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CANOLA ADVANTAGE

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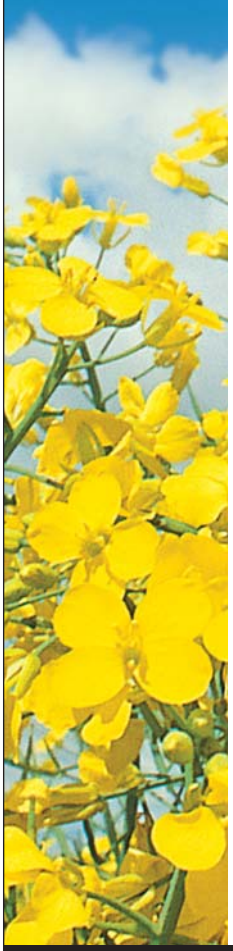
# Managing poor plant stands in canola



Young, developing canola can't stand a lot of competitive pressure. Unless they're managed well, competition from insects, weeds and weather will dramatically reduce yield potential and ultimate profitability of any variety.

Canola fields with low plant densities are more vulnerable to losses from insects, weed competition and environmental stresses such as fall frosts and are forced to compensate through increased pod and seed production per plant.

When established stands of canola are below optimum plant densities of 7 to 14 plants/ft$^2$, producers need to consider:

1. yield potential
   – Is reseeding required?
2. insect pressure
3. weed pressure
4. seed maturity differences

## 1. Assessing yield potential

Each year, producers are faced with re-seeding decisions of fields hit by poor emergence or pest damage. The crucial question to answer is whether reseeding will likely result in greater net profitability without significantly increasing risk? To aid in this decision, carefully consider the cause and severity of the damage, soil moisture, weed competition (amount and type), reseeding costs and calendar date.

An accurate assessment of crop injury is crucial to making the right decision. Producers often overrate the injury and underestimate the yield potential of the surviving stand. Canola seedlings damaged by frost, wind or hail need several days to recover before accurate assessments of survival can be made. Severe damage to cotyledons and true leaves that cause yellowing, browning or blackening does not mean that seedlings are dead.

If the growing points and hypocotyls (the stem from the seed to the above-ground growing point) remain intact and turgid, those plants should survive. Recommendations are to re-assess those plants 4 to 10 days after the damage has occurred. At this time, small leaves will begin to emerge from the growing points, indicating that the plants will survive. If no new leaves emerge, survival is unlikely.

As a reasonable guideline, plant densities of 2 to 4 plants/ft$^2$ can be adequate to produce a viable crop, provided weed competition can be effectively controlled.

An example of reseeding yields from the Canola Growers Manual.

| Date Seeded | Emergence | | Yield | |
|---|---|---|---|---|
| | plants/ $m^2$ | plants/ $ft^2$ | kg/ ha | bu/ ac |
| May 6 | 35 | 3 | 1456 | 26 |
| May 18 | 79 | 7 | 1232 | 22 |
| May 31 | 70 | 6 | 1400 | 25 |
| May 6, reseeded 31 | 62 | 6 | 1512 | 27 |
| Least significant difference | 17 | 2 | 168 | 3 |

Prairie canola growers are gaining all too much experience dealing with frost in mid-May to early June. For instance, in the spring of 2000, a significant frost touched much of central Alberta. One grower noted a plant density range of 1 to 4 plants/$ft^2$ during early plant development. The field was not reseeded. It averaged 4 plants/$ft^2$ at harvest in mid-September and yielded 38 bu/ac.

As a second example, frost hit May 23, 2004, in a canola field seeded April 29. In this particular case, half the field was reseeded on May 25 and was compared to the original frost-damaged portion of the field. The original frost-damaged half the field yielded 45.8 bu/ac compared to the reseeded half which yielded 38.4 bu/ac. This equated to a $72.00 /ac reduction in profitability, including reseeding costs.

For more information on assessing spring frost damage, go to www.canola-council.org/PDF/may5_Canola_AssessingSpring.pdf#zoom=100 in the Growing Canola section of the Canola Council's website.

