

# WHAT INFLUENCES CANOLA SEEDLING SURVIVAL?

**AGRONOMY UPDATE**  
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## BATTLE RIVER IMPLEMENTS



This is the time of year when I often spend some time looking at the thousand kernel weight (TKW) of canola seed and comparing seeding rates to what the canola stands look like as they establish. The simple part of the equation is finding out the weight of the seed, the germination of the seed lot, and the plant stand target – generally 4 to 6 plants/ft<sup>2</sup> grows a good, even stand that will hit the maximum potential yield.

So that leaves the one variable that gives me fits every spring. How many of those seeds that we are putting in the ground are actually going to germinate and emerge? Even after years of doing this, I'd be the first to admit that the number I put in this column of my seeding rate calculator is at best an educated guess. The literature that is available on this subject doesn't seem to help a lot. According to Alberta Ag, seedling survival rates generally range from 40% to 70% of the seed planted. With seed costs well in excess of \$10 a pound these days, that seems like a very large and uncertain target. The problem seems to lay in the small size of canola seed and how many variables can affect how it starts the season. Researchers at the Farm Stewardship Centre (formerly the AgTech Centre) in Lethbridge have noted that they can have variances of up to 30% on the same site, using the exact same seed and equipment. They are working hard to try to pinpoint some of the variables that we can control at seeding time, and

while there is much we still don't understand, there are a few things that we do know that will consistently help us get a more consistent result when it comes to canola seeding.

1. Seed placement and depth
2. Mechanical damage to seed
3. Fertilizer toxicity

### Seed placement and depth

Factors that can impact seedling emergence include seeding too deep, seed that is off the seed row, and packing. Improper packing or excessive residue from the previous crop that leaves insufficient seed to soil contact can often have a negative impact on the stand establishment.



*Canola Seedlings (picture compliments of Real Agriculture)*

## Mechanical damage to seed

Excessive fan speed, worn hoses, or the metering system can cause cracked seeds or can scrape some of the seed coat off.

## Fertilizer toxicity

While there are definite benefits to placing soil immobile nutrients close to the seed so the emerging canola can easily access phosphate and/or potassium, there are also risks. Commercial fertilizers carry salt and also alter the soil pH in their immediate area. If too much fertilizer is put down with the seed, the amount of seedling mortality will start to climb. Even sticking to the recommended seed placed phosphate application of 15 to 20 pounds of P2O5 (30 to 40 pounds of 11-52-0) causes minor seed damage. Pushing rates above these levels quickly causes elevated seedling loss.

By following guidelines for recommended seed depth and placement, and by using appropriate fan speed, and following seed placed fertilizer recommendations, reductions in seedling emergence can usually be limited to about 5%.

***...biggest variable that we can control and has the largest impact...***

So what is the biggest variable that we can control and has the largest impact on the establishment of a good canola stand? It's speed! Changes in seeding speed may be the largest single variable that we know we have control over.

According to the Farm Stewardship Centre, increasing speed from 4 mph to 6 mph leads to emergence losses of up to 15% across all types of drills and openers. For those who run a John Deere 1870 Drill, this difference is even more dramatic. According to a study done in 2011 and 2012 by Bob Blackshaw, AAFC, Lethbridge and Blaine Metzger, AgTech Centre, the John Deere 1870 showed as good or

superior emergence at 4 mph when compared to Flexicoil, Morris, Borgault, or even the John Deere 1895 Disc Drill. At 5 mph, while it was not statistically significant, the 1870 had gone from one of the best at canola emergence to lagging the pack a little. At 6 mph, the 1870 was throwing enough dirt to bury every 3rd drill run and the emergence had dropped by a shocking 40%, 10% more than the next closest drill. For some reason the John Deere 1870 was only included in the second year of the trial, so the data is a little more limited. They were also using an older model with 10" spacing, which would make the problem with moving dirt into adjoining seed-rows even more dramatic than we see with the more common 12" spacing. Regardless of these caveats, I believe it can be safely concluded that as speed increases, there is a negative impact on canola emergence.

***...as speed increases there is a negative impact on canola emergence...***

As a side note, if speed is essential, I would suggest looking at the John Deere 1895 Disc Drill. It seems to handle speed better than most drills.

The bottom line is that there are many environmental conditions such as soil temperature and moisture that can have a far greater impact on canola establishment than most of our seeding practices. However, what we can do in terms of creating a proper seedbed, maintaining our equipment and above all – slowing down, can have a great impact on the type of stand we see this summer. Lower plant counts don't always translate to lower yields, but they certainly increase the risk of getting them! Lower plant populations also make things harder in terms of weed control, timing for herbicide and fungicide applications and can make decisions more difficult on determining seed colour change when it comes time to start the harvest.



SEED DRILL	Speed (MPH)	% Reduction (2011)	% Reduction (2012)
<b>JD 1895 disc drill (10" rows)</b>	4	0	0
	6	17	2
	8	17	9
	9.5	26	--
<b>Flexicoil 6000 with pillar laser openers (10" rows)</b>	4	0	0
	6	10	13
	8	21	19
<b>Morris 425 with paired row openers (10" rows)</b>	4	0	0
	6	2	28
	8	11	--
<b>Borgault with narrow hoe openers (9.8" rows)</b>	4	0	--
	5	4	--
	6	11	--
<b>JD ConservaPak (10" rows)</b>	4	--	0
	5	--	13
	6	--	40

Canola seed is an expensive input, and while there are many opinions on what an acceptable plant stand looks like, I think everybody can agree that the greater the percentage of that expensive seed that manages to become seedlings in your field, the less money it will take to achieve the plant stand you are looking for.

**Wayne Spurrill, P.Ag  
Agronomist  
Battle River Implements**

[www.briltd.com](http://www.briltd.com)

[wspurrill@briltd.com](mailto:wspurrill@briltd.com)

Cell: 780-761-1616

Office: 780-672-4463

To subscribe or unsubscribe, please email us at [mhafso@briltd.com](mailto:mhafso@briltd.com)