Canadian Food Inspection Agency

Agence canadienne d'inspection des aliments

Canada

Invasive Plants Field Guide

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Cover: ***Pueraria montana*** photo by Sam Brinker, Ontario Ministry of Natural Resources & Forestry

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Introduction

Invasive alien plants are harmful non-native plant species whose introduction or spread threatens the environment, the economy, or society, including human health. They may be introduced from other countries, or spread between different areas within Canada.

The Government of Canada is committed to protecting Canada's plant resources from pests and diseases. As Canada's plant protection agency, the Canadian Food Inspection Agency (CFIA) regulates various invasive plant species under the ***Plant Protection Act*** and the ***Seeds Act***. These regulations restrict the importation of regulated species and commodities into Canada, and their movement and sale within Canada. The species included in this field guide are federally regulated in Canada as pests under the ***Plant Protection Act*** and/or as prohibited noxious weed seeds under the ***Weed Seeds Order*** of the ***Seeds Act***.

Invasive plants cause serious damage to Canada's agricultural, forestry and horticultural resources. Invasive plants in crops and pastures cost Canada an estimated $2.2 billion each year due to productivity losses and the costs of controlling their spread. Some invasive plants can affect human health by causing skin reactions or allergies; in rare cases, they are toxic to humans. The health of animals may also be affected in some instances.

Invasive plants can invade natural areas (wetlands, forests and grasslands), managed areas (cultivated fields, gardens, lawns and pastures) and areas where the soil and vegetation have been disturbed (ditches, roadsides and rights-of-way). Invasive plants can reduce biological diversity and alter the structure and function of ecosystems. Changing landscapes can have a negative impact on recreational activities and tourism, as well as on aesthetics and property values.

Field surveys and reported sightings are effective tools that help the CFIA obtain information about the plant species of concern. We encourage you to be on the lookout for the plant species identified in this guide, and to report any findings to your local CFIA office or by email to IAS.EEE@inspection.gc.ca

To find out more, visit
www.inspection.gc.ca/invasive
or call 1-800-442-2342.

Halogeton glomeratus (M. Bieb.) Ledeb.

Halogeton

GENERAL

A semi-succulent annual or winter annual of the amaranth family. It invades dry, disturbed sites, including overgrazed rangelands, and is extremely toxic to livestock, particularly sheep.

SEEDLINGS

Cotyledons are glabrous and cylindrical, and about 3–6 mm long and 1 mm wide.

STEMS

Main stems, usually five, spread from the base and then become erect, with numerous lateral branches. The stems grow 10–40 cm tall.

LEAVES

Leaves are alternate, fleshy, cylindrical, dull green to bluish-green, and 3–20 mm long by 1–2 mm wide. The apex is rounded and ends in a bristle. There are tufts of white hairs in the leaf axils.

FLOWERS

Numerous dense flower clusters develop in leaf axils, with 0–3 bracts below each cluster. Two types of apetalous flowers are produced. The larger type has greenish-yellow or red-tinged membranous sepals with narrow bases (1–2 mm long) and fan-shaped wings (2.0–3.5 mm long); the smaller type has tooth-like sepals. Flowers have 5 or fewer stamens and 2 stigmas.

FRUITS/SEEDS

Fruits and seeds are of two types: utricles enclosed by fan-shaped sepals containing blackish seeds and utricles enclosed by tooth-like sepals containing brown seeds. Seeds are oval with a protruding radicle tip, compressed, and about 1–2 mm long.

ROOTS

The taproot can reach a depth of 0.5 m; lateral roots extend in all directions.

DISTRIBUTION

Native to Eurasia, including southeastern Russia, central Asia, Pakistan, Mongolia and northwestern China. Introduced and widely distributed over millions of acres in the western United States. There are no reports from Canada.

INTRODUCTION AND SPREAD

Produces copious amounts of seeds, which are dispersed by wind, water, seed-gathering ants, animals (i.e., attached to wool, in droppings), and human activity. Humans unintentionally spread seeds in association with livestock movement, soil movement, road maintenance and recreational activities. Entry into Canada is most likely to occur along one of these human-mediated pathways.

HABITAT

Habitats include cold deserts, shrublands, dry lakebeds, and disturbed open sites such as overgrazed ranges, roadsides, railway lines and trails. It grows in arid and semi-arid localities, and is adapted to alkaline and saline soils.

SIMILAR SPECIES

No other members of this genus are found in North America. Similar plants in Canada, prior to flowering, include Russian thistle (*Salsola tragus*) and kochia (*Bassia scoparia*). Russian thistle has weakly spine-tipped leaves which are linear and lack hairs in the leaf axils. Kochia can be distinguished from halogeton by its pubescent leaves, which lack a bristle at the tip.

FLOWERING TIME

July to August.

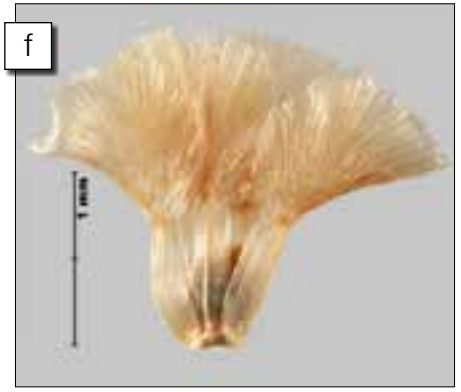
Halogeton plants.

Young halogeton plant.

Halogeton flowers.

Halogeton leaves and stem.

Halogeton utricles, one enclosed in perianth.



Halogeton utricle enclosed in perianth with wings.

Centaurea diffusa Lam.

Diffuse knapweed

GENERAL

Annual, biennial or sometimes short-lived perennial, herbaceous plant in the aster family. Very competitive in semi-arid rangelands and pastures, reducing desirable livestock forage species. Heavily branched stem gives a ball-shaped appearance.

STEMS

One, rarely 2, erect, hairy stem(s) reaching 20–80 cm. Heavily branched, mostly in the upper half.

LEAVES

Rosette leaves are deeply divided and borne on short stalks, roughly 20 cm long and 5 cm wide. Rosette and lower cauline leaves are much divided into narrow lobes, uppermost are bract-like and entire. Basal leaves often absent at flowering.

FLOWERS

Solitary or borne in clusters of 2 or 3 at branch tips. Heads are narrow and urn shaped, 10–13 mm long and 3–5 mm wide, containing 25–35 white, sometimes pink or purple florets. Heads remain on branches at maturity. Bracts are pale yellowish-green with buff or brown margins and have a fringe of spines. Purple flower forms often have dark-tipped bracts, causing confusion with spotted knapweed.

FRUITS/SEEDS

Achenes are 3–5 mm long, 1.5–2.0 mm wide, smooth, light to dark reddish-brown with thin pale stripes and prominent central stripe, and a 0.1–1.0 mm white pappus. There is a pale area around a large basal notch.

ROOTS

Slender, elongated taproot.

DISTRIBUTION

Native to southeastern Europe and western Asia, now found throughout Europe. Introduced to North and South America. Reported from 25 American states and 6 Canadian provinces, including British Columbia, Alberta, Ontario and Quebec. Previous reports from the Yukon were misidentifications. Recently reported from Saskatchewan and Manitoba, but relatively rare in these provinces.

INTRODUCTION AND SPREAD

Seeds are spread by wildlife, domestic animals and movement of infested hay and soil as well as plants caught in the undercarriage of vehicles. The mature plants may blow around in a tumbleweed fashion, distributing seed along the way.

HABITAT

Open, disturbed areas, including overgrazed pastures, rangelands, grasslands, dunes, open forests, roadsides and railway lines. It can thrive in a wide range of climate and soil conditions, preferring well-drained, light textured soils. Often found in drier sites than spotted knapweed.

SIMILAR SPECIES

Diffuse knapweed may be confused with spotted knapweed (*Centaurea stoebe* L.) and other *Centaurea* species. The unique characteristics of the floral bracts are very useful in differentiating knapweed species. Diffuse knapweed bracts are pale yellowish-green with buff or brown margins and edged with a fringe of spines narrowing into a 3 mm long spine, distinctly longer than the lateral spreading spines.

FLOWERING TIME

June to August.

Diffuse knapweed rosette.

Diffuse knapweed achenes.

Tumbling diffuse knapweed trapped in pasture fence.

Diffuse knapweed flowers showing varying colour forms. Note fringed bracts tipped with spines.

Centaurea iberica Trevir. ex Spreng.

Iberian starthistle

GENERAL

A biennial herbaceous plant in the aster family. It may behave as an annual or short-lived perennial in some environments. The rosettes have spines in the centre.

STEMS

One to several very branched stems, 30–200 cm tall, often form a rounded mound with a fuzzy or woolly surface.

LEAVES

Divided into narrow linear segments, hairy, blades 10–20 cm long. Leaf margins 1–2 times lobed; distal blades linear to oblong, entire to coarsely toothed or shallowly lobed.

FLOWERS

Inflorescence is a white, pink or pale purple flower head, 15–20 mm long, with straw-coloured, spine-tipped bracts. Heads borne singly or in leafy groups, stemless or on short stems. The bracts below the flowers are greenish, with frayed margins, spiny-fringed at base, each tipped by a stout spreading spine 1–3 cm long.

FRUITS/SEEDS

The achenes are smooth, white- or brown-streaked, 3–4 mm long and have a white pappus that is 1.0–2.5 mm long.

ROOTS

Stout taproot.

DISTRIBUTION

Native to areas from eastern Europe to extreme western China and India. Introduced into the Pacific states, Wyoming and Kansas. Listed as a noxious weed in Arizona, California, Nevada and Oregon. Reported to be extirpated in Oregon and Washington. Its presence has not been reported anywhere in Canada.

INTRODUCTION AND SPREAD

Achenes can scatter over very short distances with the wind, but most spread through livestock, vehicles, equipment and contaminated hay and crop seed. Achenes can also be transported on clothing.

HABITAT

Iberian starthistle seems to be confined to disturbed areas, including over-grazed rangelands.

SIMILAR SPECIES

Iberian starthistle is very similar to purple starthistle (*Centaurea calcitrapa*) (Figure e), but is distinguished by Iberian starthistle's pappus on the achenes, lighter purple flower colour, rounder flower head and more robust growth form. In Canada, purple starthistle has been found only in Ontario.

FLOWERING TIME

June to September.

Iberian starthistle rosette.

Iberian starthistle flower head.

Iberian starthistle plants.

Iberian starthistle achenes.

Similar species: Purple starthistle flower head.

Centaurea solstitialis L.

Yellow starthistle

GENERAL

An annual weed in the aster family. Prefers dry habitats and forms extensive monocultural stands.

SEEDLINGS

Cotyledons are oblong to spatulate, with a wedge-shaped base and a square tip. They are 6–9 mm long and 3–5 mm wide.

STEMS

Erect, rigid, 15–200 cm tall, covered in cottony hairs, openly branched from near the base. Small plants can be unbranched. Leaf bases extend down stems, giving the stems a winged appearance. Largest wings are 3 mm wide.

LEAVES

Leaves are grey- to blue-green, covered with fine white, cottony hairs hiding thick, stiff hairs and glands when viewed under 10X magnification. Basal leaves are up to 15 cm long, petiolate, divided into lobes with end lobes larger and more rounded than side lobes. Stem leaves are linear and tapered toward the leaf apex. Basal leaves are usually withered or lacking at flowering.

FLOWERS

Flower heads are solitary, borne at branch tips or occasionally in branch axils. They are broadly urn-shaped and 13–17 mm long, with many yellow florets. Bracts are ovoid, pale green and lacking obvious veins, with a palmately radiating cluster of straw-coloured spines, including a 10–25 mm long stiff central spine.

FRUITS/SEEDS

Achenes from ray flowers are dark-coloured and without bristles; those from disc flowers are lighter, with a tuft of white bristles.

ROOTS

Taproot can reach a depth of 1 m.

DISTRIBUTION

Native to Eurasia, yellow starthistle is now found throughout Europe, in parts of North and South America and in Africa. Its presence has been reported in at least 40 American states and in four Canadian provinces. No established, persistent populations appear to exist anywhere in Canada. Records are historic and scattered.

INTRODUCTION AND SPREAD

Achenes with fluffy pappus bristles are wind-disseminated; bristleless seeds fall near the parent. Reported as a seed contaminant.

HABITAT

Yellow starthistle is a serious weed of roadsides, pastures and rangelands in dry areas.

SIMILAR SPECIES

Maltese starthistle (*C. melitensis*) also has yellow flowers and has been reported in southwestern British Columbia (Figure d). The spines on the involucre bracts are 5–10 mm long, whereas those of the yellow starthistle are 10–25 mm long.

FLOWERING TIME

June to October.

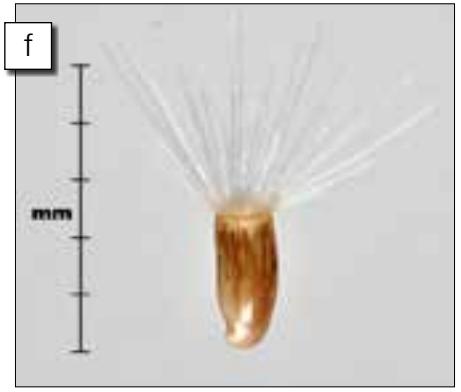
Yellow starthistle winged stems.

Yellow starthistle flower head.

Yellow starthistle plants.

Similar species: Maltese starthistle flower head.

Achene from yellow starthistle ray floret, without bristles.



Achene from yellow starthistle disc floret, with bristles.

Centaurea stoebe L.

Spotted knapweed

GENERAL

Short-lived, perennial, herbaceous plant in the aster family. Very competitive and capable of colonizing disturbed and undisturbed environments. It is especially problematic in semi-arid rangelands and pastures where it reduces desirable livestock forage species.

STEMS

One or more erect, hairy and branching stems growing up to 30–150 cm tall.

LEAVES

Rosette leaves are divided and borne on short stalks, roughly 20 cm long and 5 cm wide. Cauline leaves are alternate, with lower leaves divided into lobes and upper leaves, smaller and linear.

FLOWERS

Borne at the ends of branches. Heads are broadly urn-shaped, 10–13 mm long containing 30–40 pink to light purple, rarely white florets. Heads persist on the stiff stems throughout the winter. Bracts are mostly yellow-green to brown, smooth and strongly ribbed with a black comb-like tip, giving the flower head a distinctive spotted appearance.

FRUITS/SEEDS

Achenes are 3 mm long, 1.5 mm wide, smooth, dark greenish-brown with pale stripes and with a 1.5 mm–2.0 mm white pappus. There is a pale area around a large basal notch. The yellowish collar at the top of the achene is narrow.

ROOTS

Stout, deep taproot.

DISTRIBUTION

Native to eastern Europe and western Asia; it has been introduced to other parts of Europe as well as North America. Present in 46 U.S. states and the following Canadian provinces and territory: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia and the Yukon.

INTRODUCTION AND SPREAD

Achenes are spread by livestock, wildlife and as a contaminant of soil and hay. Achenes may also be dispersed to a limited extent by wind, leading to peripheral expansion of existing stands. Mature plants containing achenes may become associated with vehicles and dispersed great distances.

HABITAT

Open, disturbed areas including rangelands, grasslands, roadsides, riverbanks and railway lines. It can thrive in a wide range of climate and soil conditions, although it prefers well-drained, light to coarse textured soils. It tends to be managed by cultivation and is not generally considered a weed of agriculture.

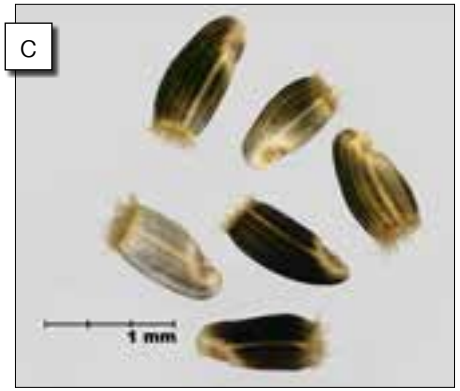
SIMILAR SPECIES

Spotted knapweed may be confused with diffuse knapweed (*Centaurea diffusa*) and other knapweed species. The unique characteristics of the floral bracts are very useful in differentiating knapweed species. Sometimes diffuse knapweed will have similarly spotted bracts, especially on purple-coloured flower forms, but these will also have a long (3 mm) terminal spine, distinctively longer than lateral spreading spines.

