UNIT IV - IDENTIFYING AND SELECTING CROPS AND SEEDS

Lesson 1: Crop and Weed Identification

**Competency/Objective:** Identify crop and weed seeds and plants.

**Study Questions**

1. What plant types and physical characteristics are used to identify crop and weed plants?
2. What are the characteristics of grass and grasslike plants?
3. What are the characteristics of legumes?
4. What are the characteristics of forbs?
5. What are the characteristics of woody plants?
6. What are the identifying characteristics of common weed plants?
7. What are the identifying characteristics of noxious weed plants?
8. What are the identifying characteristics of crop and weed seeds?
9. What weed seeds are included on the restricted noxious list?
10. What weed seeds are included on the restricted prohibited list?

**References**

1. *Advanced Crop Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 2000, Unit IV.
5. Transparency Masters
   a) TM 1.1: Leaf Characteristics
   b) TM 1.2: Cool- and Warm-Season Grass Growth
6. Activity Sheet
   a) AS 1.1: Identifying Weeds of Missouri
 UNIT IV - IDENTIFYING AND SELECTING CROPS AND SEEDS

Lesson 1: Crop and Weed Identification

TEACHING PROCEDURES

A. Introduction

This lesson will discuss the identifying characteristics of crop and weed seeds and plants. It is important for the producer to understand the differences and be able to identify, in particular, those weeds that can be harmful to the productive value of the crop. Early detection is necessary to effectively control weeds.

B. Motivation

1. Have students bring in plant samples from grasslands or crop fields near their homes. Discuss what types of plants can be found locally.

2. Divide the class into groups. Give each group a package of mixed seeds (e.g., corn, sunflower, and pinto beans). Have students separate and identify them. Discuss how they identified the seeds and why identification is important. While the students are divided into groups with the seeds separated, point out to them distinguishing characteristics of specific seeds. Refer to IML's Crop Science Student Reference for a review of identifying characteristics of crop and weed seeds.

C. Assignment

D. Supervised Study

E. Discussion

1. Discuss how plants can be classified other than by life cycles. Plants are also categorized according to their physical characteristics. Using the plants acquired during the Motivation, group the plants found locally into the four plant types. Leaf characteristics are the most varied. Using TM 1.1, review the characteristics of leaves.

   What plant types and physical characteristics are used to identify crop and weed plants?

   a) Plant types
      1) Grasses and grasslike plants
      2) Legumes
      3) Forbs
      4) Woody plants

   b) Physical characteristics
      1) Leaf shape
      2) Stem
      3) Flower
      4) Root

2. Separate grasses according to required temperature for growth. Point out examples of cool-season grasses, such as Kentucky bluegrass, orchardgrass, and smooth bromegrass. Compare the differences to warm-season grasses, such as indiangrass, big blue stem, and switchgrass.
Discuss the characteristics of both cool-season and warm-season grasses. Show TM 1.2 of Cool- and Warm-Season Grass Growth. Also refer to the *Crop and Grassland Plant Identification Manual* for more examples of grasses.

**What are the characteristics of grass and grasslike plants?**

a) Characteristics
   1) Herbaceous
   2) Hollow stems
   3) Blades and stems joined directly at sheath
   4) Parallel venation on leaf blade

b) Cool-season grasses
   1) Grow when soil temperatures reach 40°F in early spring,
   2) Optimum growth with air temperatures from 59°F to 77°F in spring and fall
   3) Dormant in summer
   4) Annuals or perennials

c) Warm-season grasses
   1) Grow when soil temperatures reach 60°F in spring, with optimum growth occurring when air temperatures increase from 77°F to 104°F in summer
   2) Dormant in winter
   3) Annuals or perennials

3. Discuss the characteristics of legumes. Point out some examples of legumes, such as clovers, alfalfa, and birdsfoot trefoil. Refer to the *Crop and Grassland Plant Identification Manual* for details.

**What are the characteristics of legumes?**

a) One-chambered fruit with seeds in a single row within the pod
b) Alternating leaf arrangement - usually connected to petiole
c) Network of veins
d) May be annuals, perennials, or biennials
e) Nodules with nitrogen-fixing capacity on most rooting systems

4. Other herbaceous plants that are neither grasses nor legumes are classified as forbs. Discuss the characteristics of forbs. Examples of forbs include sunflowers, thistles, and ragweed. Refer to the *Crop and Grassland Plant Identification Manual*.

