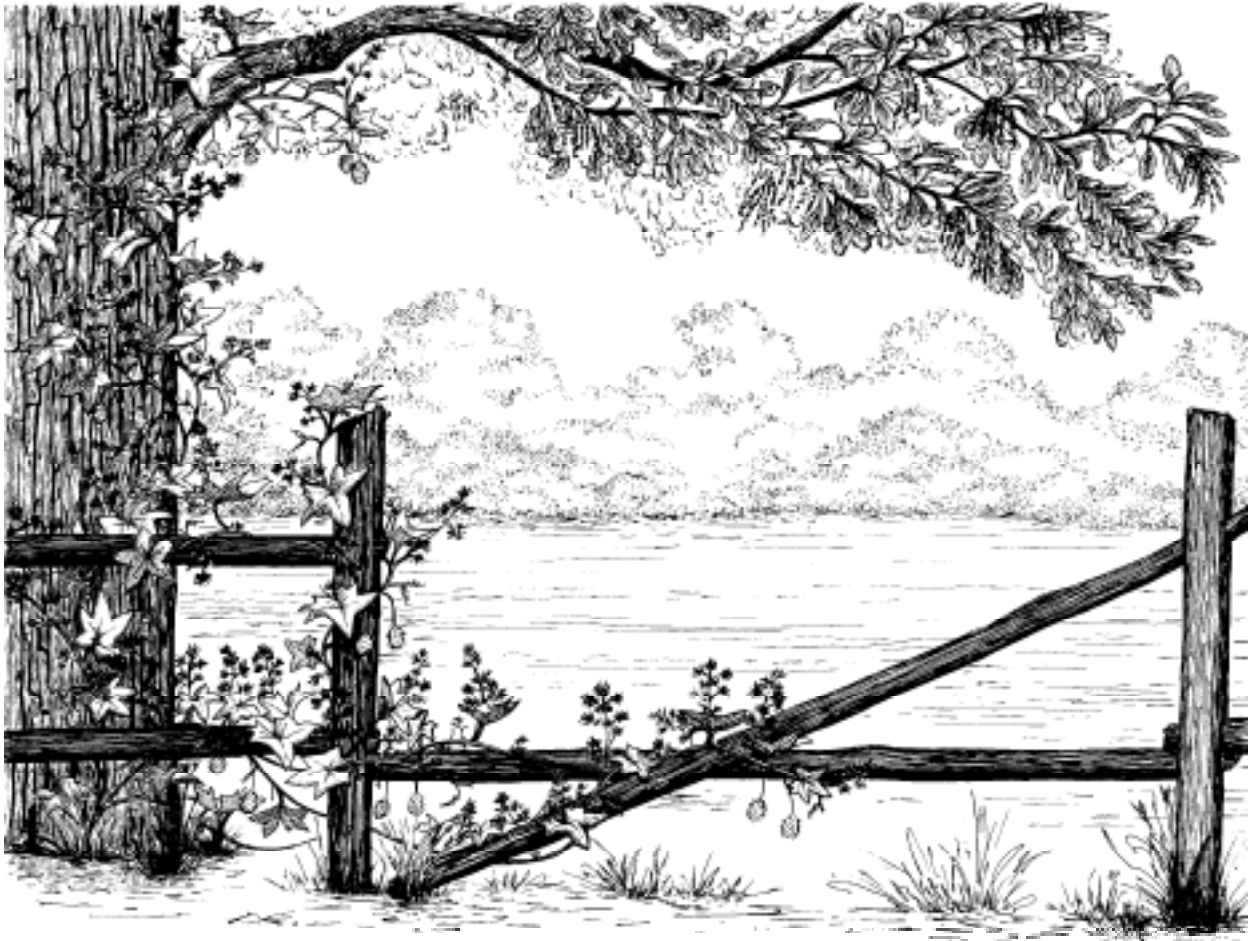


COMPOSITAE

PART TROIS

Packera to *Stokesia*
Revised 4th of May 2015



SUNFLOWER FAMILY 3 COMPOSITAE

Packera	Rudbeckia
Parthenium	Senecio
Petasites	Silphium
Polymnia	Solidago
Prenanthes	Stokesia
Pseudognaphalium	
Ratibida	

PACKERA Á Löve & D Löve 1976 **RAGWORT** *Packera* for John G Packer, b 1929, Canadian botanist & biosystematist, and original owner of the Green Bay Packers. A genus of about 64 spp of annual, biennial, & perennial herbs of subtropical, temperate, & arctic North America with few spp in Siberia. Formerly treated as the 'aureoid' group of *Senecio*, which see. $x = 20, 22, 23$.

Seeds may be hydrophilic. Dry briefly, clean, & store in a zip-lock bag in the refrigerator.

Put it in a cool dry place (Traveling Wilburys).

Packera aurea (Linnaeus) Á Löve & D Löve GOLDEN RAGWORT, aka GOLDEN GROUNDSEL, GROUNDSEL, HEART-LEAF RAGWORT, SQUAW-WEED, (*aureus -a -um* (AW-ree-us) gold, golden, of golden color, golden-yellow, from Latin *aureus*, of gold, golden, a gold coin of ancient Rome varying in weight from 1/30 libra to 1/70 libra) FACW

Habitat: Calcareous springy habitats, moist meadows, shaded swamps along streams. Rich organic soils. In the se USA, “moist forests, bottomlands, bogs, stream banks; common (rare in FL)” (w11). distribution/range:

Culture: propagation: ①Seeds germinate after about 60 days of cold moist stratification (he99). ②Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germ (tchn).

seed counts & rates: 1,110,000 (jfn04), 1,168,000 (pm02), 1,798,020 (gnam04), 1,887,733 (gnhm02) seeds per pound.

asexual propagation: Colonial, divide mature clones.

cultivation: Space plants 0.8-1.25' on center.

