

Weeds of North America



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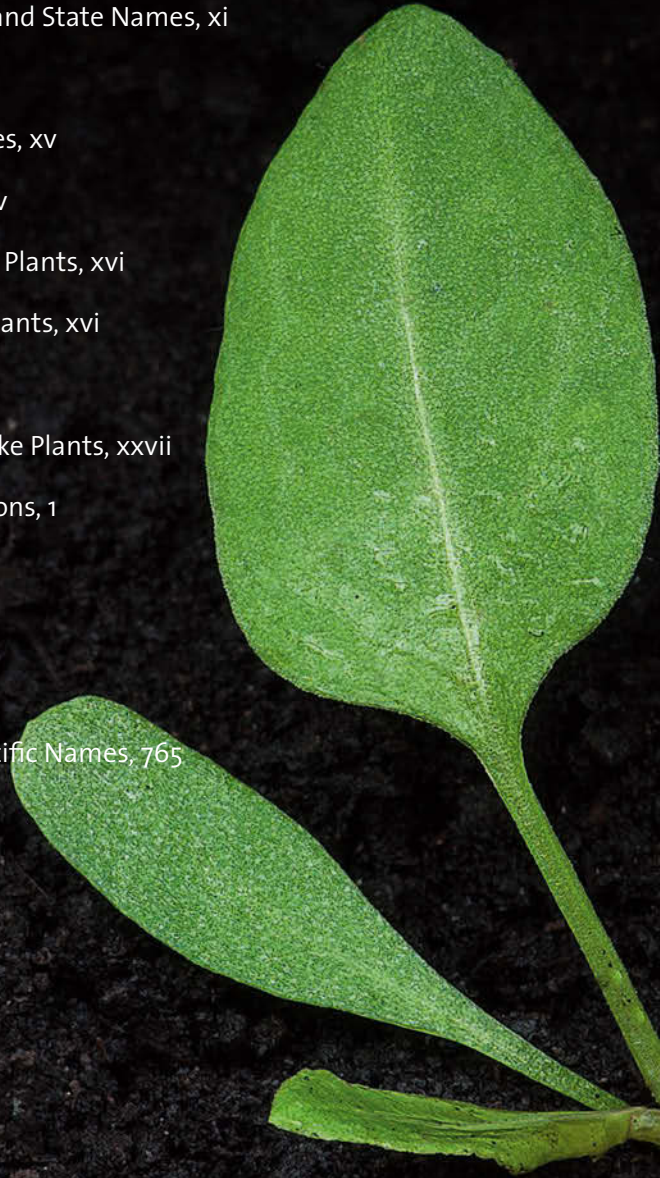
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INTRODUCTION

Since the rise of agriculture about 10,000 years ago, humankind has had to deal with unwanted plants competing with its cultivated crops, as well as affecting the health of families and livestock. It has only been in the last 400 years, however, that there has been an explosion in the spread of weeds. This marked increase coincides with colonial expansion and, more recently, an increase in world trade (Canadian Food Inspection Agency Summary Report 2008).

These troublesome plants introduced from other parts of the globe often thrive in their new environment, free of natural pests that keep them in check in their native range. Whether they affect crop yields, species diversity of the natural environment, or human health, weeds have a detrimental effect on the economy. Billions of dollars each year are spent on vegetation management, prevention, and education. Prior to implementing a management strategy, however, one must be able to identify the species, understand the biology, and institute the best control method. This book has been designed to provide assistance with the weed identification process.

This reference guide includes over 600 species from 69 plant families. Detailed descriptions of each species are included for easy recognition at any growth stage. Over 1,200 color photographs complement the informative text, aiding in identification. Closely related or similar species are described and compared using the most distinguishing characteristic between the two. Nontechnical terms have been used whenever possible, making the text easier to understand.

Scientific names used in this guide follow the Integrated Taxonomic Information System (www.itis.gov), a North American database of plant names that conforms with the International Code of Botanical Nomenclature.

