

4-H Weed Identification and Control

Know Your Weeds!



Prostrate knotweed



Chickory



Divisions I, II, III

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Bull thistle



Garlic mustard



Buckhorn plantain



Dandelion

4-H Weed Identification and Control Know Your Weeds! Divisions I, II, III

By

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Purdue University
Cooperative Extension Service
West Lafayette, Indiana

Keep this book for the three
years you are in this project.

Note to Project Helper

Congratulations! A young person has asked you to be his or her helper for the 4-H Weed Identification project. Your role as a helper is very important to the total educational experience of the young person. Helpers can be volunteers or professionals, older youths or adults; it depends on the learning environment. As the helper, you play a key role in helping young people learn about weeds and themselves. You can help through your enthusiasm and thought-provoking questions. With your help, they will set goals, find resources, and evaluate their own progress as they complete each step of the Weed Identification project.

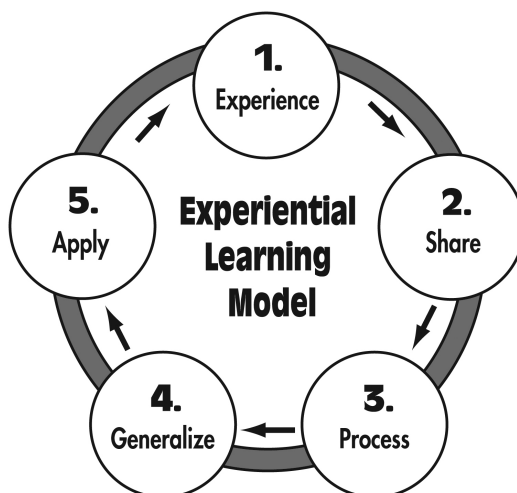
Record sheets and a sample score sheet are printed in this manual. Additional copies are available online. You can find them by clicking on "Search" at the Indiana 4-H Web site at www.four-h.purdue.edu.

The Experiential Learning Model

The experiential model and its five steps are incorporated into this guide to help youths gain the most from the experience. The five steps encourage the youths to try to do the activity before being told or shown how (experience). As the helper, you'll want to help the youths describe what they experience and their reaction (share).

You can use questions to help the youths:

- Discuss what was most important about what they did (process).
- Relate the life skill practiced to their everyday experiences (generalize).
- Share how they will use the life skills and project skills in other parts of their lives (apply).



Pfeiffer, J.W., & Jones, J.E., "Reference Guide to Handbooks and Annuals"
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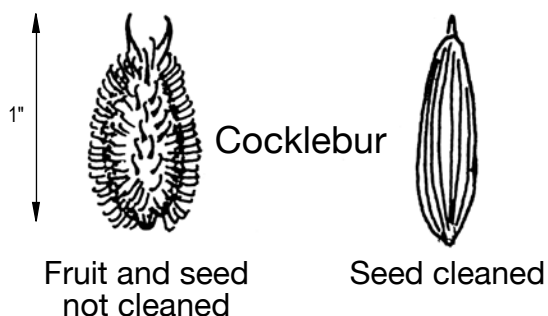
What to Exhibit

Division I

1. Collect and identify 15 different weeds from the common and/or invasive plants of Indiana. Your collection of weeds must be taken from the list of common weeds in this publication (see page 10). Be aware that some weeds may be more prevalent at different times of the year. See weed list for indications of timing.
2. Press weeds (see page 4).
3. Mount each individual weed on 8 1/2" x 11" poster board by either taping or gluing the plant to the poster board.
4. Cover the poster board containing the plant specimen with cellophane or clear sheet plastic or put it in a plastic sheet protector. Place the pages in a three-ring binder (punch holes of adequate size to allow easy turning of the pages in the binder).
5. Label (label size, 1 1/2" x 2") each weed as to:
 - a. Common name.
 - b. Where found (lawn, garden, pasture, etc.).
 - c. How it reproduces (seed and/or underground root parts).
6. Answer questions on record sheet, and put a copy of the record sheet in your notebook.
7. Exhibit collection at county fair.