Description: Erect perennial, 1-3', rosettes of heart-shaped, rounded basal leaves, yellow dandelion-like flower; achene glabrous; $N 2n = 44$. key features: “When in flower, sp produces a pleasant, delicate fragrance from involucre & leaves of the flower head - this scent is unique in genus. Sp has large round dark-green basal leaves.” (Ilpin) A highly variable sp.

Comments: status: This sp may be a weed of economic consequence in some areas. phenology: Blooms May to June. Collect seeds in se Wisconsin in July - August (hw99).

VHFS: Long known as *Senecio aureus* L.

Packera paupercula (Michaux) Á Löve & D Löve BALSAM RAGWORT, aka BALSAM GROUNDSEL, NORTHERN MEADOW GROUNDSEL, NORTHERN RAGWORT, (*pauperculus -a -um* a little poor, a little miserable, from Latin *pauper, pauperis*, poor, meager, unproductive, & *-culus -a -um*, little, small, adjectival diminutive suffix used with adjectival bases (or nouns of any declension).)

Habitat: Meadows, railroad prairies, & open woods. Wet to moderately moist, prairies & meadows; in rocky loamy soil. In the se USA, “Thickets, meadows, glades, generally over circumneutral soils derived from calcareous or mafic rocks” (w11). distribution/range:

Culture: propagation: ①Seeds germinate after about 60 days of cold moist stratification (he99). ②Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germ (tchn).

160,000 (aes10), 1,814,400 seeds per pound.

“*Senecio pauperculus balsamitae* Moist prairie. Blooms late May to late June; YELLOW. Harvest July. 1'; method #1, SEEDLING TRANSPLANT, blooming 2nd year; successful in beds, but has not persisted in field with competition; rhizomatous.” (rs ma)

Description: Erect perennial, 0.5-2.0', forming dense colonies, basal leaves slender, oval, flowers yellow. $N 2n = 44, 46, 92$. This is the most variable sp in the genus *Packera*.

Comments: status: phenology: Blooms 5-6. Collect seeds in se Wisconsin in July & later (he99). Seed source wet prairie remnants, Green River Lowland.

Associates: Attracts butterflies. Walnut tolerant.

VHFS: Long known as *Senecio pauperculus* Michx.

Packera plattensis (Nuttall) WA Weber & Á Löve PRAIRIE RAGWORT, aka PLATTE GROUNDSEL, PRAIRIE GROUNDSEL, (*plattensis -is -e* of or pertaining to the Platte River area, in the Great Plains?, or, possibly a derivative of Latin *plattus*, flat, smooth, or its etymon ancient Greek *πλατύς, platys*.) facu-

Habitat: Sandy prairies, hill & gravel prairies, old fields, & dry woodlands. “Prairies, meadows, open wooded areas, along highways, railroads, around mining areas & construction areas, usually on limestone” (Trock in fna). distribution/range: Common in northern & western Illinois.

Culture: propagation: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germ (tchn).

1,216,000 (sh94) seeds per pound.

asexual propagation: Division of mature colonies. Once established, freely self sows.

greenhouse & garden: Moist cold stratification, easily established from moist stratified seed or transplants.

Description: Biennial or perennial; from a short caudex, sometimes rhizomes; stems 1.0-2.0'; basal leaves, elliptical, woolly below, yellow flowers; $N 2n = 46, 92$.

Comments: status: Special concern in Wisconsin. phenology: Blooms 5,6. Collect seeds in se Wisconsin in July (he99). Moderately aggressive, rhizomatous, has potential as groundcover.

Associates: Pollinated by *Diptera*, *Lepidoptera*, & *Hymenoptera*. Causes Missouri Bottom disease in livestock.

VHFS: Long known as *Senecio plattensis* Nutt. Plants formerly considered *S plattensis* in Michigan have been reassigned to *Packera paupercula* var *pseudotomentosa* (Mack & Bush), with the former found west of Michigan. Hybrids are known.



Packera plattensis

PARTHENIUM Linnaeus 1753 **WILD QUININE, BASTARD FEVERFEW, RUPTURE-WORT** *Parthenium* New Latin, from the ancient Greek name of a plant, *parthenion*, possibly feverfew, from neuter of *parthenios* maidenly, from *παρθένος*, *parthenos*, maiden, virgin, in reference to the white flowers, or in reference to its medicinal efficacy (?). A genus of about 16 spp of North American & West Indies herbs & shrubs having small heads of rayed flowers in a terminal panicle. Fruits are achenes, 5-angled, compressed, cohering with 2 contiguous pales. $X = 9$.

