

## 21. Keys for Identifying Weeds

**T**HE FOLLOWING KEY is adapted from one previously prepared by the author for publication in a North Central States regional bulletin "Weeds of the North Central States." With certain exceptions, the weed kinds treated are essentially the same as those discussed in this text.

This key employs a minimum of technical terms and botanical concepts. Agricultural workers and students who are "rusty" on botanical descriptions and the characteristics of weed families should find this outline useful for identifying unknown weedy plants in flower. So that it can serve this function, independent of the remainder of the text, it contains its own explanatory exposition and briefed-down glossary.

Those who can recognize plant families can possibly determine an unknown specimen more quickly by turning to the correct family in the text and comparing the plant with the descriptions and illustrations. The key should, however, be useful in verifying identifications.

### HOW A KEY IS USED

A key is a device for identifying plants. It is an outline consisting of alternative statements about structure or appearance. From each pair of statements you choose the one that applies to the plant you are trying to identify. After you have made your first choice, you then choose from another pair subordinate to the first statement, and so on until you have finally identified the plant.

As an example, a short key to certain common cultivated legumes is given below. First look at the two headings labeled "1." If the plant to be identified has a rounded head of flowers, it will be found under the second "1." You will ignore everything under the first "1," since all the plants under that heading will have flowers in slender spikes. Next, you look at the two statements labeled "3" under the second "1." If the plant has white flowers, you choose the second "3." Subordinate to the second "3" is a pair of "4's." Assuming that the plant you are trying to identify is a trailing plant, rooting at the nodes, it "comes out" on the first "4" as white clover.

1. Flowers in slender spikes.
2. Flowers yellow.      **YELLOW SWEET CLOVER**
2. Flowers white.      **WHITE SWEET CLOVER**
1. Flowers in rounded heads.
3. Flowers pink to red.  
                                  **RED CLOVER**
3. Flowers white or pinkish.
4. Plants trailing, rooting at nodes; flowers white.  
                                  **WHITE CLOVER**
4. Plants ascending, not rooting at nodes; flowers white, becoming pink.  
                                  **ALSIKE CLOVER**

Note that you always choose between one of two alternatives, and that the two alternatives bear the same number. Note also that a given number is used for only one pair of headings and is not repeated.

When you start to use the longer keys beginning on page 252, you will find that they follow the same principle. Often, however, one of a pair of statements will be quite widely separated from the other. For example, under the first "1" in Key 1, there are pairs of "2's," "3's," "4's," "5's," and "6's" before you come to the second "1." Sometimes the separation is much wider; you may have to turn a couple of pages before you come to the second of a statement pair. In all cases, choose between two statements bearing the same number and keep on choosing until the plant is identified.

### USE OF TECHNICAL PLANT CHARACTERS IN A KEY

Individuals who easily recognize plants sometimes wonder why it is necessary to use technical details in a key, details which need not be observed in recognizing a plant. It should be borne in mind that *recognizing* a known plant and *identifying* an unknown one are two different processes.

Let us use a comparison. Most people who are interested in cars can usually differentiate even at a distance between popular makes regardless of model, year, or body type. This recognition is based upon a knowledge both of general form and of the detailed variations from model to model and from year to year, and perhaps involves a rapid, subconscious sorting of these details. But if one is to write down a few characteristics that will allow a person who has never paid any attention to cars to distinguish between two makes, one must turn to characteristics which remain fairly consistent regardless of year or model. For example, the insignias on the front of the hood would probably be constant enough to furnish a means of identification. And possibly certain details of the grille, the curvature of the fenders, or the nature of the hubcaps would be found consistent enough to be valuable.

A plant is usually recognized by a combination of superficial and frequently variable characteristics which if put into words would

frequently require an involved description. On the other hand, plants must be identified by more or less consistent characteristics which serve as "signposts"; such characteristics may sometimes be small or technical in nature.

### TECHNICAL TERMS

Arising out of the need for using technical characteristics is the necessity for technical terms. Most botanical keys contain a number of them. Obviously such words make it difficult for the person who has little familiarity with plants to use the key. But—returning to automobiles—one could scarcely discuss the ailments of his car intelligently with a mechanic if he did not know a few words such as carburetor, water pump, rings; even more or less everyday words such as steering wheel, dimmer switch, fender, and grille are names for parts of a car. In the same way, if plants are to be described with any precision, it is necessary to have words for their parts.

An attempt has been made in the following keys to hold technical terms to a minimum. In most cases, descriptive phrases are substituted for such terms. Frequently the appropriate or more exact technical term is placed in parentheses after the descriptive phrase—as a possible aid to those familiar with the terms. (Occasionally, the technical word is placed first and the descriptive phrase is put into parentheses after it.) The following words, however, are used without definition in the keys.

#### Duration of the Weed

*Annual*—lives one year. *Biennial*—lives two years. *Perennial*—lives several years. The annuals and biennials usually have only a taproot with small branches or, in the case of grasses, a fibrous root system. Perennials possess overwintering parts; for example, thickened crowns from which new shoots will arise, bulbs or tubers, or creeping underground stems (rootstocks) or roots.

#### Arrangement of the Leaves

*Alternate*—one leaf at each level on the stem. *Opposite*—two leaves opposite one another and paired. *Whorled*—three or more leaves at each level on the stem.

### Nature of the Leaf

*Simple*—the leaf blade consists of a single piece and is not divided into separate leaflets. However, simple leaves are frequently toothed or lobed. Maple and elm leaves are simple leaves. *Compound*—the leaf blade is divided into several leaf-like parts which are called leaflets. The leaf of a hickory or locust is compound.

### Leaf Shape

*Ovate*—egg-shaped, nearly elliptic but broadest at base. *Lanceolate*—lance-shaped, longer than ovate, and usually pointed at tip. *Linear*—long and narrow with nearly parallel sides. Grass leaves are linear.

### Arrangement of the Flowers

If the flowers are in a definite cluster, usually at the top of the plant, they are said to be in an *inflorescence*. On the other hand, the flowers may be borne along the stem of the plant in the angles (leaf axils) between the foliage leaves and the stem. Such flowers are said to be axillary and, if in groups, comprise *axillary clusters*.

### Flower Parts

The details of flower and fruit structure provide the best characteristics for identifying plants. But because of the technical nature of these parts they are little used in these keys. The expanded and usually colored parts of the flower are the *petals*. (However, many flowers possess no petals and are usually greenish or inconspicuous in appearance.) The *sepals* form the greenish hull around the flower when it is in bud; when the flower is open they lie outside and below the petals.

## NATURE AND ARRANGEMENT OF THE KEYS

In the following keys precision of statement has been sacrificed to avoid the use of technical terms. As a result, some leads may appear ambiguous; in a few cases it may not be clear which alternative should be applied to the weed in hand. As far as possible, such difficulties have been anticipated and the plants concerned have been entered under both alternatives, that is, they may be keyed out in either "direction."

The keys to the weeds treated in this manual are as follows:

- KEY 1, page 252. Flowers yellow, orange, or cream colored.  
 KEY 2, page 262. Flowers white.  
 KEY 3, page 271. Flowers red, pink, blue, lavender or purple.  
 KEY 4, page 278. Flowers green.  
 KEY 5, page 290. Plants woody.

Usually flower color will readily indicate the key to be used. In doubtful cases, the following analysis in the form of a key will aid in determining the proper key to use; it also treats three plant kinds not included in the keys.

1. Plant a yellowish, twining vine without leaves, growing parasitically, usually on legumes or flax.

DODDER (*Cuscuta pentagona*)<sup>1</sup> p. 140

1. Plants not as above.

2. Plants producing neither flowers nor seeds; leaves (as described below) fernlike, or absent.

3. Plant a fern; leaves (fronds) large, divided into numerous segments.

BRACKEN (*Pteridium aquilinum*)

3. Plant(s) with hollow, jointed stems and no leaves; stems of two kinds; one coming up early in the spring is whitish, unbranched, with a cone-like structure at tip; the second is green, with clusters of branches arising at each level.

HORSETAIL (*Equisetum arvense*)

2. Plants producing flowers and seeds; leaves present, various in nature.

4. Plants not woody.

5. Flowers with yellow, orange, cream-colored, or white petals or petal-like structures, occasionally greenish-white or faintly streaked with pink (the center of the flower, or flower head, is sometimes colored differently).

6. Flowers yellow to orange, or cream-colored.

KEY 1, page 252

6. Flowers white.

KEY 2, page 262

5. Flowers other than yellow, orange, cream-colored, or white.

7. Flowers red, pink, lavender, blue, or purple; petals usually present.

KEY 3, page 271

7. Flowers greenish to greenish-brown; petals usually absent.

KEY 4, page 278

4. Plants woody vines or shrubs.

KEY 5, page 290

<sup>1</sup>Several kinds of dodder, similar in appearance to the above, may attack leguminous crops.

**KEY 1. PLANTS WITH YELLOW, ORANGE, OR  
CREAM-COLORED FLOWERS**

1. Plants (leaves or stems) spiny or prickly; plants usually possessing a milky juice.
2. Plants consisting of a series of spiny pads or disks, without leaves; flowers more than 2 inches in diameter.  

PRICKLY PEAR (*Opuntia* spp.)
2. Plants not as above, with leaves; flowers or flower heads less than 2 inches in diameter.
3. Leaves and stems densely covered with rigid spines; juice not milky.  

BUFFALO BUR (*Solanum rostratum*) p. 157
3. Leaves prickly along margins and sometimes lower midrib; stems not spiny; juice milky.
4. Flowers (flower heads) less than 1/2 inch across, straw-yellow, very numerous in a diffuse flower cluster (panicle); leaves prickly on lower midrib as well as margins.  

PRICKLY LETTUCE (*Lactuca scariola*) p. 183
4. Flower heads 1/2 to 1 1/2 inches across, bright yellow, usually 5 to 20 in number; leaves not prickly on lower midrib.
5. Flower heads more than 1 inch in diameter (slightly smaller than those of a dandelion); plants perennial from creeping roots. PERENNIAL SOWTHISTLE (*Sonchus arvensis*) p. 184
5. Flower heads 1/2 to 1 inch in diameter (about half the size of those of a dandelion); plants from an annual taproot.
6. Leaf margin very prickly; base of the blade usually curled (auriculate) and clasping the stem; seeds (achenes) not cross-wrinkled.  

SPINY SOWTHISTLE (*Sonchus asper*)
6. Leaf margin soft-prickly; leaf base tapering, not clasping the stem, or some of upper leaves slightly clasping; achenes irregularly ridged and cross-wrinkled.  

COMMON SOWTHISTLE (*Sonchus oleraceus*) p. 185
1. Plants (leaves or stems) not spiny; in a few cases the fruit is spiny or prickly.
7. Plants without a leafy stem or prostrate stolons; leaves all in a cluster (rosette) at ground level; flower heads solitary on hollow, leafless stalks.
8. Seeds (achenes) red-brown to reddish-purple; leaves usually dissected nearly to the midrib with narrow, frequently downwardly curved (runcinate) lobes; inner bracts around head (phyllaries)

with horn-like appendages.<sup>2</sup>

RED-SEEDED DANDELION (*Taraxacum erythrospermum*)

8. Achenes olive-drab to dull brown; leaves extremely variable, deeply dissected or only irregularly toothed; phyllaries not appendaged.

DANDELION (*Taraxacum officinale*) p. 186

7. Plants with a leaf-bearing stem, erect or prostrate; flowers or flower heads various, not arising directly from a basal rosette (stem leaves are much reduced in Hawkweeds, *Hieracium* spp., which possess flower heads clustered at stem tip; frequently stolons are evident).

9. Plants prostrate, trailing, or spreading.

10. Leaves compound.

11. Leaflets 8 to 16; fruit a spiny bur.

PUNCTURE VINE (*Tribulus terrestris*) p. 113

11. Leaflets 3; fruit a 1-seeded pod.

BLACK MEDIC (*Medicago lupulina*) p. 97

10. Leaves simple.

12. Plant very fleshy with small, entire leaves; flowers less than 1/2 inch across; fruit a small capsule.

PURSLANE (*Portulaca oleracea*) p. 70

12. Plant not fleshy, with large, irregularly toothed leaves; flowers large, more than 2 inches long; fruit gourd-like.

WILD GOURD (*Cucurbita foetidissima*)

9. Plants erect or ascending (a few kinds may root at lower nodes or possess trailing stolons as well as erect stems).

13. Leaves compound, divided into distinct leaflets, or some or all of leaves dissected into numerous fine segments and usually appearing fern-like.