Division II

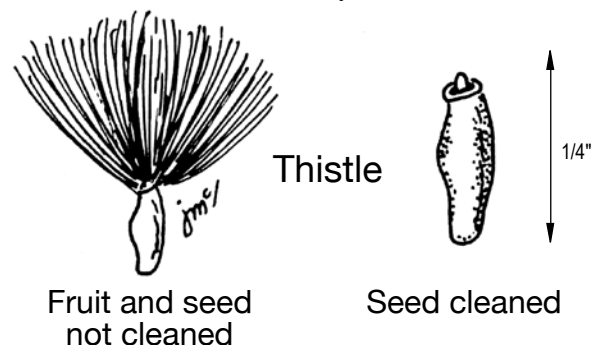
1. Collect and identify five noxious and five poisonous weeds of Indiana. Your collection of weeds must be taken from the list of noxious and poisonous weeds in this publication (see page 11).
2. Press weeds (see page 4).
3. Mount each individual weed on 8 1/2" x 11" poster board by either taping or gluing the plant to the poster board.
4. Cover the poster board containing the plant specimen with cellophane or clear sheet



- plastic or put it in a plastic sheet protector. Place the pages in a three-ring binder (punch holes of adequate size to allow easy turning of the pages in the binder).
5. Label (label size, 1 1/2" x 2") each weed as to:
 - a. Name of weed (common and scientific names – remember to italicize or underline scientific names).
 - b. Where found (lawn, garden, pasture, etc.).
 - c. How it reproduces (seed and/or underground root parts).
 6. Answer questions on record sheet, and put a copy of the record sheet in your notebook.
 7. Exhibit collection at county fair.

Division III

1. Collect and identify 15 different weed seeds from mature plants from the list of common, noxious, or poisonous weeds in this publication. Five of these weed seeds must be taken from the list of noxious weeds (see page 11).
2. Clean the seeds and separate from the fruit (see examples below).
3. Place one tablespoon of the dried weed seeds in a plastic zippered bag.
4. Mount the plastic bags on poster board (22" x 28"). Mounting must be made to exhibit the poster in a horizontal position. Place your name, county, and club name in the lower right corner of the poster.
5. Label (label size, 1 1/2" x 2") each weed seed bag as to:
 - a. Name of weed (common and scientific names – remember to italicize or underline scientific names).
 - b. Where found (lawn, garden, pasture, etc.).
 - c. Annual, biennial, or perennial.
6. Answer questions on record sheet, and put a copy of the record sheet in your notebook.
7. Exhibit collection at county fair.



Tips on Collecting, Pressing, and Mounting Your Weeds

Collecting Plants

Choose a complete representative plant. Collect enough of the top portion of the plant to show the flower (or seed head), stem, and leaf characteristics of the weed. Include a typical portion of the root on all perennial specimens. When collecting perennial weeds, the roots should be dug rather than pulled to obtain a representative sample. Be aware that some weeds are more prevalent at different times of the year. Flowering can also occur at different times of the year depending on weed species. See the weed list for an indication as to when they may be found.

A plastic bag of suitable size with three or four moistened paper towels in the bottom makes a handy device for use in collecting plants. Use a rubber band or a twist tie to fasten the bag, if necessary.

Weeds should be pressed immediately after collecting – before they wilt or dry out!

Preparations Before Pressing

Remove all soil from the roots by shaking or washing. If you wash the roots, blot well with paper towels and allow to dry somewhat before pressing. Remove some of the stems, leaves, flowers, branches, or roots if necessary to prevent crowding.

Bend or cut the plant to fit an 8" x 10" mounting sheet. Bulky parts (i.e., fruits, large stems, and thick roots from perennials) should be sliced lengthwise, with a representative section left attached to the plant. This reduces bulk, improves drying, and will simplify mounting.