FLOWERING TIME

June to September.

Spotted knapweed rosette.



Spotted knapweed achenes.

Spotted knapweed plant.

Spotted knapweed flowers and flower heads, note distinctive dark tips of bracts lacking long terminal spine.

Centaurea virgata subsp. *squarrosa* (Boiss.) Gugler

Squarrose knapweed

GENERAL

Perennial herbaceous plant in the aster family. A resilient plant that tolerates heat, cold and drought. Capable of effectively competing with forage species on rangelands and reducing forage production for livestock and wildlife.

STEMS

Multiple stems are rough textured, covered in minute hairs and highly branched reaching 20–50 cm tall. Bare branched stems persist on the plants after shedding seed heads.

LEAVES

Several rosettes are formed from the woody crown. Rosette leaves are finely hairy, stalked and deeply divided into lobes. Cauline leaves are alternate and become progressively smaller and less lobed ascending the stem, with the upper cauline leaves becoming entire, linear or bract-like. Basal leaves are mostly withered and lacking at flowering.

FLOWERS

Solitary or borne in pairs at branch tips. Heads are narrow and urn-shaped, 7–8 mm long, 3–5 mm wide, containing 10–14 pink to pale purple florets. At maturity the seed heads are shed as a single unit from the plant. Bracts are pale green to straw-coloured, sometimes tinged with purple, fringed with 4–6 pairs of lateral spines and tipped with a stout, 1–3 mm spine spreading outward or curving back towards the base.

FRUITS/SEEDS

Achenes are 2.5–3.5 mm long, 1.5 mm wide, smooth, light brown to straw-coloured with a prominent central stripe and numerous less prominent stripes, and with a 1.0–2.5 mm long pappus. Achenes have a shallow notch at the base.

ROOTS

Deep, stout taproot with a woody crown.

DISTRIBUTION

Native to southeastern Europe, western and central Asia; it has naturalized in other regions of the world including Europe and North America. In the United States, it has naturalized in the west. Squarrose knapweed is not reported in Canada.

INTRODUCTION AND SPREAD

The majority of seed heads are shed near the parent plant but the spreading and recurved spines on bracts enable them to act as burs. These burs can become associated with animal wool, hair, fur, clothing or vehicles promoting long distance dispersal of achenes. Achenes may also spread in contaminated hay and soil.

HABITAT

Rangelands, pastures, open forests and other open, dry and disturbed areas such as roadsides, off-road vehicle trails and rail lines.

SIMILAR SPECIES

Easily confused with diffuse knapweed. Distinguishable from diffuse knapweed based on the following characteristics:

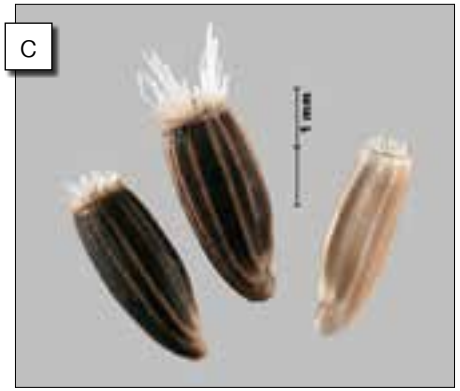
- a true perennial species,
- more slender flower head,
- bracts with terminal spines that spread outward, often bending back towards the base, and
- seed heads that are shed at maturity.

FLOWERING TIME

June to September.

Squarrose knapweed plant.

Squarrose knapweed stem and leaves.



Squarrose knapweed achenes.

Squarrose knapweed flower heads, note recurved bracts.

Crupina vulgaris Cass.

Common crupina

GENERAL

A winter annual weed in the aster family. It infests hay and forage crops, grasslands and open forest sites, and decreases pasture capacity and livestock productivity.

SEEDLINGS

Cotyledons fleshy, oblong, 1.3–2.5 cm long and have a red or purple midrib. As the plant grows, rosette leaves progress from being entire, to toothed, to lobed, to finely dissected.

STEMS

Number of stems can range from 1–15, depending on growing conditions. Main flowering stem can range from 0.3–1.2 m tall.

LEAVES

Stem leaves decrease in size with distance from the rosette and are variable in form. They generally measure 1.0–3.5 cm in length, range from entire to finely dissected, and taper to a slender, sharp tip. Blade margins are coarse and rough.

FLOWERS

Three to 130 flower heads produced per plant. Flower heads sessile or on peduncles 1–3 cm long. Each flower head is narrow, cylindrical and about 1.3 cm long. Rose or purple petals partially protrude from the scaly floral bracts.

FRUITS/SEEDS

Roughly cylindrical, banded in black and silvery beige, measuring 3–5 mm by 1.5–3.0 mm with a dense pappus of blackish-brown bristles at the apex. Achenes taper at the base, where there is an obvious attachment scar.

ROOTS

A slender taproot that grows from 1 to several metres deep.

DISTRIBUTION

Native to the Mediterranean region, it was introduced into the states of Washington, Idaho, Oregon and California. Previous reports of this species being present in Canada appear to have been erroneous; currently, it is not believed to be present in Canada.

INTRODUCTION AND SPREAD

Achenes generally fall only a few metres away from the parent plant. However, achenes can be transported with animal and human movement (including machinery), in soil and in contaminated hay, grain and seed lots.

HABITAT

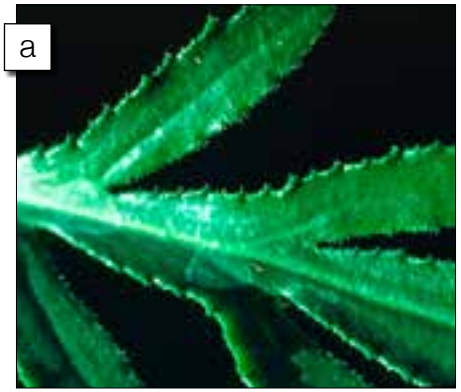
Pastures, grasslands, rangelands, hayfields, open woodlands, orchards, vineyards, roadsides, railroads and waste areas. Rarely found in cultivated crops, but may be found in field margins. Does not tolerate disturbance well.

SIMILAR SPECIES

There are no other *Crupina* species in North America. Common crupina seedlings may be distinguished from knapweed seedlings (*Centaurea* spp.) by their larger size, thick and fleshy cotyledons, and by their prominent reddish or purplish midribs. In mature plants, floral bracts of knapweed are bristly, whereas those of common crupina are not. Leaf margins of common crupina are bristly, whereas those of knapweed are not. The size and appearance of the achenes are very distinctive.

FLOWERING TIME

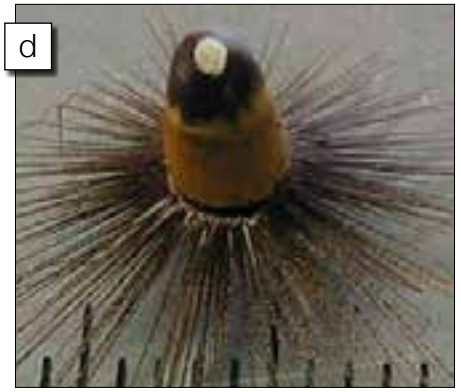
Mid-May to early June.



Common crupina leaf.

Common crupina flower head.

Common crupina seedlings.



Common crupina achene.

Bolting common crupina rosette.

Common crupina flower stalk.

Common crupina leaves and stem.

Inula britannica L.

British yellowhead

GENERAL

A biennial or perennial herbaceous plant of the aster family. Infests bulb and hosta production fields, perennial crops and pastures.

STEMS

Erect, branched, 10–75 cm tall.

LEAVES

Basal leaves are lanceolate, 4–15 cm long and 1.0–2.5 cm wide. Stem leaves are smaller, elliptical or ovate-elliptical, sessile and slightly clasping. Upper and lower surfaces are sparsely and densely pubescent, respectively. Leaf margins are entire or finely toothed.

FLOWERS

Flower heads are yellow, daisy-like and about 2.5 cm in diameter. Each flower head has 40–70+ narrow ray florets surrounding a centre of disc florets. At the base of the flower head, the involucre consists of a whorl of soft, green, linear bracts.

FRUITS/SEEDS

The fruit is an oblong, ribbed achene with flat ends, 1.0–1.5 mm long by 0.2–0.5 mm wide. The pappus has 15–25 bristles that are 4–6 mm long.

ROOTS

Produces roots and rhizomes. The rhizomes often lead to the development of 8–10 satellite plants connected to the mother plant.

DISTRIBUTION

Native to Eurasia, from Spain across much of Europe and temperate Asia, to Japan. Introduced in North America, but may not be truly established at all sites. In the United States, it has been reported from New York, Maryland, Michigan, Minnesota and Oregon. In Canada, it has been reported very locally from southern Ontario and Quebec.

INTRODUCTION AND SPREAD

This species has entered the United States in association with imported hostas, daylilies and lilies, as its roots and rhizomes become intermingled in the roots, rhizomes and bulbs of nursery stock. Populations in Canada may have occurred as a result of garden escapes. Once established it spreads by seed, which are likely wind-dispersed, and vegetatively, by rhizomes, which spread locally and to greater distances by agricultural vehicles and machinery.

HABITAT

Prefers moist habitats, including streambanks, marshes, ditches, woods, grasslands and pastures.

SIMILAR SPECIES

Two other *Inula* species have been introduced into North America: willowleaf yellowhead (*Inula salicina*) and elecampane (*Inula helenium*). The former is a very rare escape from plantings which has been reported from Massachusetts, Wisconsin and New York, but is not considered established in the United States. Elecampane is widely introduced, and in Canada is found in British Columbia and in Manitoba eastward to the Maritime provinces. Compared to British yellowhead, elecampane is a taller plant (50–200 cm), with significantly wider basal and lower stem leaves (10–20 cm) and wider involucres (15–40 mm).

FLOWERING TIME

June to September.

Young British yellowhead plant.

Mature British yellowhead plant.

British yellowhead flower heads.

British yellowhead achene.

British yellowhead flower heads showing involucres.

British yellowhead leaves and stem.

Senecio inaequidens DC.

South African ragwort

GENERAL

Short-lived, herbaceous or woody perennial shrub of the aster family. The plants contain pyrrolizidine alkaloids, which are toxic to livestock and humans.

STEMS

Erect, leafy, more or less glabrous, often branching from the base. They can reach 100 cm tall.

LEAVES

Bright green, alternate, simple, slightly thick and irregularly toothed; they usually clasp the stem. Their size is highly variable—they can grow up to 10 cm long and 1 cm wide. They taper from their base to their tip.

FLOWERS

The inflorescence is an open, broad, flat-topped cluster of flower heads. Flower heads are yellow, up to 25 mm in diameter, and composed of 7–13 female ray florets and numerous perfect disc florets.

FRUITS/SEEDS

Achenes are linear, slightly narrowed at the ends and round in cross-section; they are 2.0–2.7 mm long and 0.5–0.7 mm in diameter. The surface is densely covered in white, worm-like hairs that tend to form 9–10 rows down the length. The rough surface is brown (green when immature), with a white rim at the apex and a short peg within the rim. The long, white pappus is absent from mature fruits.

ROOTS

Shallow taproot.

DISTRIBUTION

Native to southern Africa, South African ragwort has been introduced into many European countries. Reports from Mexico and parts of South America may refer to *Senecio madagascariensis*. It is not present in Canada.

INTRODUCTION AND SPREAD

This species could be accidentally introduced into Canada with contaminated hay or grain or as a generalist contaminant on goods or travellers. Once established, achenes are dispersed naturally by wind and unintentionally by humans, in association with clothes, shoes, soil, road and rail vehicles, building materials, hay, grain, ornamental plants, livestock and wool.

HABITAT

Able to colonize a wide range of open ruderal habitats, as well as stream banks, coastal dunes, grasslands, crops and pastures.

SIMILAR SPECIES

South African ragwort is similar to other *Senecio* spp. and *Packera* spp. in Canada, such as balsam groundsel (*Packera paupercula*); however, in most cases, it is taller and has larger flower heads and/or different leaf characteristics. The achenes of South African ragwort are similar to those of common groundsel (*Senecio vulgaris*), which have a similar size, a white apex and worm-like hairs. South African ragwort achenes have straighter sides and a darker surface colour, with longer hairs over much of the surface. Achenes of Madagascar ragwort (*S. madagascariensis*) also have a very similar morphology, but those of South African ragwort are usually longer. Neither of these species is present in Canada.

FLOWERING TIME

In Europe, two main flowering periods are observed: one starting in July and one starting in September.

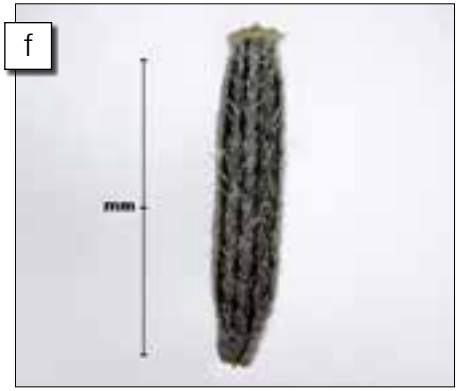
South African ragwort plants.

South African ragwort flowers.

South African ragwort mature seed head.

South African ragwort underside of flowers.

South African ragwort foliage.



South African ragwort achene.

Senecio madagascariensis Poir.

Madagascar ragwort

GENERAL

Short-lived, perennial (sometimes annual or biennial) herbaceous plant in the aster family. It is toxic to humans and animals.

STEMS

Erect and branched, reaching 60 cm tall.

LEAVES

Bright green, alternate, lanceolate to elliptic, finely to coarsely toothed, and occasionally petiolate. They grow 12 cm long and 2.5 cm wide.

FLOWERS

The inflorescence is a loose cluster of small, yellow, daisy-like flower heads. Each is 12–25 mm in diameter and has 12–13 ray florets.

FRUITS/SEEDS

The achenes are 1.4–2.7 mm long and 0.3–0.6 mm in diameter; they are elliptical, narrowed at both ends and rounded in cross-section. Short, white, worm-like hairs stretch along the length in 9–10 rows. The surface is roughened and brown in colour, with a white rim at the apex and a short peg within the rim. The long, white pappus is absent from mature fruits.

ROOTS

Shallow taproot.

DISTRIBUTION

Native to southern Africa and Madagascar, Madagascar ragwort has been introduced into Kenya, Réunion, Mauritius, United States (Hawaii), Argentina, Colombia and Australia. Its presence has not been reported in Canada.

INTRODUCTION AND SPREAD

Potential pathways for introduction into Canada include imported grass or pasture seed, or imported livestock. It can also be carried on the clothing, shoes or personal effects of travellers. Achenes are small and light and are easily dispersed by wind, wildlife and humans in association with contaminated soil, fodder and vehicles.

HABITAT

Colonizes a wide range of habitats, elevations and soil types. It is often found in arid or moist pastures, coastal plains, yards, fields and roadsides.

SIMILAR SPECIES

See *Senecio inaequidens* for similar species. The achenes of Madagascar ragwort are similar to those of common groundsel (*Senecio vulgaris*), which have a similar size, the same elliptical shape, a white apex and worm-like hairs. Madagascar ragwort achenes have a darker surface colour with longer hairs in discrete rows.

FLOWERING TIME

In Australia, it can flower year-round.

Madagascar ragwort seedling.

Madagascar ragwort flower and variable leaves.

Madagascar ragwort flowers.

Madagascar ragwort invading a field.

Madagascar ragwort plants.

Madagascar ragwort achenes.

