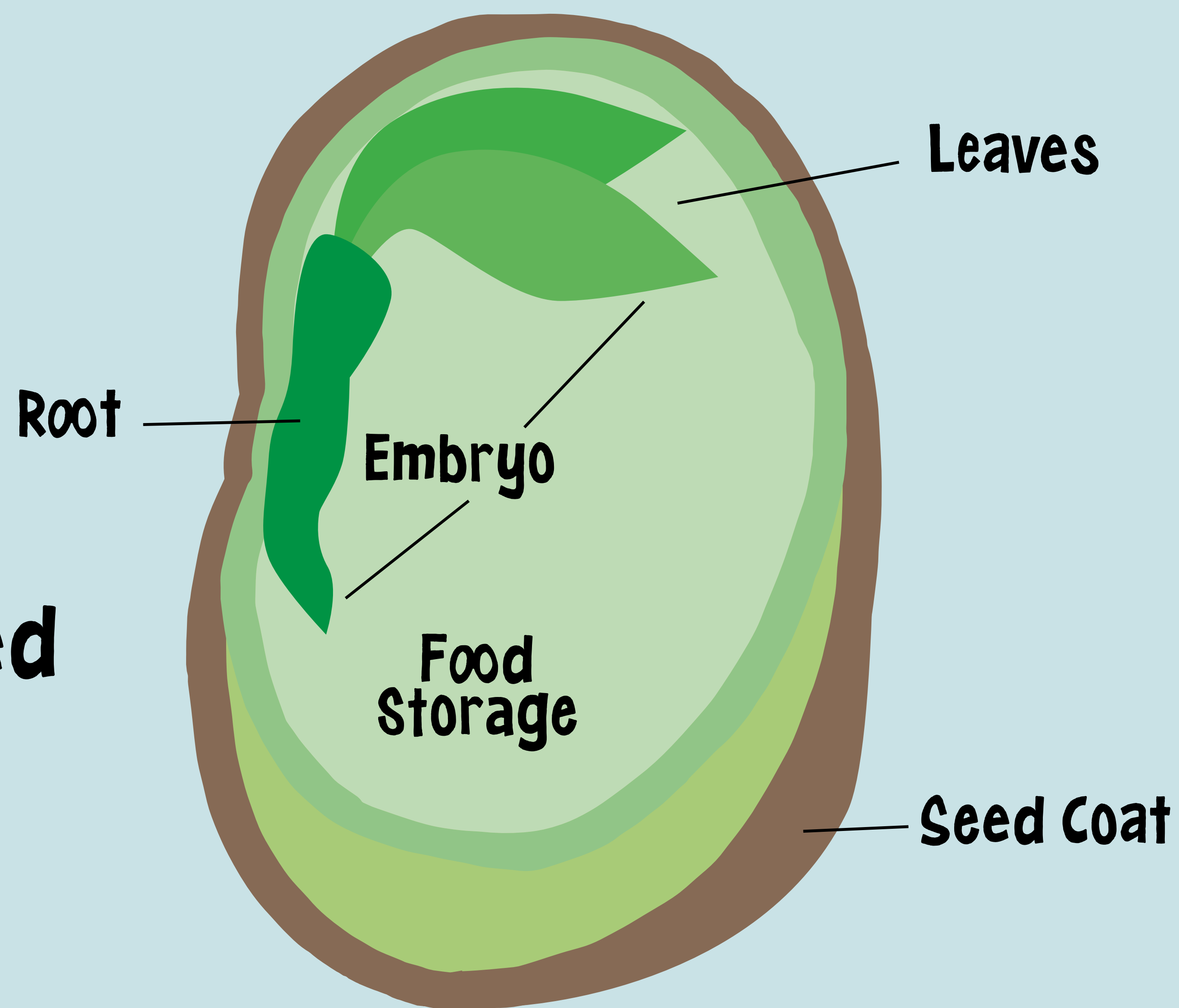







# STATION 1

# Seeding Shed

## Inside a Seed



-  A seed is a baby plant.
-  The outside of the seed is called the seed coat, not all seed coats look the same.
-  Every plant has a unique seed with a special code inside called DNA. This special code says what type of seed the plant will grow into.
-  There are different ways to start and grow seeds into seedlings.
-  Farmers have lots of tools available to help them seed their plants and get them off to a strong and healthy start.