14. Leaves compound, divided into distinct leaflets which are ordinarily more than 1/4 inch wide.

15. Leaves opposite; flowers in head (each appearing like a single flower); fruits 1-seeded (achenes), with 2 barbed, sharp projections (awns) at top.

BEGGAR'S-TICKS (*Bidens frondosa*)

15. Leaves alternate; flowers not borne in heads; fruits various.

16. Leaflets 3, entire except for a notch at apex (obcordate); each flower producing a single, many-seeded fruit (capsule).

YELLOW SORREL (*Oxalis europaea*) p. 112

<sup>2</sup>Our two kinds of dandelions are difficult for anyone except a specialist to distinguish.

16. Leaflets various in number, toothed or lobed; fruits not capsular, frequently several produced by each flower.
17. Leaves pinnately compound (leaflets arising from an elongated midrib or axis); flowers umbellate (numerous flower stalks arising from same point); each flower producing 1 fruit, which, at maturity, splits into 2 flat, 1-seeded segments (mericarps).

WILD PARSNIP (*Pastinaca sativa*) p. 129

17. Leaves palmately compound (leaflets arising finger-like from apex of leaf stalk); flowers not umbellate; each flower producing several 1-seeded fruits (achenes).
18. Leaflets lobed or dissected, frequently running together at base, their exact number difficult to determine; stipules (appendages where leaf stalk joins stem) not evident.

TALL BUTTERCUP (*Ranunculus acris*)

18. Leaflets toothed, clearly distinguishable and easy to count; stipules present.

19. Under surface of leaves silvery-hairy.

SILVERY CINQUEFOIL (*Potentilla argentea*)

19. Under surface of leaves greenish.

20. Leaflets 5 to 9; petals large, exceeding other flower parts.

SULPHUR CINQUEFOIL (*Potentilla recta*) p. 92

20. Leaflets 3; petals small and inconspicuous, scarcely exceeding sepals (greenish hulls at base of flower).

ROUGH CINQUEFOIL (*Potentilla norvegica*) p. 92

14. Leaves not divided into distinct leaflets; some or all of leaves dissected into numerous fine segments which are usually less than 1/4 inch wide, the whole leaf presenting a somewhat fern-like appearance.

21. Leaves all alternate.

22. Flowers with 4 distinct petals set at right angles to one another; fruit resembling a slender pod (silique), containing several yellowish seeds; plants not scented.

23. Mature pods more than 2 inches long; main segments of basal (rosette) leaves usually not dissected into secondary segments (1-pinnatifid).

TUMBLING MUSTARD (*Sisymbrium altissimum*) p. 82

23. Mature pods less than 1 inch long; main segments of basal leaves usually dissected into secondary segments (2-pinnatifid).

TANSY MUSTARD (*Descurainia pinnata*) p. 78



22. Flowers (flower heads) not possessing marginal petal-like structures, button- or bell-shaped; fruits one-seeded, not pod-like, clustered together in the heads; plants usually strongly scented.
24. Flower heads yellow or orange, erect, 1/4 inch or more wide.
25. Plants perennial; stems usually a foot or more in height; main leaf segments crowded, pinnatifid; flower heads orange, in a dense, flat-topped cluster.

TANSY (*Tanacetum vulgare*)

25. Plants annual; stems less than a foot high; leaf segments slender, entire, distant; flower heads yellowish, not densely clustered.

PINEAPPLE WEED (*Matricaria matricarioides*)

24. Flower heads yellowish-white, gray-yellow, or greenish, frequently bent over (nodding), distinctly less than 1/4 inch wide.
26. Plants greenish, relatively smooth; strong-scented annuals arising from a taproot.

WORMWOOD (*Artemisia annua*)

26. Plants white-silky or woolly, scarcely scented; perennials from spreading rhizomes.

MUGWORT (*Artemisia absinthium*)

21. Leaves all opposite, or only the lower opposite.

27. Flower heads with a dark center and large, petal-like marginal (ray) flowers; lower leaves with thread-like (filiform) segments, the upper mostly undivided.

COREOPSIS (*Coreopsis tinctoria*) p. 236

27. Flower heads without a dark center; ray flowers, if present, small and inconspicuous; leaves fern-like.

28. Leaves all opposite; flower heads single or in small groups at tips of branches, with small ray flowers; seeds columnar with points at the tip which readily adhere to clothing.

SPANISH NEEDLES (*Bidens bipinnata*) p. 199

28. Leaves alternate above, opposite below; conspicuous flower heads (not setting seeds) in slender spikes, without ray flowers; seeds short and broad, not adhering to clothing, produced in axils of upper leaves.

29. Plants annual, very common; leaves smooth above, usually much divided, the main segments being dissected into secondary divisions (2-pinnatifid); fruits with a distinct crown of points at tip. COMMON RAGWEED (*Ambrosia elatior*) p. 176

29. Plants perennial from creeping roots (first-year plants appear annual), very similar in appearance to common ragweed

but much less common; leaves rough above, less divided than in above species, the main segments frequently lobed but not again divided (1-pinnatifid); fruits with a very short crown of points or nearly smooth at tip.

PERENNIAL RAGWEED (*Ambrosia psilostachya*) p. 177

13. Leaves neither compound nor dissected into fine segments, if lobed or divided (pinnatifid) the blades not fern-like, or the segments relatively broad or coarse.
30. Petals 4, placed at right angles to one another (flowers cross-like); fruit pod-like (a silique), elongate or ball-shaped, several-seeded (one exception), frequently with a beak at the tip.
31. Pods upwardly appressed against stem.
32. Flowers less than 1/4 inch across; beak of pod indistinct, less than 1/16 inch long; upper leaves with 3 narrow lobes.

HEDGE MUSTARD (*Sisymbrium officinale*) p. 83

32. Flowers more than 1/4 inch across; beak of pod evident, about 1/8 inch long; upper leaves irregularly toothed.

BLACK MUSTARD (*Brassica nigra*) p. 77

31. Pods spreading, ascending, or nearly erect, but not appressed against stem.
33. Pods spherical (globose) to egg-shaped (ovoid); leaves clasping the stem by basal lobes.
34. Plants perennial from creeping roots; pods splitting open at maturity (dehiscent), with numerous tiny seeds.

AUSTRIAN FIELD CRESS (*Rorippa austriaca*)

34. Plants annual; pods not splitting open at maturity (indehiscent), with 1 large seed, or sometimes 2.

BALL MUSTARD (*Neslia paniculata*) p. 80

33. Pods oblong to linear; leaves clasping or not clasping.
35. Plants smooth or with a few scattered hairs (glabrate).
36. Leaves with a pair of basal lobes clasping about the stem, otherwise entire (neither toothed or lobed); seed pods frequently 3 inches long, and often nearly vertical in position.

HARE'S EAR MUSTARD (*Conringia orientalis*) p. 79

36. Leaves not clasping the stem, toothed or lobed; seed pods various, if vertical in position shorter than above.
37. Basal leaves with a broadly rounded terminal lobe; foliage shiny green; seed pods usually not exceeding 1 inch in length; seeds somewhat flattened.

YELLOW ROCKET (*Barbarea vulgaris*) p. 75

37. Basal leaves with pointed lobes; foliage often somewhat whitish-green; seed pods usually exceeding 1 inch in length; seeds spheroid. INDIAN MUSTARD (*Brassica juncea*) p. 77
35. Plants conspicuously bristly-hairy.
38. Fruit jointed at maturity breaking crosswise into segments which contain 1 or 2 seeds; basal leaves usually divided to the midrib into separate segments. WILD RADISH (*Raphanus raphanistrum*) p. 78
38. Fruit splitting longitudinally to release seeds at maturity; basal leaves irregularly toothed or pinnatifid, but not divided to midrib. WILD MUSTARD (*Brassica kaber*) p. 76
30. Petals not 4 in number; fruit various, not a silique.
39. Leaves alternate, occasionally the uppermost or the lower opposite, or rarely nearly all in basal clusters (rosettes).
40. Fruit a 3-lobed, 3-seeded capsule which hangs downward at maturity; leaves narrowly strap-shaped, crowded on the mostly unbranched stem; juice milky.
41. Leaves about 1/8 inch wide. CYPRESS SPURGE (*Euphorbia cyparissias*) p. 106
41. Leaves 1/4 to 3/4 inch wide. LEAFY SPURGE (*Euphorbia esula*) p. 105
40. Fruit not a 3-lobed, 3-seeded capsule; plants otherwise not with the above combination of characters.
42. Flowers without petals or petal-like structures; flowers (flower heads) appearing as erect or drooping yellow discs, or the inflorescence a cluster of short, flat spikes.
43. Leaves grass-like; stems 3-angled; inflorescence a cluster of short, flat spikes. YELLOW NUTGRASS (*Cyperus esculentus*) p. 239
43. Leaves not grass-like; stems rounded; inflorescence of disc-like flower heads.
44. Flowers (flower heads) on stalks in a branched flower cluster; stem leaves strap-shaped, not toothed; seeds with a cluster of hairs (pappus) at tip.
45. Stem unbranched below inflorescence, frequently 3 to 6 feet tall; leaves crowded, strap-shaped. HORSEWEED (*Erigeron canadensis*) p. 200
45. Stem branched, low, usually not much exceeding 1 foot; leaves narrowly linear. DWARF FLEABANE (*Erigeron divaricatus*)

44. Flower heads not stalked (sessile), arising directly from an unbranched axis; leaves usually with a pair of teeth at base; seeds not possessing a pappus.

LANCE-LEAVED RAGWEED (*Ambrosia bidentata*) p. 177

42. Flowers with petals or petal-like structures.

46. Flowers closely associated in heads, each head simulating a single flower; flowers in the head all similar, strap-shaped, and each appearing like a single petal (ray flowers), or of two kinds: small tubular flowers which are crowded together in a central disc, and marginal (ray) flowers which look like petals; each head setting several to many seeds (achenes), which frequently bear a cluster of hairs or bristles (pappus) at the apex.

47. Heads with no central disc; flowers all of the strap-shaped ray-flower type, petal-like; fresh plants frequently with a milky juice.

48. Leaves entire, grass-like; heads large, 1 1/2 to 2 1/2 inches across. YELLOW GOATSBEARD (*Tragopogon dubius*) p. 186

48. Leaves not grass-like, some or all of them usually toothed or lobed; heads usually less than 1 inch across.

49. Leaves mostly in basal rosettes; erect stems bearing only 1 to 3 reduced blades; prostrate leaf-bearing stolons often evident.

50. Flower heads orange.

ORANGE HAWKWEED (*Hieracium aurantiacum*) p. 182

50. Flower heads yellow.

HAWKWEED (*Hieracium pratense*)

49. Leaves of mature plants not mostly in rosettes, those on stems numerous; stolons not present.

51. Leaves soft-prickly, the teeth or lobes drawn out into bristles, or leaves soft-prickly on lower midvein.

52. Midvein on under surface of leaves prickly with a row of bristles; most of stem leaves twisted sidewise to that blade is in a vertical position (one edge above the other); heads less than 1/2 inch in diameter.

PRICKLY LETTUCE (*Lactuca scariola*) p. 183

52. Midvein not prickly; leaves horizontal in position; heads more than 1/2 inch in diameter.

COMMON SOWTHISTLE (*Sonchus oleraceus*) p. 185

51. Leaves not prickly-margined.

53. Branches of flower clusters (inflorescences), arched or recurving, bearing the crowded flowering heads primarily on one side in a curved wand; leaves mostly

stalked, not clasping the stem.

GOLDENROD (*Solidago*<sup>3</sup> spp.) p. 204

53. Branches of inflorescence erect or ascending, bearing upright heads at the tip; stem leaves mostly without stalks (sessile), with lower portion of the blade clasping.

54. Plants tall (3 to 8 feet) with densely leafy stems; heads very numerous, less than 1/2 inch wide; seeds (achenes) black, beaked.

