

Instructional Scenario

Diagnosing Plant Nutrition Deficiencies



Course/Duty Area: Agricultural Production Technology /Using Plant Science in Agricultural Crop Production

Scenario:

You're growing a diversified vegetable garden in raised beds, using potting mix purchased from a local lawn and garden store. In one of your raised beds, you transplant hardened off tomato and pepper seedlings that you started inside eight weeks ago. After about two weeks, you notice the plants are turning yellow, and they're not growing as fast as you think they should be. Additionally, you notice the stems on your plants seem quite fragile and weak.

In another section of your garden, you decide to plant directly into the soil. Before direct seeding your peas, you till and condition the soil with peat moss and manure. After your peas begin to grow, you notice excessive vegetative growth, but no flower production.

Big Question:

How will you diagnose these issues? What clues indicate what is happening?

Focused Questions:

1. Can nitrogen, phosphorus, and potassium use by plants be controlled? Explain.
2. How do fertilizers deliver nutrients to plants?
3. How can the fertilizer grade or guaranteed analysis on a fertilizer package be useful to a producer?
4. How does pH affect nutrient availability in soils?
5. What are the symptoms of a nitrogen deficiency?
6. What are the symptoms of a potassium deficiency?
7. What are the symptoms of a phosphorus deficiency?
8. Where might you find resources for analysis of plant nutrient deficiency?

Correlations to Virginia Standards of Learning (SOL): BIO.1

Project-Based Assessment:

Create a one-pager that explains to a new gardener or farmer the process of preparing a new garden bed for planting and provides tips for diagnosing nutritional deficiencies in plants. This may include pictures or diagrams depicting common deficiencies in plants, a comparison of fertilizers, and a comparison of planting in raised beds or in existing soil. It should also include steps for taking a soil sample.

Teacher Resources:

- Home Vegetable Gardening, Virginia Cooperative Extension, Virginia Tech and Virginia State University (<https://ext.vt.edu/lawn-garden/home-vegetables.html>)
- Soil Sampling for the Home Gardener (Publication 452-129), Virginia Cooperative Extension, Virginia Tech and Virginia State University (https://www.soiltest.vt.edu/content/dam/soiltest_vt_edu/PDF/urban-sampling.pdf)

Scenario submitted by Sarah Jo Jones, Carroll County High School, Carroll County Public Schools