Effect of saflufenacil and flumioxazin applied preharvest on canola yield and seed quality

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2010 Results

'InVigor 8440' canola was seeded into 6" rows on May 12 at 500,000 seeds per acre in conventionally tilled field. The study was conducted in a loam soil with 7.2 pH, 3.0% organic matter, and 15.7 CEC. Ignite and Select Max were applied in-crop to control weeds. Individual plots were 10 by 30 ft arranged in a randomized complete block design with four replications.

The desiccation treatments were applied with a tractor sprayer on August 12 when at least 60% of the seeds had started to turn color. Reglone was applied at 20 gpa with XR8001 nozzles at 40 psi travelling 1.5 mph. All other desiccation treatments were applied at 10 gpa using the same nozzles at 3 mph. The swath treatment was swathed on August 12. Late-season winds and heavy rain caused almost the entire plot to severely lodge. Most of the canola at the desiccant application was only 20-30 inches high.

Four equally-spaced sticky cards (6" by 12") were placed under the canopy in each plot just prior to the desiccant application to estimate seed loss due to shattering. The sticky cards were removed just prior to harvest. Seeds and intact fallen pods were counted.

Treatments were evaluated for percent pod and stem desiccation at 4, 8, 11, and 14 days after treatment (DAT). Seed moisture at harvest was estimated using a hand-held moisture tester. Yield and test weight were estimated from harvesting the middle four feet of each plot with a small plot combine. Seed samples were evaluated for green count, damage, and overall grade by ADM (Velva, ND).

Reglone clearly provided faster visual pod and stem desiccation throughout the study. At 4 DAT, Reglone provided 86% pod desiccation compared to 28-38% for Sharpen and Valor treatments. However, by 14 DAT, Sharpen and Valor treatments were only 8-15% slower in pod desiccation. At 14 DAT, Reglone provided only 6% more visual stem desiccation than Valor, but 22-28% more stem desiccation than Sharpen treatments. Sharpen at 2 and 4 oz did not provide significantly more desiccation than 1 oz.

Glyphosate alone was typically slower compared to other treatments; however, there was some variability between reps with one rep in particular providing much slower desiccation. However, despite tending to provide slower visual desiccation, glyphosate reduced seed moisture at harvest (14 DAT) similar to Sharpen treatments.

The swathed treatment and Reglone had harvest seed moistures of 6.3 and 6.6%, respectively. Valor and Sharpen+Glyphosate reduced seed moisture to 7.5 and 7.7%, respectively. Seed moisture with Sharpen alone and glyphosate alone ranged from 9.2 to 10.5%. The straight cut treatment with no desiccant had seed moisture of 14.6%.

None of the treatments resulted in severe yield loss due to shattering. All desiccated treatments had less than 50 lb/A yield loss. The swathed treatments had slightly higher yield loss (96 lb/A), but this may have been inadvertently elevated by our method of removing the sticky cards just before harvest. Some shattering may have occurred when we lifted up the swath to remove the sticky cards.

Treatments containing glyphosate tended to have lower canola yield; however, we do not know if this is a true treatment effect or just due to natural plot variability. The swathed treatment yielded slightly higher than desiccated treatments, but again we cannot say if this is a true treatment effect or not. In a 3-year

desiccation study from 2005-2007, we did not observe yield reductions from Reglone or Gramoxone treatments compared to swathing. This study will be conducted again in 2011 to help answer these questions.

Test weight was not impacted by any of the desiccants. Test weight for the straight cut treatment was slightly lower, which may be due to harvesting at a slightly higher seed moisture (14.6%).

Green count was higher in the Reglone and swathed treatments compared to the other desiccants and the straight-cut treatment.

Temperatures reached 80° F or higher seven days and 88° F or higher on five days during the study. Night-time low temps were generally in the 50s (Figure 1). Rainfall was received on only two days, 0.09 inches on August 12, and 0.79 inches on August 13.

