Grainews

Planting canola with precision

Researchers working to develop canola agronomy with precision planters

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By Melanie Epp

The Monosem is a high precision seeder meant for precise seed placement in both depth and spacing within the row. *Photo: Farming Smarter*

As more and more Western Canadian growers move into soybeans and invest in precision planters, there's increasing interest in adapting those planters for other crops as well, like canola. Can precision planters be used to grow canola better, and if so, how?

Farming Smarter Research Manager Mike Gretzinger set out to answer the agronomic questions around using precision planters to plant canola in a three-year research project funded by the Canola Agronomic Research Program (CARP).

The project could lead to increased canola yields and improved stand establishment. The goal, said Gretzinger, was to compare yield results between crops planted with a Monosem precision planter and a traditional air seeder. It aimed to measure how much and how consistently a precision planting system could improve canola emergence and uniformity, and to determine the optimum canola seeding rate when using a planter on wide row spacing.

In the spring of 2016, the Farming Smarter team set up a Monosem seeder to plant canola. The Monosem is a high precision seeder meant for precise seed placement in both depth and spacing within the row. Seed rows were set at 12- and 20-inch spacing, canola disks were installed and the machine was calibrated for canola seed. The planter was set up with four boxes of seed and two tanks, one for 10-34-0 liquid phosphorus and the other to side band 46-0-0 nitrogen.

"We also had a complementary project that looked at the specific phosphorus rates," said Gretzinger. "Because as you increase the spacing of the rows, you're really increasing the amount of fertilizer you're putting down in that specific row, so there are big implications on seed safety."

Farming Smarter general manager Ken Coles took part in the precision planting research project.photo:Farming Smarter

Seeds were planted at 20, 40, 60, 80 and 160 seeds/m2 using an air drill at 9.5 inches, as well as with the Monosem precision planter at 12- and 20-inch row spacing. Liquid phosphorus rates ranged from zero to 40 kg/ha in the first year, and zero to 60 in the second. The trials took place on three sites, one in Medicine Hat and two in Lethbridge, one of which was irrigated.

As canola growers well know, canola is very sensitive to seed and fertilizer placement. One of the advantages of the precision planter is really good uniformity and seed distribution. This was revealed in the trial results. On all three sites, the precision planter tended to have the best emergence and the air drill led to the lowest emergence.

Amalgamated data from 2016 and 2017 is still being evaluated, but Gretzinger did say that the typical seeding rate of 100 seeds/m2 gives a good approximation of overall trends.

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photo: Farming Smarter

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“In the phosphorus trial we still saw about 13 per cent higher emergence on average with the 12-inch precision planter than with the air and 20-inch,” Gretzinger said. “And similarily, at 100 seeds/m2 — extrapolated — for the seeding rate trial the 12-inch Monosem was about 18 per cent higher than the air drill and 15 per cent higher than the 20-inch Monosem.”

Despite good emergence, yield data was perhaps most surprising, although Gretzinger did say they tended to see the highest yields with the precision planter set to 12-inch row spacing. The numbers revealed a 21 per cent yield increase with the precision planter at 12-inch spacing, but a 13 per cent decrease at 20-inch spacing.

“We really have to pay attention to the difference between irrigated and dry land,” Gretzinger added as a caveat. “When I look at the irrigated data it looks like our yields are highest down on that lower end seeding rate.”

“Under irrigation, we didn’t need to go up to 160 seeds/m2 because we have such good growing conditions,” he continued. “The 40 seeds/m2 seeding rate gave us the best yield under irrigation for the 12-inch spacing. And the 60 seeds/m2 gave us the best yield for the 20-inch spacing.”

Gretzinger was also able to determine the maximum seed-safe rate of in-row liquid phosphorus for the precision planter. During the 2016 trials, they didn’t see any visual damage at all when liquid phosphorus rates ranged from zero kg/ha to 40 kg/ha. In the second year, they decided to increase the application to max out at 60 kg/ha, which is where they really started to see results.

“Basically, all the way up to 40 kg/ha we saw pretty steady emergence,” he said. “The precision planter on the 20-inch probably had the lowest emergence, the air drill was about the same, and that precision planter on 12-inch had better emergence again.”