Plant families are listed alphabetically by scientific name. The family description introduces general characteristics of the family, its worldwide distribution, and its well-known members. Within each family, species are listed alphabetically by scientific name. Synonyms appear in the text and index, allowing for easy cross-referencing. A list of regional common names is also included in the text and index.

Species selection for this guide was determined by federal, provincial, and state weed legislation, as well as those listed by various conservation and environmental associations dealing with invasive plants. Weed designation by jurisdiction is provided for each species. These designations are subject to frequent reviews and changes and should only be used as an indication of legislation at the time of printing.

Canada, Mexico, and the United States are members of the North American Plant Protection Agency (NAPPO). This organization ensures that phytosanitary measures are in place to deal with the introduction of invasive plants. In ac-

cordance with the Plant Protection Act (2000), the United States federal government designates certain plants as noxious weeds. In Canada, this designation takes place under the Weed Seeds Order (1986). In Mexico, several pieces of legislation deal with noxious plants. Within each country, states, provinces, territories, and municipalities have the power to designate weeds.

Identification keys have been constructed using easily identifiable characters and thumbprint photographs.

IDENTIFICATION OF WEED SPECIES

Plants are identified by using a combination of characteristics, such as plant type, leaf arrangement, and flower color. Species with more than one type of leaf arrangement or flower color will appear in each of their respective groups.

KEY TO TREES AND SHRUBS

LEAVES ALTERNATE

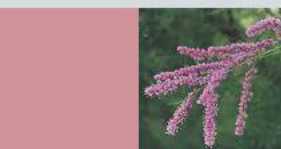
FLOWERS GREEN



Morus alba,
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Ailanthus altissima, page 698

FLOWERS PINK OR PURPLE



Tamarix ramossissima,
page 724

FLOWERS WHITE



Schinus terebinthifolius,
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Toxicodendron radicans,
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Rosa multiflora,
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FLOWERS YELLOW



Berberis vulgaris,
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Cytisus scoparius,
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LEAVES OPPOSITE OR WHORLED



Rhamnus cathartica,
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Flowers Green



Kochia scoparia,
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Flowers White



Alliaria petiolata,
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*Asparagus
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*Fagopyrum
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*Persicaria
lapathifolia*,
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Solanum nigrum,
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Solanum viarum,
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Flowers Yellow



Barbarea vulgaris,
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Brassica juncea,
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microcarpa*,
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*Descurainia
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Balsaminaceae

TOUCH-ME-NOT OR JEWELWEED FAMILY

Herbs with succulent stems, often transparent, juice watery; leaves alternate or opposite; stipules absent; inflorescence of solitary flowers or umbels; flowers perfect, irregular; five sepals, the lowest spurred; five petals, the lateral pair united; five stamens; one pistil; ovary superior; fruit an explosive capsule. Worldwide distribution: 4 genera/600 species; predominantly growing in Europe, North America and Africa.

Distinguishing characteristics: plants succulent; flowers irregular; spurs present.

A few species of *impatiens* are grown as ornamental annuals.



spotted jewelweed (*Impatiens noli-tangere*)

Impatiens glandulifera Royle
POLICEMAN'S HELMET

Also known as: Himalayan impatiens, ornamental jewelweed, Indian balsam, purple jewelweed, touch-me-not

Scientific Synonym(s):
I. roylei Walp.

QUICK ID: plants succulent; flowers pink, irregular; fruit bursting when touched

Origin: Native to the Himalayan region of Asia; introduced into England in 1839 and spreading throughout the British Isles by 1970; introduced into North America as a garden plant

Life Cycle: annual reproducing by seed; large plants may produce up to 4,000 seeds

Weed Designation: USA: CT, OR, WA; CAN: AB



DESCRIPTION

Seed: Somewhat globe-shaped, brown to black, 2–5 mm across, surface rough.

Viable in soil for 2 years.

Germination can occur underwater; seeds float.

Seedling: With oval to round cotyledons, succulent; roots form 12 days after germination; photosynthesis begins 4 weeks after germination.