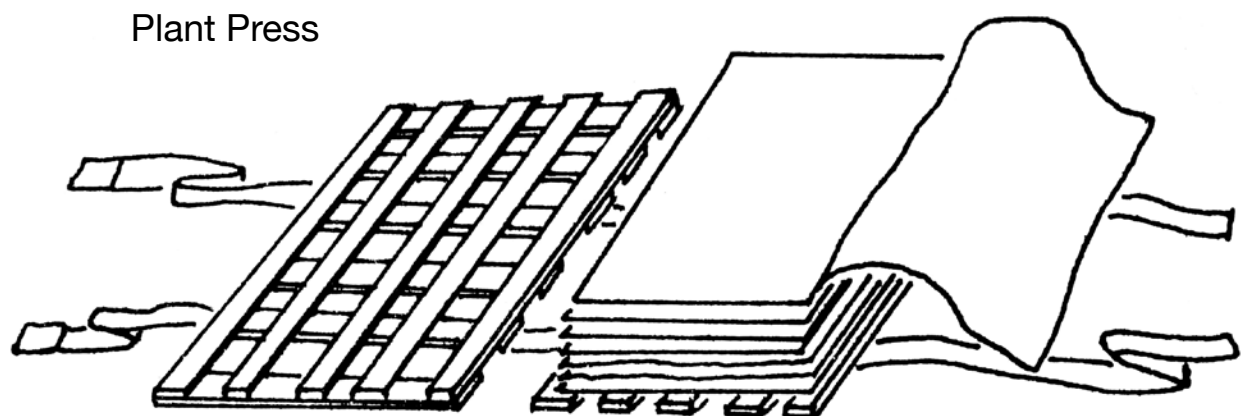
Pressing the Plants

Spread out the plants on paper or single newspaper sheets to show all the plant parts. Place only one plant in each folded newspaper. The individual leaves should be spread to show entire leaf characteristics. Moist paper towel strips may be used as "tape" to hold leaves and flower petals in the spread-out position. Place the papers containing the weeds between blotters such as newspapers. More newspaper, blotter paper, or corrugated cardboard should be placed between each weed specimen.

Making a Plant Press

There are several types of presses. A simple one can be made by placing the plants on a flat surface such as a table top, after placing them in the blotters. Completely cover them with another flat surface such as plywood or cardboard. Weigh this down with books or other sufficient weight.

A more permanent plant press can be made from 1- to 2-inch strips of quarter-inch plywood, ordinary lath, or other light material such as wood from an apple box or crate. First make a frame 13 x 8 inches, which is the standard size for presses. Then, on the inside of each frame, place the strips running both ways from 1 to 2 inches apart. Eight to 12 wooden strips are needed to complete the press. Secure the strips to the



frame with nails or screws. The slatted construction allows maximum ventilation so that plant specimens can dry properly.

The press may be held together firmly with two canvas, web, or leather belts.

Changing Paper in the Press

To maintain the natural plant color, the press must be placed in a warm, dry location. It may be necessary to change the blotter paper in the press the second day and every few days thereafter until the plants are thoroughly dry. Plants left too long in damp newspapers and dryers will turn brown.

Normal drying time for small grassy type plants should be about 4 to 6 days. Large juicy plants will take considerably longer, perhaps 8 to 15 days. Specimens should be completely dry before mounting. Pressing plants with excess moisture can lead to the growth of mold on the weed. Plant press quality points are deducted for pressed plants that have mold growth. Green or wet plants will be docked during judging. Thus, plants should be dried and mounted at least three weeks prior to judging time.

Mounting

Mount the pressed weed on white poster board (8 1/2" x 11") as directed for your division. Remember – a good plant specimen shows the plant characteristics essential in positive identification. These characteristics include flowers, fruits, stem shape, leaf arrangement and shape, and perennial root structure. In addition, it should be neat and correctly labeled. All specimens must be correctly identified to be eligible for a blue ribbon.

Description of Weeds

Since humans first began to cultivate crop plants, producers have had to contend with undesirable plants. These undesirable plants have been classified as "weeds." A weed can be described as "a plant out of place" or "any plant growing where it is not desired." These are usually objectionable plants.

Many of our weeds have been introduced from other countries through impurities in crop seeds and other imported plant materials. Although not native, they have adapted themselves to areas of favorable environmental conditions, and they often become a real problem in these areas.

Classification of Weeds

In order to control weeds, a knowledge of their habits and methods of reproduction is helpful. They may be classified by the length of their lifespan, as follows:

Annuals – Plants that start from seeds in the spring, summer, or early fall and complete their entire life cycle in one year. Plants that start from seeds in the fall we call "winter annuals." Downy brome, sunflower, and giant foxtail are examples.

Biennials – Plants that complete their life cycle in two years. The first year's growth consists of roots and rosette of leaves. The second year's growth from the roots produces flowers and seeds. Burdock, common mullen, and wild carrot are examples.

Perennials – Plants that live more than two years. They reproduce not only by seeds, but also by underground stems, creeping roots, bulblets, tubers, and stolens. Curly dock, dandelion, wild onion, and Johnsongrass are examples.

How Weeds Are Spread

All weeds produce seeds. It is not uncommon for a single plant of giant foxtail to produce 20,000 seeds. These often persist in the soil for many years.

The spread of weeds is usually caused by seed movement. Seeds can be scattered by man, animals, birds, water, and wind. On the farm, the use of impure crop seed and the scattering of weed seed by mechanical equipment can spread weeds.