Echium plantagineum L.

Paterson's curse

GENERAL

Annual or biennial herbaceous weed of the borage family. Toxic to livestock.

ROSETTES

Large, flat rosettes with broadly ovate leaves that reach 25 cm long, are hairy, stalked, and have distinct lateral veins.

STEMS

One to several much-branched stems; 20–60 cm tall (sometimes up to 150 cm) and covered with coarse, white bristles.

LEAVES

Basal (rosette) leaves die off as stems grow. Stem leaves are alternate, smaller and narrower than basal leaves, thick, rough, hairy, stalkless and almost stem-clasping.

FLOWERS

Flowers are purple (sometimes blue, pink, or rarely white), trumpet-shaped, 2–3 cm long, with 5 fused petals and 5 stamens. Two of the stamens are longer and protrude from the petal tube. Flowers are crowded along one side of a curved spike.

FRUITS/SEEDS

Fruit consists of 4 nutlets surrounded by a persistent calyx. Individual nutlets are strongly wrinkled and pitted, angular, 3-sided, brown to grey, and 2–3 cm long.

ROOTS

One or several taproots, branching into many finer roots.

DISTRIBUTION

Broad circum-Mediterranean native distribution. Cultivated for a variety of purposes. In Canada, historical records exist from Manitoba, Ontario and Newfoundland; has also been grown in field trials near Saskatoon, Saskatchewan. No populations persist in Canada.

INTRODUCTION AND SPREAD

Paterson's curse is planted as a garden and forage species and for its unique seed oil. Paterson's curse produces seed over much of the growing season, resulting in large seed banks. The seeds can germinate under a wide range of temperatures and can survive up to 10 years in the soil. Seeds spread by attaching to animal wool or fur, by being ingested, and in association with seed, hay, grain, soil, gravel, vehicles and equipment.

HABITAT

Pastures, roadsides and disturbed areas. May occur in agricultural fields.

SIMILAR SPECIES

Paterson's curse is similar in appearance to blueweed (*Echium vulgare*), which is common in Canada (local in the prairies). The two species can be distinguished by the number of stamens projecting beyond the flower tube (2 in Paterson's curse, 4 in blueweed) and by the shape of the rosette leaves (broadly ovate in Paterson's curse, and narrower, linear leaves with less conspicuous lateral veins in blueweed).

FLOWERING TIME

June to September.

Paterson's curse seeds.

Paterson's curse plant.

Paterson's curse flower, showing two exerted stamens.

Paterson's curse rosette, with broadly ovate leaves.

Paterson's curse growth habit.

Paterson's curse seedling.

Dodders

GENERAL

Twining annual (sometimes perennial) stem-parasitic vines of the morning glory family. Agricultural and horticultural pests of a number of different crops, they divert sugars from their hosts, weakening plants, reducing yields, and often causing total failure to set fruit.

SEEDLINGS

Seedlings are yellowish, filiform, leafless stems.

STEMS

Stems are slender, filiform, trailing or twining, often yellowish-orange, and attached to a host with numerous small haustoria.

LEAVES

Leaves are tiny, reduced, alternate scales sometimes visible on the stem.

FLOWERS

Flowers are small (usually less than 4 mm long), bell-shaped, radial, usually 4–5 parted, often whitish, pink, or cream coloured, with a fleshy or waxy texture, often occurring in clusters.

FRUITS/SEEDS

Fruits are round capsules containing up to 4 seeds. Seeds are small (usually 1–2 mm long), subglobose or ovoid, light grey to yellowish, reddish, or dark brown, with a hard seed coat and a roughened surface.

ROOTS

Mature plants are rootless.

DISTRIBUTION

The genus contains nearly 200 species worldwide with the majority of species (~75%) native to North and South America. There are currently 12 species reported in Canada; 9 native and 3 introduced.

INTRODUCTION AND SPREAD

About 15–20 dodder species are agricultural or horticultural pests. Most problems globally are attributed to field dodder (*Cuscuta campestris*), although many other species can be troublesome locally. Dodders produce large numbers of seeds that are particularly difficult to separate from small-seeded crops; their principal means of spread is with contaminated seed of forage legumes (e.g., alfalfa, clovers). Natural spread may also occur by wind, water, or birds.

HABITAT

Dodders occupy a wide variety of habitats in temperate and tropical regions. They are obligate parasites and require hosts to survive. Many species are generalists, attacking a wide range of hosts from different plant families, while others are specialists and have a narrow host range. The economically important species can parasitize many cultivated crops and may be particularly harmful to alfalfa, clover, fava bean, lespedeza, chickpeas, flax, sugar beet, potatoes, carrots and cranberries.

SIMILAR SPECIES

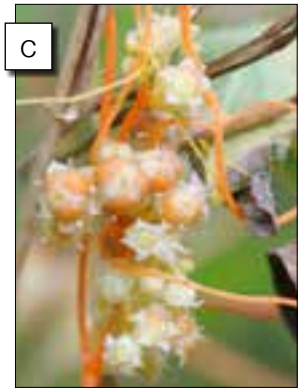
Dodders are quite distinct and not usually confused with any other plants. The genus *Cassytha* superficially resembles dodder with its similarly parasitic, twining stems, but has not been reported from Canada. Dodders are very difficult to tell apart from each other within the genus, and identification to species usually requires careful examination of flower parts under a microscope.

FLOWERING TIME

June to October.

Dodder infestation.

Five-angled dodder twining stems.



Field dodder flowers and stems.

Swamp dodder flowers and stems.

European dodder flowers and stems.

Dodder seedlings.

Field dodder seeds.

Dioscorea polystachya Turcz.

Chinese yam

GENERAL

An herbaceous, twining, perennial vine of the yam family. Invades undisturbed areas and damages trees and shrubs.

STEMS

Hairless, slender and purplish-red, up to 5 m long, twining clockwise, producing small bulbils 3 cm long and 2 cm wide in the leaf axils.

LEAVES

Broad, 3–11 cm long and 3–9 cm wide, with petioles as long as the blades. Blades are veined, glabrous, 3-lobed and can be alternate or opposite. Basal leaves are often less distinctly lobed.

FLOWERS

Flowers are small and yellowish, bell-shaped and possess a cinnamon-like fragrance. Staminate and pistillate flowers are on separate plants, with staminate inflorescences consisting of multiple flowers in bundles or spikes at branch ends and pistillate inflorescences consisting of few flowers.

FRUITS/SEEDS

Fruits are capsules 1.7–2.0 cm wide, however fruits are extremely rare in North America and if produced are often sterile. Seeds are winged.

ROOTS

Produces 1 or many large cylindrical tubers growing vertically from long stalks, buried as deep as 1 m below ground. Tubers can weigh 3.6–4.5 kg when mature.

DISTRIBUTION

Native to China, Japan, Korea, and Taiwan and naturalized and cultivated in temperate regions of the world. Introduced across the eastern United States. Established populations have not been reported in Canada.

INTRODUCTION AND SPREAD

Grown mainly as an ornamental plant in the United States, but also has medicinal and culinary uses. Reproduces through underground tubers as well as above-ground bulbils, which can be spread by rodents as well as gravity and water.

HABITAT

Prefers thickets, ravines, streams banks, creek bottoms, limesinks, granite outcrops, alluvial woods, roadsides, drainage canals, waste places and fence rows.

SIMILAR SPECIES

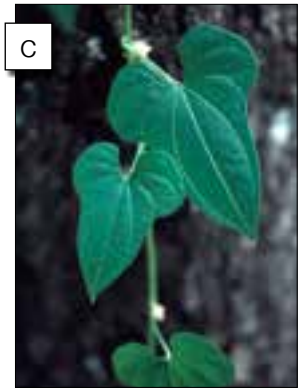
Only one other *Dioscorea* species is present in Canada, wild yam (*Dioscorea villosa*). Wild yam is a highly polymorphic species native to Ontario that varies greatly across its distribution. However, Chinese yam can be distinguished from wild yam by its lobed leaf blades, above-ground bulbils in leaf axils, glabrous leaf surfaces and underground tubers (wild yam has rhizomes).

FLOWERING TIME

June to August.

Chinese yam infestation.

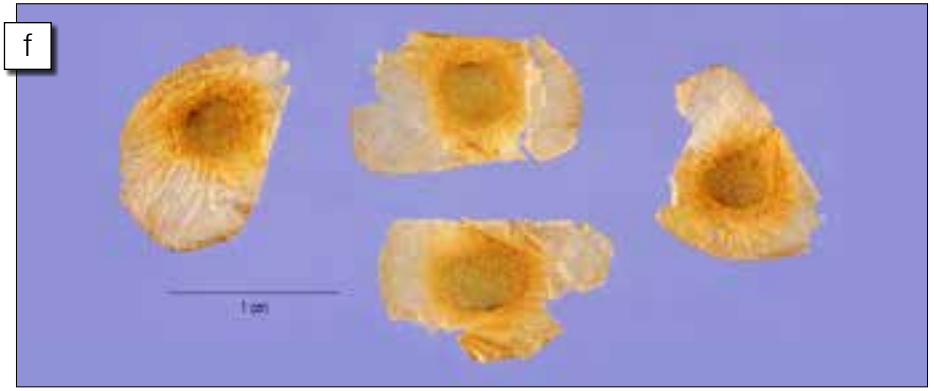
Chinese yam bulbils.



Chinese yam leaves.

Chinese yam bulbils.

Chinese yam seedling.



Chinese yam seeds.

Pueraria montana (Lour.) Merr.

Kudzu

GENERAL

An invasive, climbing, semi-woody, perennial vine in the pea family.

SEEDLINGS

Cotyledons oval to oblong. The first true leaves are opposite; subsequent leaves are alternate.

STEMS

Young vines are covered with tan to bronze hairs. Old vines are woody and can reach 10 cm in diameter and 30 m in length.

LEAVES

Deciduous, alternate, with 3 broadly ovate leaflets measuring 8–20 cm long and 5–19 cm wide. The centre leaflet is often slightly larger and has a longer stalk than the lateral leaflets. Leaflets are entire or 2–3 lobed and pubescent beneath. There are 2 leafy stipules at the base of the leaf stalk (petiole) and 2 linear bracts (stipels) at the base of each leaflet, which are readily shed.

FLOWERS

Individual flowers, which are about 2.0–2.5 cm long, are reddish-purple, highly fragrant and borne in racemes 10–20 cm long.

FRUITS/SEEDS

Seed pods are 4–13 cm long and 0.6–1.3 cm wide. They are brown, flattened, hairy and contain 3–10 hard, reddish-brown, kidney-shaped seeds with a black mosaic pattern. Seeds are approximately 3–5 mm long.

ROOTS

Develops an extensive root system with massive tuberous roots up to 45 cm wide and 2 m long at maturity, penetrating the soil to 3 m deep.

DISTRIBUTION

Native to temperate and tropical Asia and parts of Oceania, kudzu was introduced into the United States and elsewhere. In Canada, it was discovered in 2009 along the shoreline of Lake Erie, west of Leamington, Ontario but it is under official control.

INTRODUCTION AND SPREAD

Intentional planting of kudzu has been the most significant factor in its escape and spread. Once established in an area, its rapid vegetative growth allows it to spread locally. Movement of soil or equipment contaminated with kudzu seeds or plant parts can result in new introductions elsewhere.

HABITAT

Found in a variety of natural and semi-natural habitats and disturbed areas, including urban areas, roadsides, river banks, other embankments, fencerows, abandoned fields, pastures, grasslands, field edges, shrublands, conifer plantations and natural broadleaved or mixed forests.

SIMILAR SPECIES

Kudzu might be confused with other trifoliate legumes, including

- wild species, such as hog-peanut (*Amphicarpaea bracteata*) and trailing wild bean (*Strophostyles helvola*); and
- cultivated species, such as bean (*Phaseolus vulgaris*), scarlet runner bean (*P. coccineus*) and cow pea (*Vigna unguiculata*).

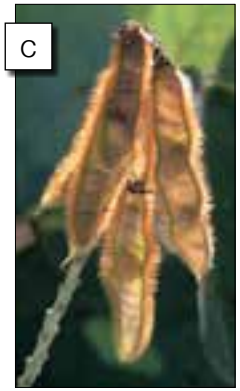
Poison ivy (*Toxicodendron radicans*) also has trifoliate leaves. Kudzu can be distinguished from other species by its climbing invasive habit, its hairy stems and leaves and its unique leaf characteristics.

FLOWERING TIME

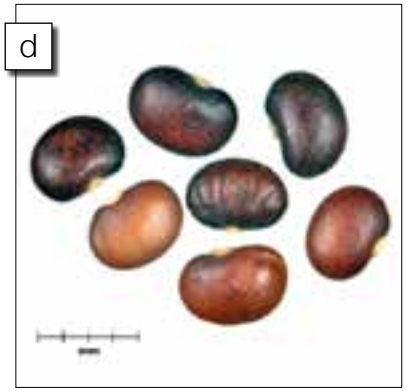
Kudzu plants flower in late summer, but usually not until their third year.

Kudzu leaf.

Kudzu plants in flower.



Kudzu seed pods.



Kudzu seeds.

Kudzu stem showing leafy stipules at base of leaf stalk.

Kudzu seedling.

Kudzu inflorescence.

Peganum harmala L.

African-rue

GENERAL

A bushy, perennial herbaceous plant in the Nitrariaceae family. It is persistent, difficult to control, and can become the dominant plant in dry rangelands. Since the plants are very unpalatable and toxic, heavily infested rangelands lose much of their forage value.

SEEDLINGS

Seedlings have 2 elongated oval cotyledons. The first true leaves are deeply dissected into 3 narrow lobes.

STEMS

Plants are erect and stiff-stemmed, growing from 30–80 cm tall.

LEAVES

Alternate, dissected and 2–5 cm long.

FLOWERS

White, solitary 5-petaled flowers, about 2.5 cm in diameter.

FRUITS/SEEDS

Numerous seeds are shed from a globose capsule that is 7–12 mm long and 12 mm wide. The long, slightly curved angular seeds are narrowly triangular in cross-section. They are 2.5–4.0 mm long and 1–2 mm wide, and look similar to orange segments under magnification. Their surfaces are rough and dull, with a honeycomb or bubbled texture. The seed colour varies from black to brown to red.

ROOTS

The rootstock is thick, robust and has a branching taproot.

DISTRIBUTION

Native to the desert regions of northern Africa, Asia (Israel to western China and Pakistan), and southern and eastern Europe, African-rue was introduced into New Mexico and has spread to scattered locations across the southwest and Pacific states. The North American populations are currently concentrated in New Mexico, Texas and Arizona. It is not present in Canada.

INTRODUCTION AND SPREAD

The most likely pathway for entry into Canada is as a seed contaminant. African-rue spreads primarily by seed. Most seeds fall close to the parent plant, but they can be moved with water flowing over soil. Animals can deposit the seeds in their droppings after feeding on the plant. Pieces of the rootstock can root and sprout if the plants are disturbed by cultivation.

HABITAT

Occurs mainly in dry grasslands and saline waste areas, but is also common along roadsides, field edges and in degraded pastures. It prefers disturbed environments.

SIMILAR SPECIES

Seedlings and small plants might be confused with some of the Asteraceae, for example, chamomile (*Matricaria chamomilla*), due to its dissected leaves. African-rue foliage is waxier and bluer than the bright green foliage of chamomile. Flowering plants are readily distinguished, as chamomile has daisy-like flowers.

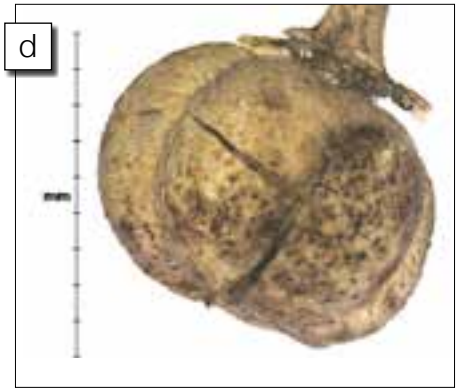
FLOWERING TIME

June to August.