Leaves: Opposite or in whorls of three or four, oblong to egg-shaped, 5–23 cm long, 1–7 cm wide, stalks 3–3.5 cm long, margins with 20 or more teeth per side.

Inflorescence a cyme, borne on elongated axillary stalks up to 9 cm long, two- to 14-flowered; bracts elliptical to oval or lance-shaped, 7–8 mm long.

Flower: Pink, white, or purple, irregular, 2–3.5 cm long; three sepals, two fused and the lower with a spur 5–6 mm long; five petals, two fused; five stamens; one pistil; first seeds produced 13 weeks after flowering begins.

Plant: Plants 1–3 m tall, frost-sensitive, partially shade-tolerant, requiring soils with high moisture content; stems succulent and hollow, green tinged with red or purple, hairless, often angular; roots shallow, extending to 6 inches deep, adventitious roots forming near the soil surface.

Fruit: Club-shaped capsule, 14–30 mm long and 4–8 mm wide, nodding, four- to 16-seeded, exploding at maturity, ejecting seeds up to 7 m from parent.

REASONS FOR CONCERN

In Great Britain this species is listed as one of the top 20 worst weeds. A prolific seed producer, policeman's helmet invades moist open areas and forests and displaces native vegetation.



Salsola kali L.

RUSSIAN THISTLE

Also known as: Russian tumbleweed, Russian cactus, tumbling Russian thistle, glasswort, burning bush, saltwort, prickly glasswort, wind witch

Scientific Synonym(s):
S. pestifer A. Nels.

QUICK ID: stems with red stripes; plants bristly at maturity; leaves spine-tipped

Origin: native to Russia; introduced into South Dakota in 1874 as a contaminant in flax seed; first reported from Ontario in 1894

Life Cycle: annual reproducing by seed; large plants capable of producing up to 25,000 seeds

Weed Designation: USA: AR, HI; CAN: BC, MB, ON, SK



DESCRIPTION

Seed: Cone-shaped, dull brown to gray, about 2 mm long.

Viable less than 1 year in soil.

Germination occurs in top 5 cm of soil; no emergence from 8 cm depth; temperature range of -2° – 41° C (optimal is 7° – 10° C).

Seedling: With narrow linear cotyledons, 10–50 mm long and less than 3 mm wide, fleshy; first pair of leaves opposite, resembling the cotyledons except for a soft spine at the tip; young stem often tinged with purple.

Leaves: Alternate, 2–6 cm long, 1–2 mm wide; lower leaves threadlike; upper leaves 1–2.2 mm long, awl-shaped and spine-tipped, becoming stiff with age.

Inflorescence a solitary flower borne in leaf axils; bracts spine-tipped.

Flower: Green, inconspicuous, less than 2 mm wide; male or female; male flowers with five sepals and five stamens; female flowers with five sepals and one pistil; two bracts, 5–7 mm long, spine-tipped.

Plant: Pyramid-shaped, turning red at maturity and breaking off at the ground and forming a tumbleweed; stems spiny, 30–120 cm tall, branched, often striped with red; taproot to 1 m deep.

Fruit: Coiled, top-shaped utricle, about 2 mm long; single-seeded.

REASONS FOR CONCERN

Russian thistle is a common weed of roadsides, railways, and dry open areas. It establishes itself in areas where there is reduced competition from other plants. The wide temperature range for germination and the mechanism of seed dispersal have assisted in the spread of this plant. It is host for beet yellows, beet curly top, and beet mosaic viruses.

Similar species: the seedling of corn spurrey (*Spergula arvensis* L., p. 249) is often mistaken for the seedling of Russian thistle. The leaf tips of corn spurrey are blunt while those of Russian thistle are spine-tipped. The tumbleweed of kochia (*Kochia scoparia* [L.] Schrad., p. 264) may be mistaken for Russian thistle. The tumbleweed of kochia is slightly hairy unlike that of Russian thistle, which is spiny.