Every plant has a unique seed with a special code inside called DNA. The plant's DNA determines what type of plant the seed grows into.

Seeds are started in the seeding shed, then moved into the nursery tunnel so that the climate can be monitored for the seeds to get a good start. Seedlings live in the nursery tunnel until they are strong enough to go out into the field to grow.

The nursery tunnel helps promote early growth by warming the air around the plants using heat from the sun. The structure also protects the young plants from frost, wind, and heavy rains.

There are many tools that can be used by farmers to help them with seeding. They might use a vacuum seeder or a drop seeder and some use a paper pot system. This specialized equipment is made by agriculture design engineers who work to make farmer's jobs easier!



## STATION 2

# The Benefits of Raised Beds



Raised beds are used because they:

- 🌱 Warm the soil and drain away excess water
- 🌱 Keep soil from turning into mud and sliding away on rainy days
- 🌱 Maximize space and enable farmers to grow more food

Raised beds, protect the soil from compaction, and erosion during heavy rains.

They also provide good drainage for the crops.

- **Compaction:** closely packed
- **Erosion:** worn away, loss
- **Drainage:** removal of excess water

Raised beds also allow farmers to plant earlier in the season because the soil is warmer and well drained when it is above ground level. As well, air and water movement in the soil is improved, so roots can spread out and search for nutrients more easily than when stuck in compacted dirt in the ground.

Farmers like planting in raised beds because it is a great use of space, and when they can use the maximum amount of space for growing it results in greater crop yields, which means more food can be grown for the community to eat.



# STATION 3

# Soil



Wood bugs

Ants

Earth Worms

Rocks

- There are both living and non-living things in the soil that provide food for plants to grow.
- Soil holds water and makes it available for plants when they need it.
- Soil provides support for a plant's roots so the plant can grow strong and reach for the sunlight.
- Soil is important for farmers because without it they cannot grow food for us to eat!

The climate and soil in the Fraser Valley is some of the best in Canada for growing food for people and crops for animals.

Soil is very important for agriculture but it needs to be managed properly because it faces numerous challenges. Every time a crop is harvested, nutrients such as **Nitrogen (N)**, **Phosphorus (P)**, and **Potassium (K)**, which feed plants, are removed from the soil with the harvest.

Farmers can make environmental improvements on their farms by following Environmental Farm Plans (EFP). These plans help farmers find ways to improve farming practices that reduce threats to the water, air, and especially the soil.

Farmers can improve their soil by:

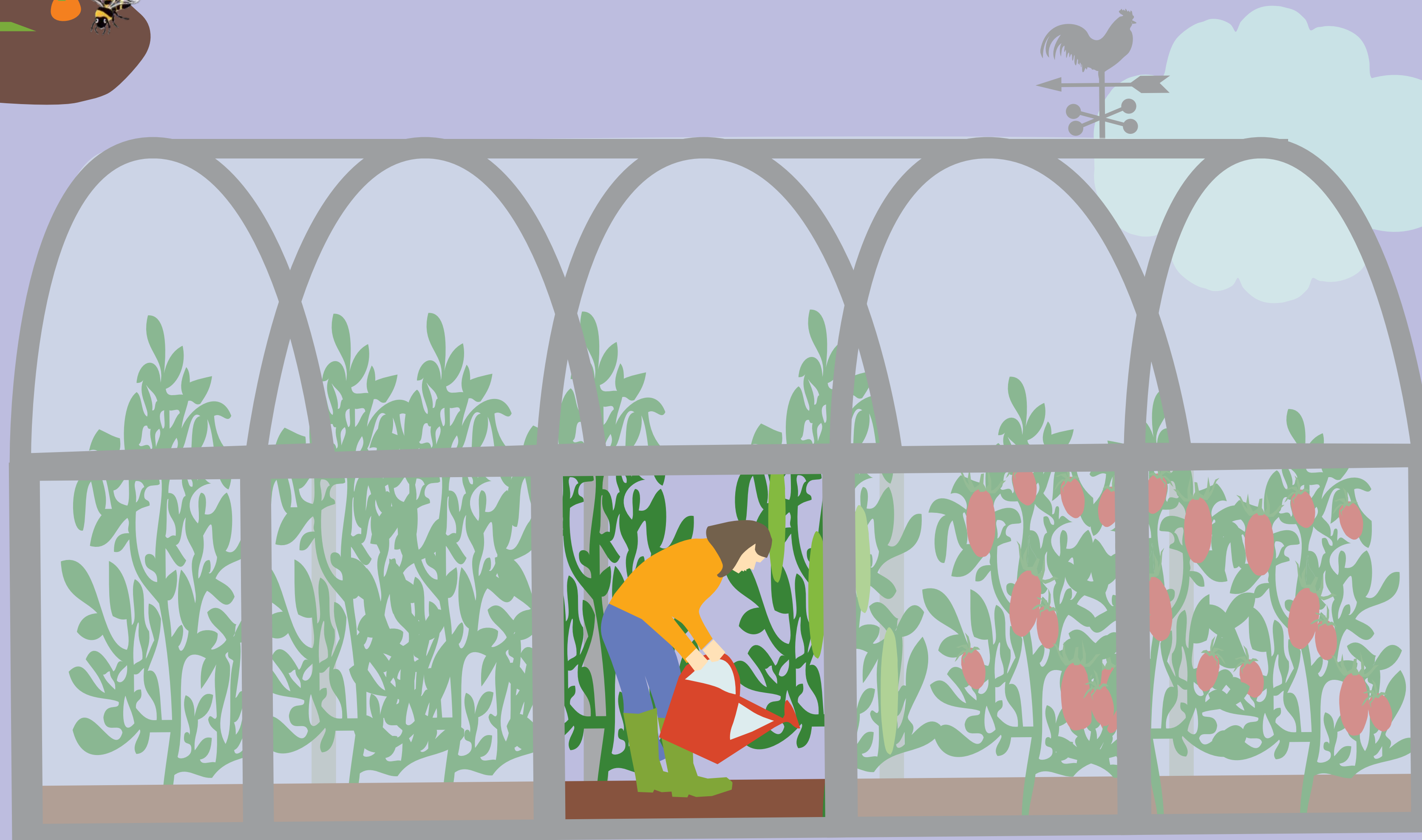
- Spreading manure or compost to improve the organic matter content
- Planting cover crops to increase fertility and prevent soil erosion in the rainy months
- Rotating the types of crops grown

Farmers also use equipment such as tractors, manure spreaders, discs, plows and harrows to help work the soil.



## STATION 4

# Greenhouse



In Southwestern BC many farmers grow fruits and vegetables inside glass greenhouses instead of outside on fields. Inside a greenhouse the crops grow upwards to the roof. Farmers can grow up to 20 times more crops in a greenhouse compared to the same area in a field. BC greenhouse farmers use only 0.01% of BC's total farmland to produce 11% of BC's total crops value.

Growing in a greenhouse differs from First Peoples ways of gathering. Much attention has to be paid to weather patterns and seasonal changes when traditionally gathering, but when using a greenhouse, the environment can be controlled and therefore the seasons can be extended and colder weather stretches do not have as much of an impact.

There are different technologies to manage and control in a greenhouse in order to create the optimal growing environment. Greenhouse technicians work to grow and harvest fresh local food year round. There are also jobs related to building and maintaining the greenhouses, such as maintenance technicians or construction workers.







