AGRONOMY

# Making Soybeans More Competitive with Volunteer Canola

Increasing seeding rates and managing residual soil N made soybeans more competitive with volunteer canola. However, these steps worked best when densities of canola were high.

**AN ASSORTMENT OF** tools are necessary when dealing with herbicide-resistant (HR) volunteer canola. Integrated weed management (IWM) is an approach that applies a set of tools to generate an effect greater than any one weed control tactic alone.

Planting in narrow rows and increasing seeding rates can increase a crop's ability to suppress weeds. In addition, limiting residual soil nitrogen (N), which fuels weed growth, favours the soybean crop that fixes its own N supply.

This study assessed cultural management techniques, evaluating the effects of soybean row spacing, seeding rate, soil N and inter-row tillage on volunteer canola interference in soybeans. Field experiments were established in Carman in 2013 and Carman, Melita and Howden in 2014. Canola was seeded across treatments to simulate volunteers from the seedbank.

Volunteer canola density differed among sites. Low densities occurred at Carman 2013 and Melita 2014 and high densities at Howden and Carman in 2014. This distinction revealed that volunteer canola at low densities appeared to be more adaptable and resilient to weed management strategies than high densities. IWM tools were more effective under high densities of volunteers.

At high canola density sites, increasing seeding rates 1.5x (275,000 plants/ac) led to a 44% yield increase in narrow rows, compared with a standard seeding rate of 185,000 plants/ac, likely due to more rapid canopy closure. However, seeding rate had no influence on volunteer canola seed production.

Surprisingly, row spacing had little impact on the yield of soybeans faced with competition from volunteer canola and had no influence on volunteer canola seed production. This lack of response is likely due to rapid early-season growth of volunteer canola compared to soybeans.

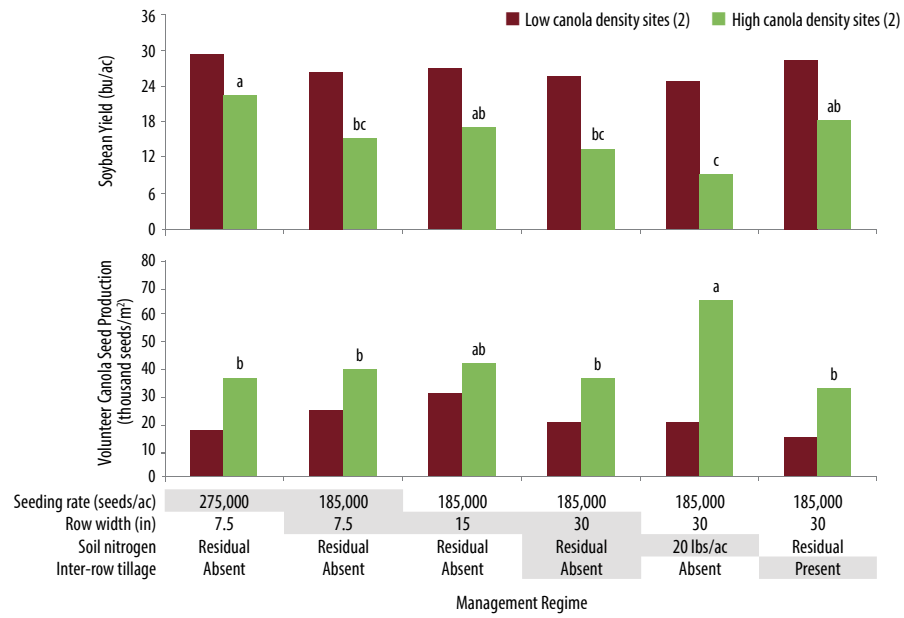
Residual soil N was supplemented in one treatment by adding 20 lbs/ac. Otherwise, these experiments were planted deliberately into soils with low levels of residual soil N (3–13 lbs available N/ac).

Adding to the N supply did not significantly affect soybean yield. Higher residual soil N was expected to tip the competitive balance in favour of volunteer canola. However, while the additional N did increase volunteer seed production at high-density sites, it did not result in significant soybean yield losses. It is possible that a 20 lb N/ac difference in available soil N was insufficient to cause differences in soybean yield.

Inter-row tillage in wide-row soybeans did not reduce volunteer canola seed production and resulted in 37% greater soybean yield at higher density volunteer canola sites, though this difference in yield was not significant.

Volunteer canola can be a highly competitive weed in soybean production and is relatively insensitive to many weed management tactics, especially at lower volunteer densities. An integrated approach to weed management is necessary to manage volunteer populations as soybean production intensifies. This study indicated that reduced soil N, elevated seeding rates and inter-row tillage in wide-row production systems may be the best IWM options for managing volunteer canola. It is likely that these tools will need to be used in combination with herbicides to target this weed.

*Figure 1. Soybean yield and number of volunteer canola seeds as affected by soybean management regimes at sites with high (89 plants/m$^2$) and low (39 plants/m$^2$) volunteer canola densities. Highlighted treatments indicate comparisons of interest within each objective.*




Different letters above bars indicate statistically significant differences among treatments.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