

Horticulture/Garden

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Understanding Soils

Investigation

- Determine the most important indicators of soil quality.
- Compare tilling and no-till in home gardens.
- Explain the benefits and limitations of each method of soil management.
- Contrast how soil is managed in a home garden and how it is managed in field crop production.
- Contrast soil management in a traditional garden and a raised bed.

Experimentation

- Hypothesize about the relative levels of organic matter that will be in these samples based on your knowledge of the history of the site and compare those hypotheses to actual results.
- Track soil samples from your garden site through the years to assess changes over time and any way your management practices may have led to any of the changes.

Understanding Plants

Investigation

- Compare the signs of nutrient deficiency and toxicity for specific macro and micronutrients.
- Classify vegetable crops based on if they are commonly started from seed versus cutting or bulb or seed piece.

Experimentation

- Compare the growth of plants in media when given different levels of nitrogen.
- Compare the growth and yield of an onion crop where the onion set and onion seed are planted at the same time and grown under the same conditions.
- Start tomatoes from seed and from a rooted cutting and compare growth and yield.



Common Vegetable Crops

Investigation

- Research common vegetable crops in different countries around the world and compare the climate to the crop needs. Explain why some crops may be most consumed in certain areas of the world.

Experimentation

- Survey your family and friends to determine taste and visual appearance preferences for several cultivars (small-scale cultivar trial).
- Plant a perennial crop (asparagus or rhubarb) and describe its growth and yield through the years.
- Take yield measurements through the season to be able to describe how much total weight and how many harvestable units were produced in a given area of the garden.

The Plant Growing Environment

Investigation

- Research some practices and methods that are used in providing very specific growing environments for plants. For example, how does NASA grow plants in space? Or how are plants grown in very cold climates? How are greenhouses and vegetable production different in tropical climates?

Experimentation

- Grow plants in the cold frame, greenhouse or under a row covers and compare their growth to those that were uncovered in the same garden. Lettuce, kale, chard and spinach would all be good examples.
- Compare spring and fall yield and quality of some common cool-season crops, such as broccoli, cauliflowers, Brussels sprouts, peas, kale, spinach and lettuce. Measure time to harvest as well as plant weight and describe quality (color, insect damage, etc.).
- Try to overwinter a hardy cool-season crop (kale, spinach) and describe its growth and appearance in the spring.

Vegetable Crop Management

Experimentation

- Take yield on successive plantings of lettuce, spinach or other cool-season crops, such as radish, when planted on the first day of every month.
- Compare the yield of common garden crops both direct seeded and transplanted (zucchini, lettuce, cabbage, tomato).
- Evaluate different types of weed control techniques. For example, plastic and natural mulches, hand weeding and garden tillers or multiple rows.
- Compare crops grown both with and without row covers in spring and fall seasons (broccoli, lettuce, kale, radishes). Describe insect pressure, crop size and weight.
- Build a small floating hydroponics bed.
- Compare the use of different types of pest and disease control.

Marketing and Selling Vegetable Crops

Investigation

- Analyze the production data to determine which crops were the most profitable per square foot.
- Create a business plan for a vegetable operation based on your crop yield and input data.
- Investigate other costs of selling produce including hiring labor, insurance, food safety requirements, marketing time required and market fees as well as transportation.

Experimentation

- Modify your business plan if needed to take into account non-crop factors and discuss the reasons that you selected the crops, seasons and marketing methods that you did.
- Shadow a vegetable crop grower during some of their growing and marketing activities to better understand the business.

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