WILD LETTUCE (*Lactuca canadensis*)

54. Plants low, usually about 1 foot tall, frequently with several branches from base; heads 3/8 to 3/4 inch in diameter; seeds (achenes) brown, not beaked.

HAWKSBEARD (*Crepis capillaris*)

47. Heads with a central disc of tubular flowers and marginal, petal-like ray flowers; plants not possessing a milky juice.

55. Central disc of head (tubular flowers) dark in color.

56. Seeds (achenes) black, brick-shaped, 1/8 inch or less in length; leaves oblong to strap-shaped, less than one inch in width.

BLACK-EYED SUSAN (*Rudbeckia hirta*)

56. Seeds white, gray or brown, larger than above; leaves usually broadly ovate to lanceolate and 1 inch or more in width.

57. Leaves rough (scabrous); seeds (achenes) dull white to gray, hairy at tip, 1/4 to 3/8 inch long (this species apparently sometimes crosses with following one).

SUNFLOWER (*Helianthus annuus*) p. 204

57. Leaves hairy but not markedly rough; seeds pale brown, hairy all over, less than 1/4 inch long.

SAND SUNFLOWER (*Helianthus petiolaris*)

55. Entire head yellow.

58. Seeds bearing at apex a cluster (pappus) of numerous fine bristles. (Note: In immature flowering heads the pappus is hidden by the flowers and the head must be split to find it; however, after the head begins to ripen, it is easily visible externally.)

59. Stem leaves pinnatifid (lobed along an elongated midrib); flower heads more than 1/2 inch across.

GOLDEN RAGWORT (*Senecio aureus*)

59. Stem leaves toothed or entire; flower heads not exceeding 1/2 inch.

GOLDENROD<sup>3</sup> (*Solidago* spp.) p. 204

<sup>3</sup>Several kinds of goldenrods are common in the fall of the year.

58. Seeds not bearing a pappus of numerous fine bristles; pappus absent, of scales, or of a few (5 to 10) somewhat flattened, stiff bristles.

60. Stem leaves narrowly linear or thread-like.

61. Heads  $1/2$  to  $3/4$  inch wide; marginal ray flowers lobed at tip.

BITTERWEED (*Helienium tenuifolium*) p. 203

61. Heads less than  $1/2$  inch wide; ray flowers not lobed.

BROOMWEED (*Amphiachyris dracunculoides*)

60. Leaves broader than above, not linear.

62. Stems winged by attached basal portions of leaf blades (leaves decurrent); ray flowers 3-toothed or lobed at tip.

COMMON SNEEZEWEED (*Helienium autumnale*) p. 202

62. Stems not winged; ray flowers not toothed.

63. Plants finely hairy, often somewhat rough; perennial from rhizomes and tubers; heads not sticky or gummy.

64. Central disc (not including petal-like rays) of heads usually  $3/8$  to  $3/4$  inch broad; lowermost leaves opposite; rhizomes bearing enlarged tubers.

JERUSALEM ARTICHOKE (*Helianthus tuberosus*)

64. Central disc of heads  $3/4$  to 1  $1/2$  inches broad; leaves all alternate; rhizomes not tuber-bearing.

MAXIMILIAN'S SUNFLOWER (*Helianthus maximiliani*)

63. Plants smooth (glabrous), without rhizomes or tubers; heads gummy.

GUMWEED (*Grindelia squarrosa*) p. 201

46. Flowers separate, not associated in heads; fruits and seeds various, not possessing a pappus.

65. Leaves velvety-hairy or densely woolly.

66. Fruit a berry enclosed in an angular, papery husk; plant perennial from creeping rootstocks.

GROUND CHERRY (*Physalis heterophylla*)<sup>4</sup> p. 155

66. Fruit a dry capsule which splits open at maturity, not enclosed within a husk; plants annual or biennial, not possessing creeping rootstocks.

67. Plants gray-woolly; flowers in a dense spike; leaves not heart-shaped at base.

MULLEIN (*Verbascum thapsus*) p. 160

67. Plants velvety; flowers not in a spike; leaves heart-shaped at base.

BUTTERPRINT (*Abutilon theophrasti*) p. 122

<sup>4</sup> Several species of *Physalis* are weedy. Not all of them are downy-hairy or perennial, but all have the characteristic berry enclosed in the husk-like calyx.

65. Leaves smooth (glabrous) or hairy, but neither velvety nor densely woolly.

68. Basal leaves palmately divided into 3 to 7 main segments which are further subdivided.

69. Flowers pale yellow, purplish in center; each flower produces a single large several-seeded fruit (capsule), partially surrounded by a bladderly hull; plant annual.

SHOOFLY (*Hibiscus trionum*) p. 123

69. Flowers bright yellow throughout; each flower produces numerous small seed-like fruits; plants perennial.

TALL BUTTERCUP (*Ranunculus acris*)

68. Basal leaves not palmately dissected.

70. Basal (rosette) leaves as broad as long, heart-shaped.

SMALL-FLOWERED BUTTERCUP (*Ranunculus abortivus*) p. 94

70. Basal leaves longer than broad, not heart-shaped.

71. Leaves entire, strap-shaped, not hairy; flowers not symmetrical, the petals of different sizes (irregular).

YELLOW TOADFLAX (*Linaria vulgaris*) p. 161

71. Leaves toothed or shallowly lobed, hairy; flowers with petals of same size (regular).

72. Leaves stalked (petioled); flowers scattered; fruit splitting into 5 seeds.

PRICKLY SIDA (*Sida spinosa*) p. 125

72. Leaves not stalked (sessile); flowers in a terminal spike; fruit with many seeds.

EVENING PRIMROSE (*Oenothera biennis*) p. 126

39. Leaves all opposite.

73. All leaves, or only the lower, lobed or cleft into segments.

74. Flowers (flower heads) in narrow spikes, without petals or petal-like structures; leaves mostly with 3 to 5 big lobes (palmately lobed).

GIANT RAGWEED (*Ambrosia trifida*) p. 177

74. Flower heads separate at stem tips, with large petal-like ray flowers; lower leaves with 3 to 7 lobes (pinnately lobed), upper blades often unlobed.

TALL CONE FLOWER (*Rudbeckia laciniata*)

73. Leaves toothed or entire.

75. Bases of upper, paired leaves joined together and forming a cup about stem at nodes.

CUP PLANT (*Silphium perfoliatum*)

75. Bases of leaves not joined together.

ST. JOHN'S WORT (*Hypericum perforatum*)

## KEY 2. PLANTS WITH WHITE FLOWERS

1. Leaves opposite or whorled.
2. Leaves whorled (several at each level on stem).
3. Plants forming prostrate mats; flowers in small axillary clusters; seeds very small, reddish.

CARPETWEED (*Mollugo verticillata*) p. 70

3. Plants not forming prostrate mats, spreading or erect; flowers in branched or rounded inflorescences; seeds not as above.
4. Stems spreading or nearly prostrate (decumbent), covered with fine hooked bristles which readily adhere to clothing; fruit separating into 2 globular seeds.

BEDSTRAW (*Galium* spp.) p. 166

4. Stems erect or ascending, not possessing hooked bristles; fruits many-seeded.
5. Stems nearly simple (unbranched); flowers in umbels (numerous flower stalks arising from the same place); pods milkweed-like, more than 1 inch long; seeds large, flat, tufted with long hairs.

WHORLED MILKWEED (*Asclepias verticillata*) p. 134

5. Stems much branched; flowers in branched inflorescences; fruits a fraction of an inch in length; seeds small, black with a white rim.

SPURRY (*Spergula arvensis*)

2. Leaves opposite (uppermost rarely alternate).
6. Plant a twining or climbing vine; leaves heart-shaped at base; fruits milkweed-like.

CLIMBING MILKWEED (*Ampelamus albidus*) p. 136

6. Plants not vines; leaves and fruits various, not as above.
7. Leaves pinnately lobed (lobed approximately at right angles to midrib of blade); mature fruits (capsules) hanging downward; plants evident in spring.

NYCTELEA (*Ellisia nyctelea*)

7. Leaves various, not as above; mature fruits not hanging down; plants flowering at various times of the season.
8. Leaves entire (edge without teeth), or (rarely) the lowermost toothed; flowers not borne in heads; fruits frequently containing several seeds.
9. Long bristles (stipules) present at leaf bases; fruits splitting into 2 or 3 large seed-like fragments, each with 3 or 4 scale-like appendages at tip.

BUTTONWEED (*Diodia teres*) p. 166



9. Stipules not present; seeds not as above described, released from within fruits at maturity.
10. Flowers borne in the axils of conspicuous alternate bracts (reduced leaves); plants appearing fleshy; fruits somewhat 2-lobed.  
PURSLANE SPEEDWELL (*Veronica peregrina*) p. 161
10. Flowers not borne in the axils of alternate bracts; bracts and leaves all opposite; plants not fleshy; fruits not 2-lobed.
11. Plants with a milky juice; fruit long and slender, shaped somewhat like a pencil; seeds with a tuft of long fine hairs.  
DOGBANE (*Apocynum cannabinum*)
11. Plants not possessing a milky juice; fruit short; seeds without hairs.
12. Plants low or creeping, rarely more than a few inches high; flowers 1/8 inch or less in diameter.
13. Lower leaves stalked (petioled); plants hairy only on angles of stems and leaf stalks.  
CHICKWEED (*Stellaria media*) p. 69
13. Leaves without stalks (sessile); plants densely hairy all over.  
MOUSE-EAR CHICKWEED (*Cerastium vulgatum*) p. 69
12. Plants erect, frequently exceeding 1 foot in height; flowers usually 1/2 inch or more across.
14. Plants glabrous (not hairy).
15. Stem sticky; fruit (capsule) surrounded by a tight-fitting hull (calyx); plant annual.  
SLEEPY CATCHFLY (*Silene antirrhina*) p. 65
15. Stem not sticky; capsule surrounded by swollen, bladdery calyx hull; plant perennial.  
BLADDER CAMPION (*Silene cucubalus*) p. 66
14. Plants hairy (pubescent).
16. Stems sticky, or viscid-hairy; styles (branches of the stalk from the pistil) 3 in number; plant annual, with single stout stem.  
NIGHT-FLOWERING CATCHFLY (*Silene noctiflora*) p. 64
16. Stems soft-hairy, not sticky or viscid; styles 5 in number; plant biennial or perennial, with several stems from its base. WHITE CAMPION (*Lychnis alba*) p. 63
8. Leaves toothed or lobed; flowers in dense clusters (frequently in heads which appear superficially like single flowers), or spikes; fruits not capsules.

17. Leaves lobed, the lower somewhat maple-like; flower clusters becoming spiny in fruit.

MOTHERWORT (*Leonurus cardiaca*) p. 146

17. Leaves toothed; flower spikes or clusters not becoming spiny in fruit.

18. Flowers in spikes or in dense clusters in leaf axils; fruits splitting into four 1-seeded segments; stems conspicuously square.

19. Flowers in spikes terminating stems.

20. Flowers closely overlapping in dense spikes; plants aromatic (leaves with a strong odor when crushed); seeds (nutlets) with a pair of white spots at base.

CATNIP (*Nepeta cataria*) p. 144

20. Flowers not closely crowded, in loose, narrow spikes, the fruits especially well separated and not at all overlapping; plants not aromatic; seeds without a pair of white spots at base.

WHITE VERVAIN (*Verbena urticaefolia*) p. 148

19. Flowers in dense clusters in leaf axils along the stem, not terminating it. WILD MINT (*Mentha arvensis*)

18. Flowers in small heads which appear somewhat like individual flowers; fruits 1-seeded (achenes), topped by a fine cluster of hairs or scales; stems not conspicuously square.

21. Flower heads with white petal-like marginal (ray) flowers and a yellow center; leaves with one main midvein; plants annual.

GALINSOGA (*Galinsoga parviflora*)

21. Flower heads entirely white; leaves with 3 main veins; plants perennial.

22. Leaves broadly lanceolate, finely hairy; clusters of small leaves usually present in the axils of the main blades; heads usually with fewer than 15 flowers.

BONESET (*Eupatorium serotinum*)

22. Leaves ovate, tapering to a point (acuminate), not hairy; clusters of small leaves not present in axils of main blades; heads usually with more than 15 flowers.

