Desiccant Effect on Canola Seed Moisture, Yield, and Quality

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Minot - Aug 5 - 2005
Diquat – 3 DAT
Untreated

Pods on the left, middle, and right represent the top, middle, and bottom pods.

Summary of 2005-07 results

Desiccant comparison:

- Desiccating with Paraquat or Diquat produced yield and quality results similar to swathing….when applied at proper timing.
- Yield, test weight, oil content, seed loss were similar.
- However, green count tended to increase with early applications and lodged canola.
- Swathing tended to provide lower harvest moisture, but desiccating also produced acceptable harvest moisture.

Summary of 2005-07 results

Timing comparison:

- Applying the desiccant before seeds in middle pods had turned color resulted in higher green count, lower yield, and lower test weight.

- Swathing too early caused similar results.

Summary of 2005-07 results

Harvest comparison:

- Minimal seed lost due to shattering at 7 or 14 DAT.
- Generally lost <50 lb/A
- Desiccated and swathed canola harvested 14 DAT had lower green count and less total damage than canola harvested 7 DAT.

Effect of Sharpen, Valor, Liberty, and Glyphosate applied pre-harvest on canola yield and seed quality (2010-2013)

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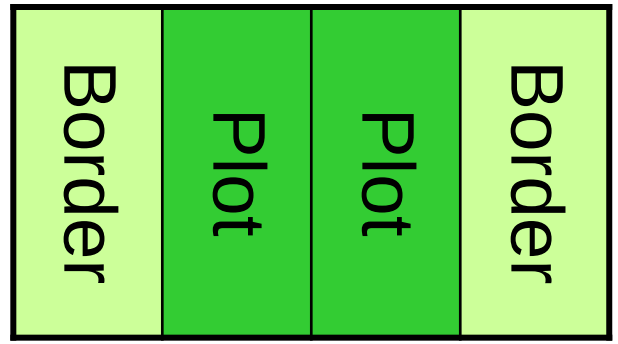
Trade Name	Common Name
Sharpen	Saflufenacil
Valor	Flumioxazin
Liberty	Glufosinate
Roundup	Glyphosate
Reglone	Diquat
Gramoxone	Paraquat

Objectives

- Determine the effect of desiccants applied pre-harvest on canola yield, seed moisture, and seed quality compared to diquat and swathing.
- Determine if diquat at 1 pt will provide effective desiccation compared to the U.S. labeled rate of 1.5 pt.
- Evaluate Liberty as a desiccant alone or with glyphosate.

Methods

- RCBD
- 10 x 30 ft plots with borders
- XR8001 nozzles at 40 psi
- 10 gpa (diquat 20 gpa)
- Tractor sprayer with rear-mounted boom extending across plot
- Harvested middle 4 feet of plot
- LL in 2010-11, CL B. juncea 2012, CL 2013



Methods

- Treatments applied when seeds in middle pods started to turn color.
- Yellow sticky cards used to collect falling seeds and pods.
- One treatment was swathed the same day desiccants were applied.
- Treatments evaluated visually 3, 7, 10, and 14 DAT.

Sticky card

Harvest Moisture

Treatment	Rate	2010	2011	2012	2013
		----------% moisture ----------			
Straight-cut		14.6	9.3	10.1	13.2
Sharpen	2 fl oz	10.5	7.4	10.0	11.9
Glyphosate	0.75 lb ae	9.7	6.6	9.8	8.7
Sharpen + Gly	1 oz + 0.75 lb	7.7	6.5	9.5	8.9
Liberty + Gly	4 oz + 0.75 lb	----	----	9.4	9.3
Liberty	29 fl oz	----	----	9.4	8.9
Diquat	1 pt	----	----	9.0	8.5
Diquat	1.5 pt	6.6	7.0	9.1	8.7
Valor	2 oz	7.5	8.1	10.5	12.4
Swath		6.3	7.1	9.2	9.7
LSD (0.05)		2.5	1.15	0.48	2.4

