Herbicide Tolerant Canola- A Farmer's Perspective

by

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Farmer Concerns re HT Canola

- HT canola not meeting yield expectations.
- Extensive plant stunting observed in 40 RR fields in 2003.
- Herbicide greenhouse trials at Lacombe and Edmonton (Harker, 2006; Schilling *et al*, 2006) reported reduced HT growth and plant mass from Roundup application but **no data on seed yield.**

Experimental design

- 4[1] Paired spray & non spray m^2 frames/field.

[1]Some pairs lost due to environmental & other hazards

Experimental design

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- 6 Roundup Ready canola fields investigated in 2004-05-06 involving varieties Banner, 43A48, 32-75 and 32-35.
- 5 Liberty tolerant canola fields investigated in 2005-06-07 involving varieties 2733, 5020, and 5108.

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Data Recorded for Each Pair

- Plant density at maturity (plants/m^2)
- Plant dry mass at maturity (g/m^2)
- Number of pods/m^2
- Seed yield (g/m^2)
- Seed weight (g/1000 seeds)
- Oil content in %

Results from Six Roundup Tolerant Canola Fields

Trait	Check	Sprayed	% of Check	DF	p-value
Plants m^2	96.5	98.8	102.4	15	0.369
Pods m^2	5619	4974	88.5^{xx}	15	0.002
Dry mass g/m^2	886	777	87.7^{xx}	12	0.002
Seed yield g/m^2	205	179	87.3^{xx}	15	0.020
Seed wt g/1000	2.48	2.49	100.4	15	0.488

Results from Five Liberty Tolerant Canola Fields

Trait	Check	Sprayed	% of Check	DF	p-value
Plants m^2	56.0	60.1	107.3	18	0.026
Pods m^2	5689	4667	91.7^{xx}	18	0.005
Dry mass g/m^2	900	826	91.8^{xx}	18	0.003
Seed yield g/m^2	298	276	92.6^{xx}	18	0.008
Seed wt g/1000	3.14	3.76	100.6	13	0.293
Oil %	51.8	51.8	100.1	14	0.447

Findings

1. Roundup and Liberty applications did not significantly affect plant density or seed weight.
2. Liberty applications did not affect oil %.

   Oil % data from RR fields insufficient for statistical analysis but suggest negative impact.

Findings continued

3. Both Roundup and Liberty applications significantly reduced the number of pods, dry mass and seed yield compared with weed free, unsprayed checks.
4. Reduction were more severe for Roundup than for Liberty – Plant mass 11.5 vs. 8.3%; Pods – 12.3 vs. 8.2% and Seed yield – 12.7 vs. 7.4%.

Findings Observed

- Average of yield of the 24 RR fields was only 14.9 bus/ac.
- Dead, dying or stunted plants observed in 100% of HT fields.
- Conventional canola (*B. napus* and *B. rapa*) fields were free of stunted and dying plants.
- Fields of Liberty tolerant canola exhibited fewer dead plants and less stunting than in RR fields but reduced pod set on main raceme evident.

Survey of Forty-two Canola Fields in 2003

Variety	No. of fields	Seed Yield bus/ac	
		Ave.	Range
3235 R.R.	10	16.8	2-23
45H21 R.R.	6	15.5	3-28
HyLite 225 R.R.	3	11.3	5-15
45A55 R.R.	3	14.3	4-24
LB0 799 R.R.	2	11.5	11-12
2733 LL	7	21.0	10-30
44A89	4	20.5	15-23
AC Sunbeam	5	19.5	15-22

Conclusions

1. Broad spectrum weed control, provided by Roundup and Liberty, have adverse side effects resulting in significant reductions in canola growth and seed yield.
2. Growers need to be aware and consider the trade off between the yield reduction caused by weed competition and the reduction caused by applications of Roundup or Liberty.
3. Results from hand weeded test plots, such as co-op trials or other trials that include herbicide tolerant and susceptible canola, over estimate yield performance of R.R. varieties by an average of 12 to 13% and Liberty varieties by 7%.

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References

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