WHITE SNAKEROOT (*Eupatorium rugosum*) p. 306

1. Leaves alternate or sometimes most of them in a basal cluster (rosette).

23. Leaves, stems, or both prickly or spiny.

24. Flowers more than 2 inches in diameter; leaves with prickly teeth along edge.

PRICKLY POPPY (*Argemone polyanthemosa*) p. 95

24. Flowers less than 1 inch in diameter; stem and leaf surfaces with yellowish thorns. HORSENETTLE (*Solanum carolinense*) p. 157
23. Leaves and stems not spiny, but fruits sometimes prickly or spiny.
25. Petals 4, placed at right angles to one another and presenting a cross-like appearance; fruits several-seeded.
26. Fruits flat.
27. Fruit triangular; plant covered with tiny, branched (stellate) hairs. SHEPHERD'S-PURSE (*Capsella bursa-pastoris*) p. 84
27. Fruit circular; plants smooth or with unbranched hairs.
28. Fruit about 1/2 inch in diameter; seeds dark brown; leaves toothed. PENNYCRESS (*Thlaspi arvense*) p. 87
28. Fruit 1/8 inch or less in diameter; seeds reddish-yellow; lower leaves pinnatifid (irregularly lobed, with lobes more or less at right angles to long midrib).  
PEPPERGRASS (*Lepidium virginicum*) p. 86
26. Fruits inflated on one or both sides, or globular.
29. Plants densely hairy.
30. Pods short-cylindric, twice as long as wide; leaves entire (not toothed). HOARY ALYSSUM (*Berteroa incana*) p. 84
30. Pods circular or broadly elliptic in outline, nearly as broad as long; leaves wavy-toothed or the lower somewhat lobed.
31. Plants perennial from creeping roots; pods inflated on both sides, with a distinct beak at tip.  
PERENNIAL PEPPERGRASS (*Cardaria draba*) p. 85
31. Plants annual; pods flat on one side, inflated on the other, with little or no beak.  
FIELD PEPPERGRASS (*Lepidium campestre*) p. 87
29. Plants without hairs (glabrous) or with inconspicuous hairs.
32. Pods well over 1/4 inch long, with a short beak (about 1/4 the length of pod); seeds about 1/10 inch long.  
LARGE-SEEDED FALSE FLAX (*Camelina sativa*)
32. Pods 1/4 inch or less long, with a somewhat longer beak (about half the length of pod); seeds less than 1/16 inch long.  
FALSE FLAX (*Camelina microcarpa*) p. 78
25. Petals not 4 in number or if so (rarely), not placed at right angles to one another; fruits various.
33. Plants vine-like, trailing, twining, or climbing; leaves heart- or arrowhead-shaped (cordate, hastate, or sagittate), or palmately lobed (lobes all originating near base of blade).

34. Plants climbing by tendrils; flowers small, in dense, branched clusters; fruits fleshy.

WILD CUCUMBER (*Echinocystis lobata*)

34. Plants not possessing tendrils; flowers large, or small in axillary clusters.

35. Flowers clustered in upper leaf axils, greenish-white, not morning glory-like; fruit resembling a buckwheat seed, 3-angled, 1-seeded, not splitting open at maturity (indehiscent); young stems with membranous sheaths (ochreae) at attachment of leaf blades. WILD BUCKWHEAT (*Polygonum convolvulus*) p. 46

35. Flowers large, morning glory-like, fruit a capsule, ripening several large seeds; young stems without membranous sheaths at attachment of leaf blades.

36. Leaves deeply 3-lobed.

IVY-LEAVED MORNING GLORY (*Ipomoea hederacea*) p. 139

36. Leaves not deeply lobed, usually heart- or arrowhead-shaped (cordate or sagittate).

37. Leaves arrowhead-shaped (sagittate or hastate) with pointed basal projections; plants perennial from slender creeping rootstocks.

38. Flowers roughly the size of a quarter; leaves tending to oblong with narrow basal lobes, the blade continuing in essentially the same direction as the leaf stalk (petiole); plants more often trailing than climbing.

FIELD BINDWEED (*Convolvulus arvensis*) p. 138

38. Flowers about the size of a silver dollar; leaves tending to be triangular with broad, basal lobes, the blade bent back at right angles to the petiole; plants twining and climbing.

HEDGE BINDWEED (*Convolvulus sepium*) p. 138

37. Leaves heart-shaped (cordate) with rounded basal lobes; plants annual or perennial.

39. Flowers about 2 inches broad, not dark purple inside; plants annual, twining.

MORNING GLORY (*Ipomoea purpurea*) p. 139

39. Flowers frequently 3 inches broad, dark purple inside of tube; plants perennial from very large roots, usually trailing on ground.

WILD SWEET POTATO (*Ipomoea pandurata*)

33. Plants erect, ascending, or sometimes prostrate, but not vine-like; leaves various, usually not as above.

40. Leaves (especially the lower ones) deeply palmately cleft (lobes directed, finger-like, to base of blade) or palmately compound, the segments in turn toothed or cleft.
41. Leaf segments closely crowded together, the blade as a whole nearly circular in outline; flowers not possessing a purple center; fruit slender and pointed.

CRANESBILL (*Geranium carolinianum*) p. 114

41. Leaf segments not crowded together, the blade not circular in outline; flowers with a purple center; fruit nearly as thick as long.
- SHOOFLY (*Hibiscus trionum*) p. 123

40. Leaves various, not palmately cleft or palmately compound.

42. Leaves pinnately compound (leaflets arising from an elongated midrib), or dissected into fine segments.

43. Flowers in compound umbels (borne in carrot-like fashion with numerous flower stalks arising from about the same point); fruits longitudinally ribbed, splitting into two 1-seeded segments at maturity.

44. Fruits bristly; plant hairy; leaves finely divided, fern-like in appearance, the ultimate segments scarcely more than 1/16 inch wide.
- WILD CARROT (*Daucus carota*) p. 127

44. Fruits not bristly; plant smooth, without hairs; leaves not fern-like, leaflets 1/8 to 1/2 inch wide.

WATER HEMLOCK (*Cicuta maculata*) p. 128

43. Flowers in heads (which look somewhat like individual flowers), or in a spike; fruits various, not as above.

45. Leaves compound with about 13 to 15 entire (not toothed) leaflets; flowers in a spike-like cluster (raceme); fruit a bur-like prickly pod.
- WILD LICORICE (*Glycyrrhiza lepidota*) p. 96

45. Leaves dissected into fine, fern-like segments; flowers in flower-like heads; fruit not a bur-like pod; plants usually strong-scented.

46. Flower heads yellow in center, approaching 1 inch in width; leaves bright green, not densely hairy.

MAYWEED (*Anthemis cotula*) p. 197

46. Flower heads gray-white, smaller than above; leaves densely hairy or smooth.

47. Flower heads erect in a flat-topped cluster rising above the leaves; plants usually hairy, perennial from a tangle of short rootstocks.

YARROW (*Achillea millefolium*) p. 197

- 47. Flower heads usually drooping from leafy, spreading, or ascending branches; plants hairy or smooth, perennial or annual.
- 48. Plant smooth, annual, pleasantly aromatic.

WORMWOOD (*Artemisia annua*)

- 48. Plant silky or woolly-hairy, perennial.

MUGWORT (*Artemisia absinthium*)

- 42. Leaves simple, not compound or dissected.

- 49. Plants with a strong, onion-like odor, arising from a fleshy bulb; leaves fleshy, narrowly linear, mostly arising at or near base of stem; flowers umbellate (numerous flower stalks arising in close proximity).

- 50. Leaves mostly in a cluster at ground level.

WILD ONION (*Allium canadense*) p. 241

- 50. Leaves borne on stem as well as at ground level.

WILD GARLIC (*Allium vineale*) p. 240

- 49. Plants and flowers various, not as above.

- 51. Stems and leaves (at least on lower surface) gray- or white-woolly; flowers in white or gray-white cottony heads which look like individual flowers.

- 52. Leaves spoon-shaped, mostly borne in basal clusters (rosettes) or on horizontal stolons (prostrate stems); heads dirty white, in small, erect clusters.

PUSSY'S-TOES (*Antennaria plantaginifolia*) p. 187

- 52. Leaves lanceolate, borne on an erect stem; heads clean white, frequently in rather dense clusters.

CUDWEED (*Gnaphalium obtusifolium*) p. 195

- 51. Stems and leaves not woolly; flowers or flower heads various, not as above.

- 53. Flowers in heads having a yellow center (tubular flowers) and white petal-like marginal (ray) flowers.

- 54. Heads more than 1 inch across; basal leaves oblong or irregularly spoon-shaped, lobed (pinnatifid) or toothed with more or less rounded segments.

OXEYE DAISY (*Chrysanthemum leucanthemum*) p. 199

- 54. Flower heads less than 1 inch in diameter; leaves various, not as above.

- 55. Plants perennial from horizontal rootstocks, flowering in early fall; stems ordinarily bearing clusters of reduced leaves in axils of main blades, frequently considerably

branched below inflorescence; flower heads often borne from one side of spreading or nearly horizontal inflorescence branches.<sup>5</sup>

56. Flower heads mostly 1/2 inch or more across; involucre bracts tending to be rolled up lengthwise at tip; stems glabrous or stiffly hairy, branched mostly in inflorescence.

ASTER (*Aster pilosus*) p. 198

56. Flower heads mostly less than 1/2 inch across; involucre bracts not rolled up, often bent backwards; stems usually finely fuzzy (pubescent), diffusely branched throughout.

ASTER (*Aster ericoides*)

55. Plants annual or biennial from taproots, flowering in summer or fall; axillary clusters of reduced leaves not present; flower heads on erect ascending branches in dense or flat-topped clusters.

57. Flower heads about 1/4 inch or less across, numerous in a dense, ellipsoidal cluster (panicle); stem usually unbranched below inflorescence, very closely leafy with crowded, strap-shaped blades.

HORSEWEED (*Erigeron canadensis*) p. 200

57. Flower heads 1/2 inch or more across in a flat-topped cluster (corymb); stem branched or unbranched, loosely leafy with well-spaced, oblong to ovate, frequently toothed blades.

58. Stem hairs conspicuous, spreading; stem leaves mostly toothed, the lowermost strongly toothed or shallowly lobed.

DAISY FLEABANE (*Erigeron annuus*) p. 201

58. Stem hairs inconspicuous, upwardly appressed against stem (strigose); leaves, except for the lower, mostly untoothed.

DAISY FLEABANE (*Erigeron strigosus*)

53. Flowers not in heads, or if in head-like clusters, not colored as above described.

59. Leaves entire, neither toothed nor lobed.

60. Fruit a fleshy berry, purplish when mature, bearing black, shiny seeds; leaves borne on distinct stalks (petioled); plants often 3 feet or more high.

POKEWEED (*Phytolacca americana*) p. 60

60. Fruit dry; seeds not as above; leaves narrowed to base, but without a distinct petiole; plants usually less than 3 feet high.

61. Plants prostrate or ascending, usually less than 1 foot tall, not possessing a milky juice; flowers inconspicuous, in leaf axils; fruits 1-seeded, triangular.

<sup>5</sup> The following leads distinguish two common kinds of Asters. Several other species may occur as roadside or pasture weeds and will key out here.

62. Plants prostrate, forming flat mats or ascending at tips; or completely ascending, but usually only a few inches high; leaves blue-green, oblong to narrowly elliptic; a very common weed.

KNOTWEED (*Polygonum aviculare*) p. 45

62. Plants ascending, frequently about 1 foot high; leaves yellow-green, elliptic to broadly elliptic, less common than above.

ERECT KNOTWEED (*Polygonum erectum*)

61. Plants erect, usually more than 1 foot high, with a milky juice; flowers in terminal clusters; fruits 3-lobed, 3-seeded capsules.

63. Plants annual; leaves, especially upper, with a white margin and greenish center; flower clusters small, somewhat hidden by the leaves; fruits hairy.