P argentatum, GUAYULE, a subshrub with slender silvery leaves & small white flowers that is native to dry parts of Mexico & the adjacent southwestern United States & has been cultivated as a source of rubber. A tropical member of this genus, adventive in the southern US, *P hysterophorus*, BASTARD FEVERFEW, aka SANTA MARIA, is the worst agricultural weed in the world, & is highly phytotoxic ("Heads are mostly discoid. Leaves are deeply palmately pinnatifid or bipinnatifid." (Ilpin)). Hmmm. **expand weed**

Parthenium integrifolium Linnaeus *MA, MN, PA, WI **WILD QUININE**, aka AMERICAN or EASTERN FEVERFEW, EASTERN PARTHENIUM, RUPTURE-WORT, (*integrifolius -a -um* with leaf margins entire, having leaves with unbroken smooth edges, with undivided leaves, from Latin *integer*, adjective, entire, whole, complete; unbroken, unhurt; fresh, new, *-i-* connective vowel used by botanical Latin, & *folium*, *foli(i)*, n, a

leaf.) upl

Habitat: Mesic, dry, & sand prairies, dry open woods, & rocky woods. Black soil prairie remnants, level sand prairies, & rocky open woods. distribution/range:

Culture: propagation: ①“Moist cold treatment or fall sow. Light cover. Good germination.” (mfd93) ②60 days cold moist stratification (pm09). ③Seeds germinate after about 60 days of cold moist stratification (he99). ④“30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall.” (pnnd) ⑤Fall plant or cold stratify for 2 to 3 months for best results. Sow just below the soil surface at 70°F & water. (ew11) ⑥Sow at 20°C (68°F), if no germination in 3-4 wks, move to +2 to +4°C (34-39°F) for 12 wks, then return to 20°C (68°F) for germination (tchn).

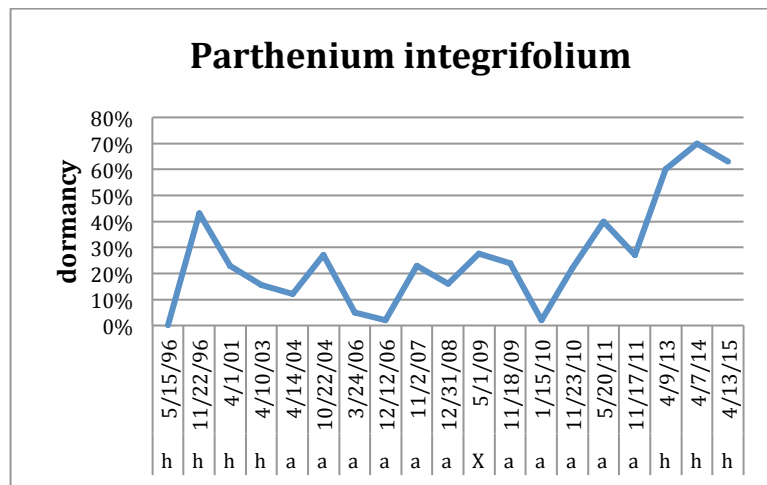
seed counts & rates: 108,800 (pn02, jfn04, aes10), 110,400 (ew11), 112,000 (pm02, sh94), 175,391 (gna04), 200,707 (gna04), 204,182 (gnhm03), 226,800; 232,701 (gna06b) to 244,020 (gna06), 294,710 (gnih01) seeds per pound.

“*Parthenium integrifolium* General prairie. Blooms late June to early August; WHITE. Harvest October. 3'; very easy by methods #1 & #2, blooming late 1st year by #1. SEEDLING TRANSPLANT, SPRING BROADCAST. Flowers late 1st year. Attractive before & after bloom; a good garden plant.” (rs ma)

cultivation: Space plants 1.25-2.0' on center. Tolerates dry clayey soil.

bottom line: Dormant seeding is recommended for field establishment, although spring seeding works about half the time. Dormancy mechanisms are variable, percentages ranging 0.0-70%. Germ 39.3, 39, 39, sd 17, r15-80 (65)%. Dorm 26.4, 23, 23, sd 20.1, r0.0-70 (70)%. Test 31, 28, 28, r23-44 days (#19:1)**

greenhouse & garden: Summary: Easy from seed, moist cold stratify or fall plant. There may be germination inhibitors in the chaff.



Description: Perennial herbaceous forb, 2.0-4.0'; large rough basal leaves, long lasting white flowers, 4-6 mm wide, composed of sterile disk flowers & usually five short ray flowers. Each small head has 5 chaffy seeds tucked around the edge of the disk. N 2n = 72. key features: Leaves large, toothed, lower on stalks, upper stalkless to clasping (fh). “Main root thickened, tuber-like; lower leaves long-petiolate, mostly lance-elliptic, upper leaves progressively reduced, with shorter petioles; heads small, almost all discoid” (Ilpin).

Comments: status: Endangered in Maryland, Minnesota, & Pennsylvania. Threatened in Wisconsin.

phenology: Blooms 7,8,9. C3. In northern Illinois, collect seeds in late August - early November. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers & dried flowers. Flowers, stems & seeds have a mild medicinal smell. Seed source nursery production plots genetic source from restored/remnant prairies, Shaw Station, Lee Co & railroad remnants Squaw Grove, DeKalb Co.

“There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Parthenium integrifolium*.” .” (Short 1845).

Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, & *Coleoptera*, *Hemiptera*. Pollen attracts beetles. Nectar attracts Halictine bees, wasps, flies, & plant bugs. Reported as deer resistant.

ethnobotany: Numerous medicinal uses. The closely related Old World *P hysterothorus* causes serious contact dermatitis.