Harvest Moisture

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		----------% moisture ----------			
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Glyphosate	0.75 lb ae	9.7	6.6	9.8	8.7
Sharpen + Gly	1 oz + 0.75 lb	7.7	6.5	9.5	8.9
Liberty + Gly	4 oz + 0.75 lb	----	----	9.4	9.3
Liberty	29 fl oz	----	----	9.4	8.9
Diquat	1 pt	----	----	9.0	8.5
Diquat	1.5 pt	6.6	7.0	9.1	8.7
Valor	2 oz	7.5	8.1	10.5	12.4
Swath		6.3	7.1	9.2	9.7
LSD (0.05)		2.5	1.15	0.48	2.4

Green Count

Treatment	Rate	2010	2011	2012	2013
		----------% green ----------			
Straight-cut		0.7	0	1.0	0.8
Sharpen	2 fl oz	1.1	0.2	0.5	0.3
Glyphosate	0.75 lb ae	1.5	0.2	2.0	0.4
Sharpen + Gly	1 oz + 0.75 lb	0.6	0.1	1.3	0.2
Liberty + Gly	4 oz + 0.75 lb	----	----	1.0	0.6
Liberty	29 fl oz	----	----	0.5	0.1
Diquat	1 pt	----	----	1.0	0.9
Diquat	1.5 pt	2.1	0.5	0.8	0.8
Valor	2 oz	0.6	0.2	0.8	0.4
Swath		2.6	2.4	0.5	0.3
LSD (0.05)		1.09	0.47	NS	NS

Seed Loss

Treatment	Rate	2010	2011	2012	2013
		----------lb/A----------			
Straight-cut		40	22	104	39
Sharpen	2 fl oz	44	25	137	34
Glyphosate	0.75 lb ae	42	16	138	67
Sharpen + Gly	1 oz + 0.75 lb	46	17	109	52
Liberty + Gly	4 oz + 0.75 lb	---	---	144	77
Liberty	29 fl oz	---	---	182	112
Diquat	1 pt	---	---	158	111
Diquat	1.5 pt	54	37	172	99
Valor	2 oz	39	11	122	62
Swath		122	65	51	59
LSD (0.05)		33	22	NS	39

Summary

3 of 4 years 8-20% difference

Pod desiccation

- (7) Diquat > Sharpen+Gly = Liberty ≥ Sharpen > Valor > Gly
- (14) Diquat ≥ Sharpen+Gly = Liberty ≥ Sharpen = Valor = Gly

3 of 4 years no difference

Stem desiccation

- (7) Diquat > Sharpen+Gly = Liberty = Sharpen ≥ Valor ≥ Gly
- (14) Sharpen+Gly ≥ Diquat ≥ Gly ≥ Liberty ≥ Valor ≥ Sharpen

5-41% difference over four years

Moisture

- Diquat > Sharpen+Gly = Liberty ≥ Gly > Sharpen > Valor

Desiccants work much better with warm temps (esp Gly)

2010-2013 Summary

- Diquat was most effective for desiccating pods and stems 3-10 DAT. It was very consistent at reducing seed moisture.
- Visually, Sharpen + Gly and Liberty were not as effective at 7 DAT as diquat, but provided acceptable desiccation after 10-14 days. Reduced seed moisture slightly less than diquat.
- Liberty + Gly tended to be less effective than either product applied alone.
- Sharpen and Valor applied alone were slightly less effective.

2010-2013 Summary

- Treatments containing glyphosate desiccated stems similar to diquat at 14 DAT in 3 of 4 years.
- Glyphosate treatments acceptably reduced seed moisture in all years (harvested 14 DAT).
- Diquat at 1 pt or 1.5 pt provided similar results.
- ~50-150 lb/ seed loss. Generally < 50 lb seed loss.
- Desiccation did not result in excessive green count.
- In 7 years, we generally have not observed high seed loss due to shattering and pod drop.

to collect any seed or pod shatter prior to harvest. All plots were combined with a Case 2388 combine. The straight combine plots were harvested with a 30 foot flex head. Harvest moisture was below 8% for all harvest treatments.

Results: All plots were harvested on September 7; which was about 12 days later than the optimum (August 25). On August 31, sustained winds of 49 mph resulted in severe pod shattering of the standing canola. The swath treatments in the trial were in an east/west direction and did not blow. Swaths in the field that were in a south/north direction had severe yield loss due to blowing. There was a significant loss in yield with the straight combined treatments compared to the swath due to extensive pod shatter. The delay in straight combining canola indicated that standing canola is more prone to shatter loss and straight combining canola at the optimum time will be very important for this practice to be successful. All harvest treatments had moisture under 8%. There was significantly higher green count with the swath treatment compared to the straight combine treatments.