Many seeds have special devices that aid in their spread. The seeds of milkweed, dandelion, and thistle are equipped with hair or plume-like attachments that enable them to be easily carried by the wind. The seeds of many common weeds have spines, hooks, or barbs with which they become attached to animals or clothing and are carried to other areas. Stick-tights, beggar-ticks, and cockleburs are examples of such weeds.

In addition to seeds, some weeds are spread by movement of their root parts. Harrows, cultivators, plows, and other equipment carry these root parts from infested to non-infested areas.

How Weeds Are Harmful

Weeds compete with crop plants for food, moisture, and light. Heavy infestations may make a crop unproductive and hamper harvest operations.

Some weeds grow on useful plants as parasites. Field dodder, a plant without the ability to produce its own food, lives on alfalfa and clover by obtaining all its food and moisture from the host plant.

Weeds harbor plant diseases and insect pests. Some parasitic fungi, like the rusts, live part of their life on weeds, and in this way they are carried from one growing season to another. Insect pests build up populations on weeds and spread to cultivated plants. These insects can carry viruses and other diseases with them.

Some weeds are poisonous to domestic animals. Water hemlock, white snakeroot, and nightshade are examples of these poisonous weeds. Certain others, such as stinging nettle, cause skin irritation. Pollen from weeds like ragweed may create a health hazard. Wild garlic and others will taint milk.

Weed seeds will lower the quality of crop seeds and grains with which the weed seeds are mixed. For instance, the Indiana seed law prohibits the sale of agricultural seeds for seeding purposes if they contain any prohibited noxious weed seeds, and/or more than one-fourth of one percent of restricted noxious weed seeds, and/or more than 2.5 percent of all weed seeds.

Weeds in general are unsightly and reduce property value.

How Weeds Are Controlled

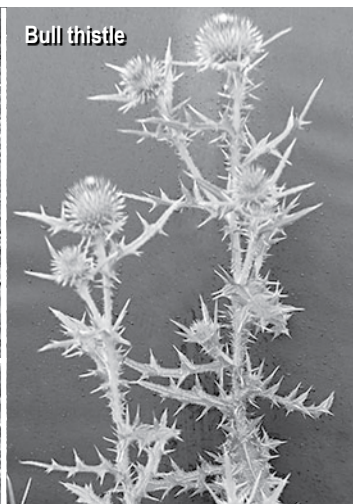
Prevention of seed production is essential in weed control. Mowing, cultivating, and applying a suitable chemical are methods of destroying a plant before the seed matures.

In the case of biennials and perennials, it is necessary to destroy the root system. In addition to the use of cultivation and smother crops, some herbicides have the ability to penetrate the plant and kill the root system.

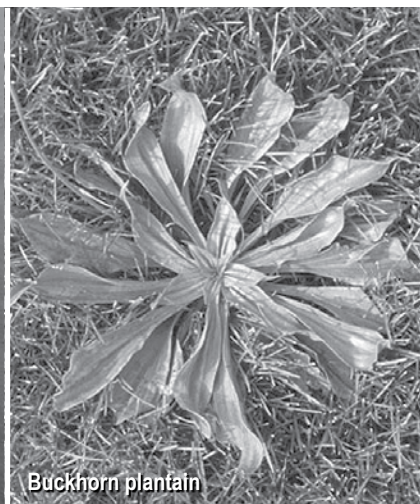
Make sure to remember that the three fundamental objectives of various methods of combating weeds are prevention, control, and eradication.



