

Cover crops as a southern Alberta option



A series of crops planted in large plots at the Farming Smarter research site near Lethbridge, AB.

Credit: Farming Smarter

Cover crops offer several benefits for soil, subsequent crop yield and weed control. The question is whether the cost/benefit analysis works here in southern Alberta. Also, is there a long-term benefit or will it be a practice that sometimes works and sometimes causes losses.

The only way to really know for sure is to try it, but for a crop production operation that's a costly experiment and additional risk that makes for a powerful disincentive.

Enter Farming Smarter working within a larger experiment across the prairie provinces and led by Yvonne Lawley, Assistant Professor, University of Manitoba. Farming Smarter began a project in spring 2018 at its Lethbridge site and will contribute southern Alberta data to the larger study. The experiment will have two main treatments: 1) a four year annual crop rotation that includes shoulder season cover crops in every year and 2) the same crop rotation without cover crops in the rotation. The study will have each crop in the rotation grown during each year. The other locations involved are Carman, MB, Saskatoon and Redverse, SK.

The 4-year Lethbridge rotation is spring wheat-canola- durum wheat- peas with clover, lentils, radish and a blend of fall rye and winter peas as cover crops. This will be compared to the same rotation without cover crops, a 2-year rotation of Canola- Wheat and 4 years of reference crop of Alfalfa.

Existing literature regarding cover crop benefits include soil erosion protection; enhanced nutrient cycling; nitrogen fixation; enhanced soil quality; reduced soil compaction; weed suppression; and insect and disease control. Cover crops cycle nutrients, such as nitrate, that can leach from the soil. Legume cover crops may also fix additional nitrogen for subsequent growing seasons. They can also enhance soil quality by providing living plant roots outside of the traditional growing season and additional plant residues that increase soil organic matter. This can provide additional habitat and food sources for the food web of macro and microorganisms that live in the soil. Over time, cover cropping can increase soil aggregate stability, macroporosity, aeration, water infiltration, and water retention, especially when used in combination with no till.

Lethbridge project lead Ken Coles remarks, “A cost exists to use cover crops, so we need to know the benefits are real. For instance, a cover crop that secures soil in the fall and adds nitrogen for the spring but dies over winter may be the best option for Alberta. But that’s an intuitive assumption. We need to actually learn how various cover crops work in our soils, climate, moisture availability etc.”

It's possible that cover crops will become a viable tool for soil and crop health within the larger context of agriculture production in southern Alberta. How it might fit is what this study hopes to learn.

As the study progresses, Farming Smarter will report on how it’s going at field days and conferences in Lethbridge and Medicine Hat.