

# How Have GMO's Changed Sugar Beet Production?

## A First-Hand Perspective From Southern Alberta Sugar Beet Farmers

By Makayla Gross

Thanks to genetically modified (GM) sugar beets, farmers are able to grow their crops and manage their resources in ways that were never possible before.

This has allowed sugar beet growers to become more sustainable in their farming practices: using less fuel, water, labor, land and chemicals.

So how exactly have genetically-modified sugar beets altered production? These interviews from Southern Alberta sugar beet growers, Frits Dekker and Jason Zeinstra, provide a first-hand view of these changes. But to truly understand the differences, one must begin by understanding the early production of sugar beets:

"Originally, [sugar beet farmers] grew a multi-germ seed which produced five or six plants from one seed. But in growing sugar beets, you only want one plant every six inches so they're not crowding each other out, [competing for nutrients and the room to grow]. So you would have to 'thin' the field and hoe out four to five plants every six inches," Dekker reported.



Photo: City of Vancouver Archives // Item : 2011-092.3545  
"Beet seed operations: field workers hoeing field of immature sugar beets"

Hoeing sugar beet fields required strenuous hours of labor out in the summer heat, and often times, crews of workers were needed to come and complete the task. To put it into perspective, a quarter-section of land (160 acres) is 1/2 mile x 1/2 mile and beet seeds are planted in rows 18-24" apart. If 4 plants have to be hoed out every 6 inches, then over 27,000,000 plants would have to be hoed out from every field -- which was no walk in the park!

This practice persisted until 1957, when a mono-germ seed was developed.

"After that, we had mono-germ seed. And this produced one plant per seed -- so we no longer had to thin out the crop -- but we still had to spray [the beets]," Dekker continued. "The chemicals we had at the time were very expensive, so [to save on costs], we would only spray a seven inch band of herbicide over top of the rows, and in between the rows, we would cultivate the ground [to tear out the weeds]."

"However, the chemicals we used were hard on the beets, and would actually set their growth back quite a bit."

"That meant we [farmers] would use very low rates of herbicides, and we would have to re-spray them every 3-5 days. Then, after you sprayed, you would go back and cultivate in between the rows."

"So in total, you would cultivate about three times a year and spray about five to six times a year. But, of course, there were always weeds that escaped -- and anything that escaped was hoed by hand. So that's what our kids would do as soon as summer holidays started -- they would go to the field, walk up and down the rows, and chop up anything that wasn't a beet."

However, in March of 2005, the first genetically modified sugar beet variety became available for farmer use. What made these sugar beets different is that the seed had been genetically engineered through the use of biotechnology to allow the plant to be resistant to glyphosate, a common, and safer, herbicide.

This means that glyphosate (or Roundup, it's shelf name) can be sprayed onto the crop, and while it won't damage the sugar

beets, it will eliminate all the weeds.

"With GMO sugar beets, we no longer have to use any of [the conventional weed control]. Now, you seed the crop, spray Roundup after your beets [begin growing], and then spray it once or twice more with a three-week interval in between [...] Then, it's just harvest after that," said Dekker.

Zeinstra's operational practices differ slightly, where, "there's a couple fields that we only sprayed once this year, the others, twice. But back in the day, doing the conventional Nortron/Betamix [herbicide applications], we were hitting the beets up to 4 times a year with that concoction of chemical."

Zeinstra further recounted how, "[those chemicals] would yellow the beets, causing them to wilt. And then, just as they would begin to pick back up again, you would have to go in and hit them again. But now, with Roundup, they're able to keep growing without getting set back."

At the end of the day, genetically modified sugar beets have helped farmers grow more, and do more, with less.

Spraying was reduced from 4-6 times a year to 1-3 times a year, while the practice of cultivating 3 times per growing season was eliminated as a whole. These two features alone

greatly reduced the amount of fuel consumption -- and the carbon footprint -- that it takes to grow the crop.

And just as cultivating has been eliminated, so has the need for the strenuous labor that was once required of hoeing crews. This has brought down the labor cost of the crop to a minimum, and farmers no longer have to struggle in trying to find adequate workers throughout the growing season.

And, as fewer weeds are in competition with the crop, less water may be used on the field. But ultimately, one of the most notable changes, besides reduced spraying, has been the dramatic increase in yields.

"The yields with the older genetics were a lot lower, too. You would dream about getting [our current yields] back in the 90's. If [my dad] got 20 tonnes / acre, he would be excited. And now it seems pretty easy to be over that 25-30 tonnes / acre yield," Zeinstra remarked.

These exciting advancements mean that farmers are able to produce more food with less land, fuel, water, and with safer chemicals.

Morris Zeinstra, Jason's dad who is now retired from the farm, summarized these incredible changes as someone who has seen the technological advancements re-shape the industry, "if it wasn't for Roundup, I think the sugar beet industry [in Canada] would have been done."

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