence (May 22). Plant densities recorded on June 13, were not proportional to seeding rates. A reduction in plant stand occurred in the 3.0 lb/ac seeding rate + Precise treatment. Weed control was good, but there were late flushes of weeds in the 3.0 lb/ac seeding rate + Precise, due to reduced crop competition. Maturity (seed colour change) was more variable in the low seeding rate treatments.

**Results: (a) Plant stand measurements**

<b>SEED BULKING (PRECISE) TRIAL</b>						
<b>Naicam, SK</b>						
<b>Treatment</b>	<b>Emergence Counts (plants/m<sup>2</sup>)</b>	<b>Plant Height (cm)</b>	<b>Lodging Ratio (%)</b>	<b># Primary Branches</b>	<b># Secondary Branches</b>	<b>Harvest Counts (plants/m<sup>2</sup>)</b>
3.0 lb/ac + Precise	24	95	94	5	4	34
3.0 lb/ac	66	100	96	3	3	69
5.0 lb/ac (check)	104	109	96	2	2	98

**Results: (b) Yield and quality data**

<b>SEED BULKING (PRECISE) TRIAL</b>							
<b>Naicam, SK</b>							
<b>Treatment</b>	<b>Yield (%)</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>	<b>1000 Kernel Weight (g)</b>	<b>Growing Degree Days</b>	<b>Days To Maturity</b>
3.0 lb/ac + Precise	84	22.5	28.35	39.7	3.4	1092	104
3.0 lb/ac	115	30.8	93.10	41.9	3.7	1055	101
5.0 lb/ac (check)	100	26.9	60.65	42.2	3.5	1046	100
LSD		1.51		0.97			
CV%		3.3		1.4			

**Discussion:**

The 3.0 lb/ac + Precise treatment had at least twice the number of primary and secondary branches as compared to the check (5.0 lb/ac) treatment. Emergence and harvest plant counts were also dramatically lower. Yield and oil content varied significantly among treatments. The 3.0 lb/ac seeding rate + Precise treatment yielded significantly lower than

the check. Contribution margins reflect differences in yield, seeding rate and seed bulking costs.

## **NORTH BATTLEFORD**

**Methodology:** This trial was seeded on May 10 and was included as part of the canopy manipulation trial. All treatments were sprayed with a Liberty (1.35 L/ac or 10 ac/jug) and Select (120 ac/case) tank mix on June 5.

**Observations:** Germination was slow but a uniform plant stand developed within each treatment. There were visible differences in plant density among the respective treatments. Heat stress was visible on all treatments and there were no visible differences in heat tolerance among the treatments. Lodging was not an issue with any of the treatments.

### **Results: (a) Plant stand measurements**

<b>SEED BULKING (PRECISE) TRIAL</b>						
<b>North Battleford, SK</b>						
<b>Treatment</b>	<b>Emergence Counts (plants/m<sup>2</sup>)</b>	<b>Plant Height (cm)</b>	<b>Lodging Ratio (%)</b>	<b># Primary Branches</b>	<b># Secondary Branches</b>	<b>Harvest Counts (plants/m<sup>2</sup>)</b>
3.0 lb/ac + Precise	30	94	90	5	6	35
3.0 lb/ac	28	96	87	5	8	34
5.0 lb/ac (check)	50	96	90	5	4	47

### **Results: (b) Yield and quality data**

<b>SEED BULKING (PRECISE) TRIAL</b>							
<b>North Battleford, SK</b>							
<b>Treatment</b>	<b>Yield (%)</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>	<b>1000 Kernel Weight (g)</b>	<b>Growing Degree Days</b>	<b>Days To Maturity</b>
3.0 lb/ac + Precise	104	25.5	51.94	43.6	5.1	1008	95
3.0 lb/ac	100	24.6	56.27	43.8	4.6	1008	95
5.0 lb/ac (check)	100	24.5	47.79	43.1	4.7	985	93
LSD		2.09		0.55	0.61		
CV%		6.8		1.0	10.0		

**Discussion:** There were no significant differences in yield or kernel weight among the treatments. The 3 lb/ac seeding rate produced significantly higher oil content than the 5 lb/ac seeding rate. Differences in contribution margins reflect differences in yield and costs associated with seeding rates and the use of Precise.

