

# Establishing a competitive crop improves canola production

The introduction of herbicide-tolerant canola systems and hybrid canola has changed the face of canola production. Given the effectiveness of the herbicide systems and the high cost of hybrid seed, producers are often tempted to cut back on seeding rates and spray only once at later weed stages in an attempt to control most of the weeds while shaving input costs. But how do these practices impact canola yield?

Scientists at Agriculture and Agri-Food Canada's Lacombe and Lethbridge Research Centres conducted a study to determine the optimum combination of seeding rate, time of weed removal, and competitive canola varieties that would produce the highest yield.

In the study, canola varieties compared were hybrid (InVigor 2153) and open-pollinated (Exceed) LibertyLink® (glufosinate-tolerant) varieties. Crop seeding rates were 100, 150 and 200 seeds per square metre (on a weight basis these seeding rates averaged 4.9, 7.4, and 9.9 lb per acre for InVigor 2153, and 3.2, 4.7 and 6.3 lb per acre for Exceed). Weed removal timings were at either the two-, four-, or six-leaf stage of canola.

Canola seed yield was significantly influenced by all factors in the study. InVigor 2153 had 22% greater yield than Exceed at all sites. Seeding at 100 seeds per square metre had lower yields, by seven percent at all sites, than higher seeding rates. The low seeding rates also increased days to maturity by one to two days. The low seeding rate established 54 plants per square metre compared to 78 and 102 with the higher seeding

rates. This indicates that a target stand density for canola should be at least 78 plants per square metre (7.2 plants per square foot).

The most striking weed effects were in response to time of weed removal. Clearly, the highest weed biomass occurred with weed removal at the six-leaf stage of canola. In addition, Liberty effectiveness decreased rapidly at advanced weed growth stages. More importantly, variability in weed biomass was also greatest when weeds were removed after the four-leaf stage.

The study showed that weed biomass is usually lowest and least variable when early weed removal is combined with higher than normal seeding rates. Higher yield after early weed removal is consistent with results from other recent studies in canola.

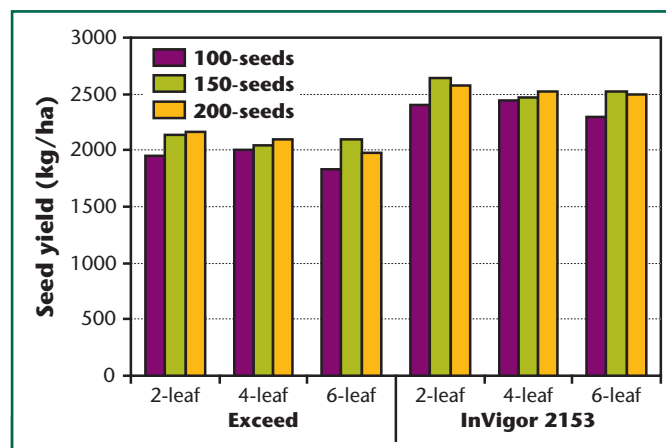
## Finding the right combination

The highest yielding combinations were achieved with the hybrid variety seeded at a rate of 150 seeds per square metre (7.4 lb per acre) or greater with

weed removal at the two-leaf stage of canola. Combining the better variety with the highest seeding rate and the earliest time of weed removal led to a 41% yield increase compared to the combination of the weaker cultivar, the lowest seeding rate and the latest time of weed removal.

These results suggest that producers should consider selecting a vigorous cultivar, use an optimal seeding

rate that is somewhat higher than is commonly used, and spray herbicides early to enhance their opportunities for optimum yield.



Integrated weed management increases canola yield. Source: Harker, K.N., Clayton, G.W., Blackshaw, R.E., O'Donovan, J.T., Stevenson, F.C. 2003. Seeding rate, herbicide timing and competitive hybrids contribute to integrated weed management in canola. *Can. J. Plant Sci.* 83:433-440.