- 🍷 A greenhouse is a building made out of glass or plastic. When the sun comes through, it warms the air inside.
- 🍷 Some plants love growing inside greenhouses because they are warm and protected from bad weather all year round. The farmers are too!
- 🍷 Farmers also love growing plants inside because they can start planting earlier in the year, and can often continue the growing seasons after the weather conditions outside are no longer ideal.
- 🍷 This is different than the ways First Peoples gather. First People use traditional knowledge based on the weather, seasons and other plants or animals. For example the Nlaka'pamux (*Ing-khla-kap-muh*) people, know that when the wild rose is blooming then soap berries are ready to be harvested.
- 🍷 Farmers can also grow much more food in a greenhouse then they can on the same amount of land outside.



## STATION 5

# Challenges to Growing Food



-  A pest is something (plant or animal) that causes harm to a farmer's crops.
-  Pests can cause disease, take over growing space, or eat plants and crops.
-  Farmers use good bugs like ladybugs to get rid of insect pests.
-  Farmers have different ways of controlling weeds and pests like cover crops and row covers.
-  Extreme weather conditions, caused by climate change, can cause damage to crops.
-  Wildlife such as rabbits, rats, voles, geese, deer, raccoons, and coyotes may also harm crops in the field.

To minimize and control the negative impact of insects, animals, fungus or weeds, farmers use a practice called Integrated Pest Management (IPM). They “integrate” or combine different methods of pest control to be effective.

### For example, they:

- Understand pest biology
- Monitor for pests
- Use crop rotation (farmers plant a different crop in a field year to year)
- Plant cover crops to protect the soil and keep down weeds
- Encourage beneficial insects (good bugs) to kill the pests (bad bugs)
- Use screens or nets called row cover
- Plant pest resistant seeds or plants

### Other obstacles:

Heavy rains can destroy entire fields, but drainage tile is used to increase the use of property and lengthen the growing season.

New farmers entering the industry also face challenges such as the high cost of land, buildings, and equipment needed to start farming.



## STATION 6

# Organic Agriculture



### Things that organic farmers do:

- 🌱 Feed their soil by adding **compost**, and natural fertilizers made from bones, feathers, or fish, instead of human-made chemicals
- 🌱 Plant cover crops like rye and buckwheat and crop rotation practices to maintain healthy soil
- 🌱 Manage weeds, pests and diseases with helpful bugs

Organic farmers want their plants to grow well in healthy soil - an added bonus of healthy soil is that it helps fight climate change!

In BC there are different ways farmers choose to grow the food we eat. One way is organic farming. Organic agriculture focuses on the health of the soils, ecosystems, and people. It aims to work with the local environment and biodiversity.

Organic farmers grow food without using synthetic pesticides. They feed their soil by adding **compost** and natural fertilizers made from bones, feathers, or fish.