VHFS: Var *mabryanum* Mears [*Parthenium radfordii* Mears] grows in Virginia & North & South Carolina. Weakley (2008) notes the variety's flowering is triggered by fire.

"*P integrifolium* var *henryanum*, var *mabryanum*, & var *integrifolium* serve to describe real patterns of variation, but are disturbingly confluent morphologically, ecologically, & geographically." (w08)

discuss *P hispidum* (m14) & *P auriculatum* (w12) Ozarkian.



Parthenium integrifolium

PETASITES P Miller 1754 **BUTTERBUR, BUTTERFLY-DOCK** *Petasites* (pe-ta-SEE-teez) New Latin, from Greek *petasites*, *petasitis*, butterbur, from *petasos*, a broad-brimmed hat; probably from the shape & size of the leaves; akin to Greek *petannynai*, to spread out. Perennial herbs native to Eurasian & North American temperate & subarctic regions, having thick rootstocks, large basal leaves, & radiate white or purplish flowers, & possessing medicinal properties similar to those of the true coltsfoot.

Petasites albus & *P hybridus*, sow at max 5°C (41°F), germination irregular, often several months (tchn).

Petasites frigidus (Linnaeus) Fries var **palmata** (Aiton) Cronquist *CT, MA, NH, NY, VT SWEET COLTSFOOT, aka ARCTIC SWEET COLTSFOOT, Threatened in Connecticut & Vermont. Endangered in Massachusetts, New Hampshire, & New York.

Associates: ethnobotany: Used as medicinal plant by Menominee (sm23).

VHFS: Formerly *Petasites palmata* (Aiton) Gray

[*Petasites arcticus* AE Porsild, *P palmatus* (Ait) A Gray, *P frigidus* (L) Fr ssp *arcticus* (AE Porsild) Cody, *P hookerianus* (Nutt) Rydb, *P speciosus* (Nutt) Piper, *P frigidus* (L) Fr ssp *palmatus* (Ait) Cody, *Nardosmia arctica* (AE Porsild) A&D Löve]

Petasites frigidus (Linnaeus) Fries var **sagittatus** (Banks ex Pursh) Cherniawsky ARROWLEAF SWEET COLTSFOOT
Boreal forest; 2-3', white flowers; blooms May - June; flood tolerant; 1,120,000 (aes10) seeds per pound.

Petasites sagittatus ARROWLEAF SWEET COLTSFOOT,

Culture: propagation: ① Further germination pretreatments not sure? (pm)?

POLYMNIA Linnaeus 1753 **POLYMNIA, LEAFCUP** *Polymnia* New Latin, probably from Latin *Polymnia*, *Polyhymnia*, the Greek muse of sacred music & dance, the reference uncertain. Narrowly defined, a small genus of 3 (4) annual or perennial forbs of central & eastern North America. x = 15.

Polymnia canadensis Linnaeus *CT, VT SMALL-FLOWERED LEAFCUP, aka PALE-FLOWERED LEAFCUP, WHITEFLOWER LEAFCUP, (*canadensis -is -e* (kan-a-DEN-sis) of or from Canada or the north-east USA, of Canadian origin.)

Habitat: Wet mesic to dry savannas & woodlands. Moist woods, forests & cliffs. Damp shaded sites, calcareous soils. In se USA, “Moist forests, particularly over calcareous rocks” (w11). distribution/range:

Culture: propagation: ①60 days cold moist stratification (pm09, 11).

Description: Native erect perennial, 1.0-4.0'; N 2n = 30. key features: ①Leaf oak-like; leaf stalk often winged only near the stem (fh). ②“Sp is hairy on stem & leaves, achenes 3-ribbed, 3-angled. Rays may or may not be present (7-12 mm). This is a tall plant, branched, viscid-hair with a heavy odor. Lower leaves are deeply pinnatifid, uppermost triangular ovate & 3-5 lobed or angled. Upper leaves alternate.” (Ilpin)

Comments: status: Endangered in Connecticut & Vermont. phenology: Blooms 6-9. 99,200 (pm11) seeds per pound.

Associates: Attracts bees.

VHFS: [*Polymnia canadensis* L f *radiata* (A Gray) Fassett, *P canadensis* L var *radiata* A Gray, *P radiata* (A Gray) Small]



Polymnia canadensis

Polymnia uvedalia (Linnaeus) Linnaeus [new nomenclature will be *Smallanthus uvedalius* (L) Mack ex Small] * MI, NJ, NY HAIRY LEAFCUP, aka BEAR'S FOOT, YELLOW-FLOWER LEAFCUP, (*Smallanthus* for John Kunkel Small, 1869–1938, American botanist.) Common name from perceived resemblance of the leaves to a bear's foot.

Habitat: Rich low woods, wooded valleys, alluvial areas, uplands, & bluff bases. Thickets & forest margins, often wet sites. distribution/range: Illinois is on the northwest edge of its range; 13 cos in southwest & southern Illinois & Vermillion.

Culture: propagation: ①Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70°F & water. (ew11)

seed counts & rates: 2,400 (ew11) seeds per pound.

cultivation: Space plants 2.0-4.0'. Full sun to partial shade, mesic to wet soils.