Garlic mustard



Bull thistle



Buckhorn plantain



Common plantain



Prostrate knotweed

Invasive Plants,

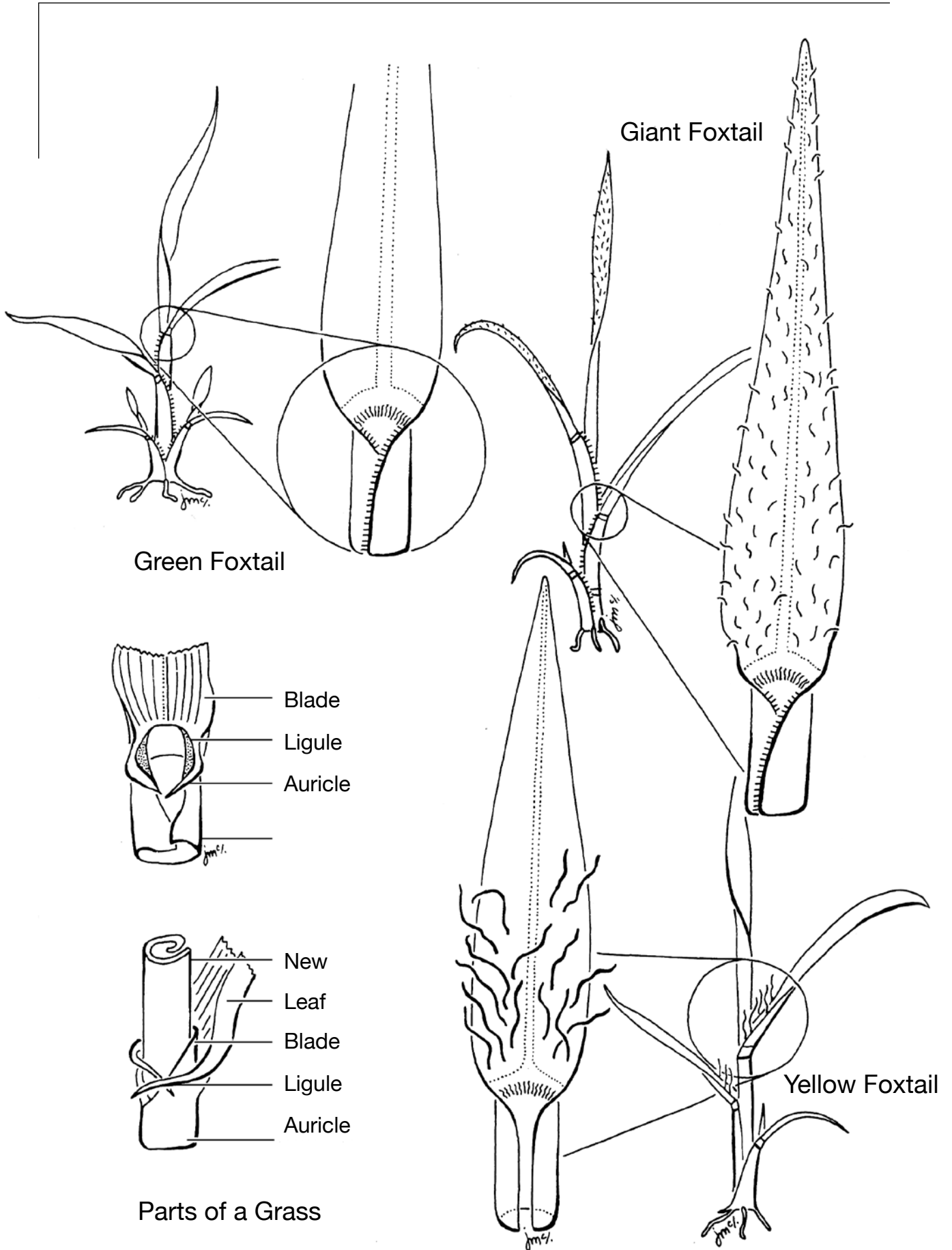
What are they?

Invasive species are plants, animals, insects, or diseases that when introduced into a new ecosystem can sometimes become aggressive in their spread. Not all plants introduced are invasive plants. Due to their aggressive natures, invasive plants can out compete and crowd out native species having an impact on Indiana's natural areas. Although there are other plants in the U.S. that have been labeled invasive a few of them are included in the common weeds list. For more information on invasive species please visit www.invasive.org or <http://www.entm.purdue.edu/CAPS/index.htm>.