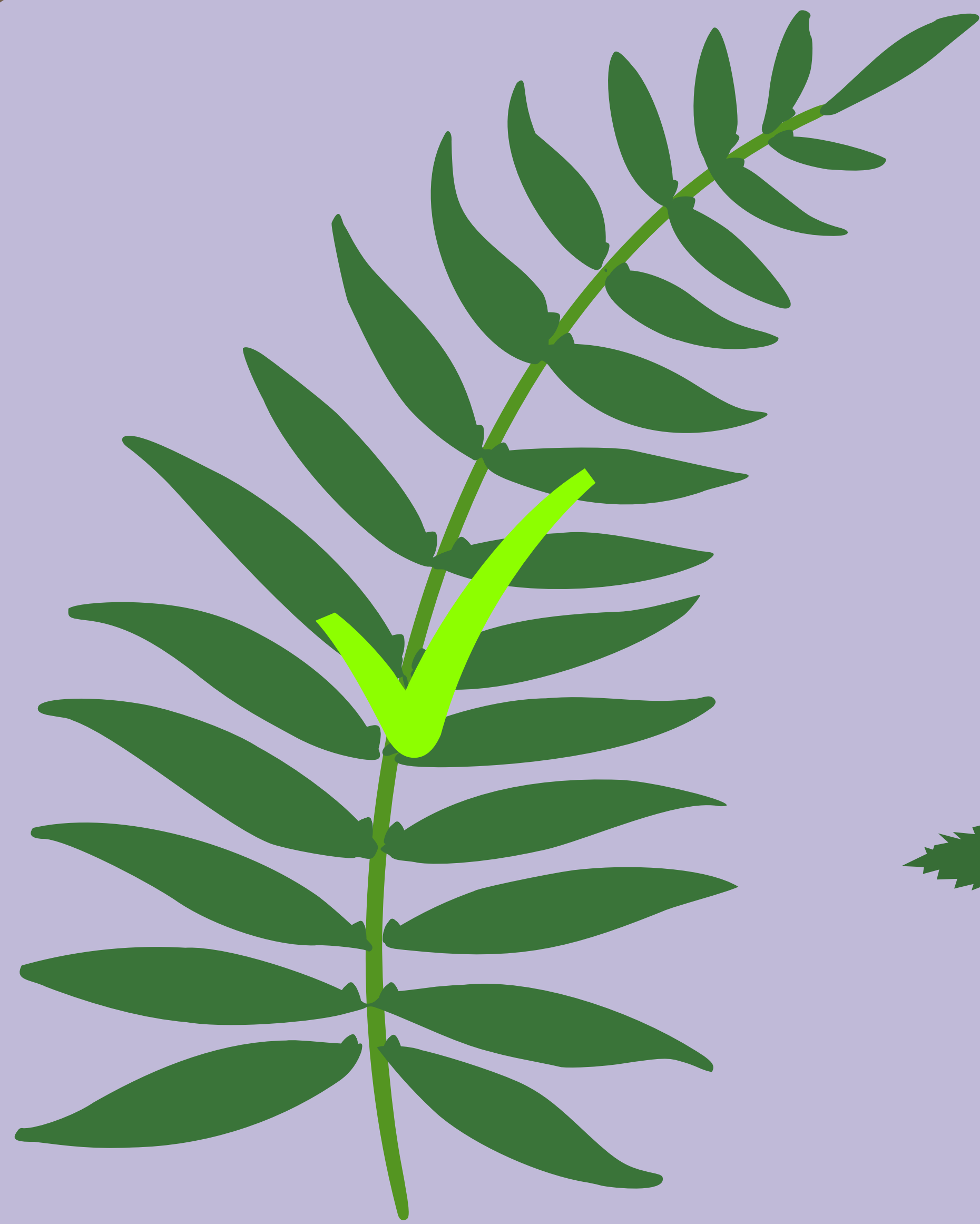
Organic healthy soil practices support optimal plant growth by retaining more water, resisting erosion, and optimizing nutrients. **Rotating crops**, and letting fields **fallow** or rest for one year, are two ways organic farmers create healthy soil. They also plant **cover crops** like rye and buckwheat and practice **interplanting**, which means that a faster growing crop is planted between a slower growing crop. Healthy soils also store carbon, which helps to mitigate climate change.

Organic agriculture in Canada is governed by rigorous standards and all products certified under the *Canada Organic Regime* or the *BC Certified Organic Program* must meet or exceed these standards.



## STATION 7





# Native & Invasive Species



Western Sword Fern



Himalayan Blackberry

-  **Plants that grow naturally in an area are called native plants.**
-  **Native plants are easy to grow in their habitat because they are used to the local weather, animals, and challenges.**
-  **Native plants are important to our ecosystem. They provide food and habitat for other animals and creatures, especially native species.**
-  **Some plants are called invasive because they grow too quickly, spread in all directions, and are hard to remove. Too many invasive species in one place can damage habitats or take over farmland.**

Plants that grow naturally in a certain area are called **native species**. Over a long period of time, these species have adapted to the area, meaning they are perfectly suited to their natural environment—the weather, the animals, the critters and the pests. This means these species require very little help from humans. Native species are also stronger against disturbances or challenges, like poor soil, rough winds, and cold winters, because they are adapted to the area, including all of its challenges.