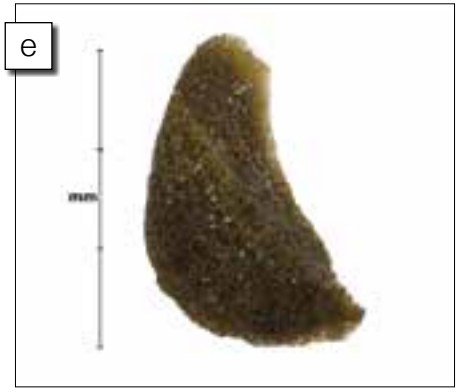
African-rue plant.

African-rue flowers.

African-rue flower.



African-rue capsule.



African-rue seed.

African-rue leaves and capsules.

Broomrapes

GENERAL

Annual, biennial or perennial root parasites of the broomrape family. Agricultural pests of many different crops, they divert sugars and water from their hosts, weakening plants and reducing yields.

SEEDLINGS

Seedlings are pale, nearly transparent, threadlike stems.

STEMS

Stems may be stout or slender, branched or unbranched, usually fleshy and pale, glandular or pubescent, white, yellow, brownish or purplish, and 10–60 cm tall (rarely more than 1 m).

LEAVES

Leaves are reduced scales or bracts, alternate or spirally arranged, sometimes overlapping.

FLOWERS

Flowers are irregular, snapdragon-like, usually 1.0–2.2 cm long and yellow, white, blue or violet, with a tubular, toothed or divided calyx, and a 2-lipped corolla, borne in terminal racemes.

FRUITS/SEEDS

Fruits are single-celled capsules containing hundreds of seeds. Seeds are minute (~0.3 mm long), ellipsoid or subglobose, black, brown, or yellowish brown, with a roughened surface.

ROOTS

Roots are poorly developed. Underground parts may consist of a swollen bulb-like structure and short, stubby roots, attached to the host via haustoria.

DISTRIBUTION

Orobanche and *Phelipanche* contain about 150 species mostly native to the Mediterranean region and western Asia. Recent phylogenetic studies propose placing an additional 20 or so related New World species into a new genus, *Aphyllon*. There are currently 6 native *Orobanche* (*Aphyllon*) species reported in Canada.

INTRODUCTION AND SPREAD

About 10 broomrape species are agricultural pests. Most problems globally are attributed to clover broomrape (*Orobanche minor*) and branched broomrape (*Phelipanche ramosa*). Broomrapes produce numerous tiny seeds that may be dispersed with seed and grain or as general hitchhikers on clothing, animals and agricultural equipment. Natural spread occurs by wind and water.

HABITAT/HOSTS

Broomrapes occupy a variety of habitats in the warmer regions of the temperate zone. They are obligate parasites and require hosts to survive. Many species are generalists, attacking a wide range of hosts from different plant families, while others are specialists and have a narrow host range. The economically important species can be particularly harmful in vegetables and legumes. They do not usually attack cereals.

SIMILAR SPECIES

Members of the *Orobanchaceae* are difficult to tell apart, and *Boschniakia*, *Conopholis* and *Kopsiopsis* are all similar to *Orobanche* and *Phelipanche* in Canada. Their inflorescences resemble compact conifer cones, whereas those of *Orobanche* and *Phelipanche* are generally looser or 1-flowered and have brighter colours. Our native *Orobanche* (*Aphyllon*) species differ from non-native broomrapes by having a calyx with 5 fully developed lobes. Identification to species requires careful examination of flowers under a microscope.

FLOWERING TIME

April to October.

Common broomrape flowers.

Branched broomrape flower close-up.

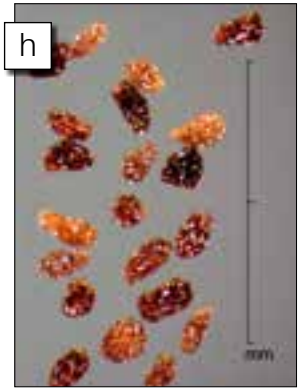
Nodding broomrape infestation in tomato.

Crenate broomrape flowering stem.

Common broomrape after flowering.

Common broomrape roots.

Common broomrape fruit capsule.



Crenate broomrape seeds.

Witchweeds

GENERAL

Annual or perennial root parasites of the broomrape family. Serious agricultural pests of cereals and legumes, they divert sugars and water from their hosts, weakening plants and reducing yields.

SEEDLINGS

Not visible above ground.

STEMS

Stems may be bright green to brown or purplish in colour, round or square in cross-section, often scabrous or sparsely hairy, usually 1.0–2.5 mm in diameter and 15–50 cm tall (rarely more than 1 m). Underground stems are white, cylindrical, thicker than aerial parts, and turn blue when exposed to air.

LEAVES

Leaves are nearly opposite, narrowly lanceolate and about 1–3 cm long (sometimes reduced to scales), with successive pairs perpendicular to one another.

FLOWERS

Flowers are small, sessile, irregular, varying widely in colour (red, orange, yellow, pink, white, blue or violet), with a ribbed, unequally lobed calyx up to 6 mm long, and a 2-lipped, tubular, recurved corolla; borne solitary in leaf axils or in spikes, usually with a pair of bracteoles.

FRUITS/SEEDS

Fruits are 5-sided capsules with narrow wings, containing hundreds of seeds. Seeds are tiny, dust-like (0.15–0.60 mm long), ovoid to oblong with a reticulate seed coat.

ROOTS

Roots are white, succulent, round, without root hairs and attached to the host via haustoria.

DISTRIBUTION

The genus contains 30–40 species mostly native to semi-arid, tropical areas of Africa. There are no witchweed species reported in Canada.

INTRODUCTION AND SPREAD

About 10 witchweed species are agricultural pests. Most problems globally are attributed to purple witchweed (*Striga hermonthica*), Asiatic witchweed (*Striga asiatica*) and cowpea witchweed (*Striga gesneroides*). Witchweeds produce thousands of tiny seeds that may be dispersed with seed and grain, soil movement and other human activities, or by adhering to the feet, fur and feathers of animals. Natural spread also occurs by wind and water.

HABITAT/HOSTS

Witchweeds generally prefer infertile soils in semi-arid tropical grasslands but can also grow in temperate regions. They are obligate parasites and require hosts to survive. Many species have co-evolved with their hosts and have narrow host ranges. The economically important species are particularly harmful in cereals such as corn, rice and sorghum, and legumes such as cowpeas.

SIMILAR SPECIES

Witchweeds can be distinguished from other root parasites by their two-lipped corollas and pronounced bend in the corolla tube. Within the genus, identification of the main species is not usually difficult, based primarily on flower characteristics, such as the number of ribs on the calyx. Seed identification requires microscopic examination.

FLOWERING TIME

July to September.

Purple witchweed infesting corn.

Purple witchweed flowers.

Asiatic witchweed plants with red and yellow flowers.

Witchweed root connections.

Asiatic witchweed plants showing pink flowers and curved corollas.

Witchweed seed capsules.

Asiatic witchweed seeds.

Jointed goatgrass

GENERAL

A winter annual in the grass family. A serious weed of winter wheat in the United States.

SEEDLINGS

The coleoptile and first leaf of seedlings are reddish- to brownish-green.

STEMS

Numerous, erect, 40–60 cm tall and branching at the base.

LEAVES

Alternate, 2–5 mm wide and 3–15 cm long. Glabrous or sparsely hairy, with hairs evenly spaced along the leaf blade margin. Auricles where the leaf sheath meets the blade are hairy. Leaves near the seed head and at the base of the plant are shorter than elsewhere on the plant.

FLOWERS

The seed head is a narrow cylinder usually 5–10 cm long with alternately arranged spikelets (or "joints") on opposite sides of the rachis. Spikelets are 8–10 mm long and usually contain 2–4 florets each. Glumes on the lower spikelets are either awnless or have one awn (0.2–0.5 cm). Glumes of apical spikelets have long awns (3–9 cm). Each spikelet contains an average of 2 seeds.

FRUITS/SEEDS

Reddish-brown caryopses, 6.5–9.0 mm long, 2 mm wide, and grooved. The lemma and palea adhere to the seed.

ROOTS

The root mass is shallow and fibrous, smaller than that of wheat.

DISTRIBUTION

Native to southeastern Europe and western Asia. Introduced into the United States, likely in contaminated winter wheat seed. It is currently found in most states. In Canada, small populations have been found in southern Ontario and British Columbia but are under official control.

INTRODUCTION AND SPREAD

Jointed goatgrass seed spreads primarily as a contaminant in wheat seed. It can also spread with farm machinery and with grain, seed and straw of other cereals.

HABITAT

Cultivated fields, pastures, disturbed areas along fences, ditches and roadsides.

SIMILAR SPECIES

Jointed goatgrass and winter wheat are similar in appearance. Jointed goatgrass seedlings may be identified by pulling up a plant and observing the joint attached near the base of the plant, just above the roots. Differences between the two species include:

- jointed goatgrass seedlings are reddish- to brownish-green, whereas those of winter wheat are whitish-green;
- jointed goatgrass seedlings are thinner;
- in older seedlings, jointed goatgrass has evenly spaced hairs along the leaf margins near the base of the leaf blade, whereas winter wheat has few or no hairs;
- the midrib of the leaf blade is inconspicuous in jointed goatgrass, but conspicuous in winter wheat;
- leaves are often shorter and there are more tillers in jointed goatgrass than in winter wheat;
- the ligule is shorter in jointed goatgrass (0.2–0.8 mm vs. 0.6–2.0 mm); and
- spikes of jointed goatgrass are much narrower and more cylindrical (Figure g).

FLOWERING TIME

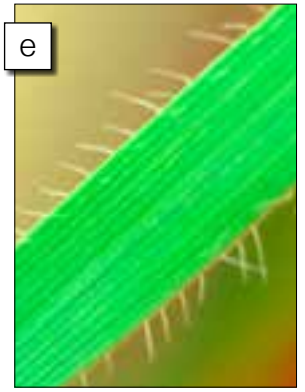
May to July.

Jointed goatgrass spikelets in wheat.

Jointed goatgrass plant.

Jointed goatgrass spikelets.

Jointed goatgrass spikes.



Hairs along margins of a jointed goatgrass leaf.

Jointed goatgrass seedlings.

Wheat (left) and jointed goatgrass (right) spikes.

Alopecurus myosuroides Huds.

Slender foxtail

GENERAL

An invasive winter annual belonging to the grass family. It reduces yields of numerous crops, particularly winter cereals, and is difficult to control due to herbicide resistance of many populations.

STEMS

Stems slender and cylindrical, growing 20–85 cm tall.

LEAVES

Leaf blades are glabrous, pointed and flat, 3–17 cm long and 3.5–6.0 mm wide. Sheaths are green or purplish and open. Auricles are absent. Ligules are membranous with a jagged edge and up to 6 mm long.

FLOWERS

Spike-like panicles are 4–12 cm long, 3–7 mm wide, compact, dense and cylindrical. They are often reddish-purple, appearing black from a distance. Spikelets contain a single floret. Glumes and lemmas are equal in length and about 4.0–7.5 mm long. Small, delicate awns from the lemmas give panicles the appearance of having short hairs.

FRUITS/SEEDS

The spikelet is the unit of dispersal. It contains a glabrous, brownish-yellow caryopsis, which is 2–3 mm long.

ROOTS

This species has a shallow root system.

DISTRIBUTION

Native to northern Africa, Asia and Europe, slender foxtail has been introduced into the United States and elsewhere. Its presence had been reported in British Columbia and Manitoba; however, populations did not persist.

INTRODUCTION AND SPREAD

Produces abundant seed, which may be transported to new areas in contaminated seed lots or on farm machinery. This species was introduced into Canada as a contaminant of grass seed. Wind is the main means of seed dispersal over short distances.

HABITAT

Moist meadows, deciduous forests, cultivated and disturbed ground. It is a significant weed of temperate cereal crops.

SIMILAR SPECIES

Slender foxtail is similar to meadow foxtail (*Alopecurus pratensis*); however, slender foxtail panicles have a smaller diameter in proportion to their length and are more tapered at each end. Slender foxtail can also be distinguished by the reddish-purple colour of the panicles. Meadow foxtail grows taller (30–110 cm tall) than slender foxtail and has longer leaf blades (6–40 cm long).

FLOWERING TIME

June to August.

Slender foxtail plant.

Slender foxtail spikelets and caryopses.

Slender foxtail plants.

Slender foxtail ligule.

Slender foxtail panicle.

Slender foxtail seedling.

Bothriochloa ischaemum (L.) Keng

Yellow bluestem

GENERAL

A perennial plant belonging to the grass family. Grows 30–80 cm tall (occasionally reaching 95 cm tall). It tends to sprawl horizontally when mown, sending up culms only when in bloom.

STEM

Stiffly erect and slender, simple or sparingly branched, solid and grooved on one side. Nodes become brown to purple and are either glabrous (var. *ischaemum*) or ringed with short hairs (var. *songarica*). Culms light green turning yellowish at maturity.

LEAVES

Often basal, blades flat to folded, 5–25 cm long and 2.0–4.5 cm wide. Papilla-based hairs on the blade, just above the collar where the sheath and blade meet, are a distinctive feature.

FLOWERS

Reddish-purple panicles reach 5–10 cm long and consist of 2–8 branches. Spikelets are arranged in pairs, each pair consisting of an awned sessile spikelet and a sterile pedicellate spikelet, both approximately 3.0–4.5 mm long. The base of sessile spikelets is hairy. Awns measure 9–17 mm long and become twisted and bent as they mature.

FRUITS/SEEDS

Caryopses enclosed within the bracts of the spikelets.

ROOTS

Occasionally almost rhizomatous.

DISTRIBUTION

Native to southern Europe and Asia, introduced and cultivated in the United States. Its presence has not been reported in Canada.

INTRODUCTION AND SPREAD

Yellow bluestem has been widely cultivated in the southern United States. It can also spread as a seed and grain contaminant, and in association with road construction and maintenance. Often abundant along roads, it tends to spread outwards from roadsides and into new areas. Yellow bluestem establishes easily from seed, which can survive a long time in soil.

HABITAT

Dry stony places, borders of fields, waste ground, roadsides, rangelands and pastures.

SIMILAR SPECIES

There are no *Bothriochloa* spp. present in Canada. Big bluestem (*Andropogon gerardii*) is similar, but is a much larger plant. Features distinguishing between the two species are:

- big bluestem is taller (1–3 m vs. less than 1 m),
- big bluestem has longer, wider leaf blades (5–50 cm long vs. 5–25 cm long; 5–10 mm wide vs. 2.0–4.5 mm wide); and
- the sessile spikelets of big bluestem are longer (5–11 mm vs. 3.0–4.5 mm) and have longer awns (8–25 mm vs. 9–17 mm).

In general, yellow bluestem can be distinguished from other grasses by the combination of reddish-purple panicles, spikelet characteristics and the papilla-based hairs on the blade just above the collar.

FLOWERING TIME

August to September.

Yellow bluestem spikes.

Yellow bluestem spikelet pairs, showing lower awned sessile spikelet and upper pedicellate spikelet.

Yellow bluestem panicle.

Yellow bluestem culm, sheath and blade.

Papilla-based hairs on yellow bluestem blade near junction of blade and sheath.

Yellow bluestem plants.

Bothriochloa laguroides (DC.) Herter

Silver beardgrass

GENERAL

A perennial in the grass family. It invades disturbed sites and rangelands.

STEMS

Erect or bent sharply at the base and branched at maturity. Usually less than 2 mm thick and growing 35–115 cm tall, occasionally reaching 130 cm. Nodes can be glabrous or possess short hairs.

LEAVES

Leaves are basal and glaucous. Ligules are 1–3 mm in length, while blades are 5–25 cm long and 2–7 mm wide, flat or folded and mostly glabrous.