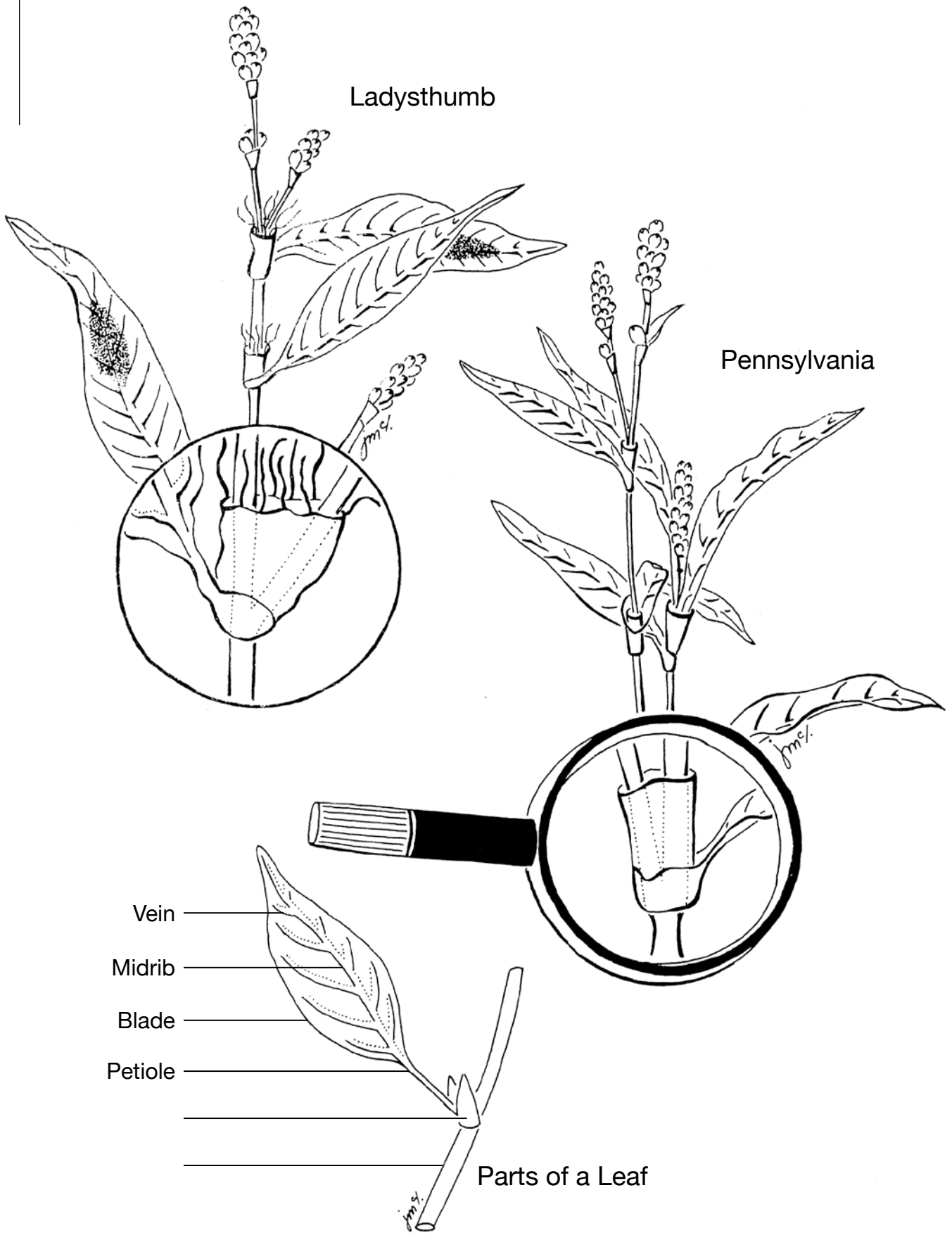
Reference Material

- 1) Weeds of the North Eastern United States, by Richard H. Uva, Joseph C. Neal, Joseph M. Ditomaso. (\$29.95)
- 2) Weeds of the North Central States. http://www.ag.uiuc.edu/~vista/html_pubs/WEEDS/list.html
- 3) Virginia Tech. Weed ID Site. <http://www.ppws.vt.edu/weedindex.htm>
- 4) USDA Plant Data Base. <http://plants.usda.gov>

How to Tell the Difference Between Foxtails



How to Tell the Difference Between Smartweeds



Common Weeds Found in Indiana

You must take your weeds from this list for Division I.