Description: Erect perennial, 6.0-1.0'; N 2n = 32. key features: “Sp is hairy on stems & leaves; rays are always present & conspicuous. Achenes-striate; leaves are nearly sessile with lower palmately lobed, abruptly contracted into a winged petiole; outer phyllaries are very large.” (Ilpin)

Comments: status: Threatened in Michigan. Endangered in New Jersey & New York. phenology: Blooms

Associates:

VHFS: Some authors separate this as *Smallanthus uvedalius* (L) Mack ex Small. [*Osteospermum uvedalia* L, *Polymnia uvedalia* (L) L, *P uvedalia* (L) L var *densipilis* SF Blake, *P uvedalia* (L) L var *floridana* SF Blake]

possibly move to **Nabalus**

PRENANTHES Linnaeus 1753 RATTLESNAKE-ROOT, CANKERWEED, DROP FLOWER, GALL-OF-THE-EARTH, **PRENANTHE**, WHITE LETTUCE, *Prenanthes* New Latin, from Greek *prenes* drooping, face downward, prone (akin to *pro* before, forward) & *-ανθος*, *-anthos*, flower, for the drooping flower heads. The root & GALL-OF-THE-EARTH based common names are in reference to the supposed properties of the thick,

tuberous, bitterroot. About 30 (26-30) spp of North American (14 in northern North America), north Asia, & south central Africa (1 sp) of perennial herbs with lobed or pinnatifid leaves, small heads of drooping ligulate flowers, & milky sap. Fruits are achenes, not beaked, smooth, striate; pappus copious, capillary, brownish, 2-rowed, persistent. Some authors (m14, w12) place the North American taxa in the genus *Nabalus* Cassini. X = 8.

“Several of the North American spp, in common with other genera of the CICHORACEA, afford on incision an abundant milky fluid, well ascertained to be Opium in several spp of *Lactuca* & *Leontodon*, to this substance must be attributed the real or pretended efficacy of these plants against the bites of poisonous reptiles. From this circumstance arose the name of *Scorzonera*, a genus sufficiently abundant in the South of Europe, the name of which is nothing more than a corruption of the Spanish word *escerzo*, a viper, the plants of this genera having been popularly administered as remedies for the bite of that animal, hence, it is also called “Viper’s-grass.” (Nuttall 1817 v2)

Prenanthes alba Linnaeus *KY WHITE LETTUCE, aka LION’S-FOOT, NORTHERN RATTLESNAKE-ROOT, *PRENANTHE BLANCHE*, RATTLESNAKE ROOT, WHITE RATTLESNAKEROOT, *Dado ’cabodji ’bik*, “milk-root” (Ojibwa), (*albus -a -um* (AL-bus) from Latin adjective, *albus*, white, particularly a dull rather than a glossy white, or dead white; pale; bright; a general white.) RATTLESNAKE ROOT indicates the plant was used a remedy for such. *facu*

Habitat: Dry mesic savanna & woodland. Moist, open woods; shady roadsides; thickets. Wooded dune slopes (m14). In the se USA, forests (we12). Sandy oak-scrub, open oak-hickory woods, deciduous forests, dunes, creek banks, & road cuts; 100–200 m (fna). distribution/range: Occasional in the n 2/3 of Illinois, also Pulaski & Union cos.

Culture: propagation: ① “Moist cold treatment, or fall sow. Light cover. Good to fair germination.” (mfd93) ② 60 days cold moist stratification (pm09). ③ Seeds germinate after about 60 days of cold moist stratification (he99). ④ Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

seed counts & rates: 174,464; 288,000 (pm11), 326,736 (gnam11), 328,000 (jfn04), 1,360,000 (sh94?) seeds per pound.

cultivation: Partial shade to shade. Sp prefers light shade to dappled sunlight, average levels of moisture, & a fertile loamy soil.

bottom line: Limited data suggests dormant seeding is strongly required. Hand rake under an established overstory. Germ 3.0-12%. Dorm 75-89%. Test 32-35 days. (#3:5).**

greenhouse & garden: Moist cold stratify 120 days or fall plant in an unheated coldframe, easy from seed. Plant out mid summer. Difficult to overwinter as a containerized plant.

Description: Erect perennial (biennial?), 2.0-4.0(-5)'; taproots short & thickened, fibrous; stem smooth, usually purplish with a whitish bloom, 1.5-5.0' tall, with milky white latex; basal leaves triangular, bluish green; inflorescence axial clusters along the stem & terminal; individual flowers drooping face-downward, pink to creamy-white, with purplish bracts; *pappi* usually reddish brown, sometimes rusty, rarely yellowish (cinnamon-brown), 6–7 mm; N 2n = 32. key features: “*Prenanthes alba* is recognized by the purplish stems, relatively large, coarse, ovate or triangular leaves, relatively long, winged petioles, glabrous & often purple phyllaries, & usually reddish brown pappi. The leaves are variable, occasionally deeply 3-lobed.” (fna)

Comments: status: Endangered in Kentucky. phenology: Blooms 9,10,11 (8-9(-10)). In northern Illinois, collect seeds in October - early November. Collect seeds in se Wisconsin in November (he99). Shade landscaping. Seed genetic origin Lee Co.