“And they all kind of tended to drop down,” he continued. “The air drill dropped a little bit, but the two precision planter on the 12- and 20-inch spacing, they really dropped.”

Where emergence had been sitting comfortably at about 50 per cent, it dropped to 35. Where 40 per cent emergence was the previous average, when liquid phosphorus was increased to 60 kg/ha that average dropped to 30 per cent.

Regarding yield, there was again a really big distinction between irrigated and dry land. “The yield was lowest again on our precision planter with 20-inch spacing,” said Gretzinger. “In the middle with the air drill, and highest with the precision planter with the 12-inch.”

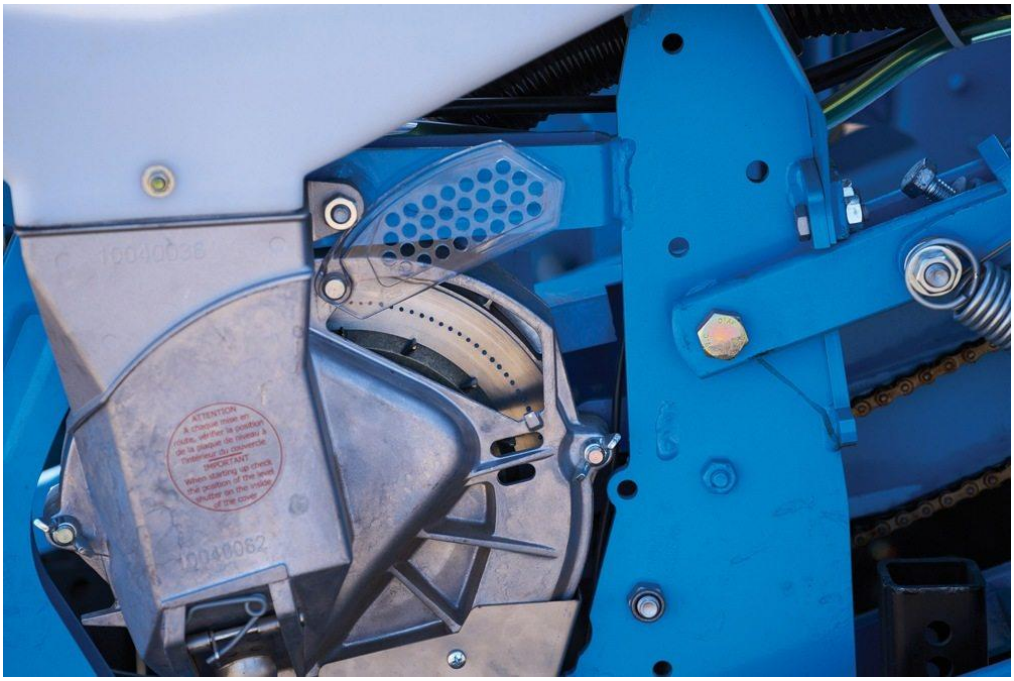

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photo: Farming Smarter

“On the 20-inch spacing, yield did show a decline at the 60 kg/ha rate,” he continued. “But on the yield end, we didn’t see a decline with the air drill and I think the reason behind that is because you’re on narrower row spacing so it takes a lot more product before it’s toxic.”

While the outcome wasn’t completely unpredictable, two elements did surprise Gretzinger. “First, it surprised us how poorly the 20-inch did even compared to our air drill,” he said. “But we were also surprised by how well the 12-inch has been doing compared to the air drill. If we can adapt this, it’s going to really be about making sure we nail down the right row spacing and seeding rates.”

The other big surprise was the differences seen between the dry land and irrigated fields. “We’re expecting usually to see the same trend more or less, but in this case, it was a totally different result in terms of seeding rate,” said Gretzinger. “They seem to do really well on the lower seeding rates, but only in the irrigation, and then when you move to dry land you’ve really got to bump the seeding rates again.”

“I think it’s just important for guys who are going to be doing this sort of thing to really pay attention to their operation and what they’re doing and not try and adapt something that’s really well suited for irrigation and expect it to work the same way under dryland conditions or vice-versa,” he concluded.