Convolvulaceae

MORNING-GLORY FAMILY

Herbs, trees, and shrubs, often twining; milky juice often present; leaves alternate, simple; stipules absent; inflorescence a cyme; bracts present; flowers perfect, regular; five sepals; five petals, united into a tube or funnel; five stamens, borne on the petals; one pistil; ovary superior; fruit a capsule, berry, or nut. Worldwide distribution: 50 genera/1,400–1,650 species; distributed throughout tropical and temperate regions.

Distinguishing characteristics: plants climbing; flowers tube- or funnel-shaped; fruit a capsule.

The morning-glory family is of limited economic importance, with some genera grown for their horticultural and ornamental value. A few species are troublesome weeds in agricultural land.



field bindweed (*Convolvulus arvensis*)

Calystegia sepium (L.) R. Br.

HEDGE BINDWEED

Also known as: devil's vine, great bindweed, bracted bindweed, wild morning glory, Rutland beauty, hedge lily, bearbind, devil's gut, hedgebell, old man's nightcap

Scientific Synonym(s):

Convolvulus sepium L.

QUICK ID: plants climbing or trailing; leaves alternate; flowers white, funnel-shaped

Origin: native to North America; introduced subspecies may be present

Life Cycle: perennial reproducing by creeping rhizomes and seeds

Weed Designation: USA: AR, TX; MEX: federal



DESCRIPTION

Seed: Round to oblong, dark brown to black, 4.6–5.1 mm long, 3.2–3.7 mm wide; surface dull.

Viable in soil for at least 50 years.

Germination occurs within 2 weeks of being shed; ungerminated seeds can remain dormant for long periods of time.

Seedling: With rectangular cotyledons, 26–50 mm long, 16–22 mm wide, prominently veined on the underside; stem below cotyledons often dull red; first leaf arrowhead-shaped, prominently veined below.

Leaves: Alternate, triangular to arrowhead-shaped, 4–15 cm long, dark green, long-stalked, tips pointed.

Inflorescence a solitary flower borne on stalks 5–15 cm long from leaf axils; stalks four-angled.

Flower: Bell- to funnel-shaped, white to pink, 4–8 cm long, 2–8 cm across; five sepals, united; five petals, united; five stamens, 2–3.5 cm long; one pistil; two bracts, heart-shaped, 1–5 cm long.

Plant: Large vine up to 3 m long, shade-intolerant; stems branched; rhizomes creeping and fleshy, buds giving rise to numerous shoots.

Fruit: Globe-shaped capsule, 8–10 mm across, two-celled, each one- or two-seeded.

REASONS FOR CONCERN

Hedge bindweed is a serious weed in orchards and vineyards, where it often climbs over the crop. It is also a weed of cultivated crops, fencerows, and roadsides. Hedge bindweed is host for cucumber mosaic and tobacco streak viruses.

Similar species: field bindweed (*Convolvulus arvensis* L., p. 282), an introduced species, is closely related to hedge bindweed. It is distinguished by smaller pinkish-white flowers, about 2 cm across, and two small bracts below the flower.



Cucurbitaceae

GOURD FAMILY

Herbs, sprawling to climbing; leaves alternate, simple, often palmately lobed and veined; tendrils present, branched inflorescence a panicle or solitary flowers; flowers imperfect (male or female), regular; male flowers, five sepals (small), five petals, five stamens; female flowers, five sepals (small); five petals; one pistil; ovary inferior; fruit a pepo (berry with a leathery rind). Worldwide distribution: 100 genera/850 species; found throughout subtropical and warm temperate regions of the world.

Distinguishing characteristics: plants trailing or climbing; flowers male or female; fruit berry-like (pepo).

The gourd family has several economically important members, including cucumbers, melons, squash, and luffa. A few species are considered weedy. Members of this family play an important role serving as reservoirs for viral disease of cultivated cucurbit crops, particularly the widely transmitted squash vein yellowing virus (SqVYV).



balsam apple (*Momordica charantia*)

Echinocystis lobata (Michx.) Torr. & Gray

WILD CUCUMBER

Also known as: balsam apple, mock apple, creeping Jenny, four-seeded bur cucumber, mock cucumber

Scientific Synonym(s):
Sicyos lobata Michx.,
Micrampelis lobata
(Michx.) Greene

QUICK ID: climbing vine; leaves alternate; flowers white; fruit green with soft spines

Origin: native to Europe; introduced as an ornamental plant

Life Cycle: annual reproducing by seed; plants capable of producing over 400 seeds

Weed Designation: none



DESCRIPTION

Seed: Elliptical, flattened, 16–20 mm long, 8–10 mm wide, less than 4 mm thick; surface dull brown marbled with patches of dark brown.

