

Instructional Scenario

Crop Rotation Consultation



Course/Duty Area: Operating the Farm Business/Using Plant and Environmental Science in Agricultural Production

Scenario:

Maple Grove Farm is a 150-acre agricultural operation located in the Shenandoah Valley and is owned and operated by farmer Jane Thompson. Jane has been farming her family's land for over 20 years and specializes in growing corn, soybeans, and barley. She is committed to sustainable agricultural practices. Jane has recently observed declining yields in her corn and soybean crops, coupled with increasing soil erosion on the southern slopes of her farm. Concerned about the health of her soil and the economic viability of her farm, she has decided to implement a crop rotation plan that promotes soil conservation, prevents nutrient depletion, and enhances overall productivity. Jane has three fields. Jane would like you to help her develop a crop rotation plan. Due to markets, two of the three fields were in soybeans this year, and one was in corn.

Big Question:

How will you develop a crop rotation plan for Jane? What research is necessary to meet Jane's objectives?

Focused Questions:

- What is *crop rotation*, and what are the benefits?
- How can crop rotation enhance soil structure?
- How can crop rotation boost soil fertility?
- How can crop rotation prevent soil erosion and increase infiltration capacity?
- What is a green manure and how can it be used in sequence with cereals and other crops for the replenishment of nitrogen in the soil? How is this achieved?
- How can crop rotation decrease pollution?
- How can crop rotation prevent the concentration of pests and diseases? How can crop rotation reduce weed growth and raise crop yield?
- How does crop rotation lower production costs?

Student Project or Outcome:

Students will work in groups to develop a crop rotation plan for Jane. Each group may vary in approach, but all should have a comprehensive crop rotation plan at the end of the project that promotes soil conservation, mitigates nutrient depletion, and enhances overall productivity.

Project-Based Assessment:

- If available, students can tour a row crop operation to discuss the importance and implementation of a crop rotation plan.
- Students can present crop rotation plans to local extension agents or Natural Resources Conservation Service (NRCS) representatives.

Teacher Resources:

- [A Crop Rotation Planning Procedure](#), Sustainable Agriculture Research and Education
- [A Farmer's Guide to Crop Rotation](#), CropCare

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