



LOOKING AT GENES AND GMOS

Did you know that only 11 crops have genetically modified properties to them? And out of these 11, one is sugar beets. Available after decades of research, the introduction of GM seed has allowed growers to use less resources and inputs, all while creating a healthier, more sustainable plant.

Today, we'll look at different plant breeding and genetic opportunities that would continue to reduce the carbon footprint, chemical usage, water amounts, and impact of this crop. But first, let's gain some more understand of gene editing and GMO plants:

***Gene editing** is used to help prevent plant diseases, produce higher crop yields with less resources, make plants more adaptable to climate change, and reduce food waste. It is a proven solution for making healthier food, stronger crops and increasing yields all while using fewer resources.

Gene editing a plant's own DNA does not create a GMO. This is because gene editing focuses on using a plant's own genetic code, meaning that the changes made to a plant through gene editing are similar to the changes you might see naturally over time or as a result of the plant breeding practices we have been applying for thousands of years. Gene editing just lets us make them in a quicker and more precise way.

****GMOs**, or genetically modified organisms, are referring to crops developed through genetic engineering, a more precise method of plant breeding. Genetic engineering, also referred to as biotechnology, allows plant breeders to take a desirable trait found in nature and transfer it from one plant or organism to the plant they want to improve, as well as make a change to an existing trait in a plant they are developing.

Some examples of desirable traits commonly transferred include resistance to insects and disease and tolerance to herbicides that allow farmers to better control weeds.

Resources and additional information:

*www.naturenurtured.ca

**www.gmoanswers.com





Group 1

Design:

A beet that will leave a smaller carbon footprint yet still grow to the same size and sugar content as a traditional beet, all while being used in dry climate areas with sandy soil and a 20% reduction in water intake.

Group 2

Design:

A beet that is able to reduce and prevent soil erosion, requires no inter-row tillage, is able to use safer, less toxic chemicals, and can grow to the same size and sugar content as traditional beets even when there are limited nutrients in the soil.

Group 3

Design:

A beet that will reduce the amount of spraying required from 4 passes to 1-2, all while being able to withstand early frost, below average soil temperatures, and reduced soil nutrients.

Traits:

- 1: Can be planted 2-3 weeks earlier than traditional seed
2. Resistant to herbicides
3. Genetically engineered to thrive in desert environments
4. Require 7% less fertilizer to produce same yields as traditional seed
5. Require less water to grow
6. Sequesters 5% less tonnage of carbon