These species are also an important part of the local ecosystem, as they support the native creatures and animals by providing food and habitat perfectly suited for these species.

A non-native species would be called an Introduced Species. Some introduced species such as corn and rice are very useful to humans and have been grown throughout agricultural history. However, when an introduced species causes problems in its environment, or dramatically harms the growth of native species, it is considered an **invasive species**. These species 1) grow rapidly, 2) spread quickly and 3) persist.

Native Species in BC include plants such as: the Western Sword Fern, Red Huckleberry, Western Trillium, and Western Red Cedar.

Invasive species in BC include plants such as: Himalayan blackberry, Creeping buttercup, and animals such as the European starling and American bullfrogs.



## STATION 8

# Biodiversity




It's important to have a variety of both plant and animal species in an ecosystem. All of the different kinds of life found in one area is called **Biodiversity**. Generally, the more diverse the environment, in plants, animals, fungi, insects etc., the healthier and stronger it is.


The species in an ecosystem are all connected, providing housing, food, protection, pollination, and other services for each other. The diversity creates a balance, the more different types of species there are, the more these species help one another.

Biodiversity also can protect against destruction from things like fires, floods, storms, insect invasions, and other disturbances. The more variety there is in the ecosystem, the more different responses there will be to these threats, which allows for more species to survive.

If we only grew one species on the farm, and it was exposed to a threat like an insect invasion or a big storm, we would likely lose it all in one event. If we grew a variety of trees, shrubs, flowers, bushes, crops, and also have an ecosystem with grass fields, ponds, ephemeral ponds, and gardens, we not only have a stronger defense in the case of a threat, but a healthy and strong ecosystem. These different spaces and species can provide habitats, food, shelter, fertilization, pollination, and other ways to support each other.

 **It's important to have a variety of species (both plant and animal) in an ecosystem, even on a farm!**

 **The more different types of species in an ecosystem, generally the healthier and stronger it is. These species are all connected: some are habitats and homes for other species, some provide food, some help to protect, and some pollinate!**

 **Biodiversity creates a balance, these creatures and plants are all working together in a system to support each other.**



## STATION 9

# Tools and Tractors



- 🍷 Farmers use hand and machine powered tools to make their jobs easier.
- 🍷 A tractor is a machine that helps farmers perform a variety of tasks on their farm using machine power.
- 🍷 Tractors can be used to pull farm implements used for plowing, planting, cultivating, fertilizing, mowing, and harvesting.
- 🍷 They help farmers get work done by saving them time and energy.
- 🍷 Before tractors, farmers and often horses or oxen would haul and pull equipment around. The invention of the tractor made many tasks easier for farmers.
- 🍷 There are many jobs related to tractors! There are tractor mechanics, engineers, and people whose job it is to sell tractors to farmers.

There are many tools and machines available to help farmers.

Stable Harvest Farm uses small scale, bio-intensive agricultural practices to produce space efficient maximum yields. Close attention is paid to sustaining the soil and increasing the biodiversity of the land. There are different types of tractors and tools which support this type of farming.

Walk behind tractors are lighter than traditional tractors, so they minimize soil compaction. They can also run many implements their larger counterparts use. Many human powered tools such as wheel hoes, stirrup hoes and rakes, also minimize compaction, and are easier to use with tighter plant spacing. In order to help control weeds in the fields before planting row crops, farmers sometimes use flame weeders.

When farmers need help fixing their equipment they might call a mechanic or if they bought their tractor at a dealership it might go back to be fixed by a mechanic there. Farmers have to make many decisions every day and trying to decide what tools are best for the type of farming they are doing is one of them!