Viability unknown.

Germination occurs when soil temperatures reach 25°C; a cold period of at least 4 months is required to break dormancy.

Seedling: With oval cotyledons, 3–7 cm long, 1–3 cm wide, dark green above and pale beneath, thick, prominently veined; stem below cotyledons pale green, hollow until the second leaf stage; first leaves kidney-shaped with three to seven prominent lobes, both surfaces rough textured.

Leaves: Alternate, palmately three- to seven-lobed, 5–13 cm across, bright green, long-stalked, base heart-shaped, margins toothed, surface with a sandpapery texture; tendril long and branched, opposite the leaf.

Inflorescence of 2 types; male flowers produced in panicles; female flowers solitary in the axil of the tendril.

Flower: Two types, male or female; male flowers white to greenish-yellow, six sepals, six petals, two or three stamens, yellow; female flowers yellowish-green, six sepals, six petals, one pistil.

Plant: Creeping or climbing vine up to 8 m long; stem bright green, twining, often grooved and angled.

Fruit: Pepo (berry), fleshy, oblong, 2.5–5 cm long; skin thick, mottled pale green, covered in weak prickles; inside fibrous and mesh like; four-seeded; opening at the apex at maturity.

REASONS FOR CONCERN

Wild cucumber is a weed of fence lines, waste areas, and meadows. It is host for cucumber mosaic, cucurbit mosaic, and several Prunus viruses.



Phragmites australis (Cav.) Trin. ex Steud. ssp. *australis*

REED

Also known as: giant reed,
common reed

Scientific Synonym(s):

P. communis Trin.,
P. phragmites (L.) Karst.,
Arundo phragmites L.

QUICK ID: plants reedlike,
somewhat woody; panicle
large; ligule membranous
and fringed with hairs

Origin: introduced from
Europe and Asia; native
populations in North
America referred to ssp.
americanus

Life Cycle: perennial
reproducing by seed,
stolons, and creeping
rhizomes; a single panicle
may produce up to 2,000
seeds

Weed Designation: USA: AL,
CT, MA, SC, VT, WA; Can:
BC



DESCRIPTION

Seed: Dark brown, elliptical, 1.2–1.5 mm long; awn
6–7 mm long; rarely produced.

Viability less than 3 years.

Germination is inhibited by water depths more
than 5 cm; occurs within 25 days at 16°–25°C.

Seedling: With one cotyledon; rarely produced in
nature.

Leaves: Flat, 15–60 cm long, 1–6 cm wide; sheaths
loose and overlapping, margins with minute
soft hairs; ligule about 0.2 mm long, a yellowish-
purple membrane topped with short white hairs
(about 0.5 mm long) and firm white hairs (5–15
mm long), hairs falling off early; auricles absent,
the yellowish-green collar resembling auricle-like
shoulders.

Inflorescence a large terminal panicle, tawny to
purple, 15–40 cm long, 6–15 cm wide, profusely
branched, silky-haired; spikelets 10–17 mm long,
three- to seven-seeded; first glume 2.5–7 mm
long; second glume 5–12 mm long, three- to five-
veined; lemma 8–15 mm long, three-nerved.

Plant: Reedlike, somewhat woody, 1.5–6 m tall, up to
10 mm in diameter; stems purplish-red near the
base, growing 4–15 cm a day in early summer;
rhizomes creeping, up to 2 m deep and 3 cm
thick, growing about 40 cm per year; stolons
spreading across the soil surface. Subspecies
americanus has red internodes while ssp. *australis*
has yellow to yellowish-brown internodes.