| Common Name | Scientific Name |
|------------------------|---------------------------------|
| Barnyardgrass | <i>Echinochloa crus-galli</i> |
| Bermudagrass | <i>Cynodon dactylon</i> |
| Bull thistle | <i>Cirsium vulgare</i> |
| Carpetweed | <i>Mollugo verticillata</i> |
| Cheat | <i>Bromus secalinus</i> |
| Common chickweed | <i>Stellaria media</i> |
| Common lambsquarters | <i>Chenopodium album</i> |
| Common milkweed | <i>Asclepias syriaca</i> |
| Common mullein | <i>Verbascum thapsus</i> |
| Common purslane | <i>Portulaca oleracea</i> |
| Common ragweed | <i>Ambrosia artemisiifolia</i> |
| Common teasel | <i>Dipsacus fullonum</i> |
| Common yarrow | <i>Achillea millefolium</i> |
| Dandelion | <i>Taraxacum officinale</i> |
| Downy brome | <i>Bromus tectorum</i> |
| Fall panicum | <i>Panicum dichotomiflorum</i> |
| Foxtail barley | <i>Hordeum jubatum</i> |
| Green Foxtail | <i>Setaria viridis</i> |
| Giant ragweed | <i>Ambrosia trifida</i> |
| Goldenrod | <i>Solidago spp.</i> |
| Ground Ivy | <i>Glechoma hederaceae</i> |
| Hedge bindweed | <i>Calystegia sepium</i> |
| Henbit | <i>Lamium amplexicaule</i> |
| Ivyleaf morningglory | <i>Ipomoea hederacea</i> |
| Jerusalem artichoke | <i>Helianthus tuberosus</i> |
| Ladysthumb | <i>Polygonum persicaria</i> |
| Large crabgrass | <i>Digitaria sanguinalis</i> |
| Musk thistle | <i>Carduus nutans</i> |
| Pennsylvania smartweed | <i>Polygonum pennsylvanicum</i> |
| Prostrate knotweed | <i>Polygonum aviculare</i> |
| Purple deadnettle | <i>Lamium purpureum</i> |
| Redroot pigweed | <i>Amaranthus retroflexus</i> |
| Tall ironweed | <i>Vernonia altissima</i> |
| Velvetleaf | <i>Abutilon theophrasti</i> |
| Wild carrot | <i>Daucus carota</i> |
| Yellow foxtail | <i>Setaria glauca</i> |
| Yellow nutsedge | <i>Cyperus esculentus</i> |
| Yellow woodsoral | <i>Oxalis stricta</i> |

Noxious and Poisonous Weeds Found In Indiana

You must take your weeds from these lists for Division II.

| Common Name | Prohibited Noxious | Scientific Name |
|----------------------|--------------------|-----------------------------|
| Canada thistle | | <i>Cirsium arvense</i> |
| Field bindweed | | <i>Convolvulus arvensis</i> |
| Johnsongrass | | <i>Sorghum halepense</i> |
| Perennial pepperweed | | <i>Lepidium latifolium</i> |
| Perennial sowthistle | | <i>Sonchus arvensis</i> |
| Quackgrass | | <i>Elymus repens</i> |
| Russian knapweed | | <i>Acroptilon repens</i> |
| Sorghum-almum | | <i>Sorghum almum</i> |
| Wild garlic | | <i>Allium vineale</i> |
| Wild onion | | <i>Allium canadense</i> |

Restricted Noxious

| | | |
|--|--|-----------------------------|
| Bitter wintercress (garden yellowrocket) | | <i>Barbarea vulgaris</i> |
| Buckhorn plantain | | <i>Plantago lanceolata</i> |
| Common cocklebur | | <i>Xanthium strumarium</i> |
| Corn cockle | | <i>Agrostemma githago</i> |
| Curly dock | | <i>Rumex crispus</i> |
| Dodder | | <i>Cuscuta species</i> |
| Eastern black nightshade | | <i>Solanum ptycanthum</i> |
| Field pennycress | | <i>Thlaspi arvense</i> |
| Field pepperweed | | <i>Lepidium campestre</i> |
| Giant foxtail | | <i>Setaria faberi</i> |
| Horsenettle | | <i>Solanum carolinense</i> |
| Oxeye daisy | | <i>Leucanthemum vulgare</i> |

Poisonous to Livestock

| | | |
|--------------------------|--|---|
| Blackeyed-susan | | <i>Rudbeckia hirta var. pulcherrima</i> |
| Ohio buckeye | | <i>Aesculus glabra</i> |
| Castorbean | | <i>Ricinus communis</i> |
| Common cocklebur | | <i>Xanthium strumarium</i> |
| Common pokeweed | | <i>Phytolacca americana</i> |
| Common sneezeweed | | <i>Helenium autumnale</i> |
| Cressleaf groundsel | | <i>Packera glabella</i> |
| Dwarf larkspur | | <i>Delphinium tricornis</i> |
| Eastern black nightshade | | <i>Solanum ptycanthum</i> |
| Common milkweed | | <i>Asclepias syriaca</i> |
| Horsenettle | | <i>Solanum carolinense</i> |
| Jimsonweed | | <i>Datura stramonium</i> |
| Mayapple | | <i>Podophyllum peltatum</i> |
| Poison-hemlock | | <i>Conium maculatum</i> |
| Red sorrel | | <i>Rumex acetosella</i> |
| Horsetail | | <i>Equisetum spp.</i> |
| White snakeroot | | <i>Eupatorium rugosum</i> |

Indiana 4-H Weed Identification Project Record

Division I

Name _____ Grade _____ Year _____

Name of Club _____ Year in Club Work _____

Township _____ County _____

Date Record Started _____ Date Record Completed _____

Signature of Leader _____ Date _____

Do not fail to complete this record. It is as important in the project as your exhibit.

