

Course	Agricultural Science II
Unit	Crop Science
Lesson	Stand Establishment
Estimated Time	50 minutes

Student Outcome

The student will be able to explain the requirements for establishing a crop stand.

Learning Objectives

1. Describe the purpose of tillage.
2. Explain how different tillage methods affect the environment.
3. Explain why different seeding methods are used.
4. Identify the factors that affect the proper depth of planting.
5. Identify the major nutrient elements that are needed for stand establishment.
6. Identify the factors that influence the optimum seeding rate.

Grade Level Expectations

SC/LO/2/B/09-11/c

SC/ES/3/A/09-11/g

SC/ST/1/C/09-11/a

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. *Crop Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1992.
2. *Crop Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- ☐ Ant farm or view box
- ☐ Eight seeds of any field crop

Supplemental Information

1. Internet Sites
 - ☐ Crops Publications. University of Missouri Extension. Accessed January 16, 2008, from <http://extension.missouri.edu/explore/agguides/crops/>.
 - ☐ Seeding by Plant Population – Crop Production. Manitoba Agriculture, Food and Rural Initiatives, Canada. Accessed January 16, 2008, from <http://www.gov.mb.ca/agriculture/crops/cropproduction/faa03s00.html>.
 - ☐ Suitable Methods of Tillage for the Farm. Corporate Document Repository, Food and Agriculture Organization of the United Nations. Accessed January 16, 2008, from <http://www.fao.org/DOCREP/006/Y5146E/y5146e08.htm>.
 - ☐ Sustainable Practices for Vegetable Production in the South, North Carolina State University. Accessed January 16, 2008, from <http://www.ncsu.edu/sustainable/tillage/tillage.html>.

Interest Approach

Use an ant farm (or view box) to show emergence of seeds. Plant seeds from 1/2 inch to 4 inches deep in 1/2-inch increments. Prepare the demonstration about 7 to 10 days before the anticipated date of presentation to the class.

Communicate the Learning Objectives

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Instructor Directions	Content Outline
Objective 1 <i>Proper preparation of a field for planting is vital to the success of the crop. Selecting the appropriate tillage method is dependent on the intended purpose.</i>	Describe the purpose of tillage. <ol style="list-style-type: none">1. To prepare a suitable seedbed2. To eliminate competition from weeds3. To improve the physical condition of the soil
Objective 2 <i>Soil is a precious natural resource. Each year over 1.6 billion tons of U.S. farm land soil is washed away due to soil erosion. The type of tillage used in crop production influences the amount of soil lost through erosion.</i>	Explain how different tillage methods affect the environment. <ol style="list-style-type: none">1. Conventional tillage leaves the soil surface relatively free of crop residue and vulnerable to erosion.2. Minimum tillage methods maintain crop residues on the soil surface and reduce soil erosion.3. No-till methods leave all crop residue on the soil surface and nearly eliminate soil erosion.
Objective 3 <i>Seeding practices vary, and care must be taken when performing this task to ensure the proper seeding method is used.</i>	Explain why different seeding methods are used. <ol style="list-style-type: none">1. Row method – for planting evenly spaced seeds in parallel rows, allows for mechanical cultivation2. Drill method – for planting seeds in narrow rows in high population rates, reduces need for mechanical cultivation3. Broadcast method – for scattering seeds in a random pattern across the top of the seedbed, does not allow for mechanical weed control, cheapest method, faster coverage for erosion control

Instructor Directions	Content Outline
<p>Objective 4</p> <p><i>Several factors should be considered when deciding on the appropriate rate and depth of planting.</i></p>	<p>Identify the factors that affect the proper depth of planting.</p> <ol style="list-style-type: none"> 1. Type of soil 2. Size of seed 3. Type of emergence 4. Soil moisture 5. Soil temperature
<p>Objective 5</p> <p><i>After planting, other factors affect the growth and establishment of the crop. Specific nutrients are needed to enable the plants to grow to their potential.</i></p>	<p>Identify the major nutrient elements that are needed for stand establishment.</p> <ol style="list-style-type: none"> 1. Nitrogen 2. Phosphorus 3. Potassium
<p>Objective 6</p> <p><i>Proper stand establishment will increase the chances of a good yield, provided the weather is conducive to proper plant growth. The desired plant population is dependent on several factors, one of which is the seeding rate.</i></p>	<p>Identify the factors that influence the optimum seeding rate.</p> <ol style="list-style-type: none"> 1. Type of crop 2. Use of crop 3. Pure live-seed ratio or percent 4. Seed quality 5. Soil moisture 6. Soil productivity 7. Time of seeding 8. Method of seeding 9. Row width 10. Expected average rainfall
<p>Application</p>	<p>Other activities</p> <ol style="list-style-type: none"> 1. Take a field trip to a local farm to observe the process of seedbed preparation. Discuss the type of tillage used. 2. Arrange for a demonstration of several methods of tillage on the school land laboratory. 3. Conduct experiments with different seeds planted at different depths and calculate emergence time and rates.
<p>Closure/Summary</p>	<p>Proper preparation of the seedbed and planting seed at the proper depth will increase the emergence rate. Tillage during stand establishment can influence the amount of soil lost due to erosion. Tillage, seeding methods, seeding</p>

Instructor Directions	Content Outline
	depth, seeding rate, and nutrient availability are factors which greatly influence the crop yields.
Evaluation: Quiz	Answers: 1. True 2. False 3. False 4. False 5. True 6. a 7. a 8. c 9. b 10. c 11. a