SNOW-ON-THE-MOUNTAIN (*Euphorbia marginata*) p. 109

63. Plants perennial; leaves all green; flower clusters conspicuous, white; fruits smooth.

FLOWERING SPURGE (*Euphorbia corollata*) p. 106

59. Leaves toothed or lobed.

64. Leaves as broad as or broader than long, roughly circular in outline with a basal notch; fruits circular, dry, when mature breaking into several 1-seeded, wedge-shaped segments.

ROUND-LEAVED MALLOW (*Malva neglecta*) p. 124

64. Leaves and fruits various, not as above.

65. Fruit a small berry, black when mature, green when immature; flowers look like tiny potato flowers; leaves wavy-toothed or shallowly lobed, almost always with insect holes.

BLACK NIGHTSHADE (*Solanum nigrum*) p. 158

65. Fruit a capsule, dry when mature; flowers not like potato flowers; leaves variable, some of them usually lobed or pinnatifid; insect injury usually not obvious.

66. Plants low or sprawling, flowering in early spring; leaves all deeply pinnatifid; capsule hairy, with 4 large seeds.

NYCTELEA (*Ellisia nyctelea*)

66. Plants erect, flowering in summer and fall; leaves variously lobed or toothed; capsules not as above.

67. Flowers large, 3 to 5 inches long; fruits large, spiny; plants rank, much branched, frequently becoming 5 feet high.

JIMSON WEED (*Datura stramonium*) p. 159

67. Flowers much smaller than above; fruits small, smooth; plants little branched, usually not more than 4 feet high.

MOTH MULLEIN (*Verbascum blattaria*) p. 160



KEY 3. PLANTS WITH RED, PINK, BLUE, LAVENDER,  
OR PURPLE FLOWERS

1. Plants (leaves, stems) spiny or thorny.
2. Leaves opposite.      TEASEL (*Dipsacus sylvestris*)
2. Leaves alternate.
  3. Leaves attached directly to stem (sessile), edges prickly; flowers in dense, globular, flower-like, prickly heads; fruit seed-like, dry; plants erect, 1 to 6 feet tall, little branched with the main axis (stem) predominant, thistle-like.
  4. Stems white-woolly.  
                                 WOOLLY THISTLE (*Cirsium flodmani*)
  4. Stems green (often pubescent but hairs not forming a white blanket).
    5. Plants perennial from creeping roots, with stems usually 2 to 3 feet high, crowded together; flower heads lavender, not prickly, up to 1 inch across (frequently less) when in flower.  
                                 CANADIAN THISTLE (*Cirsium arvense*) p. 191
    5. Plants biennial, with taller stems (2 1/2 to 6 feet high), often well separated; flower heads purple, prickly, more than 1 inch across when in flower.
    6. Head very large, 1 1/2 inches or more across, solitary, usually on a distinct stalk which is bent or somewhat re-curved; plants flowering in midsummer (July).  
                                 MUSK THISTLE (*Carduus nutans*) p. 193
    6. Heads less than 1 1/2 inches across, usually several, scarcely stalked above uppermost leaves; plants flowering in late summer (August-September).
    7. Leaves white underneath; stems not prickly; plants often 6 feet high.  
                                 TALL THISTLE (*Cirsium altissimum*) p. 190
    7. Leaves green underneath; stems prickly; plants usually 3 to 4 feet high.  
                                 BULL THISTLE (*Cirsium vulgare*) pp. 190, 192
  3. Leaves attached to stem with slender stalks (petioles), edges not prickly; prickles restricted to stems, leaf petioles, and veins; flowers separate, resembling potato flowers; fruit a berry; plants rarely more than 1 1/2 feet tall, branched and spreading.
  8. Plants white-hairy; leaves lanceolate to oblong, wavy-margined but not lobed; flowers blue-purple.  
                                 WHITE HORSENETTLE (*Solanum elaeagnifolium*) p. 156

8. Plants greenish; leaves ovate to lanceolate, frequently lobed; flowers usually light lavender.

HORSENETTLE (*Solanum carolinense*) p. 157

1. Plants (leaves, stems) not spiny or thorny (fruits or fruit clusters sometimes spiny).

9. Leaves opposite (the uppermost rarely alternate).

10. Leaves entire, without teeth or lobes along the margin.<sup>6</sup>

11. Flowers in dense globe-like clusters; fruit a soft pod, several inches long; juice milky.

COMMON MILKWEED (*Asclepias syriaca*) p. 133

11. Flowers not in globe-like clusters; fruits smaller than above; juice not milky.

12. Plants creeping with short, erect, flowering branches at most a few inches high.

13. Flowers not hidden by broad, overlapping bracts.

THYME-LEAVED SPEEDWELL (*Veronica serpyllifolia*)

13. Flowers partly hidden by broad, overlapping bracts.

HEAL-ALL (*Prunella vulgaris*) p. 144

12. Plants erect, 6 inches to several feet in height.

14. Leaves stalked (petioled); fruits 1-seeded or breaking into four 1-seeded segments (nutlets).

15. Leaves somewhat heart-shaped (cordate); plants usually about 2 feet high; flowers 2 or 3 together, borne above a membranous "umbrella" (involucre).

WILD FOUR O'CLOCK (*Mirabilis nyctaginea*) p. 59

15. Leaves not cordate; plants frequently less than 1 foot high; flowers borne in a dense spike, and partly hidden by broad, overlapping bracts.

HEAL-ALL (*Prunella vulgaris*) p. 144

14. Leaves not stalked (sessile); fruits many-seeded capsules.

16. Plant hairy; flowers purple-red, not crowded together.

CORNCOCKLE (*Agrostemma githago*) p. 67

16. Plants smooth; flowers pinkish, usually crowded together.

17. Calyx (the green hull around the base of the flower) tubular, round in cross-section; plants perennial.

BOUNCING BET (*Saponaria officinalis*) p. 68

17. Calyx becoming swollen, angular in cross-section; plants annual. COW COCKLE (*Saponaria vaccaria*)

<sup>6</sup>Two weeds in this group may have both entire and toothed leaves on the same plant. They are keyed out in both directions, i.e., under this "10" as well as the "10" following.

10. Leaves toothed or lobed along the margin, not entire.

18. Leaves cut nearly to the midrib (pinnatifid) into toothed segments or lobes; plants low, spreading, or nearly prostrate.

PROSTRATE VERVAIN (*Verbena bracteata*) p. 147

18. Leaves toothed or lobed (usually in palmate or finger-like fashion) but the incisions not extending to midrib; plants usually either erect or strictly prostrate and rooting at nodes.

19. Plants prostrate, usually ascending at the tip, or with short erect branches.

20. Flowers borne usually 2 or 3 together in axils of ordinary foliage leaves; uppermost leaf pairs sessile and grown together (connate) at base.

21. Stems extensively trailing; leaves smooth, frequently broader than long; seeds with a white spot at base.

GROUND IVY (*Glechoma hederacea*)

21. Stems short, prostrate to low ascending; leaves finely hairy, frequently longer than broad; seeds without white spot at base.

HENBIT (*Lamium amplexicaule*) p. 145

20. Flowers borne in short erect spikes in the axils of bracts or reduced leaves; uppermost leaves not connate.

22. Stems extensively trailing; flowers borne in the axils of narrow, alternate bracts.

THYME-LEAVED SPEEDWELL (*Veronica serpyllifolia*)

22. Stems short, trailing or entirely erect; flowers borne in the axils of very broad bracts, and almost hidden from external view.

HEAL-ALL (*Prunella vulgaris*) p. 144

19. Plants erect or ascending.

23. Flowers in dense clusters in the axils of foliage leaves.

24. Lower leaves maple-like, broad and palmately lobed; flower clusters becoming spiny in fruit.

MOTHERWORT (*Leonurus cardiaca*) p. 146

24. Lower leaves not as above, ovate to lanceolate and toothed; flower clusters not becoming spiny.

WILD MINT (*Mentha arvensis*)

23. Flowers in spikes, terminating stems above leaves.

25. Bracts accompanying flowers broad and very conspicuous.

HEAL-ALL (*Prunella vulgaris*) p. 144

25. Bracts narrow or inevident.

26. Flowers pink to lavender, 1/2 inch or more in length.

DRAGONHEAD (*Dracocephalum parviflorum*)

- 26. Flowers blue, usually less than 1/2 inch in length.
- 27. Leaves distantly toothed, narrowly oblong or lanceolate; flowers well spaced in the spike (may be crowded in bud), the fruits not overlapping.

LANCE-LEAVED SAGE (*Salvia reflexa*)

- 27. Leaves closely toothed, ovate or broadly lanceolate; flowers in dense spikes; fruits closely overlapping.

- 28. Plants 2 to 3 feet high, little branched except for cluster of spikes at top; leaves very hairy; flowers 1/4 inch across.

HOARY VERVAIN (*Verbena stricta*) p. 147

- 28. Plants frequently 3 to 4 feet high, often branched; leaves inconspicuously hairy; flowers less than 1/4 inch across.

BLUE VERVAIN (*Verbena hastata*) p. 149

- 9. Leaves alternate or mostly in a basal cluster.

- 29. Leaves compound with entire leaflets.

- 30. Leaves pinnately compound, terminated by tendrils; flowers pea-like (but considerably smaller).

VETCH (*Vicia villosa*) p. 100

- 30. Leaves palmately compound, not possessing tendrils; flowers not pea-like.

BEE-PLANT (*Cleome serrulata*)

- 29. Leaves various, rarely compound (if so with lobed or toothed leaflets).

- 31. Plants vine-like, trailing, twining, or climbing; leaves with a pair of downwardly or outwardly pointed basal lobes (cordate, sagittate, or hastate), or main body of blade divided into 3 segments.

- 32. Fruit a berry with numerous small, flat seeds; flowers similar to potato flowers; plant irregularly sprawling, scarcely twining, often woody at base, frequently with leaves of several shapes.

BITTER NIGHTSHADE (*Solanum dulcamara*)

- 32. Fruit a dry capsule with few, large seeds; flowers morning glory-like; plants prostrate or climbing, not woody at base; leaves on a single plant consistent in shape.

- 33. Flowers pinkish to lavender; leaves with the basal corners (lobes) pointed, these lobes sticking outward or downward (sagittate or hastate); plants perennial from slender root-stocks.

- 34. Flowers roughly the size of a quarter; leaves tending to be oblong with narrow basal lobes, the blade continuing in essentially the same direction as the leaf stalk (petiole); plants more frequently trailing than climbing.

FIELD BINDWEED (*Convolvulus arvensis*) p. 138

34. Flowers roughly the size of a silver dollar; leaves tending to be triangular with broad basal lobes, the blade bent back at right angles to the petiole; plants twining and climbing.

HEDGE BINDWEED (*Convolvulus sepium*) p. 138

33. Flowers usually deep purple or blue; leaves cordate with rounded basal lobes or deeply 3-lobed; plants annual.

35. Leaves heart-shaped (cordate); calyx lobes (the lobes of the greenish hull at the base of the flower) abruptly pointed, relatively short.

ANNUAL MORNING GLORY (*Ipomoea purpurea*) p. 139

35. Leaves deeply 3-lobed; calyx lobes slender, drawn-out, and gradually tapering to point (attenuate).

IVY-LEAVED MORNING GLORY (*Ipomoea hederacea*) p. 139

31. Plants various, sometimes trailing, but not vine-like; leaves various, not as above.

36. Leaves about as broad as long, roughly circular in outline (although sometimes lobed into numerous segments); flowers pink to lavender, relatively small and inconspicuous; plants spreading or low ascending.

37. Leaf blades finger-like (palmately) dissected into lobed segments; fruit extended into a pointed beak.

WILD CRANESBILL (*Geranium carolinianum*) p. 114

37. Leaf blades irregularly scalloped or shallowly lobed; fruit flat.

ROUND-LEAVED MALLOW (*Malva neglecta*) p. 124

36. Leaves longer than broad, not circular; flowers and plants various.

38. Stems encircled by short membranous sheaths (ochreae) just above the attachment of each leaf; flowers bright pink, or reddish to salmon-pink in short spikes; leaf blades entire; mature seeds black, smooth.

39. Plants perennial from slender creeping roots; stems and leaves covered with fine, close appressed hairs; plants usually growing in wet or poorly drained soil, especially along roadside ditches.

