

Precision planting produces results — but doesn't come cheap

Small-plot study finds 15 per cent yield bump, but cost and fertilization are issues with precision planter
By Jeff Melchior



Better establishment and uniform staging helped this canola seeded by a precision planter on 12-inch rows (on an irrigated plot) achieve a much higher yield than its air-seeded cousin in a Farming Smarter

New research shows that tightening up row spacing when seeding canola with precision planters can make a big yield difference — up to 15 per cent more, in fact — compared to conventional air drills.

That's a key finding from a four-year small-plot study by Farming Smarter researchers after adjusting a precision vacuum planter to 12-inch row spacings.

"We averaged 10 per cent better and did up to 15 per cent better depending on the location and the years," said Lewis Baarda, research lead of the Lethbridge organization.

"That's a big, big deal — 15 per cent is a lot. That was pretty exciting."

The study also compared the results of 12-inch and 20-inch spacings. The latter yielded the worst of all three methods, although Baarda said it still produced better establishment and more uniform staging than seeding with an air drill. Ultimately, the planter on 12-inch row spacing yielded around 30 per cent more canola than one on 20-inch spacing.

The results came as a surprise to the researchers, especially considering the row-spacing piece was actually a secondary component of the overall project, which included two trials. (One on a range of seeding rates between the planter and an air drill and the other on the potential for seed burn at varying levels of liquid phosphorus in crop rows.)

As it turned out, those two factors proved secondary.

"The row spacing ended up being the real story," said Baarda.

Precision makes a difference

The research supports claims by advocates who say planters produce better seed placement and waste less seed.

"With an air seeder you have a meter that meters the seed into the lines and then the air blows it down (into the opener)," said Baarda. "It's kind of haphazard. (The seeds) get hung up and move around.

"By the time the seeds get into the opener they could be coming out in clumps. There's not a whole lot of precision."

Precision planters, meanwhile, meter seeds out one at a time so each one is placed equally distant from one another. Although not all precision planters use vacuum technology, the planter used by Farming Smarter used disks and vacuum technology to place seeds into the soil.

"The disks have this series of holes in them and each hole sucks the seed into it. As the disk turns it drops those seeds one after another," said Baarda. "Put simply, there's uniform placement and uniform depths and that's where the advantage comes from."

Planter beats air drill in most categories
Farming Smarter conducted the study in three locations: Lethbridge dryland, Lethbridge under irrigation and Cypress County dryland. The planter outshone the air seeder on almost every front on 12-inch spacings, said Baarda.

“As far as emergence and establishment were concerned, the planter hands-down performed better,” he said. “We got canopy closures sooner with the planter, certainly on the 12-inch spacings. Staging was more uniform than the air drill on either row spacing. With the air drill there was spatial variability in seed placement, as well as staging variability due to varying depth of seeds.”

The flowering stage “was all over the place” when using an air seeder, but not with the precision planter.

The results on seeding rates and seed burn proved somewhat ineffectual, said Baarda.

“(We found) that the planter might be safer at lower seed rates. On the seed safety side, we looked at whether there was going to be seed burn from phosphorus in a 20-inch row. We found there wasn’t really much of an effect there other than with really, really high rates that you probably wouldn’t apply in the real world.”

Wider row spacing ‘detrimental’

Twenty-inch row spacing was used as a control in the study because it’s the typical adaptation producers make on planters when switching from larger-seed crops such as corn, dry beans and soybeans (in which 30-inch spacings are often used) when planting smaller seeds such as canola, said Baarda.

The 20-inch row ended up being detrimental to yield, he said.

“From a plant standpoint, you’re packing a lot of plants in fewer rows and they’re competing with each other fairly early on. With the narrower rows that seed spacing is a little farther apart within the row which gives the plants a little bit more time to grow before they compete.”

There is also better canopy closure.

“With the narrower rows you are filling in that space between the rows a little sooner to take advantage of moisture and nutrients between the rows,” he said.

Obstacles to adoption

However, canola planters come with some downsides — which may be why producers aren’t breaking down dealership doors to get their hands on one. Cost is the biggie.

“If you look at the cost per acre to run them, planters are definitely more expensive than air seeders,” said Canola Council of Canada agronomist Autumn Barnes, citing Manitoba Agriculture numbers.

“If you compare a planter to a larger independent opener drill — which should have excellent placement if calibrated and set properly — you can see that the custom rate is \$13.09 per acre for a large size (66 feet to 86 feet). A 24-row planter should be around 40 feet wide on 30-inch spacings and comes with a custom rate of \$30.14 per acre.



The yield increase is pretty “exciting” but using precision planters for a crop like canola has issues, said Farming Smarter research lead Lewis Baarda, seen here working on the group’s Monosem precision planter. Photo: Farming Smarter

“The custom rate comparison isn’t perfect but it is a good starting point to understand the cost of owning, running and maintaining the equipment.”

Baarda said farmers are interested in planters but they’re taking a “wait-and-see” approach. These planters were originally designed with conventional row crops such as beans and corn in mind; it’s been farmers and researchers who have been adapting them to work with canola.

Some producers would like to see the tech become suitable for other crops (including other small-seed crops) as well, said Baarda.

“At this point it’s more of a specialized tool,” he said. “Something we would like to see is for farmers to be able to adapt planters for a broader range of crops so it’s not just a tool for row crops or canola, but a tool for a variety of crops so you can use it where it best fits.”

And then there’s the fertilizer pass question.

As things stand right now, producers have to make a separate fertilizer pass if they’re seeding with a planter.

“If you are working under irrigation and incorporating fertilizer ahead of time that’s probably no big deal at all. But on dryland it’s going to mean an extra pass,” said Baarda.

“I think work needs to be done to turn it into a better one-pass system. For canola, where you might grow it both under irrigation or on dryland, some work needs to be done to build in some of those efficiencies.”