FLOWERS

Inflorescence consists of panicles, silvery-white or light tan in colour and 4–12 cm long, narrowly oblong or lanceolate. Rachises are 4–8 cm long, with more than 10 branches; each branch is 1.0–5.5 cm long. Spikelets are smooth and shiny with white hairs, consisting of sessile spikelets 2.5–4.5 mm long and sterile pedicellate spikelets 1.5–2.5 mm long. Awns measure 8–16 mm.

FRUITS/SEEDS

Fruits are caryopses enclosed within spikelets, lanceolate to oblong in shape and somewhat flattened.

ROOTS

Shallow, fibrous root system.

DISTRIBUTION

Native to North and South America. The plant is widespread across the southern United States. Its presence has not been reported in Canada.

INTRODUCTION AND SPREAD

Intentionally cultivated and traded as an ornamental plant in the United States. The subspecies *Bothriochloa laguroides* susbp. *torreyana* has also been cultivated as a forage crop and used in landscaping. Dispersed naturally by wind or animals. No evidence has been found that the plant is being sold in Canada.

HABITAT

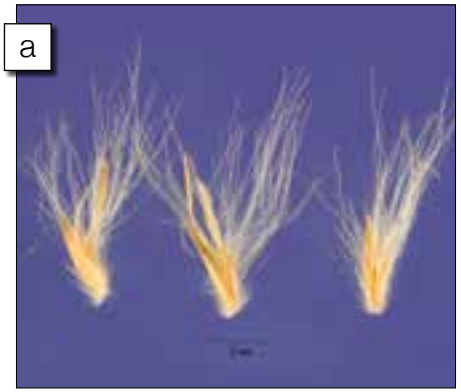
Prefers well-drained soils of grasslands, prairies, roadsides, river bottoms and woodlands, often on limestone.

SIMILAR SPECIES

Silver beardgrass is similar to yellow bluestem (*Bothriochloa ischaemum*) in size, shape, and colour. Yellow bluestem spikelets are approximately 1 mm longer than silver beardgrass. The back of the outer bracts of silver beardgrass spikelets are smooth, while those of yellow bluestem are furrowed with purple tips. Teeth on the back of yellow bluestem bracts are larger, and hairs at the tips of pedicels are 3 mm shorter than those of silver beardgrass.

FLOWERING TIME

May to November in southern regions of the United States, unknown for Canada.



Silver beardgrass spikelets.

Silver beardgrass plants.

Silver beardgrass infestation.

Silver beardgrass inflorescence.

Silver beardgrass spikelet, inner side.

Silver beardgrass spikelet, outer side.

Eriochloa villosa (Thunb.) Kunth

Woolly cupgrass

GENERAL

An invasive annual plant belonging to the grass family.

SEEDLINGS

Large in size. Similar to foxtails, but its leaves are larger.

STEMS

Stems are erect or partially decumbent, growing 30–200 cm tall. They are smooth and hairless, except at the tip and at the inflorescence axis.

LEAVES

Leaf blades are 10–20 cm long and 5–12 mm wide. One edge of the leaf blade is typically crinkled. Plants are densely hairy on both blades and sheath, giving them a velvety feel. Auricles are absent and the ligule is a fringe of fine hairs.

FLOWERS

Panicles are 3–16 cm long, with 3–8 raceme-like branches extending out from 1 side. Branches are 2–7 cm long, with 2 rows of solitary spikelets on the lower side. The central axis of the panicle and the branches are very woolly.

FRUITS/SEEDS

Ovate-elliptic, 4.5–5.0 mm long and 2–3 mm wide. Colour ranges from green to tan, depending on maturity. Seeds have a unique, cup-like depression at the base.

ROOTS

Fibrous or thread-like.

DISTRIBUTION

Native to Asia, woolly cupgrass has been introduced into the United States and elsewhere. In Canada, this species has been found at several sites in southern Quebec.

INTRODUCTION AND SPREAD

The most likely means of introduction into Canada is contaminated farm machinery. Once established, plants are spread by seed; however, the means of natural seed dispersal is unknown.

HABITAT

Weed of cultivated fields. Also found in open grassy places, hillsides, roadsides and wastelands.

SIMILAR SPECIES

Woolly cupgrass is similar to *Setaria* spp., *Paspalum* spp., *Digitaria* spp. and *Echinochloa crus-galli* (barnyard grass). Woolly cupgrass can be distinguished from the others by:

- its wider leaf blades,
- its terminal panicles with raceme-like branches, and
- its seeds with a cup-like callus at the base.

FLOWERING TIME

Early August to October.

Woolly cupgrass plants in a field.

Woolly cupgrass ligule.

Woolly cupgrass panicle.

Woolly cupgrass plants.

Woolly cupgrass spikelets.

Woolly cupgrass seedling.

Woolly cupgrass seeds.

Microstegium vimineum (Trin.) A. Camus

Japanese stiltgrass

GENERAL

A sprawling annual plant in the grass family. Invades forests and wetlands where it outcompetes native vegetation. Plants turn purple-brown in autumn.

STEMS

Stems are loosely branched, have glabrous nodes, and reach 40–120 cm in length. They are erect at first but become decumbent as they elongate, and form roots at the lower nodes.

LEAVES

Leaf blades are thin, pale green, tapered at both ends, 5–15 mm wide, 3.5–16.0 cm long, with a distinctive shiny midrib. Ligules are membranous, truncate and 0.5–1.0 mm long.

FLOWERS

The inflorescence consists of 1 to a few slender terminal racemes, 3–9 cm in length. The spikelets are 4–6 mm long, hirsute, and paired, with one spikelet sessile and the other pedicellate. Glumes are 5 mm long, pale green and awnless. Upper, fertile lemmas are usually awned; awns are 2–8 mm long.

FRUITS/SEEDS

Caryopses are ellipsoid, yellow to reddish in colour and 2–3 mm long.

ROOTS

Produces a sparse, fibrous and very short root system that is remarkably small compared to its above-ground biomass.

DISTRIBUTION

Native to countries in tropical and temperate Asia, including Russia, China, Japan, India, Nepal, Thailand and the Philippines, Japanese stiltgrass is naturalized elsewhere, including the eastern United States. It is not present in Canada.

INTRODUCTION AND SPREAD

This species could be accidentally introduced into Canada with contaminated hay or soil, or in association with travellers. Once established, plants spread by rooting at the nodes along the stem. Seeds are dispersed by water and animals, and remain viable in the soil for many years.

HABITAT

Occupies riparian habitats, lawns, woodland thickets, damp fields and roadside ditches. It is usually found under moderate to dense shade in moist conditions, but it does not persist in areas with periodic standing water or in full sunlight.

SIMILAR SPECIES

Japanese stiltgrass can be distinguished from other grasses by its thin, pale green, tapered leaf blades and multiple spikelets. It is sometimes confused with white cutgrass (*Leersia virginica*), which is native to New Brunswick, Ontario and Quebec, but which differs from Japanese stiltgrass by its glabrous nodes and the presence of hairs at the summit of the leaf sheaths. In addition, Japanese stiltgrass flowers from August to September, whereas white cutgrass flowers from June through July.

FLOWERING TIME

August to September.

Japanese stiltgrass spikelets.

Japanese stiltgrass inflorescence.

Japanese stiltgrass foliage.

Japanese stiltgrass foliage, showing purple-brown colour in autumn.

Japanese stiltgrass leaves.

Japanese stiltgrass stems, rooting at nodes.

Milium vernale M. Bieb.

Spring milletgrass

GENERAL

An invasive annual belonging to the grass family. A weed of winter wheat and pastures.

STEMS

Stems grow erect, solitary or clumped, 10–70 cm tall and are slightly rough.

LEAVES

Leaf blades are light green, flat, 1.7–8.2 cm long and 1.9–5.0 mm wide; veins and margins are slightly rough. The majority of leaf blades are concentrated at the base of the culms. Sheaths are slightly rough. Auricles are absent. Ligules are 2.4–4.5 mm long, blunt to pointed.

FLOWERS

Panicles are open, 4.0–11.5 cm long, with ascending or erect branches. Spikelets are confined to the outer half of the branches. Spikelets are elliptical, compressed, 2.5–3.0 mm long. Glumes are 2.5–3.2 mm long, slightly rough, 3-veined and pointed. Lemmas are 2.0–2.3 mm long.

FRUITS/SEEDS

The fruit is a glabrous, shiny, ellipsoid, dorsally compressed caryposis, 2.0–2.5 mm long.

DISTRIBUTION

Native in areas from western Europe to central Asia; introduced in Idaho. It is not present in Canada.

INTRODUCTION AND SPREAD

The most likely means of introduction into Canada is as a contaminant of grain or cereal seed lots from Idaho. Once established, plants spread by natural seed dispersal. Seeds do not appear to be well adapted for long-range seed dispersal.

HABITAT

Grows in winter wheat fields, other crop fields, areas near infested fields, and pastures. Prefers sandy and other light soils.

SIMILAR SPECIES

Spring milletgrass is similar to wood milletgrass (*Milium effusum*), which is native to Canada and is found from Saskatchewan to the Atlantic provinces. Spring milletgrass can be distinguished from this species by its narrower leaf blades and smaller panicles.

FLOWERING TIME

May to June.

Spring milletgrass seeds.

Spring milletgrass plant.

Spring milletgrass leaf.

Spring milletgrass flowers.

Spring milletgrass roots.

Spring milletgrass stem nodes.

Nassella trichotoma (Nees) Hack. ex Arechav.

Serrated tussock

GENERAL

A perennial, drought-resistant, tussock-forming plant in the grass family.

STEMS

The tussocks are up to 70 cm high and 60–70 cm wide at the base. The stems stand erect until the seeds are mature. The stem bases are whitish and swollen. The flowering stems are up to twice as long as leaves.

LEAVES

Leaves are bright green and upright in small plants, becoming duller and more drooping as plants mature. They feel rough when rubbed from tip to base. Leaves are narrow (0.5 mm in diameter), hard, tightly rolled and finely serrated. The leaf blade is linear with a pointed tip, 8–50 cm long. The leaf sheath is up to 16 cm long, rounded and smooth. The ligule is membranous, short (1 mm long), obtuse at the tip, white and glabrous.

FLOWERS

The inflorescence is an open, much-branched panicle, 20–35 cm long, with fine, brittle branches. The panicles are erect when young, and droop over the leaves when mature. The spikelets are small and inconspicuous. Two purplish glumes enclose each spikelet, imparting a purple tinge to the inflorescences.

FRUITS/SEEDS

The dispersed seed unit is a floret, with hard and shiny lemma and palea. The floret is 1.5–2.7 mm long and 1 mm wide, with a long awn (often broken during processing), 10–25 mm long. The florets are light brown, oval, with a hairy pointed base and a flat top; they are covered with bumps on the upper half and on a seam along 1 side.

ROOTS

Fibrous, matted and deep.

DISTRIBUTION

Native to South America, including parts of Argentina, Brazil, Chile and Uruguay, serrated tussock has been introduced into Australia, New Zealand, South Africa and, very locally, into Europe. It is not present in Canada.

INTRODUCTION AND SPREAD

Serrated tussock is most likely to enter Canada as a seed contaminant in grass seed. Plants are most likely to be found around seed handling facilities or in forage grass fields where seed imported from South America has been planted. The panicle breaks off when mature, and the florets are dispersed as the panicle tumbles along the ground.

HABITAT

Where introduced, it can become dominant in natural and planted pastures, native grasslands and open forests.

SIMILAR SPECIES

Most related grasses, while having a general structural similarity, have florets that are much larger, with stouter awns. Mexican feathergrass (*Nassella tenuissima*), is sold by nurseries in North America as an ornamental plant. Uruguayan ricegrass (*Piptochaetium montevidense*) can occur as an impurity in imported grass seed of South American origin. Uruguayan ricegrass florets are almost round in outline, dark brown, wider and covered in bumps along the length of the floret.

FLOWERING TIME

In Australia, flowers in spring and produces mature seed in summer.

Serrated tussock spikelets.

Serrated tussock seedlings.

Serrated tussock plant.

Serrated tussock inflorescence.

Serrated tussock seed.

Serrated tussock ligule.

Paspalum dilatatum Poir.

Dallis grass

GENERAL

An invasive tufted perennial in the grass family. Its dense growth habit smothers other low-growing plants in turf areas.

SEEDLINGS

Leaf blades may be hairy when young.

STEMS

Stems arise from a knotted base of short rhizomes (less than 1 cm) and grow erect (50–175 cm tall).

LEAVES

Mostly glabrous, with a few long hairs near the base on the upper surface. They are flat, 35 cm long and 2.0–16.5 mm wide. Ligules are membranous, 1.5–3.8 mm long. Auricles are absent.

FLOWERS

Inflorescence is a terminal panicle composed of 2–7 spikes. Spikes are 4–10 cm long, branching at different points along the stalk; each spike is composed of 4 rows of spikelets. The spikelets are oval, compressed, 3–4 mm long and 2–3 mm wide. They comprise 2 leathery outer bracts (glume + sterile lemma) and 2 hard, inner bracts (fertile lemma + palea). The outer bracts have white silky hairs around the edges and a distinctive central nerve.

FRUITS/SEEDS

Caryopses enclosed within the bracts of the spikelets are white to brown and 2.0–2.3 mm long.

ROOTS

The roots are fibrous with short rhizomes.

DISTRIBUTION

Native to Bolivia, Brazil, Chile, Paraguay, Uruguay and Argentina, dallis grass has been introduced into the southern United States, southern Europe, tropical and southern Africa, Asia, Australia, New Zealand, Macaronesia, the Mascarenes, Melanesia and Polynesia. Its presence has not been reported in Canada.

INTRODUCTION AND SPREAD

This species could potentially be introduced into Canada as a contaminant in turf grass seed. Its introduction elsewhere has mainly resulted from intentional planting as a forage grass. Once established, seeds are dispersed by attaching themselves to animals and people.

HABITAT

In its native range, dallis grass grows in moist grassland. Where introduced, it invades heaths, shrubland, riparian habitats and freshwater wetlands. It is also found in waste places, lawns, golf courses and other turf areas.

SIMILAR SPECIES

Dallis grass is similar to thin paspalum (*Paspalum setaceum*) and Peruvian paspalum (*Paspalum racemosum*), both of which have been reported from Ontario; however, both species are rare. Thin paspalum is a highly variable species with fewer (1–2) spikes than dallis grass and only 2 rows of alternately arranged spikelets. Peruvian paspalum can be distinguished from dallis grass by its purple nodes and numerous (40–75) spikes.

FLOWERING TIME

May to October.

Dallis grass panicles.

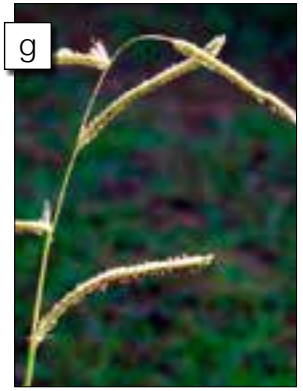
Dallis grass seedling.

Dallis grass spikelets.

Dallis grass plants.

Dallis grass spikelets on a spike.

Dallis grass ligule.



Dallis grass panicle.

Taeniatherum caput-medusae (L.) Nevski

Medusahead rye

GENERAL

A cool-season annual or winter annual in the grass family. Invades semi-arid rangelands and plant communities degraded by fire or cultivation. Its stiff awns can injure the ears, eyes, noses and tongues of livestock.

SEEDLINGS

Similar to mature plants but with narrower leaves.

STEMS

Long, slender, glabrous, 10–55 cm tall. Each stem has 3–6 nodes.

LEAVES

Leaf blades are flat or rolled inwards, 0.7–2.5 mm wide and 3–10 cm long. Auricles are sickle-shaped and 0.1–0.5 mm long. Ligules are membranous and 0.2–0.6 mm long.