**2. Checking insect pressure**

Regardless of the insect in question, infestation levels can have a more dramatic impact on yield potential when plant densities are lower than the optimum 7 to 14 plants/$ft^2$. It makes sense - because the insects are spread over fewer plants. The lower the plant density, the fewer insects needed to reach the action threshold for control.

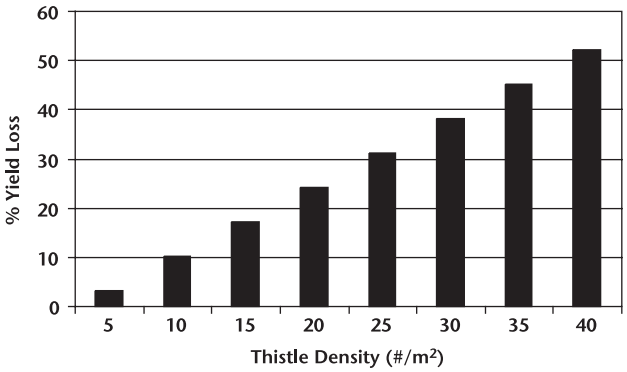
For example, canola in the Canola Council's Canopy Manipulation Trial in 2002 at Yorkton, Saskatchewan, experienced moderate to severe flea beetle pressure. Treatments with an average of 2 to 3 plants/$ft^2$ reached the action threshold of 25% defoliation 8 days after emergence compared to treatments with 8 to 9 plants/$ft^2$ which reached the action threshold at 20 days after emergence.

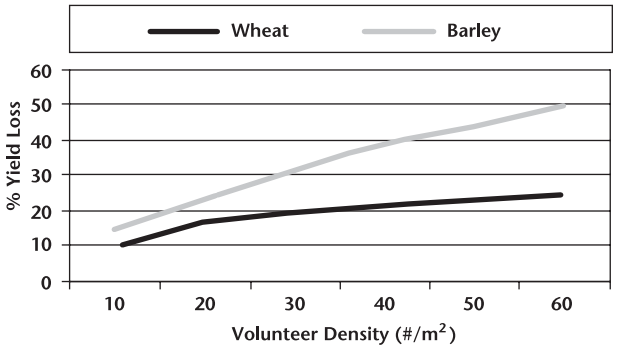
Crops with low plant densities also require more frequent and intensive scouting for insects at all plant growth stages. Thin stands are more susceptible to plant losses from insects since any losses are more likely to reduce yield. Thin stands often require additional application of a foliar insecticide to control damaging insects.

**3. Measuring weed impact**

The Canola Growers Manual (pgs 1003a – 1007a) indicates that weeds can dramatically reduce yields through competition with the crop for light, moisture and nutrients. This competition reduces canola plant growth and leaf area resulting in increased flower, pod and seed abortion. Depending on weed type, density and stage of development, yields can be reduced by 5% to over 50%.

Figure 1 and figure 4 from the Canola Growers Manual show the potential yield loss due to Canada thistle and volunteer cereal competition.




As a result, canola plant densities below recommended levels require more intensive field scouting to ensure timely and effective weed control and to reduce the impact of weed competition. This is mainly due to the canola plant's inability to fully cover the ground during early plant development. Sequential applications of system specific herbicides may be required until full canopy closure is achieved.

**4. Recognizing seed maturity differences**

Recommended plant densities normally produce between 3 and 5 secondary branches, not including the main stem. Low plant densities of 2 to 3 plants/ft² will cause plants to branch up to 4 times more that those in optimum plant densities of 7 to 14 plants/ft². This extra branching can delay seed maturity up to 21 days depending on environmental conditions. Canopy manipulation trials conducted at the Canola Production Centres over a three year period support these results.

Check the Canol@Fact "Plant Populations for Profitability" on the Canola Council website at www.canola-council.org/PDF/plant_pop_profit.pdf Extra branching also calls for careful harvest management. Swathing when seed colour is at 50 to 60% change on the main stem will reduce quality concerns and improve yield potential on areas with marginal increases in secondary branches (2 times the normal). If there is a substantial increase in secondary branches (3 to 4 times the normal), check the whole plant to determine maturity. Look for an average of 30 to 40% seed colour change. Make sure as much of the immature seed in the side branches as possible is at least firm and dark green to help reduce yield and quality losses.



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