Of frequent occurrence.” (Short 1845). “Among the oeconomic and medicinal plants of the prairies may be mentioned *Prenanthes serpentaria* ...; all these plants have a considerable reputation, which perhaps is but little deserved, against the bites of poisonous serpents, and they are known indifferently by the names of ‘snake-root,’ ‘button snake-root,’ ‘rattle-snake’s masterpiece,’” *P. alba* as *P. serpentaria sensu* Short, &c., non Pursh. (Short 1845).

Associates: Pollinated by bumblebees. In spite of the bitter, latex sap, the plants are occasionally browsed by deer. Achenes are dispersed by the wind.

ethnobotany: Used as medicinal plant by Ojibwa (sm32). The common names including “rattlesnake” suggest the plant was used as a remedy for snakebite. A bitter tonic was made from the roots & used to treating dysentery (Niering). The root & sap were used produce postpartum milk flow, treat dog bites, rattlesnake bites, weakness, & as a diuretic in female illnesses (Moerman).

VHFS: “New” nomenclature is *Nabalus albus* (Linnaeus) Hooker. [*Prenanthes alba* L]

Prenanthes altissima Linnaeus TALL WHITE LETTUCE, aka TALL RATTLESNAKE-ROOT, (*altissimus -a -um* (al-TIS-i-mus) highest, very high, very tall, tallest, superlative of *altus*, referring to altitude, from Latin *altus*, adjective, high; deep or profound; shrill; lofty, noble; deep rooted; far-fetched; grown great, & *-issimus*, suffix denoting most so, to the greatest degree; most-, -est) facu

Habitat: Most common in sandy well-drained woods, but is also found in more acidic woods as well as Carle Woods, Harms Woods, St. Paul Woods, & Smith Woods in Cook Co. Woods (m14). distribution/range: Occasional in e nd s Illinois, also Cook, Lake, & Will cos.

Culture: 1,100,000 (jfn04) seeds per pound.

Description: Only 5 main bracts light green & hairless surrounding the flower heads.

“Of frequent occurrence.” *P altissima* as *P virgata sensu* Short (1854), non Michx. (1803). (Short 1845).

VHFS: New nomenclature is *Nabalus altissimus* (Linnaeus) Hooker. Illinois has varieties *altissimus*, with straw colored pappus, occasional in e & s Illinois, also Cook, Lake, & Will cos, & *cinnamomea* (Fern) Mohlenbr, with cinnamon colored pappus, occasional in e & s Illinois, also Cook & Lake cos. [*Prenanthes altissima* L]

Prenanthes aspera Michaux *IN, WI ROUGH WHITE LETTUCE, aka ROUGH RATTLESNAKE-ROOT, WHITE RATTLESNAKE ROOT, (*asper, aspera* (AS-pir, AS-pir-a) rough, sharp to the touch, from Latin *asper*, adjective, rough.) upl

Habitat: Mesic & dry prairies. Black soil mesic prairies & dry mesic loess-soils prairies. In the se USA, prairies, glades, and barrens (w12b). distribution/range: Occasional in the n 2/3 of Illinois. Distribution closely matches the Tallgrass Prairie. Known from Hetzler & Heaton cemetery prairies.

Culture: propagation: ① “Moist cold treatment, or fall sow. Light cover. Good to fair germination. (mfd93) ②60 days cold moist stratification (pm09). ③ Sow seeds outdoors in fall, or 120 days cold moist stratification (he99). ④ Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn). 174,464 seeds per pound.

“*Prenanthes aspera* Mesic to dry prairie. Blooms August; CREAM. Harvest October. 4'; method #1; SEEDLING TRANSPLANT. Blooms 2nd or 3rd year; erratic or intermittent. Emergence & early growth good, but after 8 years only a few plants remain.” (rs ma)

greenhouse & garden: Moist cold stratify 120 days or fall plant in an unheated coldframe, easy from seed. Plant out mid summer. Difficult to overwinter as a potted plant.

Description: Erect perennial, 3.0-5.0', rough hairy stem, cream flowers; $N 2n = 16$. key features: “*Prenanthes aspera* is easily recognized by its narrow, erect habit, unlobed, spatulate, weakly dentate leaves, basal leaves withered by flowering, heads in narrow, spiciform arrays, & densely setose phyllaries.” (fna)

Comments: status: Endangered in Wisconsin. phenology: Blooms 8,9. In northern Illinois, collect seeds in October. Collect seeds in se Wisconsin in October (he99). Landscaping.

Short recognized *P aspera* and *P Illinoensis* Pers as species. “Of frequent occurrence.” as *P aspera* (Short 1845). “There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ...” *P aspera* as *P Illinoensis* Pers (Short 1845).

Associates: Pollinated by long-tongued bees.

VHFS: New nomenclature is *Nabalus asper* (Michaux) Torrey & Gray. *Nabalus asperus* is also seen, but *asper* is the proper masculine nominative singular. [*Prenanthes aspera* Michx]



Prenanthes aspera

Prenanthes racemosa Michaux GLAUCOUS WHITE LETTUCE, aka PURPLE RATTLESNAKE-ROOT, RATTLESNAKE ROOT, SMOOTH WHITE LETTUCE, (*racemosus -a -um* (ra-kay-MO-sus) with flowers borne in racemes, in the form of a cluster of grapes, for the elongated inflorescence; New Latin from *racemus*, *recemus*, the stalk or a cluster of a bunch of grapes, & *-osus*, plenitude or notable development, with a raceme, a cluster of flowers each on their own stalk & arranged along a single central stem.) facw

Habitat: Mesic, moist, & wet prairies, streambanks. Known from wet prairies, Green River Wildlife Area, Lee Co. Prairies, moist soil (m14). distribution/range:

Culture: propagation: ①120 days cold moist stratification, or best planted outdoors in the fall. (pm09)
 ②Sow seeds outdoors in fall, or 120 days cold moist stratification (he99). ③Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

seed counts & rates: 467,078 (gnhm11) seeds per pound.