2005 Field Scale Canola Harvest Trial Results, Rugby, ND

Treatment	Yield lb/A	Oil %	Green Count %	Total Seed Shatter At Harvest lb/A
Swath	2266	40.5	5.5	330
Straight	1356	40.2	0.6	831
Straight w/Spodnam	1391	40.3	0.4	735
LSD 5%	148	NS	0.9	318

Trial 2 Steve Kakela Farm, Langdon, ND:
InVigor 4870 was seeded in late May. The trial was a randomized complete block design with three replicates. Plots were 45 feet wide by 500 feet long. Spodnam was applied at 1 pt/A with 20 gpa on August 21. The swath treatment was swathed September 2. All plots were harvested on October 3 with a John Deere 9600 combine. The straight combine plots were harvested with a 30 foot rigid head. Harvest moisture was below 8% for all harvest treatments.

Results: The straight combining yields were significantly higher at the 10% level compared to the swath treatments. All harvest treatments had moisture under 8%. There was no difference in yield with the straight combining treatments with and without Spodnam. There was significantly higher green count with the swath treatment compared to the straight combine treatments.

2005 Field Scale Canola Harvest Trial Results, Langdon, ND

Treatment	Yield lb/A	Oil %	Green Count %	Seeds/lb
Swath	2792	43.9	2.9	114,766
Straight	3062	43.8	0.3	106,468
Straight w/Spodnam	3030	44.0	0.6	103,444
LSD 5%	NS	NS	1.1	NS
LSD 10%	207	NS	0.9	NS

2006 Trial Information

Trial 1 Kipp Johnson Farm, Rugby, ND:
Hyola 357 Magnum RR was seeded in late April. The trial was a randomized complete block with three replicates. Plots were 50 feet wide by 500 feet long. Biovital was applied at 1 pt/A with 20 gpa on July 28. The swath treatment was swathed August 2. Shatter cards were placed under the canopy in each plot to collect any seed or pod shatter prior to harvest. All plots were harvested on August 28. All plots were combined with a Case 2388 combine. The straight combine plots were harvested with a 30-foot rigid head.

Results: There were no differences in yield or oil content across harvest treatments. There was no difference in yield with the straight combining treatments with and without Biovital. The rigid head did not cause any significant harvest loss compared to the pick-up head.

2006 Field Scale Canola Harvest Trial Results, Rugby, ND

Treatment	Yield lb/A	Harvest Moisture %	Oil %	Total Seed Shatter At Harvest lb/A
Swath	2239	9.3	45.7	51
Straight	2207	8.9	45.4	42
Straight w/Biovital	2199	8.9	44.9	19
LSD 5%	NS	0.2	NS	NS

Trial 2 Dave Thom Farm, Velva, ND:
InVigor 5550 was seeded in late April. The trial was a randomized complete block design with three replicates. Plots were 50 feet wide by 500 feet long. Biovital was applied at 1 pt/A with 20 gpa on July 26. The swath treatment was swathed August 2. Shatter cards were placed under the canopy in each plot to collect any seed or pod shatter prior to harvest. All plots were harvested on August 17 with a New Holland CR970 combine. The straight combine plots were harvested with a 42-foot draper head. Harvest moisture was approximately 9.5 % for the straight combined treatments and 11.5% for the swathed treatments.

Results: Straight combining yields were slightly higher than the swath treatments. There was no difference in oil content between harvest treatments. There was no difference in yield with the straight combining treatments with and without Biovital. The draper head did not cause any significant harvest loss compared to the pick-up head.

2006 Field Scale Canola Harvest Trial Results, Velva, ND

Treatment	Yield lb/A	Harvest Moisture %	Oil %	Total Seed Shatter At Harvest lb/A
Swath	2212	11.4	44.3	37
Straight	2356	9.3	44.3	41
Straight w/Biovital	2299	9.5	43.8	42
LSD 5%	NS	0.2	NS	NS

Questions??