**What are the characteristics of forbs?**

a) Herbaceous (not woody) stems
b) Broadleaf plants
c) Commonly appear in pastures, fields, and native plant habitats
d) May be annuals, perennials, or biennials
e) Valued as wildlife food and cover
f) Prevent soil erosion
g) Some are noxious

5. Other nonherbaceous plants found in grasslands are woody plants. In crop production, most woody plants will be weedy saplings or small immature trees and shrubs. Examples of woody plants include wild rose, red cedar, and oak. Discuss the characteristics of woody plants. Refer to the *Crop and Grassland Plant Identification Manual*.

**What are the characteristics of woody plants?**

*Advanced Crop Science, IV-4*
a) Woody (nonherbaceous) stems
b) Shrubs, vines, or trees
c) Usually immature in grasslands
d) Perennials

6. Explain that common weeds are relatively easy to control but reduce crop yields and increase production costs. Remind students that plants that are considered crops, such as corn and soybeans, are weeds if they are growing in the wrong field. Refer to the *Crop and Grassland Plant Identification Manual* to identify common weed plants. The *Growers Weed Identification Handbook* available from MRCCTE can also be used.

**What are the identifying characteristics of common weed plants?**

a) Easy to control  
b) Annual or perennial  
c) Grass or forb

7. Explain that noxious weeds are difficult to control and that the presence of noxious weed seed in agricultural crop seeds is restricted in Missouri. Refer to Table 1.1 in the Student Reference for detailed characteristics of noxious weeds.

**What are the identifying characteristics of noxious weed plants?**

a) Crowds out desirable crops  
b) Robs crops of plant nutrients and moisture  
c) Causes extra labor in cultivation  
d) Annual, biennial, or perennial  
e) Grass or forb  
f) Growing plants considered noxious  
   1) Musk thistle  
   2) Scotch thistle  
   3) Canada thistle  
   4) Multiflora rose  
   5) Bindweed  
   6) Purple loosestrife  
   7) Marijuana (*Cannabis sativa*)  
   8) Johnsongrass

8. The Bureau of Feed and Seed administers laws and regulations to ensure that seeds are labeled consistently and accurately. Discuss with the class various characteristics of crop and weed seeds. Refer to IML’s *Crop Science* curriculum for further information.

**What are the identifying characteristics of crop and weed seeds?**

a) Size  
b) Shape  
c) Color  
d) Surface markings  
e) Other botanical characteristics

9. Refer to the current Missouri Seed Law and Regulations for weed seeds listed as restricted noxious. Restricted noxious weed seeds are defined as highly objectional in fields, lawns, or gardens of Missouri and are difficult to control by good cultural practices. Seed companies must list these seeds, if any, on labels.

*Advanced Crop Science, IV-5*
What weed seeds are included on the restricted noxious list?

a) Red sorrel  
b) Curled dock  
c) Dodder  
d) Buckhorn plantain  
e) Black nightshade  
f) Giant foxtail  
g) Hedge bindweed  
h) Leafy spurge  
i) Hoary cress  
j) Purple moon flower  
k) Quackgrass  
l) Russian thistle  
m) Slender oats  
n) Wild garlic  
o) Wild onion  
p) Wild oats  
q) Yellow star thistle

10. Discuss the weed seeds that are listed on the restricted prohibited list. Restricted prohibited weed seeds are defined by law as the seeds of weeds that when established are highly destructive and difficult to control in this state by good cultural practices. Explain that each state determines its own prohibited seed list. Seed companies must design seeds to certain state specifications.

What weed seeds are included on the restricted prohibited list?

a) Canadian thistle  
b) Field bindweed  
c) Johnsongrass  
d) Sorghum almum  
e) Musk thistle  
f) Balloon vine  
g) Serrated tussock

F. **Other Activities**

1. Take a field trip to a nearby pasture or field and discuss the different types of plants found there. Have the students explain the different plant uses for producers, livestock, wildlife, and others.

2. Have students create their own plant guide with samples collected from local grasslands and crop field areas. Guides should include 25 different plants with at least three from each classification. Plant samples should be collected, mounted, and labeled according to plant type: grass (warm- or cool-season), legume, forb, or woody.

G. **Conclusion**

The ability to identify the differences between crops and weeds is important to the production of a profitable crop. Proper seed and plant identification plays a part in the process of reducing weeds and in turn reducing the damage to crops.
H. Answer to Activity Sheet

AS 1.1

Answers will vary.

I. Answers to Evaluation

1. b
2. e
3. c
4. a
5. d
6. d
7. b
8. a
9. a
10. b
11. c
12. e
13. a
14. b
15. b
16. a
17. a
18. a
19. b
20. b
21. c
22. They are nonherbaceous with woody stems.
23. Common, noxious, prohibited
24. Missouri Seed Law and Regulations
UNIT IV - IDENTIFYING AND SELECTING CROPS AND SEEDS

Lesson 1: Crop and Weed Identification

Name__________________________

Date __________________________

EVALUATION

Match the characteristics in the left column with the correct plant type in the right column.