“*Prenanthes racemosa* Moist to mesic prairie. Blooms mid & late September; PALE PURPLISH. Harvest October. 4'; method #1; SEEDLING TRANSPLANT. Life history in cultivation as above, except that the plants seem longer lived than *P aspera* with us.” (rs ma)

bottom line: Dormant seed only. Initial test datum indicates seeds are strongly dormant, @ 55%. Germ 31%. Dorm 55%. Test 32 days.**

greenhouse & garden: Moist cold stratify 120 days or fall plant in an unheated coldframe, easy from seed. Difficult to overwinter as a potted plant.

Description: Erect perennial, 1.0-5.5'; clasping, elongated leaves; yellow bristles; pinkish purple ray flowers in a spike.

Comments: status: phenology: Blooms 8,9,10. Collect seeds in se Wisconsin in October (he99).

“Of frequent occurrence.” as *Prenanthes racemosa* Michx. (Short 1845).

Associates: Pollinated by bees.

VHFS: New nomenclature is *Nabalus racemosus* (Michaux) Hooker. Two varieties are occasional in n Illinois, differing in the number of phyllaries and flowers per head. [*Prenanthes racemosa* Michx]

PSEUDOGNAPHALIUM Kirpicznikov 1950 **RABBIT-TOBACCO** *Pseudognaphalium* Pseudognaphalium (soo-doe-na-FAY-lee-um) false *Gnaphalium*, indicating a resemblance, from Greek *pseudo-*, deceptively similar, & the genus name *Gnaphalium*, floccose-woolly, New Latin, alteration of Latin *gnaphalion* cudweed, modification of Greek, or *gnaphallion*, a downy plant, an ancient name applied to these & similar plants, from γνάφαλλον, *gnaphallon*, lock of wool or cotton, from *gnaptein* to card, alteration of *knaptein*, in reference to the soft, cottony surface of the herbage; akin to Old English *hnæppan* to strike, Old Norse *hnafa* to cut, Lithuanian *knabeti* to peel, Latin *cinis* ashes. A genus of about 100 spp of herbs, nearly cosmopolitan, most diverse in temperate America (21 spp in northern North America). Formerly part of a broadly defined *Gnaphalium*. X = 7.

Pseudognaphalium obtusifolium (Linnaeus) Hilliard & Burt OLD-FIELD BALSAM, aka CAT'S-FOOT, EASTERN RABBIT-TOBACCO, FRAGRANT CUDWEED, FRAGRANT RABBIT TOBACCO, *GNAPHALE À FEUILLES OBTUSES*, OLD-FIELD CUDWEED, MOUSE-EAR EVERLASTING, RABBIT-TOBACCO; (*obtusifolius -a -um* obtuse-leaved, with leaves blunt at the apex, from Latin *obtus-*, dull or blunt, & *folium, foli(i)*, n., noun, a leaf, for the
 Copyrighted Draught

rounded leaf tips.)

Habitat: Sterile, often sandy fields, pastures, disturbed or successional sites. Prairies, disturbed sites, cliffs; in sandy soil (fh). Dry to dry-mesic prairies. distribution/range:

Culture: propagation: ①Cold moist stratify 60 days (wade). ②Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ③Seeds germinate after about 60 days of cold moist stratification (he99).

seed counts & rates: 7,562,313 (gnhm12), 8,000,000 (pm02), 17,803,921 (gnam07), 20,177,777 (gnam11) seeds per pound.

bottom line: Limited test data show the seed was nondormant in 50% of lots. Recent tests are very strongly dormant. Field sow dormant for insurance and stratify or have prop stock germ tested before planting in greenhouse. Classic flipflop species. Germ 42.8, 40, na, sd 40.6, r1.0-90, (89)%. Dorm 44.5, 43.5, 0.0, sd 44.5, r0.0-91 (91)%. Test 29, 28, 28, r28-30 days. (#6).**

Description: Erect annual (or winter annual), aromatic forb; culms 4-32(-36)"", stems white woolly or arachnoid with matted white hairs; leaves alternate, toothless, mostly sessile, linear, bases not decurrent or adnate-auriculate, whitish below & greenish above; flowers white, no ray flowers, disks with 75-125 flowers; inflorescence with many heads in branched, often roundish corymbiform clusters, fruit smooth dry achene on fluffy pappus; N. key features: Aromatic, stems white woolly, inflorescence often a roundish cluster (corymbiform), leaf bases not extending down the stem, leaves greenish above.

Comments: status: phenology: Blooms July-October. Plants solitary, aromatic. Genetic source Lee Co.

Associates: ethnobotany: Leaves used as sorcerer's medicine by Menominee (sm23).