FLOWERS

Produces distinctive, erect spikes, 1.2–6.0 cm long excluding awns. Spikelets are 6–45 mm long and contain 2 florets, the lower fertile and the upper highly reduced and sterile. Glumes are awn-like and reach 5–80 mm in length. Fertile florets have rough-textured lemmas which are 5.5–8.0 mm long. The lemma tip tapers into an awn 20–110 mm long. The awns are straight when green but twist and spread erratically when dry. Glumes and lemma awns have minute, upward-pointing barbs.

FRUITS/SEEDS

The fruit is a hairy, dorsally compressed caryopsis enclosed within the bracts of the floret, 4.0–5.2 mm long.

ROOTS

Roots grow quickly after autumn germination, reaching 100 cm in depth. They spread laterally in spring.

DISTRIBUTION

Native to northern Africa and Eurasia, from Portugal and Morocco to Kyrgyzstan. Introduced in the United States, Chile and Australia. In the United States, it has spread throughout rangelands and wildlands of the western states and has occurred as a rare introduction in the eastern states, where it may not persist. It is not reported in Canada.

INTRODUCTION AND SPREAD

A prolific seed producer, its seeds could be accidentally introduced into Canada in association with travelers, vehicles or animals. The barbed florets readily cling to passersby and viable seeds may be dispersed in animal droppings. Human-mediated spread can also occur in association with soil movement or contaminated seed.

HABITAT

Grows in rangelands, grasslands, sagebrush communities, woodlands, disturbed sites, and rarely, agronomic fields. Prefers areas with an annual precipitation of 22–100 cm.

SIMILAR SPECIES

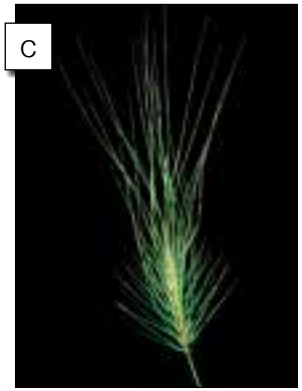
Medusahead rye is the sole member of the genus *Taeniatherum*. Its seed heads resemble those of two perennial species, foxtail barley (*Hordeum jubatum*) and long-bristled wildrye (*Elymus elymoides*). However, medusahead rye heads remain after the seeds fall, leaving a persistent, bristly head of awn-like glumes. The seedlings of medusahead rye also resemble those of downy brome (*Bromus tectorum*) but the latter are much hairier.

FLOWERING TIME

May to June or July.

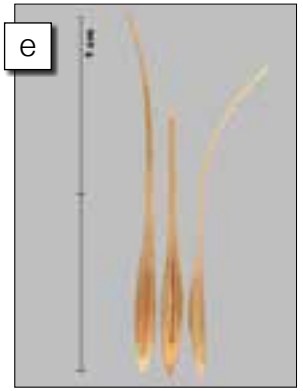
Medusahead rye plants.

Medusahead rye seed head after seed shed, showing bristly glumes.



Medusahead rye spike.

Medusahead rye seed head with florets remaining.



Medusahead rye florets with awns.

Medusahead rye infestation along roadside.

Persicaria perfoliata (L.) H. Gross

Devil's-tail tearthumb

GENERAL

Herbaceous annual or perennial vine of the buckwheat family. It is also known as mile-a-minute weed, and was formerly known as *Polygonum perfoliatum*.

STEMS

Thin, elongate, branched, sprawling and armed with recurved barbs. They are usually 1–2 m long, but can reach 7–8 m long along forest edges. Distinctive circular, cup-shaped, leafy structures called ocreae surround the stem at the nodes.

LEAVES

Alternate and roughly shaped like equal-sided triangles, 2.5–7.5 cm long and wide.

FLOWERS

Terminal spikes, or racemes, emerging from the ocreae. Individual flowers are small (3–4 mm), white and generally inconspicuous.

FRUITS/SEEDS

Fruits are a deep metallic blue colour and are arranged in clusters. Each berry-like fruit is about 5 mm in diameter and contains a single seed. Seeds are hard, glossy, black or reddish-black achenes, approximately 3 mm in diameter.

ROOTS

Shallow, weak and fibrous.

DISTRIBUTION

Native to the cool, temperate regions of eastern Asia, devil's-tail tearthumb has established in the northeastern United States and Oregon. Although its presence has been reported in the past in southwestern British Columbia, no surviving populations are known to exist in Canada.

INTRODUCTION AND SPREAD

Devil's-tail tearthumb reproduces by seed. It is also known for its remarkably rapid vegetative growth. People may unintentionally transport devil's-tail tearthumb in association with nursery stock. The seeds may be transported in root balls, or its vines may be wound around the stems of other plants. Seeds may also be transported in association with ornamental seed, hay, mulch, vehicles, equipment, clothing and baggage. Natural means of dispersal include water, ants, birds, small animals and deer.

HABITAT

Riparian areas as well as a wide variety of disturbed areas, including roadsides, hedges, fields, pasture and forest edges, early successional forests, plantations, gardens and parks.

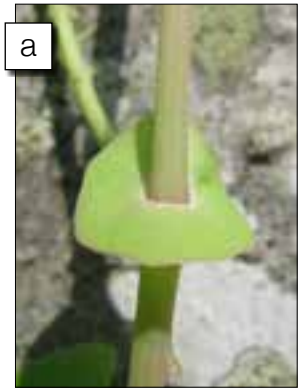
SIMILAR SPECIES

Devil's-tail tearthumb may be confused with several species in the same family, including wild buckwheat (*Fallopia convolvulus*), halberdleaf tearthumb (*Polygonum arifolium*), arrow-leaved smartweed (*Persicaria sagittata*), climbing false buckwheat (*Fallopia scandens*), fringed wild buckwheat (*Polygonum cilinode*), hedge bindweed (*Calystegia sepium*) and plants in the Convolvulaceae family, including field bindweed (*Convolvulus arvensis*), all of which are present in Canada. Two of these, halberdleaf tearthumb and arrow-leaved smartweed, are also barbed. However, devil's-tail tearthumb is easily distinguished from other vines by its:

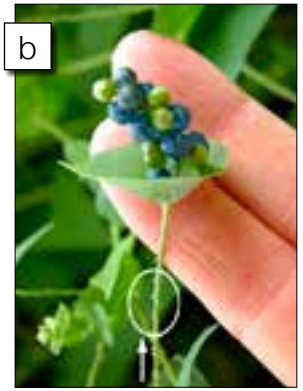
- roughly equilateral triangular leaves,
- recurved barbs on the stems and the undersides of its leaves,
- ocreae surrounding the nodes, and
- distinctive fleshy, metallic blue, berry-like fruits.

FLOWERING TIME

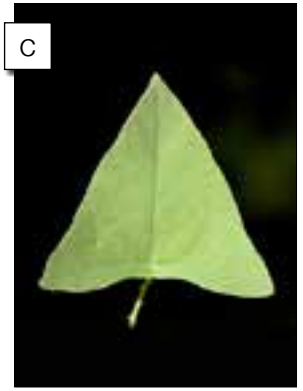
In the northeastern United States, flowering begins in June.



Devil's-tail tearthumb ocrea surrounding the stem.

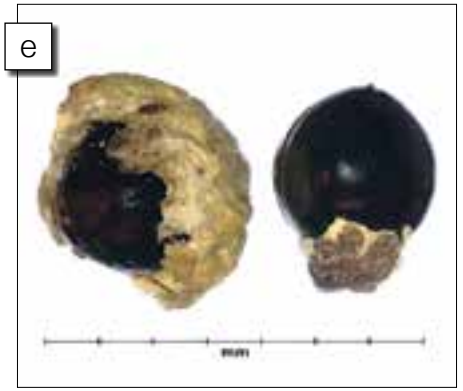


Devil's-tail tearthumb fruits and recurved barbs.



Devil's-tail tearthumb leaf.

Devil's-tail tearthumb plants.



Devil's-tail tearthumb seeds.

Devil's-tail tearthumb foliage.

Devil's-tail tearthumb stem.

Solanum elaeagnifolium Cav.

Silverleaf nightshade

GENERAL

An invasive, shrub-like, perennial plant in the nightshade family.

SEEDLINGS

Cotyledons are linear and covered with hairs; stems below the cotyledons are covered with hairs and often purple tinged.

STEMS

Plants are multi-stemmed, growing 30–60 cm tall. Stems are cylindrical, branched, and covered with short, dense, fine hairs that give the plant a silvery-white appearance. Stems have numerous, slender, yellow-to-red prickles.

LEAVES

Alternate, stalked, about 2.5–10.0 cm long and 1.0–2.5 cm wide. They are lance-shaped with wavy or scalloped edges and, like the stems, they are covered with short, dense, silvery-white hairs. The main veins have numerous, slender, yellow-to-red prickles.

FLOWERS

Star-shaped, bright blue to purple/violet (or occasionally white), with 5 fused petals and 5 prominent yellow anthers.

FRUITS/SEEDS

Clusters of smooth, globular berries are green with stripes when new and are mottled yellow/orange or brownish when ripe. Each berry contains 60–120 seeds that are flat and light, closely resembling the seeds of tomatoes.

ROOTS

Extensive, spreading root system that penetrates to depths of more than 3 m.

DISTRIBUTION

Native to southwestern United States and northeastern Mexico, silverleaf nightshade is widespread in the United States in all but the Great Lakes and New England regions. It is not present in Canada.

INTRODUCTION AND SPREAD

The most likely means of introduction into Canada would be as a contaminant in seed lots. Once established, plants spread by seed and from cut root sections. Its berries are spread by birds, animals, water and wind.

HABITAT

A variety of cultivated lands and disturbed areas, particularly in areas of low annual rainfall.

SIMILAR SPECIES

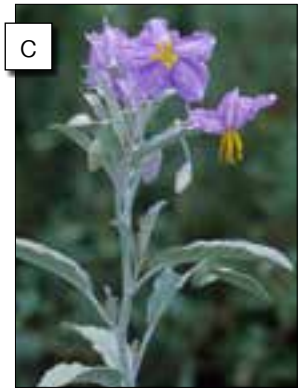
Many species of nightshade are present in Canada. Silverleaf nightshade can be distinguished from other nightshade species by its silvery-white hairs.

FLOWERING TIME

May to September.

Silverleaf nightshade plants.

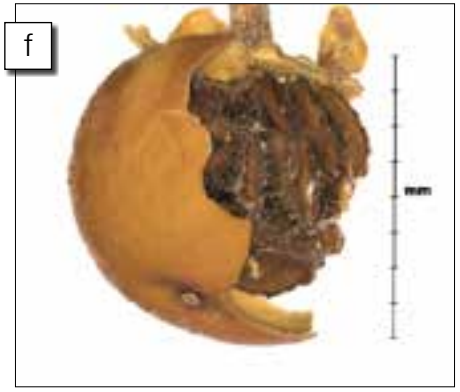
Silverleaf nightshade flower.



Silverleaf nightshade flowers.

Silverleaf nightshade fruit.

Silverleaf nightshade seeds.



Silverleaf nightshade fruit.

Silverleaf nightshade leaves.

Zygophyllum fabago L.

Syrian bean-caper

GENERAL

An invasive, multi-branched, herbaceous plant in the creosote bush family. In cold environments, this species can function as an annual.

STEMS

Smooth, thickened, multi-branched and up to 1 m tall. Plants grow as wide as they are tall and have a bushy appearance. Basal shoots are spreading and upper shoots are ascending.

LEAVES

Succulent, opposite and compound, with 2 leaflets. Leaflets are oval, 15–26 mm long and 10–18 mm wide.

FLOWERS

Individual flowers are borne from the leaf axis with 5 green sepals and 5 white petals with salmon markings. Ten orange stamens extend past the petals.

FRUITS/SEEDS

Fruit is a 5-valved capsule with a single seed in each valve. Capsules are oblong, cylindrical and 5-sided; they are 20–35 mm long and 4–6 mm wide. Seeds are 3 mm long, oblong, compressed, rough and shiny.

ROOTS

Stout, deep, well-developed taproot with creeping lateral roots. Lateral roots can produce new plants.

DISTRIBUTION

Native to eastern Europe, the Middle East and central Asia, Syrian bean-caper has been introduced into Washington, Idaho and elsewhere. Its presence has not been reported in Canada.

INTRODUCTION AND SPREAD

The most likely means of introduction is intentional planting in ornamental gardens. Plants can spread by root fragments and seed dispersal; however, the natural means of seed dispersal is unknown. Once established, plants form large, dense colonies.

HABITAT

Disturbed areas, including roadsides, corrals and gravel pits.

SIMILAR SPECIES

No similar species are present in Canada.

FLOWERING TIME

May to August.

Syrian bean-caper flowers and leaves.

Syrian bean-caper plant.

Syrian bean-caper seeds.

Syrian bean-caper flower.

Syrian bean-caper leaves and capsules.

Syrian bean-caper infestation.

Federal Regulations

The species included in this field guide are federally regulated in Canada as pests under the *Plant Protection Act* and/or as prohibited noxious weed seeds under the *Weed Seeds Order* of the *Seeds Act* as indicated in the following table.

Scientific Name	*Plant Protection Act*	*Weed Seeds Order*
Aegilops cylindrica	X	X
Alopecurus myosuroides	X	X
Bothriochloa ischaemum		X
Bothriochloa laguroides		X
Centaurea diffusa		X
Centaurea iberica	X	X
Centaurea solstitialis	X	X
Centaurea stoebe		X
Centaurea virgata subsp. *squarrosa*		X
Crupina vulgaris	X	X
Cuscuta spp. *	X	X
Dioscorea polystachya	X	
Echium plantagineum	X	X
Eriochloa villosa	X	X
Halogeton glomeratus		X
Inula britannica		X
Microstegium vimineum	X	
Milium vernale		X
Nassella trichotoma	X	X
Orobanche spp. * and *Phelipanche* spp.	X	
Paspalum dilatatum	X	X
Peganum harmala		X
Persicaria perfoliata	X	X
Pueraria montana	X	X
Senecio inaequidens	X	X
Senecio madagascariensis	X	X
Solanum elaeagnifolium	X	X
Striga spp.	X	
Taeniatherum caput-medusae		X
Zygophyllum fabago	X	X

** Native species are not regulated under the Plant Protection Act*

More information on plants regulated as pests under the *Plant Protection Act* and the *Weed Seeds Order* of the *Seeds Act* can be found at www.inspection.gc.ca.

Glossary

ACHENE: A 1-seeded, dry hard fruit that does not open when ripe.

ANNUAL: A plant that germinates, flowers and whose seeds ripen in one year.

APETALOUS: Without petals.

AURICLE: An ear-shaped appendage (the "ear") at the base of a leaf.

AWN: A bristle, often found on grass flowers.

AXIL: The upper angle formed where a leaf stalk or a branch joins a stem.

BERRY: A pulpy fruit with several seeds, such as a currant or grape.

BIENNIAL: Of two years' duration.

BLADE: The expanded part of a leaf.

BRACT: A reduced leaf or scale, often borne below a flower or flower cluster.

BRACTEOLE: A small bract, especially when borne on the pedicel of a flower.

CALYX: The outer floral ring comprising sepals; usually green, but sometimes brightly coloured.

CAPSULE: A dry fruit consisting of two or more chambers that open at maturity.

CARYOPSIS: A grain, as in the grasses.

CAULINE: Belonging or attached to the stem.

COLEOPTILE: A protective, cylindrical, sheath-like structure that surrounds the shoot apex in cereal and grass embryos.

COLLAR: The outer side of a grass leaf at the juncture of the blade and the sheath.

COROLLA: The inner floral ring, composed of free or united petals.

COTYLEDON: The first leaf from the seed, sometimes called the seed leaf.

CULM: The stem of a grass or sedge.

DECUMBENT (STEM): A stem whose base lies on the ground and whose tip grows upright.

DISC FLOWER: A tubular, radially symmetric flower (i.e., floret) of the Asteraceae family, with male and female organs.

FILIFORM: Thread-like, long and very slender.

FLORET: A single flower, usually part of a composite head or cluster.

GLABROUS: Smooth, without hairs.

