

VII SEED PRIMING TRIAL

Objective: Evaluate a novel seed priming system in terms of enhancing emergence, maturity and yield of canola.

Background: A method of priming seed has been developed and commercialized by a company named Kamterter II L.L.C. for a number of vegetable crops including some crucifers. This priming system enhances the germination speed and rates of these small seeded vegetable crops. The aim of this trial was to determine whether primed canola would exhibit similar advantages. Potential benefits include faster germination rates, which should reduce the incidence of seedling diseases such as *Rhizoctonia*, *Fusarium* and *Pythium*, better crop competition with weeds; shorter days to maturity; and higher yields.

Methodology: This trial was conducted in conjunction with the seed bulking trial. InVigor 2663 was used. The primed treatment was seeded at 3 lb/ac and compared to an unprimed 3 lb/ac and 5 lb/ac treatment. Seed lots were identical for both primed and unprimed treatments. Each treatment was replicated four times.

Western Canadian Summary:

CPC Location	Dauphin, MB		Yorkton, SK		Nipawin, SK		Lethbridge (Irr), AB		Dawson Creek, B.C.	
	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD	NYD	CMD
SEED PRIMING TRIAL										
3 lb/ac unprimed	31.7	158	22.3	85	19.3	57	57.1	380	39.2	169
3 lb/ac primed	33.9	172	22.8	84	17.1	57	53.5	342	39.9	168
5 lb/ac unprimed	35.0	177	24.8	96	20.4	32	51.6	319	-	-
LSD (bu/ac)	2.44		2.20		3.40		3.12		5.22	
CV (%)	5.6		6.5		14.0		4.5		7.9	

Note: NYD - Net Yield Data (bu/ac), CMD - Contribution Margin Data (\$/ac)
 (-) Indicates treatment not conducted.
 An estimated/projected price of \$1.71/lb for seed priming was used for calculating contribution margins.

Discussion: Seed priming did not significantly improve yields at any of the locations this year. Quicker emergence was observed at all sites. However, this only translated into earlier maturity at the Lethbridge (Irrigation) location.

DAUPHIN

Methodology: The seeding date of this trial was May 14, at a depth of ¾ to 1". All treatments were sprayed with Liberty (1.35 L/ac) on June 14 when the crop was at the 2 to 3-leaf stage. All treatments were swathed on August 13 at approximately 30% seed colour change.

Observations: Soil temperatures were quite cold at seeding, ranging from 0 to 10 °C throughout the day, but moisture conditions were good. Plant counts were 19 and 25 plants/m² five days after seeding, for the unprimed three and five pound per acre seeding rates, respectively. The primed 3.0 lb/ac seeding rate produced 27 plants/m² by 5 days after seeding. Subsequent counts at 10 and 21 days after seeding showed that both the primed and unprimed 3.0 lb/ac treatments leveled off at around 50 plants/m², while the 5.0 lb/ac treatment peaked at 73 and then dropped back to 64 plants/m². No visible differences in plant stands were noted throughout the remainder of the growing season.

Results:

SEED PRIMING TRIAL Dauphin, MB							
System	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Growing Degree Days	Days To Maturity	Grade
3.0 lb unprimed	91	31.7	157.69	42.6	1135	91	1
3.0 lb primed	97	33.9	172.21	42.2	1135	91	1
5.0 lb unprimed	100	35.0	177.31	42.5	1135	91	1
LSD		2.44		0.51			
CV%		5.6		0.9			

Note: An estimated/projected price of \$1.71/lb for seed priming was used for calculating contribution margins.

Discussion: The 5.0 lb/ac seeding rate produced the highest yield and contribution margin, but only the unprimed 3.0 lb/ac treatment was significantly lower yielding. Contribution margins reflected differences in yield, seed costs and estimated priming costs. Oil content, final maturity and grade were unaffected by the treatments.

YORKTON

Methodology: This trial was seeded on May 9. A liquid fertilizer blend of 80-0-0-20 (actual) was applied prior to seeding. A fertilizer blend of 7-30-10-0 (actual) was seed-placed for all treatments. A Liberty (1.35 L/ac) and Select (0.025 L/ac) tank mix was applied to all treatments at the 2 to 3-leaf stage. 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. Emergence was more uniform for the primed treatments than the unprimed. Plant counts indicated no advantage for 3.0 lb primed compared to 3.0 lb unprimed treatments. Flea beetle pressure was high within all treatments. However, insecticide applications were effective in controlling flea beetle populations. Weed pressure was similar throughout all treatments. The 5.0 lb unprimed treatment was first to reach 100% ground cover at twenty-eight days after emergence. Length of flowering, pod filling and ripening were similar. Harvestability ratings were equal.

Results:

SEED PRIMING TRIAL Yorkton, SK							
System	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Growing Degree Days	Days To Maturity	Grade
3.0 lb unprimed	90	22.3	84.56	44.6	1010	96	1
3.0 lb primed	92	22.8	83.77	44.3	1010	98	1
5.0 lb unprimed	100	24.8	96.45	44.8	1010	96	1
LSD		2.10		1.34			
CV%		6.5		2.2			

Note: An estimated/projected price of \$1.71/lb for seed priming was used for calculating contribution margins.