1. Define a weed.

2. Classify weeds according to their length of life (shortest to longest).

- a.
- b.
- c.

3. How may weeds be introduced?

4. How are weed seeds scattered?



5. List three ways in which weeds cause losses.

- a.
- b.
- c.

6. The Indiana seed law prohibits the sale of seeds for seeding purposes that contain:

- a.
- b.
- c.

7. Name three general methods of weed control.

- a.
- b.
- c.

8. Give four plant parts that should be included in a good plant specimen.

- a.
- b.
- c.
- d.

9. About how many hours did you spend on this project?

10. Why did you enroll in this weed project?

- *Keep your records, pictures, and newspaper clippings of all your 4-H activities.*
- *Use them to make your 4-H Club Achievement Record Book later.*

Indiana 4-H Weed Identification Project Record

Division II

Name _____ Grade _____ Year _____

Name of Club _____ Year in Club Work _____

Township _____ County _____

Date Record Started _____ Date Record Completed _____

Signature of Leader _____ Date _____

Do not fail to complete this record. It is as important in the project as your exhibit.

1. Define a weed.

2. A good plant specimen should include the following four plant parts:

- a.
- b.
- c.
- d.

3. Pollen from some weeds causes:

4. List a weed that causes skin irritation.



5. List three ways in which weeds cause losses.

- a.
- b.
- c.

6. Classify weeds according to their length of life (shortest to longest).

- a.
- b.
- c.

7. How are weed seeds scattered?

8. Name three general methods of weed control.

- a.
- b.
- c.

9. Why did you enroll in this weed project?

10. About how many hours did you spend on this project?

- *Keep your records, pictures, and newspaper clippings of all your 4-H activities.*
- *Use them to make your 4-H Club Achievement Record Book later.*

Indiana 4-H Weed Identification Project Record

Division III

Name _____ Grade _____ Year _____

Name of Club _____ Year in Club Work _____

Township _____ County _____

Date Record Started _____ Date Record Completed _____

Signature of Leader _____ Date _____

Do not fail to complete this record. It is as important in the project as your exhibit.

1. Define a weed.

2. What amount of prohibited noxious weed seeds is allowed in agricultural seed sold for seeding purposes?

3. What amount of restricted noxious weed seeds is allowed in agricultural seed sold for seeding purposes?

4. What amount of total weed seeds is allowed in agricultural seed sold for seeding purposes?



5. List two special devices that seeds have to aid in their distribution.

a.

b.

6. List a weed that is a plant parasite.

7. What amount of wild garlic seed is allowed in agricultural seed sold for seeding purposes?

8. List three ways in which weeds cause losses.

a.

b.

c.

9. About how many hours did you spend on this project this year?

10. Why did you enroll in this weed project?

- *Keep your records, pictures, and newspaper clippings of all your 4-H activities.*
- *Use them to make your 4-H Club Achievement Record Book later.*

Suggestions for County Judges

Correct identification of the weed specimens is of major importance in this exhibit. All specimens must be correctly identified to be eligible for a blue ribbon.

Other factors to be considered are listed in order of importance:

- Completeness and quality of specimens.
- Completeness of labels (according to project).
- Neatness of total exhibit (well pressed, dry, and well placed).
- Completeness and correctness of project record.

4-H-247D-W

4-H Weed Exhibit Scorecard


Name _____

Division _____

County _____

| | Possible Points | Your Score |
|--|-----------------|------------|
| Correct identification | 60 | _____ |
| Completeness and quality of specimens | 15 | _____ |
| Completeness of labels | 10 | _____ |
| Neatness of total exhibit | 10 | _____ |
| Completeness and correctness of project record | 5 | _____ |
| Total points | 100 | _____ |

Remarks:



A Suggested Rating of Exhibits

Possible Points

| | |
|--|-----|
| Correct identification | 60 |
| Completeness and quality of specimens | 15 |
| Completeness of labels | 10 |
| Neatness of total exhibit | 10 |
| Completeness and correctness of project record | 5 |
| Total points | 100 |

All specimens must be correctly identified to be eligible for a blue ribbon.