1. ____ Plant with seeds in a single row within the pod
   a. Cool-season grass
2. ____ Herbaceous, broadleaf plant growing in a native habitat
   b. Legume
3. ____ Nonherbaceous perennial plant
   c. Woody plant
4. ____ Plant with parallel venation and optimum growth from 59E to 77EF
   d. Warm-season grass
5. ____ Plant with parallel venation and optimum growth from 77E to 104EF
   e. Forb

Match the plant in the left column with the plant type in the right column.

6. ____ Corn
   a. Cool-season grass
7. ____ Soybeans
   b. Legume
8. ____ Wheat
   c. Woody plant
9. ____ Orchardgrass
   d. Warm-season grass
10. ____ Alfalfa
    e. Forb
11. ____ Red cedar
12. ____ Cotton

Match the weed seed in the left column with the correct designation in the right column.

13. ____ Yellow star thistle
    a. Restricted noxious seed
14. ____ Johnsongrass
    b. Restricted prohibited seed
15. ____ Canada thistle
16. ____ Wild onion
17. ____ Giant foxtail
18. ____ Dodder

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19. _____ Balloon vine

Circle the letter that corresponds to the best answer.

20. Which plant types are the dominant species in a pasture, grassland, or range?
   a. All plant species
   b. Grasses and legumes
   c. Forbs and grasses
   d. Woody plants, grasses, and legumes

21. Which plant species is not usually cultivated for agricultural production?
   a. Grasses
   b. Legumes
   c. Forbs
   d. Grasses and legumes

Complete the following short answer questions.

22. What makes woody plants different from all the other plant types?

23. What are three types of weed plants?
   a.
   b.
   c.

24. What reference should be used for information concerning weed seeds listed as restricted noxious?
Leaf Characteristics

Leaf Parts

Simple
- margin
- base

Compound
- veins
- midrib
- leaflet
- blade
- petiole
- stipule
- branch

Leaf and Bud Arrangement

- alternate
- opposite
- basal
- whorled

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Leaf Venation

parallel

palmate

pinnate

Leaf Types

Simple

Compound

simple (palmate)

palmately compound

bipinnate

simple (pinnate)

pinnately compound

trifoliate
Leaf Shapes

- Ovate
- Obovate
- Oblong
- Oval
- Orbicular
- Linear
- Lancelolate
- Oblanceolate

Common Leaf Margins

- Entire
- Semidate
- serrate
- doubly serrate
- dentate
- crenate
- sinuate
- crenulate
- lated
- laciniate
Common Base Shapes

- truncate
- cordate
- rounded
- cuneate

Common Tip Shapes

- emarginate
- obtuse
- cuspidate
- acute
Identifying Weeds of Missouri

Objective: Students will identify terms used to identify weeds found in Missouri.

Directions: Complete the word search puzzle below by finding the following ten noxious weeds listed below that are found in Missouri. There are no blank spaces between words in the word search.

<table>
<thead>
<tr>
<th>Black Nightshade</th>
<th>Buckhorn Plantain</th>
<th>Giant Foxtail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curled Dock</td>
<td>Dodder</td>
<td>Hedge Bindweed</td>
</tr>
<tr>
<td>Quackgrass</td>
<td>Red Sorrel</td>
<td>Wild Garlic</td>
</tr>
<tr>
<td>Wild</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Black Nightshade: XEVDJPLTGSYHCDCUABBSS
Curled Dock: NWAZANRDFGXMCUXWLLUS
Quackgrass: RVVLEWILDGARLICAHEJCA
Wild: JDDFXOGBEQLKPCCEFNKR
Quackgrass: PXWHLQXKDKYINKFUDGHB
Wild: XMAIWQDBCMSMNUNKDOK
Quackgrass: WKQJLXLGJIYDJCOBRC
Wild: CDEEWDNIBEGDEHODEANA
Quackgrass: JAHHTEOVAHVWXDDPULPU
Wild: ADEWMDFNTTQQDELDMMLO
Quackgrass: RXBHNFSITVXERIITKTAAT
Wild: ETGINOHQEOLOQQQZKJKJS
Quackgrass: DUNFNAIWRWRLNLFGWVHVTA
Wild: SUHODVIYUZRXTGFWAAAM
Quackgrass: OHSEMGAACDILNTRNCQHIO
Wild: REKIPYRTNBTFQFIAASNN
Quackgrass: RXDECOHQLOHLBLYLIAOX
Wild: EAITAMPPBABKPYYZHOGDN
Quackgrass: LPDFGNGOGTGRAWLUVRYX
Wild: WSPTWDFFJLYLORTZWKTSSU

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