GLANDULAR: Possessing glands.

GLUME: A scaly bract on the floral parts of grasses and sedges.

HAUSTORIA: Specialized projections from a parasitic plant that enable it to absorb nutrients from its host.

INFLORESCENCE: An arrangement of flowers in a cluster.

INVOLUCRE: The whorl of bracts below a flower cluster, or around a flower belonging to the aster family (Asteraceae).

LEAFLET: A division of a compound leaf.

LEMMA: The lower of the two bracts enclosing a grass flower.

LIGULE: A strap-shaped organ, as in the collar of a grass blade.

Glossary cont.

MIDRIB: The central vein of a leaf or other organ.

NODE: The place on a stem where leaves grow or normally arise; the solid part of a culm.

OBOVATE (LEAF): An egg-shaped leaf, with the widest part near the tip.

NUTLET: A small nut.

PALEA: The inner of two bracts enclosing a grass flower.

PANICLE: A branched cluster of flowers, each stalked; the lower branches are the longest and open first.

PAPILLA: A minute, nipple-shaped projection.

PAPPUS: The bristly or scale-like appendage on the fruits of the Asteraceae family.

PEDICELLATE: Having, or attached by, a pedicel.

PERENNIAL: A plant that persists for two or more years.

PETIOLE: The stalk of a leaf.

PINNATE (COMPOUND LEAF): With leaflets (pinnae) arranged on each side of a common axis.

PUBESCENT: Covered with hairs.

RACEME: A flower cluster, with each flower borne on a short stalk from a common stem.

RAY FLOWER: A flower (i.e., floret) of the Asteraceae family that has a pistil or is neutral, and that has a three-lobed, strap-shaped lip.

RHIZOME: A creeping, underground stem.

ROSETTE: A dense cluster of leaves on a very short stem or axis.

SCABROUS: Surface rough to the touch, due to minute projections.

SEPAL: One of the separate parts of a calyx, usually green and leaf-like.

SESSILE: Without a stalk.

SHEATH: A long, tubular structure surrounding some part of a plant.

SPIKE: A flower cluster, the individual flowers of which are stalkless, borne on a common stalk.

SPIKELET: A secondary spike, especially in grasses and sedges.

STIPEL: A stipule of a leaflet.

STIPULE: An appendage at the base of a leaf.

TILLER: A shoot growing from the base of the stem of a grass plant.

TRUNCATE: Appearing as if cut off transversely straight at the end.

UTRICLE: A thin-walled, 1-seeded, more or less inflated fruit.

VALVE: The units or pieces of a capsule or pod.

WINTER ANNUAL: A plant that germinates between late summer and early spring, and that flowers and produces seeds in mid- to late spring, after which it dies.

Sources for glossary:

Hickey, M. and C. King, 2000. The Cambridge Illustrated Glossary of Botanical Terms. Cambridge University Press, Cambridge, United Kingdom.

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Uva, R.H., J.C. Neal, and J.M. DiTomaso, 1997. Weeds of the Northeast. Cornell University Press, Ithaca, New York.

Photo Credits

Aegilops cylindrica—Jointed goatgrass

Caption: Jointed goatgrass spikelets in wheat.
Source: http://www.invasive.org/weedcd/species/5038.htm
Attribution: Phil Westra, Colorado State University, www.bugwood.org

Caption: Jointed goatgrass plant.
Attribution: Sam Brinker, Ontario Ministry of Natural Resources—Natural Heritage Information Centre.

Caption: Jointed goatgrass spikelets.
Attribution: Sam Brinker, Ontario Ministry of Natural Resources—Natural Heritage Information Centre.

Caption: Jointed goatgrass spikes.
Attribution: Sam Brinker, Ontario Ministry of Natural Resources—Natural Heritage Information Centre.

Caption: Hairs along margins of a jointed goatgrass leaf.
Source: http://www.invasive.org/weedcd/species/5038.htm
Attribution: Steve Dewey, Utah State University, www bugwood.org

Caption: Jointed goatgrass seedlings.
Source: http://www.invasive.org/weedcd/species/5038.htm
Attribution: Steve Dewey, Utah State University, www.bugwood.org

Caption: Wheat (left) and jointed goatgrass (right) spikes.
Source: http://www.invasive.org/weedcd/species/5038.htm
Attribution: United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, www.bugwood.org

Alopecurus myosuroides—Slender foxtail

Caption: Slender foxtail plant.
Attribution: Richard Old, XID Services, Inc., www.bugwood.org

Caption: Slender foxtail spikelets and caryopses.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Slender foxtail plants.
Source: http://www.biolib.de/
Attribution: Kurt Stueber.

Caption: Slender foxtail ligule.
Source: http://www.jvsystem.net/app19/Species.aspx?pk=10055&lng_user=2
Attribution: Luděk Tyšer, www.weed-atlas.eu

Caption: Slender foxtail panicle.
Source: http://www.jvsystem.net/app19/Species.aspx?pk=10055&lng_user=2
Attribution: Pavel Hamouz, www.weed-atlas.eu

Caption: Slender foxtail seedling.
Source: http://www.jvsystem.net/app19/Species.aspx?pk=10055&lng_user=2
Attribution: Pavel Hamouz, www.weed-atlas.eu

Bothriochloa ischaemum—Yellow bluestem

Caption: Yellow bluestem spikes.
Source: http://www.wnmu.edu/academic/nspages2/gilaflora/bothriochloa_ischaemum.html
Attribution: Russ Kleinman and Bill Norris, Western New Mexico University Department of Natural Sciences and the Dale A. Zimmerman Herbarium.

Caption: Yellow bluestem spikelet pairs, showing lower awned sessile spikelet and upper pedicellate spikelet.
Source: http://www.biosci.utexas.edu/prc/DigFlora/KR/BOISS-morph.html
Attribution: Bob Harms, University of Texas, Plant Resource Center.

Caption: Yellow bluestem panicle.
Source: http://www.biosci.utexas.edu/prc/DigFlora/KR/BOISS-morph.html
Attribution: Bob Harms, University of Texas, Plant Resource Center.

Caption: Yellow bluestem culm, sheath and blade.
Source: http://www.biosci.utexas.edu/prc/DigFlora/KR/BOISS-morph.html
Attribution: Bob Harms, University of Texas, Plant Resource Center.

Caption: Papilla-based hairs on yellow bluestem blade near junction of blade and sheath.
Source: http://www.biosci.utexas.edu/prc/DigFlora/KR/BOISS-morph.html
Attribution: Bob Harms, University of Texas, Plant Resource Center.

Caption: Yellow bluestem plants.
Source: http://www.tropicalforages.info/key/Forages/Media/Html/Bothriochloa_ischaemum.htm
Attribution: Bill Ocumpaugh.

Bothriochloa laguroides—Silver beardgrass

Caption: Silver beardgrass spikelets.
Source: https://commons.wikimedia.org/wiki/
Attribution: Jose Hernandez, Agricultural Research Service, United States Department of Agriculture.

Caption: Silver beardgrass plants.
Source: https://plants.usda.gov/gallery/pubs/bola2_001_php.jpg
Attribution: Patrick J. Alexander, Agricultural Research Service, United States Department of Agriculture.

Caption: Silver beardgrass infestation.
Source: https://bugwoodcloud.org/images/768x512/1392211.jpg
Attribution: Charles T. Bryson, USDA Agricultural Research Service, Bugwood.org

Caption: Silver beardgrass inflorescence.
Source: https://bugwoodcloud.org/images/768x512/1391336.jpg
Attribution: John D. Byrd, Mississippi State University, Bugwood.org

Caption: Silver beardgrass spikelet, inner side.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Caption: Silver beardgrass spikelet, outer side.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Centaurea diffusa—Diffuse knapweed

Caption: Diffuse knapweed rosette.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5366168
Attribution: K. George Beck and James Sebastian, Colorado State University. Bugwood.org

Caption: Tumbling diffuse knapweed trapped in pasture fence.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5366160
Attribution: K. George Beck and James Sebastian, Colorado State University. Bugwood.org

Caption: Diffuse knapweed achenes.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Caption: Diffuse knapweed flowers showing varying flower colour forms. Note fringed bracts tipped with spines.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5374330
Attribution: Joseph M. DiTomaso, University of California - Davis. Bugwood.org

Centaurea iberica—Iberian starthistle

Caption: Iberian starthistle rosette.
Source: http://flora.huji.ac.il/browse.asp?action=specie&specie=CENIBE&fileid=6001
Attribution: Avinoam Danin, The Hebrew University of Jerusalem.

Caption: Iberian starthistle flower head.
Source: http://www.treknature.com/gallery/Middle_East/Turkey/photo188099.htm
Attribution: Ozgur Kocak, TrekNature.

Caption: Iberian starthistle plants.
Source: http://calphotos.berkeley.edu/cgi/img_query?query_src=&seq_num=104265&one=T
Attribution: Dean Kelch, California Department of Food & Agriculture.

Caption: Iberian starthistle achenes.
Source: http://calphotos.berkeley.edu/cgi/img_query?query_src=&seq_num=103629&one=T
Attribution: Dean Kelch, California Department of Food & Agriculture.

Caption: Similar species: Purple starthistle flower head.
Source: http://www.nwcb.wa.gov/detail.asp?weed=25
Attribution: Washington State Noxious Weed Control Board.

Centaurea solstitialis—Yellow starthistle

Caption: Yellow starthistle winged stems.
Source: http://www.wnmu.edu/academic/nspages2/gilaflora/centaurea_solstitialis.html
Attribution: Russ Kleinman.

Caption: Yellow starthistle flower head.
Source: http://www.wnmu.edu/academic/nspages2/gilaflora/centaurea_solstitialis.html
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Caption: Yellow starthistle plants.
Source: http://www.wnmu.edu/academic/nspages2/gilaflora/centaurea_solstitialis.html
Attribution: Russ Kleinman.

Caption: Similar species: Maltese starthistle flower head.
Source: http://www.pbase.com/lethrus/image/51281053/original
Attribution: Guy Bruyea.

Caption: Achene from yellow starthistle ray floret, without bristles.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Achene from yellow starthistle disc floret, with bristles.
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Centaurea stoebe—Spotted knapweed

Caption: Spotted knapweed rosette.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1459267
Attribution: Steve Dewey, Utah State University.

Caption: Spotted knapweed plant.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5456029
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Caption: Spotted knapweed achenes.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Caption: Spotted knapweed flowers and flower heads, note distinctive dark tips of bracts lacking long terminal spine.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5374335
Attribution: Joseph M. DiTomaso, University of California – Davis, Bugwood.org

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Centaurea virgata subsp. ***squarrosa***—Squarrose knapweed

Caption: Squarrose knapweed flower heads, note recurved bracts.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5374341
Attribution: Joseph M. DiTomaso, University of California – Davis. Bugwood.org

Caption: Squarrose knapweed plant.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1624009
Attribution: Steve Dewey, Utah State University. Bugwood.org

Caption: Squarrose knapweed stem and leaves.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5374342
Attribution: Joseph M. DiTomaso, University of California - Davis. Bugwood.org

Caption: Squarrose knapweed achenes.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
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Crupina vulgaris—Common crupina

Caption: Common crupina leaf.
Source: http://www.forestryimages.org/browse/detail.cfm?imgnum=1459127
Attribution: Utah State University Archive, www.bugwood.org

Caption: Common crupina flower head.
Source: http://www.stammer.nl/gallery13/225_2586_crupina_vulgaris_std.jpg
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Caption: Common crupina seedlings.
Attribution: Cindy Roché.

Caption: Common crupina achene.
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Caption: Bolting common crupina rosette.
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Caption: Common crupina flower stalk.
Source: http://www.weedimages.org/browse/detail.cfm?imgnum=5231085
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Caption: Common crupina leaves and stem.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5374425
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Cuscuta spp.—Dodders

Caption: Dodder infestation.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=2124085
Attribution: Chris Evans, University of Illinois, www.bugwood.org

Caption: Five-angled dodder twining stems.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1116055
Attribution: Charles T. Bryson, USDA Agricultural Research Service, www.bugwood.org

Caption: Field dodder flowers and stems.
Source: https://commons.wikimedia.org/wiki/Cuscuta#/media/File:Cuscuta_campestris.jpeg
Attribution: Kristian Peters.

Caption: Swamp dodder flowers and stems.
Attribution: Mihai Costea, Wilfrid Laurier University.

Caption: European dodder flowers and stems.
Source: https://commons.wikimedia.org/wiki/Cuscuta#/media/File:Cuscuta_europaea_(flowers).jpg
Attribution: Hans Hillewaart.

Caption: Dodder seedlings.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1149022
Attribution: USDA APHIS PPQ – Oxford, North Carolina, www.bugwood.org

Caption: Field dodder seeds.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Dioscorea polystachya—Chinese yam

Caption: Chinese yam leaves.
Source: https://bugwoodcloud.org/images/768x512/1237002.jpg
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Caption: Chinese yam bulbils.
Source: https://bugwoodcloud.org/images/768x512/1237053.jpg
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Caption: Chinese yam bulbils.
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Caption: Chinese yam infestation.
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Caption: Chinese yam seedling.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5377469
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Caption: Chinese yam seeds.
Source: https://plants.usda.gov/gallery/large/diop_001_lhp.jpg
Attribution: Steve Hurst, Agricultural Research Service, United States Department of Agriculture.

Echium plantagineum—Paterson's curse

Caption: Paterson's curse growth habit.
Source: https://commons.wikimedia.org/wiki/File:Echium_plantagineum_(Puntallana)_01.jpg
Attribution: Frank Vincentz.

Caption: Paterson's curse plant.
Source: http://www.oregon.gov/ODA/PLANT/WEEDS/profile_pcurse.shtml
Attribution: Tim Butler, Oregon Department of Agriculture.

Caption: Paterson's curse flower, showing two exerted stamens.
Attribution: Ken Allison, Canadian Food Inspection Agency.

Caption: Paterson's curse rosette, with broadly ovate leaves.
Source: http://www.oregon.gov/ODA/PLANT/WEEDS/profile_pcurse.shtml
Attribution: Tim Butler, Oregon Department of Agriculture.

Caption: Paterson's curse seedling.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5374619
Attribution: Joseph M. DiTomaso, University of California – Davis, www.bugwood.org

Caption: Paterson's curse seeds.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Eriochloa villosa—Woolly cupgrass

Caption: Woolly cupgrass plants in a field.
Attribution: Mylène Bourgeois, Canadian Food Inspection Agency.

Caption: Woolly cupgrass ligule.
Source: http://www.mapaq.gouv.qc.ca/dgpar/arico/herbierv/erbvi/f-erio/factsheetx.htm
Attribution: Romain Néron, Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec.

Caption: Woolly cupgrass panicle.
Source: http://www.mapaq.gouv.qc.ca/dgpar/arico/herbierv/erbvi/f-erio/factsheetx.htm
Attribution: Romain Néron, Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec.

Caption: Woolly cupgrass plants.
Source: http://www.mapaq.gouv.qc.ca/dgpar/arico/herbierv/erbvi/f-erio/factsheetx.htm
Attribution: Romain Néron, Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec.

Caption: Woolly cupgrass spikelets.
Source: http://www.mapaq.gouv.qc.ca/dgpar/arico/herbierv/erbvi/f-erio/factsheetx.htm
Attribution: Romain Néron, Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec.

Caption: Woolly cupgrass seedling.
Source: http://www.mapaq.gouv.qc.ca/dgpar/arico/herbierv/erbvi/f-erio/factsheetx.htm
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Caption: Woolly cupgrass seeds.
Source: http://www.mapaq.gouv.qc.ca/dgpar/arico/herbierv/erbvi/f-erio/factsheetx.htm
Attribution: Romain Néron, Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec.