Discussion: The unprimed 5.0 lb seed rate treatment yielded significantly higher than the 3.0 lb unprimed treatment. Contribution margins reflected differences in yield, seed cost and estimated cost of priming. There were no statistical differences in terms of oil content among treatments.

NIPAWIN

Methodology: This trial was seeded on May 18. A liquid fertilizer blend of 87-30-10-20 (actual) was side-banded with all treatments. A Liberty (1.35 L/ac) and Select (0.025 L/ac) tank mix was applied to all treatments at the 2 to 3-leaf stage.

Observations: Cool conditions combined with heavy trash resulted in slow and uneven emergence (see *Site Information - Comments*). It was estimated that emergence reached 70% by June 1. Emergence was more uniform for the primed treatments compared to the unprimed. Emergence counts indicated an advantage of 11 plants/m² for the 3.0 lb primed compared to the 3.0 lb unprimed treatments. Weed pressure was similar throughout all treatments. The 5.0 lb unprimed treatment was first to reach 100% ground cover at twenty-seven days after emergence. Length of flowering, pod filling and ripening were very similar. Harvestability ratings were equal.

Results:

SEED PRIMING TRIAL Nipawin, SK							
System	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Growing Degree Days	Days To Maturity	Grade
3.0 lb unprimed	94	19.3	57.27	42.8	1144	98	1
3.0 lb primed	87	18.1	32.14	42.3	1144	98	1
5.0 lb unprimed	100	20.4	56.52	43.0	1144	98	1
LSD		3.40		0.86			
CV%		14.0		1.5			

Note: An estimated/projected price of \$1.71/lb for seed priming was used for calculating contribution margins.

Discussion: There were no statistical differences in terms of yield or oil content among treatments. Contribution margins reflected differences in yield, seed cost and estimated cost of priming.

LETHBRIDGE (IRRIGATION)

Methodology: The trial was seeded on May 15. All treatments were sprayed with Liberty (1.35 L/ac) and Select (0.025 L/ac).

Observations: Emergence was even across all treatments. The primed treatment was the only treatment that had emerged at 5 days after seeding. Emergence counts completed 21 days after seeding revealed the primed treatment averaged 88 plants/m², the unprimed 80 plants/m², and the 5.0 lb/ac treatment 140 plants/m². The primed treatment was the first to cover the ground and achieve 30% bloom. The primed treatment started flowering when temperatures were hot, and flower blast was quite visible. The unprimed treatments started flowering five days later when the weather had cooled off and no flower blast was evident. The more advanced growth in the primed treatments led to heavier flea beetle, cabbage seedpod weevil and lygus bug pressures. Although insect populations were below threshold levels it was observed that the primed treatments had more damage. At swathing, the primed seed treatments were 5 days ahead of all other treatments. Judging the proper stage to swath the primed treatment was easy as the majority of the plants were at the same stage of maturity. In the other treatments maturity was more variable.

Results:

SEED PRIMING TRIAL Lethbridge (Irrigation), AB							
System	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Growing Degree Days	Days To Maturity	Grade
3.0 lb unprimed	111	57.1	379.52	44.8	1163	106	1
3.0 lb primed	104	53.5	341.79	44.4	1112	101	1
5.0 lb unprimed	100	51.6	319.31	44.7	1130	102	1
LSD		3.12		0.53			
CV%		4.5		0.9			

Note: An estimated/projected price of \$1.71/lb for seed priming was used for calculating contribution margins.

Discussion: The 3.0 lb/ac unprimed treatment yielded significantly higher than the 3.0 lb/ac primed and 5.0 lb/ac unprimed treatments. Although the primed treatment yielded lower than the 3.0 lb/ac unprimed, there were agronomic advantages that included quicker, more even emergence, shorter days to flowering and earlier maturity. Earlier flowering this year resulted in flowering during the hotter days of July. This resulted in blossom blast that contributed to yield losses. There were no significant differences in oil content.

DAWSON CREEK

Methodology: This trial was seeded on May 26 at a seeding rate of 3 lb/ac. A fertilizer blend of 25-25-15-20 (actual) was seed-placed for all treatments. A Liberty (1.35 L/ac) and Select (0.025 L/ac) tank mix was applied at the two to three-leaf stage of the crop. Swathing occurred on September 16 and the trial was harvested on November 7.

Observations: Conditions at this site were ideal for emergence. Emergence counts at 5, 10 and 21 days after seeding (DAS) indicated that the primed treatments emerged quicker. However, by 21 DAS this advantage started to decline. Throughout the season the primed treatments remained one to two growth stages ahead of the unprimed until the end of flowering.

Results:

SEED PRIMING TRIAL Dawson Creek, BC							
System	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Growing Degree Days	Days To Maturity	Grade
3.0 lb primed	102	39.9	168.35	42.9	1020	113	sample
3.0 lb unprimed	100	39.2	169.00	42.7	1020	113	sample
LSD		5.22					
CV%		7.9					

Note: An estimated/projected price of \$1.71/lb for seed priming was used for calculating contribution margins.

Discussion: There were no significant differences in yield, grade or final maturity. An early August frost followed by several days of frost in mid September contributed to the sample grade for both treatments. Contribution margins reflected minor differences in yield and estimated cost of priming.