



Controlling volunteer canola in soybean

CATEGORY [weeds](#) | December 2, 2021

Action and economic thresholds for volunteer Roundup Ready canola in Roundup Ready soybean were determined. Economic thresholds of less than 0.5 plants/ft² (<5 plants/m²) highlight the highly competitive nature of volunteer canola in soybean crops.

Volunteer glyphosate-resistant (GR) canola is a challenge for Roundup Ready soybean growers since glyphosate application does not control the volunteers. The objectives of this research study were to determine the action and economic thresholds for volunteer canola (*B. napus*) in soybean grown at narrow- and wide-row spacing, and to evaluate the impacts of increasing volunteer canola densities on both soybean and volunteer *B. napus* plant development and seed yield.

The research was conducted at 3 sites in 2012 and 2013 at the Ian N. Morrison Research Farm near Carman, at Kelburn Farms near St-Adolphe, and on an independent research farm near Melita, Manitoba. Roundup Ready soybeans were seeded into wheat stubble in mid- to late-May at 180,000 seeds/ft² (445,000 seeds/m²) in narrow (10 inch; 25 cm) and wide (30 inch; 75 cm) row spacing. Roundup Ready canola was broadcast on the plots immediately before seeding soybean at densities of 0, 1, 2, 4, 8, 16, and 32 seeds/ft² (0, 10, 20, 40, 80, 160, and 320 seeds/m²) in 2012, with an additional treatment of 64 seeds/ft² (640 seeds/m²) included in 2013.

Other weeds were controlled with two in-crop applications of glyphosate at 0.67 l/ac rate (900 g a.e./ha).

Yield losses were high

Volunteer canola competition with soybean was intense and caused over 50% yield loss in soybean in most cases and as much as 79% soybean yield loss under wide row production at Carman 2013.

Average maximum soybean yield loss of about 60% was similar in narrow- and wide-row production systems. This was unexpected as other weed interference research has found greater yield loss in wide-row soybean compared to narrow row spacing.

Soybean yield loss at low and high volunteer canola densities were similar. This indicates that volunteer canola competition with soybean is generally intense, leading to substantial yield loss in soybean at most volunteer canola densities – even at less than one volunteer canola plant/ft² (10 plants/m²).

Action and economic thresholds established

Action and economic thresholds generally were low due to the highly competitive ability of volunteer canola with soybean. Overall, action thresholds were less than 0.9 plants/ft² (<9 plants/m²) and economic thresholds were less than 0.5 plants/ft² (<5 plants/m²). At these thresholds, volunteer canola seed return to the weed seedbank was on average 1,440 seeds/ft² (14,400 seeds/m²) in narrow- row soybean, and 1,040 seeds/ft² (10,400 seeds/m²) in wide-row soybean.

The low economic and action thresholds were attributed to the differences in canola and soybean development. For example, by the time soybean reached the first trifoliolate, volunteer canola plants already had an average of three leaves and, once soybean reached its fourth trifoliolate, volunteer canola had reached the reproductive phase. Additionally, canola has the ability to aggressively branch out and compete for soil and water resources when plant densities are low.

Thresholds developed in this study are an important decision making tool for effective management of volunteer canola in soybean, and highlight the need for volunteer canola control in soybean, even at low plant densities.

Volunteer canola seed return at the action thresholds were greater than typical seedbank additions caused by harvest losses of a canola crop. Therefore, soybean in rotation can be a significant contributor to the replenishment of volunteer canola in weed seedbanks if left uncontrolled.

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Paul Gregoire, Jonathan D. Rosset, and Robert H. Gulden. Volunteer *Brassica napus* (L.) interference with soybean [*Glycine max* (L.) Merr.]: management thresholds, plant growth, and seed return. *Canadian Journal of Plant Science*. **101**(4): 556-567. <https://doi.org/10.1139/cjps-2020-0258>