

## Seeding Date

Most producers believe that early seeding always yields the highest, but it would be more accurate to say that *optimal* seeding will give the highest yields. Seeding early can be detrimental to your crop if it is caught by frost or if the seedlings sit in cold, wet soil for extended periods of time. Optimal soil temperature for Alberta crops is generally around 10°C. Seeds sown at this temperature will germinate and grow quickly, without the lags that can increase their susceptibility to seedling disease. If temperature is sufficient for germination, then yield generally increases the earlier the crop is seeded

## Seeding Rate

Even if you are seeding a non competitive crop, you can help your crop compete against weeds by increasing your seeding rate. For many cereal crops, optimal plant density is between 20 and 24 plants per square foot. For flax, which is one of the least competitive crops grown in Alberta, the optimal plant population is 30-40 plants per square foot. Seeding at such a high rate not only increases plant populations, competitiveness and yield, but also helps ensure uniform maturity.

Table 1. Optimal plant populations for common Alberta crops.

Crop	Target Plant Population (per ft <sup>2</sup> )
HRS wheat	24
Durum wheat	20
Barley	22
Oats	24
Triticale	30
Canola	7-17
Field peas	7
Beans	2.4
Fababeans	4.3
Lentils	12
Safflower	3-6
Flax	30-40
Silage corn	0.7

Seeding rates can be determined by using the Seeding Rate Calculator on the Alberta Agriculture website ([www.agric.gov.ab.ca](http://www.agric.gov.ab.ca))



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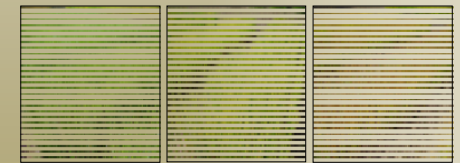
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# Increasing Adoption of Integrated Pest Management in Cereals

## Part 1

### Reducing Pesticide Use by Increasing Crop Competitiveness



Canada



## Why Increase Crop Competitiveness?

With the development and increased use of herbicides, many producers have come to depend on chemicals as their only weed control practice. Herbicides do play an integral part in modern conventional agriculture, and are applied to almost 16 million acres in Alberta yearly (Statistics Canada, 2006). In response to the heavy dependence producers have on herbicides, a new management strategy called Integrated Weed Management (IWM) is gaining popularity. IWM uses agronomic practices (e.g. crop rotation, increased seeding rates, etc.) in conjunction with herbicides to manage weeds. Under an effective IWM regime, the same or better control of weeds can be achieved as through herbicide use alone, but at a much lower economic and environmental cost.



Proper IWM practices make the plot on the right much more competitive with wild oats as compared with the plot on the left.

## Competitive crops and cultivars

Producers have always known that certain crops are more competitive against weeds than others. Using a crop's inherent competitive ability to combat weeds is one of the simplest and most cost effective weed management tools available. In general, competitive ability of Alberta crops is as follows:

**Barley, Rye > Oats > Canola, Wheat > Peas, Flax**

Barley and rye are extremely vigorous crops. They sprout and grow quickly, closing the crop canopy and choking out weeds. At high seeding rates, these crops can outcompete wild oats and even Canada thistle. Crops like peas and flax, however, are slower to emerge and slow-growing. They take a long time to close their canopies and do not compete well against weeds. It would be best to grow these crops in already clean fields.

Experiments are underway at the Lacombe Research Station testing the competitive ability of new, more vigorous hybrid canola varieties. Preliminary results indicate that highly vigorous hybrid canola crops have competitive ability similar to the most competitive barley varieties. This may be due to their larger seed having a better chance of emerging and surviving to produce a plant. Combined with judicious use of in-crop herbicides, canola is becoming one of the best

options for producers to clean up problem fields.



Figure 1. Canopy cover of hybrid (left) and open pollinated canola sown at 6 lbs/acre.

## Seed Treatments

Seed treatments represent an extremely simple and economical way to increase plant populations. Recent studies have shown that as few as 50% of the seeds planted will survive to harvest. In addition to germination losses due to dead seed, seedling death may occur from disease, frost, insect and animal predation, and competition from weeds. Seed treatments help defend against seedling diseases such as damping-off, seedling blight, smut, bunt, and common root rot, increasing the density and vigour of your crop to help outcompete weeds. They also decrease the need for in-crop fungicide applications and reduce the chemical load on your crop.

Kernel weight should always be used to determine seeding rate. Seeding crops by bu/acre or lb/acre can vary actual plant populations by as much as 100%.