DEVIL'S SHOESTRING (*Polygonum coccineum*) p. 47

39. Plants annual; stems and leaves smooth; plants common in all kinds of soil.

40. Flowers bright rose or pink; stem sheaths (ochreae) smooth or torn at the top; flowers and seeds distinctly larger than in the following species—hulled seeds are about 1/8 inch long.

PENNSYLVANIA SMARTWEED

(*Polygonum pensylvanicum*) pp. 43, 44

40. Flowers dull pink to salmon-pink; ochreae topped by a line of hairs (ciliate); hulled seeds much less than 1/8 inch long.

LADYSTHUMB (*Polygonum persicaria*) p. 42

38. Stems not possessing ochreae; flowers usually blue to purple or lavender; if pinkish, in globular, flower-like heads; leaves and seeds various, usually not as above.

41. Fruit a berry; flowers similar to potato flowers; plant reclining or sprawling, somewhat woody at base; leaves heart-shaped or 2-lobed at base. BITTER NIGHTSHADE (*Solanum dulcamara*)

41. Fruit dry, not a berry; flowers not resembling potato flowers; plants erect or ascending; leaves not as above.

42. Fruits (or bur-like hulls enclosing a cluster of fruits) spiny or prickly.

43. Fruits breaking into 4 1-seeded segments at maturity, much less than an inch in length.

44. Flowers blue, small, about 1/8 inch across; leaves narrow.

STICK-SEED (*Lappula echinata*) p. 150

44. Flowers reddish to reddish-purple, 1/4 to 1/2 an inch across; lower leaves large and broad.

HOUNDS-TONGUE (*Cynoglossum officinale*)

43. Fruits or fruit-containing burs enclosing numerous seeds (or 1-seeded fruits), an inch more-or-less in length.

45. Flowers large, 2 to 5 inches long; fruit a capsule, prickly with short, straight spines, bearing numerous rounded or kidney-shaped seeds; leaves irregularly wavy-toothed or lobed. JIMSON WEED (*Datura stramonium*) p. 159

45. Flowers smaller than above, aggregated into bur-like heads about 1 inch long; burs soft-prickly with hooked bristles, bearing several oblong 1-seeded fruits (achenes); leaves mostly entire. BURDOCK (*Arctium minus*) p. 187

42. Fruits not prickly.

46. Inflorescence an unbranched spike; flowers large with 5 petals; fruit a many-seeded capsule.

BELL-FLOWER (*Campanula rapunculoides*)

46. Inflorescence various, branched; flowers small, in flower-like heads; fruits 1-seeded achenes, several to a head.

47. Plants with a milky juice; individual flowers in the head strap-shaped and petal-like.

48. Flowers pink; leaves small, entire; stem conspicuously ridged, the upper portion practically leafless.

SKELETON WEED (*Lygodesmia juncea*)

48. Flowers blue; leaves (at least the basal ones) large, pinnatifid or coarsely toothed; stem not conspicuously ridged.

49. Plant with numerous well-developed stem leaves, the upper narrowly strap-shaped and entire (usually with no teeth); stems straight, ordinarily branched only at top; seeds (achenes) flattened with a short beak.

BLUE LETTUCE (*Lactuca pulchella*)

49. Plant with well-developed leaves mostly at base, the upper reduced; stem much branched; achenes neither flattened nor beaked.

CHICORY (*Cichorium intybus*) p. 181

47. Plants not possessing a milky juice; individual flowers tubular, not petal-like.

50. Flower heads 1/2 inch or more across; lower leaves pinnatifid or irregularly toothed, the upper essentially entire or with slender divisions; plants usually less than 3 feet high.

51. Plants perennial from creeping roots; heads not dark-spotted on outside; seeds (achenes) ivory-colored, without a crown of bristles at top. RUSSIAN KNAPWEED (*Centaurea repens*) p. 189

51. Plants biennial from a taproot; heads dark-spotted on outside; achenes dark, with an oblique notch at base and a crown of bristles at top.

SPOTTED KNAPWEED (*Centaurea maculosa*) p. 189

50. Flower heads about 1/4 inch across; lower and upper leaves essentially similar with numerous even teeth; plants often exceeding 3 feet.

IRONWEED (*Vernonia* spp.) p. 196

#### KEY 4. PLANTS WITH GREENISH FLOWERS

1. Plants grass-like; leaf blades sessile (without a stalk or petiole) and attached to a sheath which encircles the stem; blades narrowly strap-shaped, entire (without teeth or lobes), with numerous parallel veins.
2. Plants with a strong onion-like odor, arising from a fleshy bulb, bearing clusters of small scaly bulblets below flowers.
3. Leaves mostly in a cluster at ground level.

WILD ONION (*Allium canadense*) p. 241

3. Leaves borne on stem as well as at ground level.

WILD GARLIC (*Allium vineale*) p. 240

2. Plants not possessing an onion-like odor, not bearing aerial bulb-lets.

4. Stems triangular in cross-section; leaves harsh and somewhat stiff, arising in 3 rows.

5. Plants arising from heavy, creeping rhizomes (underground stems); fruits borne in broad spikes; seeds (1-seeded fruits) produced within an inflated, sac-like structure (perigynium).

SEDGE (*Carex* spp.)<sup>7</sup> p. 238

5. Plants with slender, string-like rhizomes and small tubers; fruits borne in narrow, clustered yellowish-green spikes; seeds (1-seeded fruits) hidden by closely overlapping bracts, but not in sac-like structures.

YELLOW NUTGRASS (*Cyperus esculentus*) p. 239

4. Stems not triangular in cross-section, round or flattened; leaves various, usually arising in 2 rows from opposite sides of the stem.

6. Fruit a spiny bur.

SANDBUR (*Cenchrus pauciflorus*) p. 216

6. Fruit not a spiny bur.

7. Plants low and wiry, rarely found in cultivated soil; flowers numerous in nearly flat-topped clusters (cymes) with tiny green petals and sepals; fruits bearing many very small, dust-like seeds.

RUSH (*Juncus tenuis*) p. 239

7. Plants various; flowers not in flat-topped clusters, without petals and sepals, usually hidden from external view by

---

<sup>7</sup>A number of sedges (*Carex* spp.) may occur as agricultural weeds. They are usually conspicuous in the spring, growing in wet, low meadows and along ditches. They are rare in agricultural soil. All species of *Carex* have the seed borne within the sac-like perigynium. The size, appearance, and arrangement of the perigynia are extremely variable.



enclosing hulls; fruit (the grain) 1-seeded, much larger than above.  
(GRASSES)<sup>8</sup>

8. Stem or its main branches terminated by a single flowering spike (like wheat or quackgrass); spikes neither borne in clusters at stem tip nor arising from leaf axils along the stem.
9. Seeds (spikelets), when "shucked" from the spike, rounded or elliptic in outline, not sharply pointed or terminated by a bristle; spikes usually dense and cylindric, very bristly from clusters of stiff hairs which surround the seeds (but which are not borne by the seed hulls).
10. Spikes with fine "stickers" and readily adhering to clothing or hands if touched; plant of local abundance.

BRISTLY FOXTAIL (*Setaria verticillata*) p. 222

10. Spikes neither stickery nor adherent.

11. Seeds (spikelets) broadly oval, 1/8 inch or more long; hard inner hull (lemma) coarsely cross-wrinkled; bristles tawny yellow; a few long, slender hairs present on upper side of blade at base; sheaths not finely hairy (ciliate) along overlapping margins.

YELLOW FOXTAIL (*Setaria lutescens*) p. 222

11. Seeds (spikelets) narrowly oval, less than 1/8 inch long; inner hull (lemma) granular or faintly cross-wrinkled; bristles green or pale yellow when dry; leaves without hairs on upper surface, or entirely covered with fine, short hairs; sheath marginally hairy, or ciliate (hand lens will help).

12. Leaves without hairs (glabrous) on upper surface; spikes erect or slightly drooping at tip; plants usually less than 3 feet high. GREEN FOXTAIL (*Setaria viridis*)<sup>9</sup> p. 221

12. Leaves finely hairy on upper surface; spikes drooping at tip; plants sometimes up to 6 feet high.

GIANT FOXTAIL (*Setaria faberii*) p. 221

9. Seeds (spikelets or florets), when "shucked" from spike, oblong to lanceolate, pointed at tip (or entire spike fragmenting into seed-containing bony joints—see GOATGRASS, lead 13); hulls frequently terminated by bristles; spikes various, bristly or not bristly.

<sup>8</sup> Although many grasses are easily recognized, it is difficult to identify them in a key without the use of technical characteristics. This key, avoiding the use of exact (and more technical) terms, is necessarily less precise than if such terms were employed. Reference to the illustrations (pages 216 to 235) may facilitate keying grasses.

<sup>9</sup> This weed appears to cross with foxtail millet (*Setaria italica*). The hybrids are common in some areas and may be much taller than the above, with lobed, somewhat drooping spikes.

13. Spike axis with hard, bony joints, the seeds contained within these joints; bristles few in number, 3 or 4 long ones protruding from tip of spikes, the ones below becoming progressively shorter to base; plant occurring mostly in southern part of our range.

GOATGRASS (*Aegilops cylindrica*) p. 220

13. Spike axis not as above; seed-bearing units produced in various manners but not inside of joints of spike axis.

14. Spikes dense, bristly or plume-like with numerous bristles arising between the seeds (florets) as well as from the tips of them; bristles mostly considerably longer than the seeds.

15. Spikes plume-like with numerous very long, green or silvery bristles protruding in all directions.

SQUIRREL-TAIL GRASS (*Hordeum jubatum*) p. 218

15. Spikes stiff (like a small head of barley) with rigid, ascending bristles about as long as or slightly longer than the seeds.

WILD BARLEY (*Hordeum pusillum*) p. 219

14. Spikes looser, the seed-bearing units (spikelets) usually clearly separate from one another; bristles absent, or, if present, relatively short, and arising only from the tips of the seeds.

- 16.. Seed-bearing units (spikelets) placed with narrow edge against spike axis; plants annual, primarily grain-field weeds.

DARNEL (*Lolium temulentum*)

16. Seed-bearing units (spikelets) placed with the broader, flat edge against spike axis; plants perennial from scaly, creeping rootstocks, abundant throughout most of north-central states.

QUACKGRASS (*Agropyron repens*) p. 216

8. Stems not terminated by a single spike; inflorescences various—if spikelike, the spikes borne in leaf axils along stem or clustered together in finger-like fashion at tip.

17. Inflorescence of 2 to 5 spikes which arise in finger-like fashion from tip of stems; bristles (awns) not present.

18. Plants perennial with short ascending branches arising from extensively creeping stolons (prostrate stems); leaves at base of erect branches much reduced; seed-bearing units (spikelets) not hairy, 1-seeded.

BERMUDA GRASS (*Cynodon dactylon*) p. 225

18. Plants annual, ascending or sprawling and rooting from lower nodes; none of leaves reduced; spikelets finely hairy or several-seeded.

19. Spikes mostly less than 1/8 inch wide; seed-bearing units (spikelets) finely hairy, 1-seeded; a fine row of hairs (ligule) present at base of upper side of blade where it joins the sheath.

20. Stems and leaf sheaths hairy; seeds (spikelets) narrowly oval, the inner hull brownish.

CRABGRASS (*Digitaria sanguinalis*) p. 223

20. Stems and leaf sheaths almost without hairs; spikelets broadly oval, the inner hull (when mature) black.

SMOOTH CRABGRASS (*Digitaria ischaemum*) p. 223

19. Spikes broader than 1/8 inch; spikelets smooth, bearing several seeds; ligule a fine membrane rather than a row of hairs.

GOOSEGRASS (*Eleusine indica*) p. 224

17. Inflorescences not of 2 to 5 spikes, or if spike-like, bristly or long-hairy.

21. Seed-bearing units (spikelets) without bristles (awns).

22. Spikelets oblong, several-seeded, with several or numerous hulls (lemmas) overlapping in shingle-like fashion.

23. Spikelets not strongly flattened, with about 6 overlapping hulls; leaves without glands.

ANNUAL BLUEGRASS (*Poa annua*)

23. Spikelets conspicuously flattened, with more than 10 overlapping hulls; leaves with small, bumpy glands, especially along edges (a hand lens may be needed for these distinctions).