Fruit: Caryopsis (grain); rarely produced.

REASONS FOR CONCERN

The expansion of reed along the Gulf of Mexico and Atlantic coasts has been a concern for the past 30 years. Expansion of populations along the northern shorelines of Lake Ontario and Lake Erie in Ontario have been implicated in reduction of waterfowl habitats.



Poa annua L.

ANNUAL BLUEGRASS

Also known as: dwarf

meadow grass, causeway grass, speargrass, sixweeks grass, walkgrass

Scientific Synonym(s):

P. triangularis Gilib.

QUICK ID: sheath loose; leaf tips are boat-shaped; plants less than 30 cm tall

Origin: native to the Mediterranean area of southern Europe and Asia; first observed in California in 1797; New Brunswick in 1875, spreading to British Columbia by 1891

Life Cycle: annual or winter annual reproducing by seed; each plant capable of producing up to 2,250 seeds; 30–100 flower clusters per plant

Weed Designation: USA: none

DESCRIPTION

Seed: Straw-colored, oval, 2–3 mm long, 1–1.3 mm wide.

Viable in soil for 4 years.

Germination best at 2°–5°C; light required for germination.

Seedling: With one cotyledon; first leaf 5–9 mm long, 1–3 mm wide, young leaves with scattered soft hairs.

Leaves: Mostly basal, flat, 1–14 cm long, 1–4 mm wide, surface with soft hairs; sheaths flattened, loose, hairless, light green, tips boat-shaped; ligule membranous, 2–5 mm long.

Inflorescence an open panicle, pyramid-shaped, 2–12 cm long; spikelets 3–10 mm long, three- to 10-flowered; glumes 1.5–3 mm long, lance-shaped, one-veined; lemmas 2.5–4 mm long, elliptical, five-nerved.

Plant: Often rooting at lower nodes and forming large mats; stems 3–30 cm long, bright green; two to four nodes.

Fruit: Caryopsis (grain).



REASONS FOR CONCERN

Annual bluegrass is a serious weed in lawns, golf courses, and waste areas. In early summer, plants mature and die leaving brown patches of dead grass in turf. It is host for barley yellow dwarf and lucerne dwarf viruses.

Similar species: Canada bluegrass (*P. compressa* L.), another introduced species, is common in meadows and waste ground. It is distinguished from annual bluegrass by its creeping rhizomes and flattened stems. The panicle, 2–8 cm long, has several branches that occur in pairs.



Glossary

achene

dry, one-seeded fruit that does not open when ripe



allelopathic

a plant that produces a chemical that suppresses the growth of other plants

annual

plant with a life cycle that is completed in one growing season

anther

the pollen-producing sacs of the stamens

apex

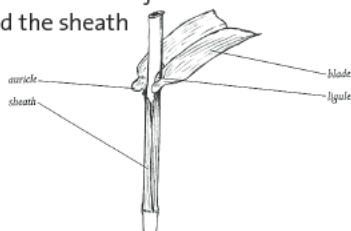
tip of a leaf or petal

apical

at the tip

auricle

earlike appendages; in grasses, auricles are found at the junction of the blade and the sheath

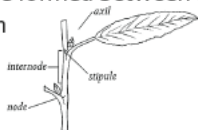


awn

a stiff bristle

axil

the angle formed between the leaf and the stem



axillary

found in the axil of leaves

basal

from the base; often used in reference to leaves

berry

a fleshy fruit with one to many seeds

biennial

a plant that takes two years to complete one life cycle

bract

leaflike structure found below a flower or flower cluster



bracteole

a small bract

bulb

a short vertical underground stem

bulbil

a fleshy reproductive structure borne on the aerial part of the plant

calyx

a collective term for the sepals of a flower

capitulum

a head



capsule

a dry fruit that opens when mature



caryopsis

the fruit or grain of a grass

cleft

deeply lobed

collar

in grasses, part of the leaf where the blade and sheath are connected

compound leaf

a leaf composed of two or more leaflets

coma

a tuft of hairs

