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Researchers invent their own version of the great white combine

Farming Smarter has created a hail simulator so it can test 'hail rescue' treatments



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Reporter

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Farming Smarter has created a hail simulator — dog chains attached to a bar that can be attached to a front-end loader — to create a reasonable imitation of hail damage. *Photo: Alexis Kienlen*

What can you do when your crops get pounded by hail? How do crops recover from hail damage?

There are a lot of questions about this subject, and little information available. That's why the team at Farming Smarter developed its own hail damage simulation machine, which it unveiled at the organization's recent field school.

“We wanted to do this so we could test management practices that could be considered crop recovery attempts for hail,” said general manager Ken Coles. “You have this crop that you've invested in, and when it gets beat up, you want to give it some medicine to help it along.”

The team at Farming Smarter had many farmers coming to it with questions about hail recovery products, and found a lack of scientific data on how crops recover from hail.

Questions abound

Hailstorms cause crop tissue damage, stem breaks, bruising, scraping, and leaf defoliation. When hail crushes a mature crop, it often wipes it out. But an early crop can recover and so it's difficult to assess the damage, said Ian Wood, an adjuster with the Agricultural Financial Services Corporation.

Typically a sample of 100 plants is used to assess what percentage was damaged. Adjusters will often wait for about 10 days before they come out for an assessment, so they can see how much of the crop has actually died.

But the survivors can be in for a rough ride. For example, open wounds on a plant can become a vector for disease, allowing it to be attacked by opportunistic pathogens.



Rod Werezuk photo:Alexis Kienlen

“There's a lot of talk about whether or not hail causes disease or contributes to disease,” said Rod Werezuk, a research technologist with Alberta Innovates Technology Futures in Vegreville.

Werezuk has been simulating hail damage on crops for research purposes for four years. It's an area that hasn't seen a lot of study, but that hasn't stopped claims being made for so-called 'hail recovery' products. Farming Smarter will be testing these products as well as regular fungicides, nutrient blends, and growth regulators on plots with simulated hail damage.

"Most people like to talk about rescue attempts, but most people don't know what's going to work," said Werezuk, who works mainly with plant pathology. "Although hail damage has been simulated in research for a couple of decades now, we're still left with these questions."

Simulating hail damage

In a real-life situation, hail damage is uneven, which makes it difficult to study. So researchers used controlled trials that can be reproduced, which allow both scientists and adjusters to gather accurate data. All treatments applied to damaged plots are applied to uninjured check plots as well, so the true effects of the treatments can be studied.

After consulting with members of Alberta Innovates Technology Futures in Vegreville, the staff at Farming Smarter simulated hail damage by whipping test plots with dog chains. A local company, Kirchner Machine, custom built a hail damage simulator that can be attached to a front-end loader for larger plots. The simulator consists of a bar covered in dog chains which whips the crops to simulate heavy hail damage.

For the purpose of the study, test plots will be damaged at various levels and different growth stages. Crops in the study, funded by the Alberta Pulse Growers, include fababeans, dry beans, peas, wheat and canola.

"We can also play with the timing of the application and the treatment," said Coles.

Being able to conduct controlled studies next to check plots will shine a light on what works, he said.

"We hope that in creating the simulator, we'll be able to test some of these products and get some more funders on board," said Coles.