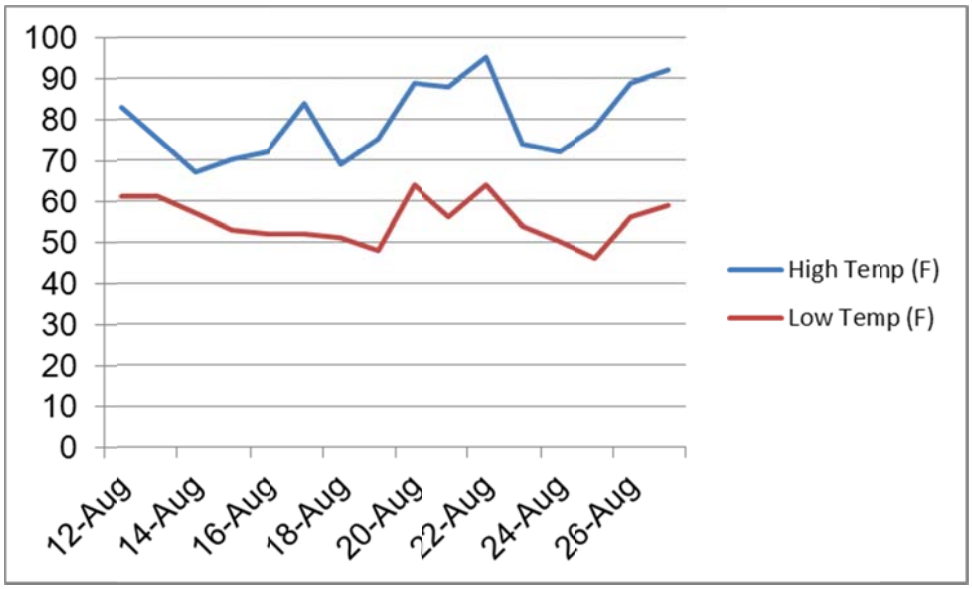

Figure 1. High and low temps during canola desiccation study at Minot, ND (2010).

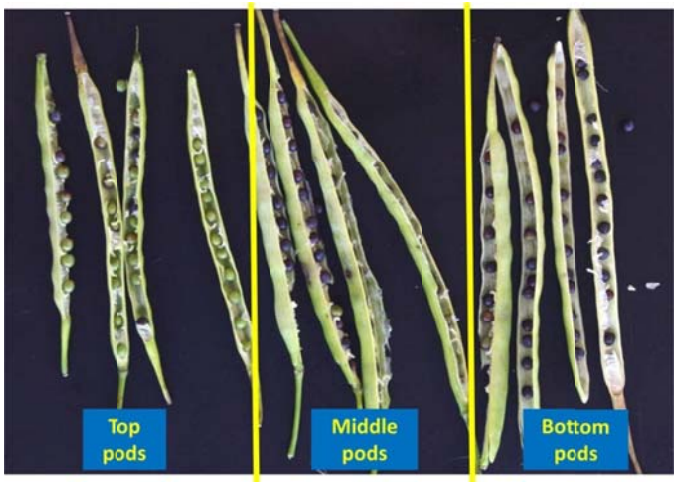

Figure 2. Canola seeds at time of desiccant application (Minot 2010).

Table. Canola desiccation with Sharpen (1042)

		Canola desiccation (DAT)[c]								Canola					
		Pods				Stem				Moisture[d]	Yield	TW	Loss[e]	Green	Grade
Treatment[ab]	Rate	4	8	11	14	4	8	11	14	Aug 27					
		----------%----------				----------%----------				----%---	lb/A	lb/bu	lb/A	%	
Straight cut[f]		21	34	55	66	5	5	11	12	14.6	2057	49.0	40	0.7	1.0
Sharpen	1 oz	34	55	70	84	8	15	20	23	9.2	2008	50.9	34	0.7	1.0
Sharpen	2 oz	38	60	75	84	10	15	20	24	10.5	2133	51.1	44	1.1	1.3
Sharpen	4 oz	36	61	78	89	10	16	23	27	10.3	2187	50.0	31	0.7	1.0
Glyphosate	0.75 lb ae	21	38	61	73	6	8	16	21	9.7	1910	51.0	33	1.5	1.3
Sharpen + Glyph	1.5oz + 0.75 lb ae	28	51	76	87	6	11	23	29	7.7	1882	51.8	37	0.6	1.0
Reglone	1.5 pt	86	97	99	99	26	34	44	51	6.6	2025	52.5	43	2.1	1.5
Valor	2 oz	31	63	84	91	9	19	29	45	7.5	2115	50.9	31	0.6	1.0
Swath[f]		91	98	99	99	60	88	95	98	6.3	2358	51.7	96	2.6	1.5
LSD (0.05)		9	9	9	8	4	5	5	5	2.5	267	1.0	26	1.09	NS
CV		14	10	8	6	18	14	10	9	19	9	1	41	64	31

[a]*Sharpen and Glyphosate applied with MSO (1%) + AMS (5%); Valor applied with MSO (2.5%); Reglone applied with NIS (0.25%)*

[b]*All treatments applied 14 days prior to harvest*

[c]*DAT = Days after treatment*

[d]*Seed loss due to shattering as estimated by use of sticky cards under canopy*

[e]*Moisture = Harvest Moisture*

[f]*No desiccant applied*

Effect of saflufenacil and flumioxazin applied preharvest on canola yield and seed quality

Ed Davis, Montana State University

2010 Results

'InVigor 8440' canola was seeded into 10" rows on May 3 at 500,000 seeds per acre in conventionally tilled field. The study was conducted in a silty clay loam soil with 6.9 pH and 2.2% organic matter. Ignite and Select Max were applied in-crop to control weeds. Individual plots were 14 by 30 ft arranged in a randomized complete block design with four replications.