Halogeton glomeratus—Halogeton

Caption: Halogeton plants.
Source: https://www.ipmimages.org/browse/detail.cfm?&imgnum=5164043
Attribution: Clinton Shock, Oregon State University, Bugwood.org

Caption: Young halogeton plant.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5164048
Attribution: Clinton Shock, Oregon State University, Bugwood.org

Caption: Halogeton flowers.
Source: https://www.ipmimages.org/browse/detail.cfm?imgnum=5164045
Attribution: Clinton Shock, Oregon State University, Bugwood.org

Caption: Halogeton leaves and stem.
Source: http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0810+0518
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Caption: Halogeton utricles, one enclosed in perianth.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Caption: Halogeton utricle enclosed in perianth with wings.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Inula britannica—British yellowhead

Caption: Young British yellowhead plant.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1265070
Attribution: Robert Richardson, Michigan State University, Bugwood.org

Caption: Mature British yellowhead plant.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1265077
Attribution: Robert Richardson, Michigan State University, Bugwood.org

Caption: British yellowhead flower heads.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1265071
Attribution: Robert Richardson, Michigan State University, Bugwood.org

Caption: British yellowhead leaves and stem.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1265072
Attribution: Robert Richardson, Michigan State University, Bugwood.org

Caption: British yellowhead flower heads showing involucres.
Source: https://commons.wikimedia.org/wiki/
Attribution: Public domain.

Caption: British yellowhead achene.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Photo Credits cont.

Microstegium vimineum—Japanese stiltgrass

Caption: Japanese stiltgrass spikelets.
Source: http://plants.usda.gov/java/profile?symbol=MIVI&photoID=mivi_002_ahp.tif
Attribution: Steve Hurst.

Caption: Japanese stiltgrass inflorescence.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5483868
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Caption: Japanese stiltgrass foliage.
Source: http://www.invasive.org/species/subject.cfm?sub=3051
Attribution: Chuck Bargeron.

Caption: Japanese stiltgrass foliage, showing purple-brown colour in autumn.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5483848
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Caption: Japanese stiltgrass leaves.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5483577
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Caption: Japanese stiltgrass stems, rooting at nodes.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5483861
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Milium vernale—Spring milletgrass

Caption: Spring milletgrass seeds.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Spring milletgrass plant.
Attribution: T. Prather, S. Robins, and D. Morishita. 2010. Idaho's Noxious Weeds, 5th ed. Bulletin 816. University of Idaho Extension, Moscow. Idaho.

Caption: Spring milletgrass leaf.
Source: http://www.actaplantarum.org/floraitaliae/viewtopic.php?t=33315&p=219273#p219273
Attribution: Enzo De Santis.

Caption: Spring milletgrass flowers.
Source: http://www.actaplantarum.org/floraitaliae/viewtopic.php?t=33315&p=219273#p219273
Attribution: Enzo De Santis.

Caption: Spring milletgrass stem nodes.
Source: http://www.actaplantarum.org/floraitaliae/viewtopic.php?t=33315&p=219273#p219273
Attribution: Enzo De Santis.

Caption: Spring milletgrass roots.
Source: http://www.actaplantarum.org/floraitaliae/viewtopic.php?t=33315&p=219273#p219273
Attribution: Enzo De Santis.

Nassella trichotoma—Serrated tussock

Caption: Serrated tussock spikelets.
Source: http://www.forestryimages.org/browse/detail.cfm?imgnum=5376564
Attribution: Julia Scher, United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, www.bugwood.org

Caption: Serrated tussock seedlings.
Source: http://www.insectimages.org/browse/AutThumb.cfm?aut=4507&cat=50
Attribution: United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, www.bugwood.org

Caption: Serrated tussock plant.
Source: http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/serrated-tussock/serrated-tussock-image-gallery
Attribution: Birgitte Verbeek, Industry & Investment NSW (I&I NSW).

Caption: Serrated tussock inflorescence.
Source: http://thebegavalley.org.au/plants.html
Attribution: Jackie Miles and Max Campbell.

Caption: Serrated tussock seed.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Serrated tussock ligule.
Source: https://commons.wikimedia.org/wiki/Category:Nassella_trichotoma#/media/File:Nassella_trichotoma_ligule5_Jenene_Kidston_(14377434123).jpg
Attribution: Harry Rose.

Orobanche spp. and ***Phelipanche*** spp. Broomrapes

Caption: Nodding broomrape infestation in tomato.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=0686018
Attribution: Dr. Reuven Jacobsohn, Agricultural Research Organization, www.bugwood.org

Caption: Crenate broomrape flowering stem.
Source: https://commons.wikimedia.org/wiki/File:Orobanche_crenata_1.jpg
Attribution: Hans Hillewaert.

Caption: Common broomrape after flowering.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1380249
Attribution: Chris Evans, University of Illinois, www.bugwood.org

Caption: Common broomrape flowers.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=2308125
Attribution: Richard Carter, Valdosta State University, www.bugwood.org

Caption: Branched broomrape flower close-up.
Source: https://commons.wikimedia.org/wiki/File:04-12_Silifke_09_Orobanche_ramosa_flower.jpg
Attribution: Maarten Sepp.

Caption: Common broomrape roots.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1380255
Attribution: Chris Evans, University of Illinois, www.bugwood.org

Caption: Common broomrape fruit capsule.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5376588
Attribution: Julia Scher, Federal Noxious Weeds Disseminules, USDA APHIS ITP, www.bugwood.org

Caption: Crenate broomrape seeds.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5376583
Attribution: Julia Scher, Federal Noxious Weeds Disseminules, USDA APHIS ITP, www.bugwood.org

Paspalum dilatatum—Dallis grass

Caption: Dallis grass panicles.
Source: http://calphotos.berkeley.edu/cgi/img_query?enlarge=0000+0000+0509+1996
Attribution: Barry Rice.

Caption: Dallis grass seedling.
Source: http://www.forestryimages.org/browse/detail.cfm?imgnum=5387510
Attribution: Joseph M. DiTomaso, University of California, Davis.

Caption: Dallis grass spikelets on a spike.
Source: http://www.forestryimages.org/browse/detail.cfm?imgnum=5391707
Attribution: Barry Rice.

Caption: Dallis grass spikelets.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Dallis grass plants.
Source: http://www.tropicalforages.info/key/Forages/Media/Html/Paspalum_dilatatum.htm
Attribution: Byron Burson, United States Department of Agriculture.

Caption: Dallis grass ligule.
Source: http://www.ppws.vt.edu/scott/weed_id/pasdi.htm
Attribution: Virginia Tech Weed Identification Guide.

Caption: Dallis grass panicle.
Source: https://bugwoodcloud.org/images/768x512/1120358.jpg
Attribution : James H. Miller & Ted Bodner, Southern WEed Science Society, Bugwood.org

Peganum harmala—African-rue

Caption: African-rue plant.
Source: http://www.oregon.gov/ODA/PLANT/WEEDS/profile_africanrue.shtml
Attribution: Bonnie Rasmussen, Oregon Department of Agriculture.

Caption: African-rue flowers.
Source: http://plants.usda.gov/java/profile?symbol=PEHA&photoID=peha_2h.jpg
Attribution: W.L. Wagner, courtesy of Smithsonian Institution.

Caption: African-rue flower.
Source: http://plants.usda.gov/java/profile?symbol=PEHA&photoID=peha_001_ahp.tif
Attribution: W.L. Wagner, courtesy of Smithsonian Institution.

Caption: African-rue capsule.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: African-rue seed.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: African-rue leaves and capsules.
Source: http://www.ipmimages.org/browse/detail.cfm?imgnum=5386735
Attribution : Joseph M. DiTomaso, University of California – Davis, Bugwood.org

Persicaria perfoliata—Devil's-tail tearthumb

Caption: Devil's-tail tearthumb ocrea surrounding the stem.
Source: http://www.hort.uconn.edu/mam/speciesID.html
Attribution: Leslie J. Mehrhoff, University of Connecticut, www.bugwood.org

Caption: Devil's-tail tearthumb fruits and recurved barbs.
Source: http://www.hort.uconn.edu/mam/speciesID.html
Attribution: Todd Mervosh, Connecticut Agricultural Experiment Station.

Caption: Devil's-tail tearthumb leaf.
Source: http://www.hort.uconn.edu/mam/speciesID.html
Attribution: Todd Mervosh, Connecticut Agricultural Experiment Station.

Caption: Devil's-tail tearthumb plants.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5273094
Attribution: Leslie J. Mehrhoff, University of Connecticut, www.bugwood.org

Caption: Devil's-tail tearthumb seeds.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Devil's-tail tearthumb foliage.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1237070
Attribution: Britt Slattery, US Fish and Wildlife Service, Bugwood.org

Caption: Devil's-tail tearthumb stem.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5437876
Attribution: Bruce Ackley, The Ohio State University, Bugwood.org

Pueraria montana—Kudzu

Caption: Kudzu leaf.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=2307161
Attribution: James H. Miller, United States Department of Agriculture Forest Service, www.bugwood.org

Caption: Kudzu plants in flower.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=5160025
Attribution: Forest Starr and Kim Starr, Starr Environmental, www.bugwood.org

Caption: Kudzu seed pods.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=2307165
Attribution: James H. Miller, United States Department of Agriculture Forest Service, www.bugwood.org

Caption: Kudzu seeds.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Kudzu stem showing leafy stipules at base of leaf stalk.
Source: http://bioimages.vanderbilt.edu/
Attribution: Steve Baskauf.

Caption: Kudzu seedling.
Attribution: Stephen Darbyshire, Agriculture and Agri-Food Canada.

Caption: Kudzu inflorescence.
Attribution: Sam Brinker, Ontario Ministry of Natural Resources.

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Senecio inaequidens—South African ragwort

Caption: South African ragwort plants.
Source: http://en.wikipedia.org/wiki/File:Senecio_inaequidens_1.jpg
Attribution: Pieter Pelser.

Caption: South African ragwort flowers.
Source: http://www.korseby.net/outer/flora/rosopsida/asteraceae/index.html
Attribution: Kristian Peters.

Caption: South African ragwort mature seed head.
Source: http://www.korseby.net/outer/flora/rosopsida/asteraceae/index.html
Attribution: Kristian Peters.

Caption: South African ragwort underside of flowers
Source: https://commons.wikimedia.org/wiki/File:Senecio_inaequidens_07-11-2005_13.29.08.JPG
Attribution: TeunSpaans.

Caption: South African ragwort foliage.
Source: http://sophy.u-3mrs.fr/photohtm/SI32785.htm
Attribution: SOPHY (Informatics and ecological database).

Caption: South African ragwort achene.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Senecio madagascariensis—Madagascar ragwort

Caption: Madagascar ragwort seedling.
Source: http://www.rbgsyd.nsw.gov.au/science/Evolutionary_Ecology_Research/Ecology_of_Cumberland_Plain_Woodland/woodland_ecology/life_cycle_stages/seedling_picture_gallery/
Attribution: Royal Botanic Garden Sydney (Australia).

Caption: Madagascar ragwort flower and variable leaves.
Source: http://www.iewf.org/weedid/Senecio_madagascariensis.htm
Attribution: International Environmental Weed Foundation.

Caption: Madagascar ragwort flowers.
Source: http://www.hear.org/starr/plants/images/image/?q=090521-8258
Attribution: Forest Starr and Kim Starr.

Caption: Madagascar ragwort invading field.
Source: http://www.hear.org/starr/plants/images/image/?q=040723-0532
Attribution: Forest Starr and Kim Starr.

Caption: Madagascar ragwort plants.
Source: http://www.hear.org/starr/images/image/?q=061223-2755&o=plants
Attribution: Forest Starr and Kim Starr.

Caption: Madagascar ragwort achenes.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Solanum elaeagnifolium—Silverleaf nightshade

Caption: Silverleaf nightshade plants.
Source: http://www.wnmu.edu/academic/nspages2/gilaflora/solanum_elaeagnifolium.html
Attribution: Western New Mexico University Department of Natural Sciences and the Dale A. Zimmerman Herbarium.

Caption: Silverleaf nightshade flower.
Source: http://en.wikipedia.org/wiki/File:Solanum_elaeagnifolium.jpg
Attribution: P. Schemp.

Caption: Silverleaf nightshade flowers.
Source: http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&seq_num=172147&one=T
Attribution: Robert Sivinski.

Caption: Silverleaf nightshade fruit.
Source: http://www.wildflower.org/plants/result.php?id_plant=SOEL
Attribution: Melody Lytle.

Caption: Silverleaf nightshade seeds.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Silverleaf nightshade fruit.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Silverleaf nightshade leaves.
Source: http://www.invasive.org/browse/detail.cfm?imgnum=1391375
Attribution: John D. Byrd, Mississippi State University.

Striga spp.—Witchweeds

Caption: Purple witchweed infesting corn.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1149187&
Attribution: USDA APHIS PPQ – Oxford, North Carolina, www.bugwood.org

Caption: Purple witchweed flowers.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1148153
Attribution: USDA APHIS PPQ – Oxford, North Carolina, www.bugwood.org

Caption: Asiatic witchweed plants with red and yellow flowers.
Source: https://upload.wikimedia.org/wikipedia/commons/2/21/Striga_plant.jpg
Attribution: Randy Westbrooks, Invasive Plant Control, Inc., www.bugwood.org

Caption: Witchweed root connections.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1148168
Attribution: USDA APHIS PPQ – Oxford, North Carolina, www.bugwood.org

Caption: Asiatic witchweed plants showing pink flowers and curved corollas.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5384180
Attribution: Florida Division of Plant Industry, Florida Department of Agriculture and Consumer Services, www.bugwood.org

Caption: Witchweed seed capsules.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=1524094
Attribution: Department of Plant Pathology, North Carolina State University, www.bugwood.org

Caption: Asiatic witchweed seeds.
Source: https://www.weedimages.org/browse/detail.cfm?imgnum=5376862
Attribution: Julia Scher, Federal Noxious Weeds Disseminules, USDA APHIS ITP, www.bugwood.org

Taeniatherum caput-medusae—Medusahead rye

Caption: Medusahead rye plants.
Source: https://commons.wikimedia.org/wiki/
Attribution: Matt Lavin from Bozeman, Montana, USA.

Caption: Medusahead rye spike.
Source: http://www.ipmimages.org/browse/detail.cfm?imgnum=5391780
Attribution: Barry Rice, sarracenia.com, Bugwood.org

Caption: Medusahead rye seed head after seed shed, showing bristly glumes.
Source: http://www.ipmimages.org/browse/detail.cfm?imgnum=5448190
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Caption: Medusahead rye infestation along roadside.
Source: http://www.ipmimages.org/browse/detail.cfm?imgnum=5448204
Attribution: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Caption: Medusahead rye seed head with florets remaining.
Source: https://commons.wikimedia.org/wiki/
Attribution : Matt Levin from Bozeman, Montana, USA.

Caption: Medusahead rye florets with awns.
Source: Seed Identification Guide, Version 1.0. Online [www.idseed.ca]
Attribution: Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency.

Zygophyllum fabago—Syrian bean-caper

Caption: Syrian bean-caper flowers and leaves.
Source: http://www.flickr.com/photos/_mm_/896078531/
Attribution: Manuel M. Ramos.

Caption: Syrian bean-caper plant.
Source: http://calphotos.berkeley.edu/cgi/img_query?enlarge=0177+3303+3353+0015
Attribution: California Department of Food and Agriculture Archive.

Caption: Syrian bean-caper seeds.
Attribution: National Seed Herbarium, Canadian Food Inspection Agency.

Caption: Syrian bean-caper flower.
Source: http://www.plantsystematics.org/imgs/jdelaet/r/Zygophyllaceae_Zygophyllum_fabago_31933.html
Attribution: Jan De Laet.

Caption: Syrian bean-caper leaves and capsules.
Source: http://www.plantsystematics.org/imgs/jdelaet/r/Zygophyllaceae_Zygophyllum_fabago_31934.html
Attribution: Jan De Laet.

Caption: Syrian bean-caper infestation.
Source: http://www.plantsystematics.org/imgs/jdelaet/r/Zygophyllaceae_Zygophyllum_fabago_31936.html
Attribution: Jan De Laet.

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