

PROJECT IDEA STARTER

Crop Production

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Plants are all around us in the world, and many of them produce food we eat or are used for other purposes, like making clothes or fuel. Producing the food we need in a responsible way takes work, but it also can be fun and rewarding. Learning about what plants need to grow helps you understand more about where food comes from and what it takes to feed the world.

When driving down the highway, you are likely to see a lot of two crops in Ohio: corn and soybeans. These two crops are grown on over 8 million acres of Ohio every year. That is over 8 million football fields!

Soybeans are shorter and are used for different food products including edamame (a bean you can eat directly), soybean oil, protein and soy “milk.” Soybeans are also used to make other products, like crayons, foam, and a fuel called “biodiesel” that helps power semi-trucks and other engines. Most soybeans are harvested in late-September and in early October.

The corn grown in the field in most of Ohio is a little different than the kind you buy in the grocery store. **Sweet corn**, what you get in the summer, has more sugar in it and is harvested when the kernels are still juicy and easy to eat. What’s grown on about 4 million acres in Ohio is called **field corn**, which is more starchy than the sweet corn you get for barbeques. Field corn is usually what you see in corn mazes. It

is harvested in the fall in October or November. The grain is ground into flour, used to get corn oil, or used for feeding animals, among other uses. Ethanol, a component of most gasoline, also comes from field corn.

Crop growth and development depends on many factors, like the weather, soil type, and pest presence. The process of managing these factors is a continuing challenge that producers face every day. Decisions related to how to manage the crop are called **agronomic** decisions. These are broken down into four general categories.

The first category is decisions related to **nutrient management**. Just as your body needs a balanced diet and minerals, plants need nutrients like nitrogen (N), phosphorus (P), and potassium (K). Nitrogen is needed to build proteins and pigments like chlorophyll, the chemical that makes plants green. Phosphorus is the major energy driver in plants.

PLAN YOUR PROJECT

Use this idea starter AND publication 4-H 365 *Self-Determined Project Guide* as the starting place for your 4-H self-determined project. The *Self-Determined Project Guide* is available from your county OSU Extension office or on the Web at ohio4h.org/selfdetermined. You may choose to do a little or a lot depending on your level of interest. Be sure to register your project with your county OSU Extension office.

Potassium helps plants regulate water. Without these nutrients, plants are not able to grow well. Deciding when and how to add these nutrients is very important, as some of these can cause environmental issues if they move away from the crops.

The second category is related to **soil and water management**. Most crops are produced in soil, so making decisions about when and when not to till the soil are very important. Some soils are made of larger particles, like sand. They do not stick together well or hold onto water for very long. Other soils are made of tiny particles that are really sticky and that stay wet for long periods of time. Making decisions on how to manage water in these soils is really important. If soil is not managed well, it can erode, which means it is lost from the area growing crops. Managing soils to reduce **erosion** is very important.

The third category is related to **pest management**. Many pests affect crop production, and deciding how and when to manage them is really important. Scouting a field is one way to learn more about what pests are present, and scouting can help growers make these decisions. Many pest control options and methods are available, so deciding which to use can be challenging.

The last category is related to **crop management**. In this category, decisions like what type of soybean to grow and when to plant are made. Other decisions, like how close to grow the plants to one another and how deep to plant the seed have impacts on production too.



Crop production can be challenging, and there are many decisions that go into growing plants for food and fuel. Next time you see a corn or soybean field, think about the decisions that go into growing that crop. Use the ideas below to identify areas of interest and things to do as you investigate crop production.

AREAS OF INTEREST AND THINGS TO DO

Every self-determined 4-H project can be broken down into areas of interest. These are the specific things members want to address during their project adventures. Using *4-H 365 Self-Determined Project Guide*, identify at least three areas of interest with at least three activities per area to explore. Take your ideas from the list below or make up your own.

Nutrient Management

- ☐ Make a resource to show what nutrients crops need to grow.
- ☐ Explore how plants take up nutrients from the soil and create a model using beans.
- ☐ Learn about different sources of nutrients, and create a quick reference guide that describes each source, its nutrient content, and its form (liquid, solid, or gas).
- ☐ Explain how crop producers apply different nutrient sources.
- ☐ Learn about soil testing and how to measure nutrient levels in soil, and have a soil tested for nutrient levels.
- ☐ Find an article about nutrient management on the AgCrops Team Newsletter: corn.osu.edu.

Soil and Water Management

- Explore how surface coverage impacts the speed of water movement, and test this using soil, woodchips, and opened soda bottles. Here's a helpful Fun Science Demo video: [youtube.com/watch?v=im4HVXMGI68](https://www.youtube.com/watch?v=im4HVXMGI68).
- Learn and report how water infiltration is affected by soil type.
- Describe different types of tillage and how they impact soil movement.
- Explore different erosion types, and report how buffer strips and wind breaks help stop soil erosion.
- Investigate and report how the Natural Resource Conservation Service, formerly the Soil Conservation Service, got started.
- Explain why water management is important for crop production. Hint: soil water drainage and irrigation.
- Find an article about soil management on the AgCrops Team Newsletter: corn.osu.edu.

Pest Management

- Explore what insect pests are problematic for corn and soybean production in Ohio.
- Learn about diseases that impact crops in Ohio. Create a quick reference that identifies at least six different diseases.
- Describe a weed and how it affects crop production.

- Learn about and demonstrate a scouting pattern to monitor a specific pest.
- Explore biological control methods for a crop pest and provide three examples.
- Learn about how pesticides can be used to control pests. Be able to demonstrate how to put on protective equipment as required by the label.
- Find an article about a crop pest on the AgCrops Team Newsletter: corn.osu.edu.

Crop Management

- Learn more about corn hybrids and soybean varieties and pick the best three performers from your region using u.osu.edu/perf.
- Describe the crop growth stages that explain how crops grow throughout the season.
- Explore when corn and soybeans are planted in Ohio, and explain why planting date can impact crop productivity.
- Investigate how corn and soybeans are harvested, and explain why different combine headers are needed.
- Find an article about crop management on the AgCrops Team Newsletter: corn.osu.edu.
- Explore and report on five examples how different growth factors can affect corn ear formation: u.osu.edu/mastercorn.

RELATED RESOURCES

For videos on weeds, go to [youtube.com](https://www.youtube.com) and search for the “Ohio State University Weed Science” channel.

For videos on crop management, go to [youtube.com](https://www.youtube.com) and search for the “Ohio State university Agronomic Crops Team” channel.

The OSU Extension Agronomic Crops Network provides real-time updates on current issues in crop production at corn.osu.edu.

Soybean and small grain research can be found at stepupsoy.osu.edu.

For quick pest ID, check out the *Corn, Soybean, Wheat and Forages Field Guide* available from extensionpubs.osu.edu as a full-color, searchable PDF for about \$8.

