

Does deep banding work? New research aims to find out

The practice could make immobile nutrients more available for three major crops

By Jennifer Blair

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Farming Smarter deep banded immobile nutrients at a depth of six inches using a seed drill with a basic stealth opener system. Photo: Farming Smarter

The jury is still out on whether deep banding fertilizer is worth the time and money — but researchers across Alberta are hoping to settle the debate once and for all.

“I don’t think there’s any proof yet that deep banding works,” said Ken Coles, general manager of Farming Smarter.

“We want to have some actual scientific evidence as to whether there’s a benefit.”

Deep banding — or placing the nutrients in the soil at least three inches deep — isn’t really on the radar for most Alberta farmers, said Coles.

“We haven’t seen anybody doing it. It’s a rather novel approach for small-grains cropping.”

But it’s an approach that could gain some ground if three Alberta research groups can prove it works — particularly for immobile nutrients like phosphorus, potassium, and copper. Those nutrients aren’t make or break for crop yield like nitrogen is, but they still boost yield, making them an important part of a plant’s diet.

“It’s not the same as nitrogen, where you’ll see an immediate, obvious response,” said Coles. “But you want to put them down to make sure you’re not limiting yields.”

Typically, these nutrients can be found in soil organic matter, but as Alberta farmers shift toward low- or no-till systems, crop residues are left on the soil’s surface, rather than being incorporated into the soil. Over time, these residues create layers of nutrients within the top three inches of soil — not where the crop really needs them.

Coles found this to be a problem in their test sites near Lethbridge, where they took soil samples at depths of zero to three inches; three to six inches; and six to 12 inches.

“On our fields, there’s some significant stratification of phosphorus, particularly in the zero- to three-inch depth,” he said. “We probably had three-quarters of our phosphorus in that very top layer.”

This nutrient stratification is a problem in and of itself, but when those nutrients are also largely immobile (like phosphorus is), they aren’t readily available for the crops. And that means producers have to supplement them with fertilizer blends.

The research groups hope to solve that problem through deep banding.

“We want to see if there’s any kind of benefit to getting those nutrients down more,” said Coles.

Time and cost savings

Along with Farming Smarter in Lethbridge, SARDA Ag Research in Falher, and InnoTech Alberta in Vegreville will be comparing deep banding at a depth of six inches to the more traditional shallow banding in three different crops — wheat, canola, and pea — during the three-year study.

Earlier studies have compared deep-banded fertilizer to surface broadcast fertilizer, but this is the first time that researchers will be doing a side-by-side comparison of shallow and deep banding.

“We’re hoping to learn which one is economically and agronomically viable for crop production in Alberta,” said Khalil Ahmed, research co-ordinator at SARDA.

Deep banding is already being practised in corn and soybean crops, where researchers found that when compared to broadcast fertilizer application and incorporation, deep banding improved nutrient uptake and increased yield.

“We’re trying to figure out if it will work for other crops,” said Ahmed. “We don’t know for sure yet, but the project results will allow producers to choose the better between shallow and deep banding.”

The shallow-banded plots will receive an annual application of phosphorus, potassium, and copper, while the deep-banded plots received a one-time application at the start of the study this spring.

“I think once every three years is a practice that could work,” said Coles, citing the “convenience factor” of it.

“Once every three years, you just go in there with your seed drill and band three years’ worth of phosphorus or potassium at around five to six inches deep.”

That could save producers both time and input costs, Ahmed added.

“They won’t have to deep band those nutrients every year, so they might save on some input costs,” he said. “We’re going to be looking at the economics and how much time we’re putting in. After that, we can evaluate whether it’s worth it.”

But even if deep-banded nutrients don’t boost yields much, producers may still benefit from shifting to a deep-banded system.

“Even if there’s no change in yield, it might be a good practice — then you don’t have to put down phosphorus every year. You can focus on your key nutrients,” said Coles.

And in an increasingly competitive industry where every bushel counts, pushing the maximum yield even a little could pay off big.

“Lots of times in crop production, it comes down to whatever the limiting factor is,” said Coles. “If we have a good year with good soil moisture, some of these nutrients could be a limiting factor.

“So if anything, I think it will help push the maximum yields a little higher where nutrients are a limitation.”