

Alberta Farmer

EXPRESS

Get your timing right with PGRs

By increasing or decreasing hormone production, plant growth regulators can either promote or limit growth



By [Alexis Kienlen](#)



Phil Bernardin of Engage Agro explained some of the ins and outs of using plant growth regulators at Farming Smarter field days. *Photo: Alexis Kienlen*

Plant growth regulators may offer some benefits, but the timing and staging of their application is critical.

“Plant growth regulators change the hormone relationships within plants and can increase or decrease hormone production,” Phil Bernardin, a technical rep with Engage Agro, said at Farming Smarter’s recent field day.

In cereals, plant growth regulators act as retardants to shorten the plant, thicken the stem, maintain yield potential, and prevent lodging.

There are five types of plant growth regulators. Three promote growth: auxins stimulate cell elongation and growth and cause plants to grow towards a light source; cytokinins play a big role in cell division and the growth of lateral buds; and gibberellins stimulate cell elongation and stem growth.

Two others limit growth. Abscisic acid causes tiny pores on the plant leaf to close and prepares the plant for dormancy.

“If I’m in a dry year, much like we are this year, if my roots start running out of water, they will increase abscisic acid production, and that abscisic acid will travel up the roots into the leaves, and tell that stomata to close,” said Bernardin. “I’m running out of moisture, the plant doesn’t want to die, so it prevents transpiration to keep the moisture in.”

Ethylene, which plays a big role in fruit or cereal ripening, can also cause shortening and thickening stems, and senescence (biological aging). Etherel is a new product that contains ethylene.

“When applied at the right time on cereals, it will have that ripening effect and thicken the stems,” said Bernardin. “When applied properly, it can work really well.”

Caution required

However, there are a number of concerns involved with the product.

“If I have hail damage, a plant will naturally produce ethylene,” said Bernardin. “If you get any kind of stress on the plant, and you spray Etherel, you just added ethylene to a plant that is already producing ethylene, so you can have some issues there.”

The timing of Etherel application is critical.

“You don’t want to add ethylene at the wrong time, or you will cause damage,” he said. The optimal window to spray Etherel is full flag, when the boot is starting to fill on the main stem. If the boot starts to crack, then it’s too late.

Chlormequat (Manipulator) and trinexapac-ethyl are both anti-gibberellins — reducing the amount of gibberellin hormone a plant produces, causing a shorter stem and reducing lodging. Manipulator is slow acting and has a long residual period in the plant. Trinexapac-ethyl is quick acting and has a short residual period.

Timing is important. The ideal time for applying anti-gibberellins are growth stage 30 to growth stage 32.

“That’s when that little head is about a half-inch above ground,” said Bernardin. “That’s our indication that the stem is starting to move up, gibberellins are being produced, and now is a good time to apply our anti-gibberellin.”

Growth stage 31 occurs when the first node is a half-inch above ground and growth stage 32 is when the second node is a half-inch above ground.

Timing critical

The team at Engage Agro has done some work with Manipulator at herbicide timing and has seen some results.

“However, if you put it on at that three- to four-leaf stage, at herbicide timing, you will lose some activity,” he said.

If applied at flag-leaf stage, there’s a chance it will shorten the middle portion of the stem and make it more susceptible to lodging.

“If you want to tank mix, I’d much rather you went in at fungicide timing, rather than going early,” said Bernardin. “At least when you put it on at flag leaf, it’s got something to do right away, as there are still gibberellins being produced. Flag leaf is the latest you can go with the anti-gibberellins. There’s not much point in going any later.”

Another complication with Manipulator is that there is no residue limit established in the U.S., so not all companies will accept Manipulator-treated wheat.

“If you want to use it, you need to make sure you’ve got your marketing sorted out,” said Bernardin.

Within cereal varieties, there are differences in responses to plant growth regulators. Hard red is more responsive than CPS.

“Typically, what we’re seeing is that the taller the variety, the more of a response you’ll see,” he said.