The desiccation treatments were applied with a tractor sprayer on August 23 when at least 60% of the seeds had started to turn color. Reglone was applied at 20 gpa with XR8002 nozzles at 40 psi travelling 3 mph. All other desiccation treatments were applied at 10 gpa using XR8001 nozzles at 3 mph. The swath treatment was swathed on August 23. The trial site experienced a hail storm on June 30 when the canola plants were initiating flowering. An estimated 40-50% of the terminal stems were broken off or crimped over. The crop recovered but was delayed in maturity by a week to 10 days.

Four equally-spaced sticky cards (6" by 12") were placed under the canopy in each plot just prior to the desiccant application to estimate seed loss due to shattering. The sticky cards were removed just prior to harvest. Seeds and intact fallen pods were counted.

Seed moisture at harvest was estimated using a hand-held moisture tester after the seed sample was screened to remove non-seed plant material. Seed moisture was measured again at 24 hours after harvest following air drying at room temperature, and again at 4 days after harvest. Yield and test weight were estimated from harvesting the middle five feet of each plot with a small plot combine. Seed samples were evaluated for green count and overall grade by ADM (Velva, ND).

Unusually cool, moist conditions in late August – early September reduced natural senescence of the canola plants in the direct combined plots and diminished the effectiveness of the desiccation herbicides with the exception of Reglone which did effectively desiccate the canola prior to harvesting. Harvesting occurred at 15 days after desiccation treatments were applied instead of the targeted 7 days due to the unusual weather and crop conditions. The delay in crop maturity resulting from the early season hail damage also contributed to the reduced natural senescence. From August 22 (day prior to application of treatments) to September 8 (day after harvest) there was 1.46 inches of precipitation, average daily relative humidity 71%, average daily minimum air temperature 44° F, average daily maximum air temperature 70° F (Table 2).

Grain moisture at harvest was 9.6% for Reglone-treated canola and 12% for swathed canola (Table 1). Canola desiccated with 1 oz Sharpen or 2 oz Valor had grain moisture of 23% which was similar to direct combined canola. Canola treated with Roundup or Roundup plus Sharpen resulted in grain moisture of 14% and 16%, respectively at harvest.

Test weight was highest for canola that was swathed, treated with Reglone or Roundup, and lowest test weight was measured in direct combined canola. Canola grain yield was highest when Sharpen or Valor was used as the desiccant.

Table 1. Effect of saflufenacil and flumioxazin applied preharvest on canola yield and seed quality.

		Canola					
Treatment[ab]	Rate	Seed Loss	Moisture	Yield	TW	Green cnt.	Grade
		lb/A	---%---	lb/A	lb/bu	---%---	
Direct Combined		27	23.3	1807	41.0	3.1	1.5
Sharpen	1 fl oz	18	22.6	2245	42.5	3.0	2.0
Roundup	22 fl oz	27	13.9	1802	47.9	3.7	2.0
Sharpen + Glyphosate	1 oz + 22 oz	17	15.8	2403	45.6	4.6	2.0
Reglone	1.5 pt	41	9.6	1941	48.6	1.9	1.5
Valor	2 oz	21	22.7	2341	42.7	3.2	1.8
Swathed		48	12.9	2090	47.3	6.5	2.8
LSD (0.05)		NS	10	NS	NS	2.08	0.72
CV		66	39	27	9	38	25

[a] *Sharpen applied with MSO (1%) and AMS (2%); Valor applied with MSO (2.25%);*

[a] *Glyphosate applied with MSO (1%) and AMS (2%); Reglone applied with R-11 (0.25%)*

[b] *All treatments applied preharvest on August 23*

Table 2. Daily temperature, precipitation, and relative humidity at Bozeman, MT during canola desiccation study (2010).

DATE	DAILY AIR TEMPERATURE (F)			DAILY PRECIPITATION	DAILY % RH
	MINIMUM	MAXIMUM			
8-22	48	76		0.178	42
8-23	45	67	TREATMENTS	0.01	60
8-24	39	76		0.0	50
8-25	45	88		0.0	46
8-26	50	95		0.0	30
8-27	57	75		0.003	40
8-28	43	57		0.157	70
8-29	46	62		0.038	82
8-30	43	51		0.384	86
8-31	36	60		0.038	82
9-1	47	66		0.007	57
9-2	39	65		0.003	63
9-3	40	78		0.007	53
9-4	46	82		0.003	49
9-5	39	58		0.307	75
9-6	38	58		0.003	58
9-7	35	71	HARVESTED	0.017	50
9-8	48	73		0.30	62