



A photograph of a vast field of young sugar beet plants, arranged in neat, parallel rows. The plants are a vibrant green color, with their leaves showing characteristic ruffled edges. The perspective is from a slightly elevated angle, looking down the rows of the field.

# **PLANTS USED FOR FOOD AND FIBRE**

Science and Technology used to produce  
sugar beets in Southern Alberta



An aerial photograph of a sugar beet farm. In the foreground, a white tractor is pulling a red harrow, which is working a row of soil. To the right, a yellow trailer is filled with harvested sugar beets. The background shows a large field of lush green sugar beet plants. The text 'SUGAR BEET PRODUCTION' is overlaid on the image in a white box with a black border. The box is decorated with a red tab on the left and an orange paperclip on the right.

# SUGAR BEET PRODUCTION



## BACKGROUND:

Sugar beets are grown in Canada, The USA, and Europe to make sugar. In Canada, sugar beets are only grown in Alberta and Ontario. Sugar is important to add flavour, help preserve, and give texture to foods. Sugar beets can also be feed to livestock.



If only sugar beets are grown in the field, it is a **monoculture**; there are no other crops growing in the field at the same time.

# HOW DO FARMERS GROW SUGAR BEETS?

Farmers start by **preparing the seed bed**. A machine like a disc or chisel plow is used to work up the dirt and break up any large clumps, make the field level, and remove any of the previous year's crop residue.

Some farmers are able to plant right into **stubble** and do not have to do this step.





# HOW DO FARMERS GROW SUGAR BEETS?



Farmers then use a **planter** to precisely place the seeds in the soil. This process is called **seeding**. This usually takes place near the end of April and into the month of May.





# IRRIGATION

Sugar beets require lots of water, which means that **irrigation** is needed to supply water to the crop when it is needed. In southern Alberta, the most common type of pivot is a center pivot.





# FERTILIZER

Sugar beets also require specific **nutrients**. The main nutrients that sugar beets (as well as many other crops) require include **nitrogen, phosphorus, potassium, and sulfur**. These nutrients occur naturally in the soil and more can be added in the form of synthetic fertilizer or manure. This can be added when the seed bed is being prepared before planting.





# HERBICIDE AND GMOS

Other plants usually grow in the field at the same time as the sugar beets.

These plants use the water and nutrients that are meant for the sugar beets, which we do not want.

Any plant in the field that is not a sugar beet is called a **weed**. Weeds are usually controlled using **herbicides**, which are special chemicals that kill only the weeds and not the sugar beets.





# HERBICIDE AND GMOS

Sugar beets are **genetically modified organisms**, which means that their genes are changed by humans so that they have special traits that the farmer wants. In this case, sugar beets are "round up ready" which means they can be sprayed with a herbicide that will kill all the weeds, but not the sugar beets.

## HERBICIDES USED ON SUGAR BEETS

### BEFORE ROUND UP



#### Toxicity Levels \*

Poast: 5,000 mg/kg  
Lontrel: 5,000 mg/kg  
Upbeet: 5,000 mg/kg  
Nortron: 2,100 mg/kg  
Betamix: 2,000 mg/kg

MORE TOXIC



### WITH ROUND UP



#### Toxicity Level \*

Roundup: 5,600 mg/kg



# INSECTICIDE

Insects also like to eat the sugar beets as they are growing. These are known as **pests**, and when there are too many pests, the sugar beets can

be seriously damaged. To prevent damage, **insecticide** can be used. It

is important to remember that insecticides hurt more than just the insects they intend to hurt and are only used when the farmer is at risk of losing a significant portion of his crop.





# HARVEST

At the start of October, the beets are ready to be **harvested**. One machine takes the leaves off the sugar beets, while another pulls the beets out of the ground. These are called a “topper” and “digger”.





The sugar beets are loaded onto semitrucks and taken to piling grounds.





The sugar beets are taken to the sugar factory in Taber, Alberta where they will be processed to produce sugar.





# A SHORT VIDEO ON SUGAR BEET PRODUCTION



<https://www.youtube.com/watch?v=k9rg98Qao7w>



# KEY TERMS

**monoculture** – when only one crop is planted in a field at once.

preparing the seed bed – techniques done to get the soil ready for seeding.

**stubble** – the left over stems from the crop the year before.

**planter** – a special type of machine used to put sugar beet seeds into the ground.

**seeding** – the process of pulling the planter behind the tractor to put seed into the soil.

**irrigation** – supplying water to crops to help them grow.

**nutrients** – minerals that are essential for plant life.

**nitrogen, phosphorus, potassium, and sulfur** – the four nutrients required by all plants in large amounts.

**weed** – any plant in the field that the farmer does not want to be growing there.

**herbicides** – special chemicals used to control weeds.

**genetically modified organisms** – plants with genes that are changed by humans so that they have special traits that the farmer wants.

**pests** – insects that damage the crops.

**insecticides** – special chemicals used to control pests.

**harvest** – when the sugar beets are done growing and ready to be removed from the field.