LOVEGRASS (*Eragrostis cilianensis*)<sup>10</sup> p. 229

22. Spikelets oval, 1-seeded, without a series of shingle-like hulls.

24. Inflorescences diffusely branched (a panicle), the spikelets well separated from one another at the tips of the ultimate branchlets; plants annuals.

25. Plant erect or ascending, densely hairy.

WITCHGRASS (*Panicum capillare*) p. 234

25. Plant prostrate-spreading or ascending, smooth.

FALL PANICUM (*Panicum dichotomiflorum*) p. 235

24. Inflorescences slender, appearing almost spike-like (the branches ascending and pressed together), or the spikelets irregularly congested.

26. Seed heads sticking up beyond leaves, irregularly congested and lopsided, or consisting of an aggregation of short spikelets each shelling down to a hard, shiny hull which is nearly as broad as long; plant annual, husky, with stems usually more than 1/4 inch in diameter.

BARNYARD GRASS (*Echinochloa crusgalli*) p. 233

<sup>10</sup> Some two additional species of *Eragrostis* are common late-summer, waste area or roadside weeds, usually in dry soil.

26. Seed heads usually overtopped by some of the leaves, not lopsided but narrow and spike-like in appearance; spikelets about twice as long as broad.

27. Plants perennial, robust from scaly rootstocks; seed head (panicle) evident; usually a weed of moist, fertile soils.

MUHL GRASS (*Muhlenbergia frondosa*)

27. Plants annual, very slender, without rootstocks; seed head very slender, spike-like, often nearly hidden in upper leaf sheaths; a weed usually of dry sterile areas.

DROPSEED GRASS (*Sporobolus neglectus*)

21. Spikelets with short or long bristles or awns.

28. Inflorescences with dense, long silky hairs, appearing like a series of separate or somewhat congested plumes; lower portion of the stem flattened with somewhat keeled edges; plants perennial.

BROOMSEDGE (*Andropogon virginicus*) p. 231

28. Inflorescences not silky-hairy; pubescence (hairs), if present, relatively short; plants various.

29. Bristles (awns) 3-branched (shorter unbranched bristles may also be present). TRIPLE-AWN GRASS (*Aristida oligantha*) p. 236

29. Awns unbranched.

30. Some or all of awns spirally twisted at base.

31. Awn 3 to 4 inches long, several times length of seed, frequently twisted for much of its length.

PORCUPINE GRASS (*Stipa spartea*)

31. Awn scarcely exceeding 1 inch in length, up to about twice the length of seeds, usually twisted near the base.

32. Spikelets about 3/4 inch long (excluding awns), gaping open at the tip when mature, 2- to 3-seeded; seeds (florets) oblong, dull gray to black; plants annual, oat-like in appearance.

WILD OATS (*Avena fatua*) p. 228

32. Spikelets (excluding awns) about 1/4 inch long, not opening at tip, 1-seeded; seeds (spikelets) plump, elliptic, straw-colored to shiny black; plants perennial from stout creeping rootstocks, resembling sudan grass, occurring only in southern part of our range.

JOHNSON GRASS (*Sorghum halepense*) p. 232

30. Awns not spirally twisted.

33. Inflorescence open-branched (a panicle) but occasionally appearing somewhat plume-like, the spikelets usually well separated from one another; spikelets large, oblong, 1/2 to 3/4 inch in length (excluding awns), with a series of hulls

overlapping in shingle-like fashion and breaking into several seeds at maturity.

34. Stems essentially smooth and without hairs; awns usually rather short. CHEAT (*Bromus secalinus*) p. 227

34. Stems finely hairy; awns long and conspicuous.

35. Spikelets and seeds finely hairy; panicle rather dense, frequently turning reddish-purple at maturity and appearing plume-like.

DOWNY BROMEGRASS (*Bromus tectorum*) p. 226

35. Spikelets and seeds not hairy; panicle more open, neither becoming reddish nor appearing plume-like.

JAPANESE BROME (*Bromus japonicus*) p. 226

33. Inflorescence not open-branched, usually irregularly congested, or very slender, the spikelets crowded together; spikelets broadly or narrowly elliptic, 1-seeded, less than 1/2 inch long (excluding awns).

36. Plants husky, growing in the open, the stems usually more than 1/4 inch in diameter; inflorescence an irregular, often lopsided cluster of spikelets, or forming a series of short, dense spikes; spikelets broadly rounded, often covered with short bristles; annual. BARNYARD GRASS (*Echinochloa crusgalli*) p. 233

36. Plants running along ground and rooting at the joints; slender, frequently growing in partial shade, the stem less than 1/4 inch in diameter; inflorescence long and narrow; spikelets small, narrowly elliptic; perennial.

NIMBLEWILL (*Muhlenbergia schreberi*) p. 230

1. Plants neither grasses nor grass-like; leaves without a basal sheath; blades frequently stalked (petioled), various in shape, often toothed, lobed, or compound, not parallel-veined, but with a main vein and branches (pinnately veined), or 3 to 5 main veins from base of blade (palmately veined), the interspaces net-veined.

37. Stem not leaf-bearing; leaves all in a basal cluster (rosette) at ground level.

38. Leaves broadly ovate or elliptic; flower-producing portion of spike longer than stalk (peduncle); seeds irregular in shape, several in each seed pod (capsule).

39. Leaves glossy green, almost without hairs; petioles usually purple at base; seeds black when mature (but immature ones brownish). RUGELS PLANTAIN (*Plantago rugellii*) p. 165

39. Leaves dull green or gray-green, covered with fine hairs; petioles not purple; seeds brown when mature.

COMMON PLANTAIN (*Plantago major*) p. 164

- 38. Leaves lanceolate to linear; flower-producing portion of spike about as long as, or much shorter than peduncle; seeds 2 in each capsule, hollowed out on one side and boat-shaped.
- 40. Plants perennial, usually appearing smooth; leaves narrowly elliptic to lance-shaped; flowering spike less than 1/5 as long as stalk (peduncle); mature seeds glossy, without a white line on the concave surface.

BUCKHORN PLANTAIN (*Plantago lanceolata*) p. 163

- 40. Plants annual; usually appearing hairy or woolly; leaves narrowly oblong to linear; flowering spike 1/2 as long or nearly as long as peduncle; mature seeds not glossy, with an elliptic, white line on concave surface.
- 41. Bracts much longer than flowers and giving the spike a bristly appearance; plants loosely hairy (villous) or occasionally nearly smooth, most common in the southern part of our range.

BRACTED PLANTAIN (*Plantago aristata*) p. 162

- 41. Bracts mostly shorter than flowers and hidden by them; entire plant, including spike, woolly, most common in western portion of our range.

WOOLLY PLANTAIN (*Plantago purshii*) p. 164

- 37. Stem leaf-bearing with opposite or alternate blades at time of flowering (a basal rosette of leaves may or may not also be present).
- 42. Leaves palmately compound with 5 to 7 narrow leaflets arising finger-like from the same point at the end of the leaf stalk.

HEMP (*Cannabis sativa*) p. 38

- 42. Leaves various, not palmately compound.
- 43. Leaves fern-like, divided into numerous, narrow segments (1- or 2-pinnatifid); plants ragweed-like, topped by a spike (raceme) of yellowish-green, sterile, pollen-producing flowers (flower heads).
- 44. Leaves woolly beneath or on both sides; fruit a spiny bur, usually with 2 or 3 seeds; plants primarily of western portion of our range.
- 45. Leaves woolly beneath; stamen-producing flowers (flower heads) short-stalked; fruits with straight spines.

BUR RAGWEED (*Franseria discolor*) p. 178

- 45. Leaves woolly on both sides; stamen-producing flowers (flower heads) slender-stalked; fruits with curved spines.

BUR RAGWEED (*Franseria tomentosa*)

- 44. Leaves not woolly; fruit 1-seeded, not a spiny bur; plants abundant throughout our range.

46. Plants annual, very common; leaves smooth above, usually much divided, the main segments being cut into secondary divisions (2-pinnatifid); fruits with a distinct crown of points at tip.

COMMON RAGWEED (*Ambrosia elatior*) p. 176

46. Plants perennial from creeping roots (first-year plants appear annual), very similar in general appearance to above, but much less common; leaves rough on upper surface, less divided than in above species, the main segments frequently lobed but not again divided (1-pinnatifid); fruits with a very short crown of points or nearly smooth at tip.

PERENNIAL RAGWEED (*Ambrosia psilostachya*) p. 177

43. Leaves not fern-like; entire, toothed, or lobed but not pinnatifid; plants various.

47. Plant a twining vine; mature fruits (after husk is rubbed off) black.

WILD BUCKWHEAT (*Polygonum convolvulus*) p. 46

47. Plant not a twining vine; fruits brown.

48. Stem encircled by a white or brownish membranous sheath (ochrea) for a short distance just above attachment of each leaf (this sheath is easily seen on younger parts of stem—it is frequently broken and partly destroyed on older portions); seeds (achenes) 3-angled.

49. Plants with a basal rosette of leaves as well as stem leaves (rosette blades may mostly be gone on old plants); flowers in a terminal spike; seeds (achenes) shiny.

50. Leaves arrowhead-shaped (hastate) with pointed basal lobes; plants with creeping rootstocks; fruit hulls (calyx lobes) tightly appressed to fruit.

SHEEP SORREL (*Rumex acetosella*) p. 40

50. Leaves not hastate; plants not possessing creeping rootstocks; fruit hulls loose around fruit.

51. Leaves smooth and even, neither closely wavy along margin nor lobed at base; fruiting hulls, when mature, about 1/4 inch long.

SMOOTH DOCK (*Rumex altissimus*) p. 40

51. Leaves either closely wavy-crisped along margin or slightly basally lobed (cordate); fruiting hulls less than 1/4 inch long.

52. Leaves ovate to oblong, mostly somewhat cordate at base, frequently with reddish veins; fruit hulls toothed along margin.

BROAD-LEAVED DOCK (*Rumex obtusifolius*) p. 41

52. Leaves oblong, with crisped or wavy-curved edges, rarely red-veined; fruit hulls not toothed.

SOUR DOCK (*Rumex crispus*) p. 39

49. Plants not possessing a basal rosette; flowers axillary; seeds (achenes) usually dull.

53. Plants prostrate, forming flat mats or ascending at tips, or completely ascending, but only a few inches high; leaves blue-green, oblong to narrowly elliptic; a very common weed.

KNOTWEED (*Polygonum aviculare*) p. 45

53. Plants ascending, frequently about 1 foot high; leaves yellow-green, elliptic to broadly elliptic; less common as a weed.

ERECT KNOTWEED (*Polygonum erectum*)

48. Stem not encircled by a sheath as above described; fruits various, not as above.

54. Leaves entire, neither toothed nor lobed.

55. Plants spiny.

56. Upper leaves narrow, hardened, and spine-tipped; seeds snail-like in appearance.

RUSSIAN THISTLE (*Salsola kali*) p. 58

56. Leaves all normal, the spines arising in pairs at base of leaf stalks; seeds lens-shaped, black.

SPINY PIGWEED (*Amaranthus spinosus*) p. 53

55. Plants not spiny (fruit sometimes a spiny bur).

57. Plants with a milky juice; leaves without stalks (sessile) or very short-stalked, strap-shaped or oblong; flower clusters yellowish-green or greenish-white.

58. Flowers with small greenish-white petals; leaves with very short stalks; fruit long and slender.

DOGBANE (*Apocynum sibericum*) p. 137

58. Flowers borne above yellowish-green bracts; leaves without stalks, strap-shaped; fruit as wide as long.

59. Leaves about 1/8 inch wide.

CYPRESS SPURGE (*Euphorbia cyparissias*) p. 106

59. Leaves usually 1/4 to 1/2 inch wide.

LEAFY SPURGE (*Euphorbia esula*) p. 105

57. Plants not possessing milky juice; leaves stalked or sessile; flower clusters not yellow-green.

60. Plant prostrate, forming a mat on ground.

PROSTRATE PIGWEED (*Amaranthus graecizans*) p. 52



60. Plants erect or ascending.

61. Plants woolly.

GOATWEED (*Croton capitatus*) p. 111

61. Plants smooth or hairy, but not woolly.

62. Plants perennial from creeping rootstocks, mostly restricted to western portion of our range; leaves elliptic to oblong, not stalked (sessile), 3-veined; flower clusters borne in leaf axils.

