

Glyphosate application strategies in glyphosate-resistant canola

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Weed control and canola response to selected glyphosate treatments were evaluated in a randomized complete block design with three replicates. The experiment was conducted on a loam soil with 7.2 pH and 2.9% organic matter at Carrington, ND in 2001. 'Hyola 357RR' canola was seeded on May 3 in 7-inch rows at the rate of 15 pure live seeds/ft² in a conventional tillage system. Guard plots were present between treated plots. Herbicide treatments were applied to 5 by 25 ft plots with a CO₂ pressurized hand-held plot sprayer at 14 gal/A and 30 psi through 8001 flat fan nozzles. Early postemergence (POST1) treatments were applied on May 25 with 63 F, 51% RH, 95% clear sky, and light wind to 2-leaf canola, 1- to 2-leaf yellow foxtail, 0.5-inch tall redroot and prostrate pigweed, 0.5-inch tall common lambsquarters, and 1-inch tall wild buckwheat. Mid postemergence (POST2) treatments were applied on June 1 with 49 F, 85% RH, 10% clear sky, and light wind to 4-leaf canola, 3- to 4-leaf yellow foxtail, 0.5- to 1-inch tall redroot and prostrate pigweed, 0.5- to 4-inch tall common lambsquarters, and 2-inch tall wild buckwheat. Late postemergence (POST3) treatments were applied on June 7 with 52 F, 100% RH, clear sky, and 7 mph wind to 5- to 6-leaf canola, 3- to 5-leaf yellow foxtail, 0.5- to 2-inch tall redroot and prostrate pigweed, 3- to 4-inch tall common lambsquarters, and 3-inch tall wild buckwheat. Average canola density was 6 plants/ft², yellow foxtail density was 3 plants/ft², pigweed density was 3 plants/ft², common lambsquarters density was 2 plants/ft², and wild buckwheat density was 1 plant/ft². The trial was swathed on August 7 and harvested on August 14 with a plot combine.

Table. Weed control and crop response in glyphosate-resistant canola.

| Treatment ^a | Herbicide | | Weed control | | | | | | | | Canola seed yield lb/A |
|-------------------------------|-----------------------|---------------------|-------------------------|--------------------|-------|-------|-------|-------|-------|-------|---------------------------|
| | Rate | Timing ^b | 30 days after treatment | | | | 8/2 | | | | |
| | | | SETLU | AMASS ^c | CHEAL | POLCO | SETLU | AMASS | CHEAL | POLCO | |
| | lb/A ^d | | % | | | | | | | | |
| Glyphosate | 0.38 | POST2 | 94 | 98 | 94 | 91 | 80 | 98 | 87 | 78 | 2048 |
| Glyphosate | 0.56 | POST2 | 95 | 99 | 97 | 91 | 79 | 95 | 87 | 70 | 2103 |
| Glyphosate | 1.12 | POST2 | 95 | 98 | 98 | 91 | 85 | 95 | 93 | 79 | 1961 |
| Glyphosate+clopyralid | 0.38+0.089 | POST2 | 96 | 98 | 98 | 99 | 90 | 98 | 88 | 91 | 2234 |
| Clopyralid+ quizalofop+MSO | 0.094+ 0.07+1% v/v | POST3 | 93 | 76 | 58 | 75 | 79 | 69 | 70 | 79 | 1763 |
| Glyphosate | 0.38 | POST3 | 87 | 80 | 86 | 84 | 92 | 73 | 79 | 67 | 2302 |
| Glyphosate | 0.56 | POST3 | 96 | 86 | 98 | 86 | 94 | 78 | 91 | 70 | 2230 |
| Glyphosate | 1.12 | POST3 | 91 | 90 | 99 | 79 | 85 | 83 | 99 | 60 | 2194 |
| Glyphosate/glyphosate | 0.38/0.38 | POST1/3 | 93 | 98 | 99 | 94 | 87 | 94 | 99 | 82 | 2122 |
| untreated | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2293 |
| LSD (0.05) | | | 7 | 11 | 14 | 22 | 15 | 9 | 14 | 20 | NS |

^aGlyphosate=Roundup UltraMax except fourth glyphosate treatment=Glyphomax Plus. Glyphosate treatments include AMS at 2% w/w.

MSO=Destiny, a methylated seed oil from Agrilience, St. Paul, MN.

^bPOST1=May 25; POST2=June 1; POST3=June 7.

^cAMASS=Redroot and prostrate pigweed.

^dGlyphosate rates=acid equivalent.

Glyphosate at 0.38 lb/A generally provided similar yellow foxtail, pigweed, common lambsquarters, and wild buckwheat control as glyphosate at 0.56 or 1.12 lb/A (Table). Glyphosate at 0.38 lb/A applied at the 4-leaf stage of canola provided 91 to 99% control of all weed species when evaluated 30 days after treatment application.

Glyphosate at 0.38 lb/A applied at the 4-leaf stage or sequential application generally provided greater control of pigweed compared to all glyphosate rates applied at the 5- to 6-leaf stage of canola. Glyphosate+clopyralid provided 88 to 98% control of all weed species at crop maturity (late evaluation date). Wild buckwheat control was 60 to 82% with all glyphosate treatments at crop maturity. Very low crop chlorosis ($\leq 4\%$) was observed 3 days after treatment application and no growth reduction was observed on August 2 (data not shown). Canola seed yield was similar among treatments, likely due to low weed densities.