

Soil Health



In a high-ranking priority, session stakeholders advocated more focus and research on the character and quality of agricultural soil, and ways to improve it.

Alberta crop producers spend most of their time managing what goes on *above* the soil. They worry about issues like weed spectrums, crop staging and the best approach for harvesting the crop in optimum condition.

Judging by stakeholder views expressed at the ACIDF Cropping Initiatives Issues/Solutions Sessions, however, producers want more information on what's happening *below* the soil surface.

Charles Schmidt, for one, believes that what's good for the soil is good for the farmer. Over the last 20 years, he's seen how new and better farming practices can improve soil health.

“When guys in this area were doing tillage, the soil was getting lumpy, more claylike and it was just a very dead type of soil,” says Schmidt, who farms in the Chinook area east of Hanna. “With direct seeding and chemfallow, that's changed dramatically. We're now seeing more of a loamy soil. By not tilling, we're not getting rid of the organic matter. I think the soil is more mellow and has a lot more life to it now.”

While many priority areas were discussed at the ACIDF Cropping Initiative Issues/Solutions sessions, Schmidt came with a back-to-basics message. He advocated for Soil Health as a priority, and when all responses were analyzed, it ranked #2.

With all the progress made in soil quality in recent decades, you might think there's not much left to do. Schmidt thinks we're just getting started. He's looking for knowledge that can advance both crop yields and sustainability, and he knows that many feel the same way.

“We want to understand our soil, the limitations of it and the role played by nutrients,” he says. “We want to know how to build health in our soil, such as encouraging microbial activity to help fight diseases.”

What's going on down there?

The high ranking earned by Soil Health as a priority area may seem a bit surprising. According to session participant J.P. Pettyjohn, it's a heart-and-soul issue for Alberta crop producers.

“Soil health is a question that is very much on the minds of producers,” says Pettyjohn, a Falher-based agronomist with the Smoky Applied Research and Demonstration Association (SARDA). “Yet it's an abstract concept. What really is a healthy soil? How do you get your soil healthier? It's an area where we have a lot of dialogue with producers.”

Years ago, conventional tillage practices took a toll on prairie soils. Having successfully made the transition to reduced, minimum or zero-tillage, many feel better about their soil in that regard.

“Soil structure and soil tilth have improved because of reduced tillage and that is well-documented,” says Pettyjohn.

Even so, growers have an abiding interest – with different parts agronomy, economics and emotion – in what's going on down there. As Pettyjohn sees it, many producers' concerns are now about what farming *adds* to the soil and how this may affect its quality. Fertilizer is one point of interest. Everyone recognizes that fertilizer is an important input, but some wonder whether a *go-for-it* soil fertility program could be counter-productive in the long run.

In Pettyjohn's view, economics dictates that producers want to push production higher and higher. The dilemma is, are farming practices maximizing yields today, but short-changing future generations tomorrow?

Alberta crop producers spend their summers managing the impact of insects on their crops. Session discussions revealed they're also concerned about life at the root level. Are micro-fauna and other micro-organisms abundant and healthy enough to contribute to soil health? Could anhydrous applications be compromising the delicate balance in our soils?

Beyond a specific issue like the impact of fertilization, Pettyjohn and other session participants maintained that a sound base of soil knowledge is the first order of business.

“So number one, what is healthy soil? Two, how do we measure it? Three, how can we improve it? The more you know about your soil, the better positioned you are to grow crops profitably and with an eye to the future.”

Soil Health:

Issues identified by stakeholders

- influence of crop rotation on soil health
- increasing growers' basic knowledge related to understanding a soil test and key prairie soil characteristics
- management practices that favour beneficial soil organisms
- soil health in a no-till system
- key soil health characteristics (non-nutrient)
- gathering long-term data (of value to producers) on rotations
- impact of irrigation on soil quality and health (i.e. compaction)
- information on the residual impacts of chemical and herbicide inputs
- understanding the limitations and the environmental impacts

Soil Health:

Action items: what should be researched first

- define soil health, as this definition is the basis for discussion and measurement
- determine ways to evaluate key characteristics of soil health
- develop management practices and technologies that would improve these characteristics, either individually or in combination
- understand the impact of periodic tillage in a zero-tillage regime.