

<b>Course</b>	Agricultural Science II
<b>Unit</b>	Crop Science
<b>Lesson</b>	Crop Uses (Products and By-Products)
<b>Estimated Time</b>	50 minutes

#### Student Outcome

The student will be able to identify how crops are used.

#### Learning Objectives

1. Identify the major uses of crops.
2. Identify the major crops in each of the major use categories.
3. Identify the products that are made from corn.
4. Identify the products that are made from soybeans.
5. Describe the characteristics which determine how a crop is used.

#### Grade Level Expectations

#### 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

- ☐ Several samples of retail products made from one crop

##### Supplemental Information

1. Internet Sites
  - ☐ Products Made from Corn. Corn Refiners Association. Accessed January 14, 2008, from <http://www.corn.org/products.htm>.
  - ☐ Products Made from Soybeans. SoyWorld. Accessed January 14, 2008, from <http://soyworld.com/>.

### Interest Approach

Have samples of several retail products made from one crop (e.g., sweeteners, corn oil, soy-oil, peanut oil, linseed oil, and/or cottonseed oil), and discuss how the products are used.

### Communicate the Learning Objectives

1. Identify the major uses of crops.
2. Identify the major crops in each of the major use categories.
3. Identify the products that are made from corn.
4. Identify the products that are made from soybeans.
5. Describe the characteristics which determine how a crop is used.

Instructor Directions	Content Outline
<b>Objective 1</b>  <i>As the world population continues to grow, the demand and need for a continual supply of food and agricultural products increases. In order to meet the growing need, agricultural scientists through research and technology continue to develop new products and by-products from crops. Crop plants can be grouped according to how they are used.</i>	<b>Identify the major uses of crops.</b>  <ol style="list-style-type: none"><li>1. Human and animal consumption (food or feed)</li><li>2. Production of various oils (human consumption/industrial use)</li><li>3. Medicines (pharmaceuticals)</li><li>4. Fibers (cloth, pulp)</li><li>5. Sugars/sweeteners</li><li>6. Alternative fuels</li><li>7. Shelter materials (lumber)</li><li>8. Ornamentals</li><li>9. Stimulants</li></ol>
<b>Objective 2</b>  <i>Write on the chalkboard the major uses of crop plants, and ask the students for suggestions of what crops would belong under each major use area. (List plants suggested by students and also the list found here.)</i>	<b>Identify the major crops in each of the major use categories.</b>  <ol style="list-style-type: none"><li>1. Crops for human and animal consumption (food or feed)<ol style="list-style-type: none"><li>a. Cereal or grain crops – wheat, rye, barley, oats, rice, sorghum, corn</li><li>b. Legumes for seed – field beans, field peas, peanuts, cowpeas, soybeans</li><li>c. Fruits – apples, peaches, berries, cherries, etc.</li><li>d. Vegetables – tomatoes, cucumbers, squash, etc.</li><li>e. Nuts – pecans, walnuts, etc.</li></ol></li><li>2. Oil crops for human consumption and industrial use: soybeans, peanuts, castor beans, flax, sesame, cottonseed, corn, canola</li><li>3. Medicine crops: digitalis, quinine, reserpine</li><li>4. Fiber crops: cotton, flax, hemp</li><li>5. Sugar crops: sugar cane, sugar beets</li><li>6. Alternative fuels: crops that contain sugar or starch</li></ol>

Instructor Directions	Content Outline
	for ethanol (corn, etc.) 7. Materials for shelter: timber production 8. Ornamental plants 9. Stimulant crops: tobacco, tea, coffee
<b>Objective 3</b>  <i>Although corn is the most widely grown crop throughout the U.S., less than 10% is used for human consumption. Corn is used in a variety of products.</i>	<b>Identify the products that are made from corn.</b>  1. Livestock feed 2. Cooking oils 3. Breakfast cereals 4. Corn on the cob 5. Corn starch 6. Cornmeal 7. Refined corn sugar 8. Flour 9. Popcorn 10. Adhesives 11. Dyes 12. Plastics 13. Ethanol 14. Others
<b>Objective 4</b>  <i>Soybean production has become very important to the U.S. and the world. Since World War II, soybean production has increased in the U.S.</i>	<b>Identify the products that are made from soybeans.</b>  1. Cooking oil 2. Soybean meal 3. Soy-flour 4. Tofu (protein supplement) 5. Shortenings 6. Margarines 7. Inks for printing 8. Industrial oils in paints, varnishes, caulking compounds and linoleum 9. Soy sauces 10. Others
<b>Objective 5</b>  <i>Controlled production of plant crops plays a key role in the overall process of supplying food to the growing human population. However, not all plants are grown for food. Many plants are grown for specific products. Such plants</i>	<b>Describe the characteristics which determine how a crop is used.</b>  1. Nutritive value (protein content, carbohydrate content, oil content, etc.) of the plant parts 2. Palatability of the plant for food or feed products 3. Use of the plant's parts (stems, leaves, roots, seeds) for the processing of specific products other than food products

Instructor Directions	Content Outline
<i>are produced because of the desirable characteristics they possess.</i>	
<b>Application</b>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Visit a processing plant in the area that uses plant products.</li> <li>2. Divide students into groups and have them research a selected plant crop and list as many products or by-products from that crop as they can.</li> <li>3. Using the lists generated in 2 above, write on the chalkboard all the plant products or by-products that the students would come in contact with on a daily basis.</li> <li>4. Have each student write a paper on what everyday life would be like without plant products and by-products.</li> </ol>
<b>Closure/Summary</b>	<p>Plant crops have many uses. The production of human food, animal feed, various oils, pharmaceuticals, sugars, stimulants, and fibers have been brought about through the manipulation of specific plant characteristics. Researchers continue to broaden the list of products through research and technology.</p>
<b>Evaluation: Quiz</b>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. True</li> <li>2. True</li> <li>3. False</li> <li>4. True</li> <li>5. FF</li> <li>6. OC</li> <li>7. OC, FC</li> <li>8. MS</li> <li>9. OC, FF</li> <li>10. FF, OC, AF</li> <li>11. OP</li> <li>12. ST</li> <li>13. FF</li> <li>14. SC</li> <li>15. ST</li> <li>16. SC, AF</li> <li>17. MS</li> <li>18. OP</li> <li>19. ST</li> </ol>

Instructor Directions	Content Outline
	20. FF 21. PH 22. FF 23. FC