## LETHBRIDGE (IRRIGATION)

**Methodology:** InVigor 2153 was seeded May 10. One of the 3 lb/ac treatments was blended with Precise (20 lb/ac), the other was blended with corn cob grit. The 5 lb/ac treatment was seeded without bulking.

**Observations:** At seeding, both the Precise and corn cob grit treatments were monitored for flowability, potential bridging, and separation of seed from the bulking agents. The Precise flowed easier through the seed drill cups. No bridging or plugging were seen using the Precise. No bridging was seen with the corn cob grit. However, because the bulk density of the corn cob grit is not the same as the bulk density of canola, some separation could be seen. No differences in days to emergence were seen among the treatments. The Precise treatment flowered one to two days longer.

### Results: (a) Plant stand measurements

SEED BULKING (PRECISE) TRIAL Lethbridge, AB (Irrigation)						
Treatment	Emergence Counts (plants/m <sup>2</sup> )	Plant Height (cm)	Lodging Ratio (%)	# Primary Branches	# Secondary Branches	Harvest Counts (plants/m <sup>2</sup> )
3.0 lb/ac + Precise	91	91	83	5	3	89
3.0 lb/ac	59	90	84	5	3	59
5.0 lb/ac (check)	147	92	82	4	1	147

### Results: (b) Yield and quality data

SEED BULKING (PRECISE) TRIAL Lethbridge, AB (Irrigation)							
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	1000 Kernel Weight (g)	Growing Degree Days	Days To Maturity
3.0 lb/ac + Precise	99	30.1	41.80	43.4	4.0	1023	95
3.0 lb/ac	103	31.2	58.50	43.3	3.8	1023	95
5.0 lb/ac (check)	100	30.3	53.21	42.3	3.8	1009	94
LSD		3.98		0.82	0.70		
CV%		12.7		1.6	14.5		

**Discussion:** There were no significant differences in yield. The check had significantly lower oil content than the other treatments. The 3 lb/ac treatment gave the highest contribution margin.

As a bulking agent, Precise had good flowability and did not bridge inside the seed drill cups. The added benefit of sulphur would not be realised until late in the season or next year.

## ROLLA

**Methodology:** The Precise treatment consisted of 5 lb/ac of seed bulked up with 20 lb/ac of Precise. No herbicides were applied. Decis 5EC (60 mL/ac) was aerial applied on August 2 to control diamondback moth larvae.

**Observations:** Optimal growing conditions existed at the time of seeding and continued through the rest of the season. Weed pressure was very minimal over all treatments. All treatments were swathed at 40 % seed colour change. There were no apparent differences among these treatments during swathing or combining when considering the ease of equipment operation.

### **Results: (a) Plant stand measurements**

<b>SEED BULKING (PRECISE) TRIAL</b>					
<b>Rolla, BC</b>					
<b>Treatment</b>	<b>Plant Height (cm)</b>	<b>Lodging Ratio (%)</b>	<b># Primary Branches</b>	<b># Secondary Branches</b>	<b>Harvest Counts (plants/m<sup>2</sup>)</b>
5 lb/ac + Precise	120	70	3	1	76
5 lb/ac	119	74	3	0	104
8 lb/ac (check)	119	68	3	1	136

### **Results: (b) Yield and quality data**

<b>SEED BULKING (PRECISE) TRIAL</b>							
<b>Rolla, BC</b>							
<b>Treatment</b>	<b>Yield (%)</b>	<b>Yield (bu/ac)</b>	<b>Contribution Margin (\$/ac)</b>	<b>Oil (%)</b>	<b>1000 Kernel Weight (g)</b>	<b>Growing Degree Days</b>	<b>Days To Maturity</b>
5 lb/ac + Precise	104	49.0	202.90	43.6	4.5	947	112
5 lb/ac	100	47.2	199.05	43.7	4.8	947	112
8 lb/ac (check)	100	47.2	189.45	43.8	5.0	947	112
LSD		1.53		0.64	0.82		
CV%		2.6		1.2	14.5		

**Discussion:** The Precise treatment yielded significantly higher than the check. There were no significant differences in oil content or 1000 kernel weight of the treatments. Contribution margins are a function of yield, seed costs and cost of Precise. Although the treatment with the Precise had the added cost of the seed-bulking agent, it still had a higher contribution margin. This was a result of having a higher yield and lower seeding rate. The addition of Precise had no effect on maturity.