



Precision Agronomists Let the Fields do the Talking

By Becky Zimmer

Five agronomists are sitting in a bar. One asks the others a question. A fight breaks out. Tables get overturned. RCMP are called. This hypothetical scenario happened all because of one question: what is the best way to soil test a field?

Thoughts are mixed about how much soil testing even takes place in Western Canada, besides the best techniques that get farmers the best results.

According to Statistics Canada's 2021 Farm Management Survey, a fair amount of soil testing is being done across Canada but not to a satisfying degree for local agronomists, including Marilyn Kot, president, Green Acres Tech; and Dale Steele, owner, Steele Ag Insight.

"In 2021, 94 per cent of field crop (oilseed, grain and pulse) farms that applied fertilizer tested their soil for nutrient content and varied their fertilizer application rate," says the report. "This represents a four per cent increase compared with 2017. Among these farms, 42 per cent tested their soil every year."

However, according to the description of the sample size, 18,000 farms were selected to be representative of 81 per cent of Canadian production and, "small farms were automatically excluded; large ones were considered 'must take' because of their national influence on farm practices."

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- Statistics Canada's 2021 Farm Management Survey

"Steele Ag Insight Ltd. in southern Alberta serves larger operations," says Steele, and even this owner sees a lack of soil testing in Western Canada.

As part of the Analysis of Precision Agriculture Adoption and Barriers in western Canada Survey, the first benchmark study of precision ag adoption rates completed in 2017, Steele was a huge part in surveying Western Canadian farmers on their precision ag practices. With 261 responses representing almost

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one million acres of cropland across Western Canada surveyed for the study, 63 per cent of those acres were soil tested. With layoffs and a lack of research funding available, Steele says there is even more testing that needs to be done with very few people trained and operating to do it. While he and his crew are kept busy, he’s always looking for more clients, 100 per cent of which come his way through referrals.

Back 20 years ago, Kot, president of Green Acres Tech Inc. in southern Saskatchewan, would estimate the number of fields being tested at 10 per cent. Now she estimates that number at around 30 per cent.

With 44 years in the industry, Kot says the hypothetical bar scenario is the easiest way to start an argument among agronomists. While Kot has her own tried and tested methods, she knows that those methods can vary among agriculture professionals.

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Kot has had clients with her for over 15 years who have tracked the data and improved their operations through soil testing but some farmers do not see the benefits, she notes.

“When clients match the nutrients going out of their field to what they are putting back in, soil testing shows those numbers,” she says. “Farmers see those returns on investment in two ways: farmers get more bushels per acre and save on those inputs when the field doesn’t need them. I’ve proved time and again that if we pay attention to what the soil test is telling us, the history of the field, the crops being grown and we work the rates according to the field, they get that much more grain off it over time. Or at the very least, they save fertilizer.”

Just like many agronomists in the industry, Kot knows how she is collecting those samples and how to properly get them to a testing facility. It works for her organization and she knows what she is looking for when she sends that sample in, paying attention to the historical data just as much as the recent test results.

For Kot, she decides on a square acre by acre benchmark as a representation of the entire 160-acre field and marks that spot using GPS, consistently coming back to that point year after year.

After that, she lets the field tell her where and how to sample by zone, turning that one benchmark sample into six to 10 precise zones where, again, she consistently takes samples.

One question debated by the industry is how big the sample should be. Through Kot’s experience and research, she takes, at minimum, 15 core samples from ground level down to 24 inches, with some exceptions due to manure application. Following that, she is separating the cores by depth since there is a difference between what is going on at that surface to six inch depth down, to what is going on at that farthest point.

One thing Kot also does is freeze the sample for transport to maintain its integrity.

“If the sample gets exposed to some warm air, it’s going to start mineralizing. This means the lab result for nitrogen will include what was present in the soil as well as what was mineralized in the sample bag. Therefore, the test results will not be a true representation of what was in the field the day the sample was taken.”

With more year-over-year samples, Kot has a better understanding of what the numbers are telling her. Making a plan for nutrient management, the lowest number is going to dictate crop yields and for a few bucks, Kot encourages farmers to look beyond nitrogen to see what other micronutrients are lacking.

Steele Ag Insight does a number of services for large operations, including soil sampling, satellite imagery, irrigation scheduling, crop scouting and multiple rate fertilizer prescriptions. How often farmers take on these services is up to them, says Steele.

“Prior sampling inaccuracies have caused farmers to doubt those benefits of soil sampling,” he says, “but done properly, it can provide a lot of valuable information for farmers. That lack of soil sampling also comes from a place of belief in using a single rate of fertilizer for every field. Even though we see topography differences and low spots and hilltops and sandy



Marilyn Kot takes core samples by hand but also uses a Wintex automated sampler to collect soil at varied levels.
Photo Credit: Marilyn Kot

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spots and different yields, they’re not doing anything about it. It’s like, well, I’m just going one rate to fertilizer. I don’t need to know what’s in every field or different parts of the field.”

He continues, “Actions taken from testing results come from what the farmer wants to do with this information. Are they wanting to mine, maintain or build up the nutrients and organic matter in their field? There’s not a right or wrong answer to this question but the answers are more accurate with multiple years of testing. How do farmers know what they are doing is the right thing without going back and testing again?”

“If you’re asking for an average of the field – a composite or benchmark – I’ll request your prior sampling points. It’s funny how very few farmers can ever give me those; they always appear to be lost or missing. So, we’ll create new points with our trained technicians.”

For Steele, the best results come from composite sampling in the winter without including those hill and valley outliers that would skew a more realistic average of the whole field, he says.

Farmers need time to make decisions and winter sampling paints a more accurate picture without the mineralization that takes place in October and November, April and May, with time to plan for spring seeding. It is also safer for his staff since it is easier on the equipment and teams and for contending with less mud. Also, there is less risk of a service truck burning up on stubble.

“When taken correctly, samples will offer the same readings from one lab to another,” says Steele, “but there may be differences in how they are presented, i.e. Celsius versus Fahrenheit.”

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According to Steele, finding a trusted agronomist is the key to identifying the problems and finding the solutions to the all-important question of how to improve yields. **F**