POVERTY-WEED (*Iva axillaris*) p. 179

62. Plants annual; widely distributed; leaves various, not as above described; flower clusters (except for bushy-branched *Amaranthus albus*, below) in terminal spikes.

63. Leaves not stalked (sessile), narrowly strap-shaped (linear) to lanceolate; seed brownish, longer than wide.

KOCHIA (*Kochia scoparia*) pp. 56, 57

63. Leaves stalked (petioled), ovate to lanceolate; seeds black when mature, circular.

64. Plants bushy-branched, the flowers borne in clusters in leaf axils.

TUMBLING PIGWEED (*Amaranthus albus*) p. 52

64. Plants little branched with the main axis predominant; flowers in dense terminal spikes.

65. Spikes dense, bristly in appearance and somewhat prickly to touch; leaves finely hairy, usually broadly lanceolate and upwards of 1/2 inch in width.

66. Spikes thick, the main portion more than 1/2 inch thick (this plant is not always clearly distinguishable from the following species).

ROUGH PIGWEED (*Amaranthus retroflexus*) p. 51

66. Spikes narrow, the main portion less than 1/2 inch across. GREEN PIGWEED (*Amaranthus hybridus*)

65. Spikes often somewhat interrupted, and not especially dense, not bristly nor prickly to touch; leaves smooth, usually narrowly lanceolate, frequently not more than 1/2 inch wide.

WATER HEMP (*Acnida* spp.) p. 54

54. Leaves not entire, toothed (the teeth sometimes small or scattered) or lobed.

67. Fruit a bur covered with numerous hooked spines; leaves long-stalked, irregularly shallowly lobed and toothed, rough.

COCKLEBUR (*Xanthium strumarium*) p. 180

67. Fruit not a spiny bur; leaves various.

68. Plants with milky juice, rarely more than 1 foot high; leaves frequently with dark blotches or spots, all opposite.

69. Plants prostrate.

PROSTRATE SPURGE (*Euphorbia maculata*) p. 107

69. Plants ascending, usually with slanting stems which frequently recurve at tip. NODDING SPURGE (*Euphorbia nutans*) p. 108

68. Plants not possessing milky juice; leaves various, not spotted—if all opposite, the plants usually much taller than above described.

70. Leaves all alternate, the basal ones not opposite.

71. Fruits produced in irregularly branched spikes which protrude beyond leaves, 1-seeded; seeds lens-shaped, usually black in color after being rubbed to remove scurf; plants not restricted to southern part of range.

72. Fruits (actually fruits plus enveloping calyx) with a marginal wing; upper portion of stem often nearly naked at maturity; leaves sharply sinuate-toothed; mostly limited to western portion of our range.

WINGED PIGWEED (*Cycloloma atriplicifolium*)

72. Fruits not possessing a marginal wing; leaves retained at maturity, i.e., stem not becoming naked; leaves variously toothed; plants not restricted to western portion of north-central states.

73. Plants strongly aromatic; leaves oblong, wavy-toothed or shallowly lobed, not white-mealy beneath.

MEXICAN TEA (*Chenopodium ambrosioides*)

73. Plants not aromatic; leaves ovate to oblong, irregularly lobed, toothed or nearly entire, frequently white-mealy beneath.

74. Seeds (easily rubbed out of hulls) about 1/16 of an inch in diameter; leaves dull green to green, often scurfy-whitish beneath, the larger blades usually not exceeding 2 to 3 inches in length; common weed.

LAMBSQUARTER (*Chenopodium album*) p. 55

74. Seeds 1/16 to 1/8 inch in diameter; leaves bright green, the larger blades often 4 inches or more in length; only locally common.

MAPLE-LEAVED GOOSEFOOT (*Chenopodium hybridum*)

71. Fruits solitary or in small clusters at base of upper leaves, frequently mostly hidden by the leaves, forming 2 to 4 seeds;

seeds usually turtle-shaped; plants restricted to southern portion of our range. CROTON (*Croton capitatus*) p. 111

70. Lower leaves opposite, the upper becoming alternate, or all leaves opposite.<sup>11</sup>

75. Flower clusters produced in leaf axils and not protruding above leafy stem.

76. Leaves all opposite; stems frequently more than 2 feet high, with stinging hairs; flower clusters slender, catkin-like, drooping from leaf axils. STINGING NETTLE (*Urtica dioica*) p. 38

76. Leaves mostly alternate, usually with insect holes; stems usually less than 2 feet high, not possessing stinging hairs; flower clusters mostly hidden by toothed bracts in leaf axils.

THREE-SEEDED MERCURY (*Acalypha rhomboidea*) p. 110

75. Flower clusters in simple or branched spikes (racemes or panicles), entirely or in part borne apically on stem above leaves.

77. Seeds circular in outline, blackish, borne within a pair of pointed husks which fit together in clamshell-like fashion; leaves frequently arrowhead-shaped (hastate).

ORACHE (*Atriplex patula*) p. 57

77. Seeds (fruits) not circular in outline, not borne as above described; leaves not hastate.

78. Leaves narrow, usually with 1 or 2 upward-pointing teeth on each side; plants low, usually not much more than 1 foot high, restricted to southern portion of our range.

LANCE-LEAVED RAGWEED (*Ambrosia bidentata*) p. 177

78. Leaves broad and large, with numerous teeth, or 3- to 5-lobed; plants tall, frequently more than 3 feet high.

79. Leaves, except sometimes for the uppermost, 3- to 5-lobed; fruits with a crown of points at tip.

GIANT RAGWEED (*Ambrosia trifida*) p. 177

79. Leaves unlobed; fruits seed-like without a crown of points.

MARSH ELDER (*Iva xanthifolia*) p. 179

---

<sup>11</sup> If lowermost leaves have fallen off, their position can be verified by noting leaf scars at stem nodes.

## KEY 5. PLANTS WOODY

**WARNING:** Poison ivy and poison oak have compound leaves with three leaflets. Don't pick or handle leaves of this type.

1. Plants thorny or spiny.

2. Leaves simple.

3. Leaves entire; fruit the size of a large orange, green.

OSAGE ORANGE (*Maclura pomifera*)

3. Leaves toothed or lobed; fruits like small crabapples, usually reddish.

HAWTHORNS (*Crataegus* spp.)

2. Leaves compound.

4. Leaflets toothed; shrubby plants.

5. Stipules fused to petioles; flowers usually pinkish, one inch or more across, rose-like.

WILD ROSES (*Rosa* spp.) p. 93

5. Stipules essentially free from petioles; flowers usually white, less than one inch across.

BRAMBLES, WILD BLACKBERRIES (*Rubus* spp.)

4. Leaflets entire; trees.

6. Some of leaves twice-compound (i.e., the main divisions of the leaves in turn compound); thorns various, becoming more than one inch long and branched.

HONEY LOCUST (*Gleditsia triacanthos*)

6. Leaves all once-compound; thorns (spines) less than one inch in length, unbranched.

BLACK LOCUST (*Robinia pseudo-acacia*)

1. Plants not thorny or spiny.

7. Leaves compound.

8. Leaves opposite.

9. Plant a vine with trumpet-shaped orange-red flowers, 2 to 3 inches long.

TRUMPET CREEPER (*Campsis radicans*)

9. Plants shrubs or trees; flowers small.

10. Flowers white, in conspicuous flat- or convex-topped clusters (corymbs) appearing in summer; fruit a small fleshy berry; twigs with conspicuous, light-colored bumps (lenticels).

ELDERBERRY (*Sambucus* spp.)

- 10. Flowers greenish-yellow, inconspicuous, appearing with or before leaves; fruit dry, winged (a samara); twigs not as above.
- 11. Leaflets mostly 5, conspicuously toothed or lobed; young twigs usually with a whitish-waxy covering.

BOX ELDER (*Acer negundo*)

- 11. Leaflets 5 to 7, entire or finely toothed; twigs not whitish waxy.

ASHES (*Fraxinus* spp.)

8. Leaves alternate.

- 12. Leaflets three; fruits berry-like, white; plants trailing, climbing or forming small shrubs (poisonous to touch!).

POISON IVY, POISON OAK (*Rhus toxicodendron*) pp. 115, 116

- 12. Leaflets 5 or more; fruits not white; plants large shrubs or trees.

- 13. Fruits small, reddish "berries," in dense clusters at branch tips; leaves mostly with more than 9 leaflets.

SUMAC (*Rhus* spp.)

- 13. Fruits hickory nuts; leaves of common kinds with 5 to 7 leaflets.

HICKORY (*Carya* spp.)

7. Leaves simple, not divided into leaflets.

- 14. Plants evergreen, with needle-like or scale-like leaves.

- 15. Leaves needle-like, in clusters of 2 to 5; fruit a cone.

PINES (*Pinus* spp.)

- 15. Leaves overlapping scales, or on young plants sometimes like short needles (but not in clusters); fruit berry-like.

CEDAR (*Juniperus virginiana*)

- 14. Plants with deciduous leaves (fall off in winter) which are neither scale- nor needle-like.

- 16. Leaves opposite.

- 17. Leaves broad, palmately lobed; fruit dry.

MAPLES (*Acer* spp.)

- 17. Leaves elliptic, entire; fruit a berry.

- 18. Stems viny or forming mats on the ground.

HONEYSUCKLE (*Lonicera japonica*)

- 18. Stems erect, plants forming low shrubs.

BUCKBRUSH (*Symphoricarpos* spp.) p. 167

16. Leaves alternate.

- 19. Plants vine-like, trailing or climbing, fruit a berry.

- 20. Plants with tendrils; leaves palmately lobed.

WILD GRAPES (*Vitis* spp.)

20. Plants not possessing tendrils; leaves ovate and entire or with 1 or 2 irregular lobes at base; flowers potato-like.

BITTER NIGHTSHADE (*Solanum dulcamara*)

19. Plants shrubs or trees; fruit various, usually not a berry.

21. Leaves lobed.

22. Leaves densely white-hairy beneath.

WHITE POPLAR (*Populus alba*)

22. Leaves not white-hairy underneath.

23. Leaves both lobed and serrate; fruit fleshy; plants with milky juice.

MULBERRY (*Morus rubra*)

23. Leaves not serrate; fruit an acorn; juice not milky.

OAKS (*Quercus* spp.)

21. Leaves not lobed.

24. Leaves 3 to 5 times as long as wide (in common species); buds covered by a single hood-like scale.

WILLOWS (*Salix* spp.)

24. Leaves less than 3 times as long as wide; buds various, usually with several overlapping scales.

25. Leaves palmately veined with 3 (sometimes 5) main veins from base of blade.

26. Leaves lopsided or asymmetric at base; fruit fleshy, 1-seeded; bark usually with distinctive narrow ridges or bumps.

HACKBERRY (*Celtis* spp.)

26. Leaves essentially symmetric; fruit if fleshy with several seeds.

27. Juice milky; fruits fleshy, several-seeded; leaf petioles scarcely flattened.

MULBERRY (*Morus rubra*)

27. Juice not milky; fruits dry with tiny air-borne seeds; petioles often flattened.

COTTONWOODS, POPLARS (*Populus* spp.)

25. Leaves pinnately veined, with one main vein from base of blade.

28. Leaves asymmetric at base.

ELMS (*Ulmus* spp.)

28. Leaves symmetric.

29. Leaves nearly as broad as wide, abruptly pointed; petioles flattened; buds sticky.

COTTONWOOD (*Populus* spp.)

29. Leaves various but distinctly longer than wide; petioles not flattened; buds not sticky.
30. Leaf petioles with one or two or sometimes several small glands at upper end; flowers white, conspicuous; fruits fleshy.  
WILD CHERRIES (*Prunus* spp.)
30. Leaf petioles not bearing glands; flowers greenish, some of them in catkins; fruit dry.
31. Some of leaves crowded together on short spurs; fruits in cone-like clusters. BIRCHES (*Betula* spp.)
31. Leaves alternate, not crowded together; fruit a nut enclosed in a husk. HAZELBRUSH (*Corylus* spp.)





## *Poisonous Weeds*