## STATION 10

# Bat Boxes, Houses for Owls and Bug Hotels



- 🍷 Bats help farmers by being predators of agricultural insects.
- 🍷 Bat boxes are put up on farms to encourage them to roost and raise their babies in a safe location.
- 🍷 Barn Owls like to hunt in grassy fields and make their nests in old barns.
- 🍷 Nesting boxes encourage Barn Owls to stay as grassy fields and old barns become less common.
- 🍷 Barn Owls can eat up to 600 small mammals per year.
- 🍷 Good bugs, like ladybugs, bees, hoverflies, lacewings are insects that help create a healthy growing environment for plants.
- 🍷 It is important to create an environment that supports the good bugs by providing food and shelter like a bug hotel.
- 🍷 Bug hotels can be made from simple and easily found natural materials such as sticks, bark, and paper straws. These can be used to create holes and nooks for the insects to nest in.

Bats are major predators of agriculture and forest insects, and they love they eat pesky mosquitos.

There are bat boxes on the farm so that the bats can roost and raise their offspring, which encourages them to stay.

Barn Owls are closely tied to agriculture as they like to hunt in grassy fields and make their nests in old barns. As grassy fields are lost to urbanization, and old barns are demolished, nesting boxes encourage Barn Owls to continue to make their homes on farms.

Rats and voles can eat and ruin crops, so Farmers are thankful for Barn Owls as they can really contribute to controlling pest problems as they eat up to 600 small mammals per year.

Insects need a stable and bountiful environment to thrive. In the colder months, shelter is harder to find due to less plant matter being available. Farmers can build bug hotels, which provide insects refuge and nesting spots.

Helping the beneficial insects to overwinter on the farm will increase biodiversity and help reduce pest populations.



## STATION 11

# Bees & Pollinators



Pollinators, like bees, butterflies, hummingbirds, and bats, help to create new seeds by carrying pollen from flower to flower. The goal for the pollinators is to get food from the nectar (a sweet sugary substance) and pollen (a yellow powdery substance). In doing so, they collect pollen on their legs, bellies, or bodies, and transport it to the next flower, spreading the pollen as they go.

Bees are some of our best, and busiest, pollinators on the farm. Female bees are the worker bees; they collect the pollen and store it in tiny baskets on their legs. They return to their beehive to share the nectar and pollen with others in their colony.

We have a few types of bees on the farm, Honeybees (introduced species from Europe), Bumblebees (native species), and Mason Bees (native species). All of these bees help to pollinate our crops and other plants here on the farm, but the native bees and other pollinators rely on native plants to thrive!

All of these pollinator populations have been declining in recent years. Some causes are chemicals used in pesticides harming the pollinators, loss of habitats due to development, poor nutrition (not enough flowers/food), and diseases. These pollinators help us create food and are an essential part of our ecosystems—we have to protect them!

 **Pollination happens when pollen gets moved from flower to flower.**

**This process also helps to make seeds.**

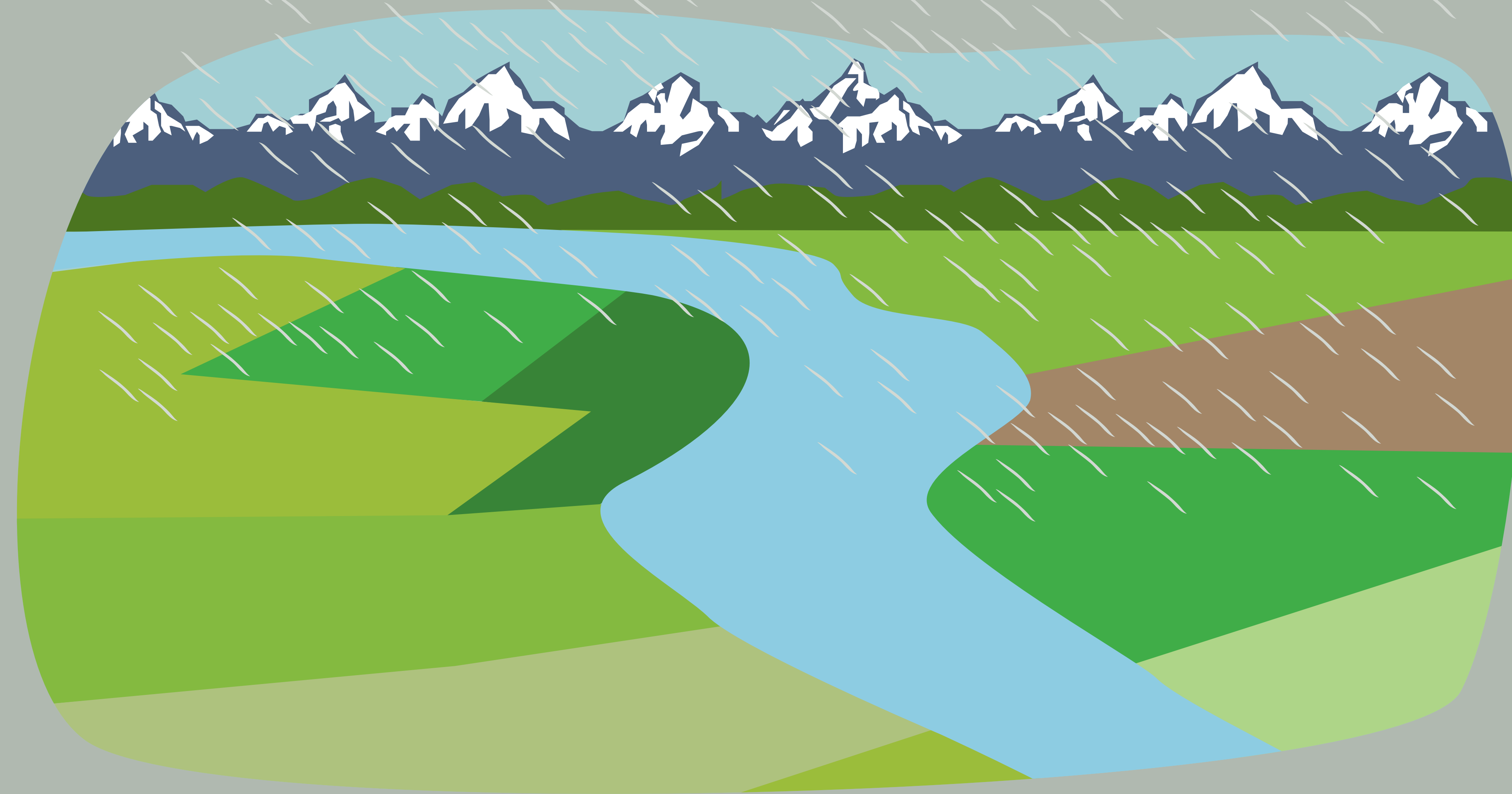
 **Bees, butterflies, hummingbirds and bats are the pollinators on our farm. While all of them help us to grow more food, bees are one of the best pollinators. Almost half of our food crops (40%!) here in BC are are pollinated by bees!**





 **Bees and other pollinators are disappearing because they don't have enough safe food or safe spaces to live. We have to protect them!**



## STATION 12

# Watering on the Farm



-  Water is essential for plants to grow.
-  Farmers use different types of irrigation to help save water, while still providing their crops with the water they need to grow.
-  Drip irrigation gives the water directly to the plant's roots, which minimizes water use.
-  Low volume sprinklers minimize overspray and soil disturbance because of the way the water leaves the sprinkler.

British Columbia is considered “rich” with natural resources such as water. Even though we are fortunate to live in a land of plenty, water conservation is still important.

Farmers use improved methods of irrigation for water conservation. For example, drip irrigation is now widely used, which brings water directly to the plant's roots as well as low volume sprinklers.

Stable Harvest Farms pulls their irrigation water from an aquifer. The aquifer holds water year-round and it is used for drinking water, washing produce and irrigating crops. The water in the aquifer reduces during the warm dry growing season of spring/summer and is replenished by rain and snow during the fall/winter.

Being active and mindful about water conservation on the farm is important as our planet's population grows, and global warming occurs. We will need to grow more food on less land, with less water.