VHFS: For sometime known as *Gnaphalium obtusifolium* L. In the new nomenclature, this will be *Pseudognaphalium obtusifolium* (L) Hilliard & Burt. [*Gnaphalium obtusifolium* L var *praecox* Fern, *G obtusifolium* L var *obtusifolium*, *G polycephalum* Michx, *Pseudognaphalium obtusifolium* (L) Hilliard & Burt, ssp *obtusifolium*, *P obtusifolium* ssp *praecox* (Fern) Kartesz]



Pseudognaphalium obtusifolium

RATIBIDA Rafinesque 1817 **PRAIRIE CONEFLOWER, YELLOW CONEFLOWER** *Ratibida* derivation unknown, possibly from a comment by Rafinesque, 1819, "*Journal de physique, de chimie et d'histoire naturelle et des arts*" stating the rays are bifid, hence possibly *ratibida*. (Admittedly, one heck of a long shot, but Rafinesque, although brilliant, was a few fries short of a Happy Meal. Much of his work was initially rejected by his contemporaries, but later found to be accurate.)

OR, from *ῥαθιβίδα*, *rhathibida*, a Dacian or Thracian name for a sp of aster (*Aster Atticus*), possibly meaning 'remarkable plant', rendered in Greek & reported by Dioscorides. (The *rho* has a rough breathing diacritic (*dasia* or *spiritus asper*) & is properly transliterated as *rh*, but few know what an aspirated *rho* is, so this is on the net as *rathibida*, not *rhathibida*.) Compare with Dioscorides' *ῥάβδιον*, *rhaboion*, a little bush, a twig, a small stem, or *ῥεβίθι*, *rhebithi*, the present name for *ἔρεβίνθος*, *erebinthos* of Dioscorides' *Cicer arietinum*. Burgess notes *ῥαθιβίδα* has the aspect of a compound name, formed of *ῥά*, *rha*, or the root *ῥατ-*, *rhat*, meaning a plant, a weed, & suggests *ῥά θηβαίδος*, *rha thebaidos*, or Rha of Thebaid, or Theban Plant. Compare *ῥά ποντικόν*, *Rhapontikhon*, (*Rhapontikhum*) the Rha of Pontus, *ῥά βάραρον*, *Rhabarbarum*, Rha of the Barbarians, the same plant, Rhubarb. Burgess suggests *ῥατ*, *rhat*, may be cognate with Old High German *rato* & old Low German *rado*, a weed, the source of present

German *raden*, a weed. The root $\theta\eta\beta\acute{o}\varsigma$, *thebos*, meaning admirable or remarkable, is the supposed source of the name of Boeotian Thebes, & when combined with $\rho\acute{\alpha}$ or $\rho\acute{\alpha}\tau$, yields remarkable plant. (Burgess 1902)

The Dacians were a Thracian people living in what is now Romania & Moldova, related to the Greeks, & spoke a similar language. *Rhathibida* may ultimately be of the old Thracian speech. However, the Dacian names in Dioscorides were probably collected between 200 & 250 AD, after more than a century of Roman influence upon Dacian speech. (Burgess 1902) How Rafinesque applied all this to this plant genus is unknown, maybe he was smitten with this ‘remarkable plant’.

A genus of about 7 spp of perennial North American composite herbs which are sometimes cultivated for their showy flower heads. Fruits are achenes, fertile achenes compressed, 1 to 2-winged, pappus 0. The genus was formerly known as *Lepachys* Raf, *Rudbeckia* Mx, & *Obeliscaria* Cass, or included in *Rudbeckia* L $\times = 16$ (but most taxa are $2n = 28$).

Seeds ripen late summer. Seeds may germinate after 90 days storage at 70°, but cold moist stratification is more uniform. Code A or B. (cu00)

Ratibida columnifera (Nuttall) Wootton & Standley LONG-HEADED CONEFLOWER, aka COLUMNAR CONEFLOWER, PRAIRIE CONEFLOWER, UPRIGHT PRAIRIE CONEFLOWER, YELLOW PRAIRIE CONEFLOWER, (*columniferus -a -um* columnar, bearing columns or with columns, in reference to the columnar disks.) upl
Habitat: distribution/range: Native of the Great Plains & western prairies, Alberta to Minnesota, south to Arkansas, New Mexico, & Mexico.

Culture: propagation: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③Sow at 20°C (68°F), germinates in less than two wks (tchn). ④“Seeds exhibit physiological dormancy. Seeds are placed in cold moist stratification for 90 days. Germination occurs at 21°C.” (bb02) ⑤“Very easy to propagate from seed in spring or fall though a fall seeding is recommended. Seeds do not have to be treated but may benefit from a period of stratification. Plants from seed usually bloom the second year. Be sure the seed is in good contact with the soil by lightly raking it into loose topsoil. Stratify at 40° for 9 weeks.” (lbj)

seed counts & rates: 512,000 (sh94), 592,000, 672,000 (ew12, pm12), 737,000 (stocks), 832,000 (appl02), 894,008 (s&s nysstl02), 900,000 (cci), 1,184,064 (wns01), 1,230,000 (gran), 1,248,000 seeds per pound. Plant 1.0-1.5 lb pls / acre (0.25 lb pls in mixes). For a single sp plot, plant 0.8 oz per 1,000 sq ft (stock). Pure stand plant 2 lb per acre (gran). Pure stand 2.0-4.0 lb per acre (lbj).

cultivation: Space plants 1.25-1.5’. Drought tolerant once established, full sun. Moderately coarse to moderately fine soils, tolerant of poor soils, but intolerant of moist, heavy clays. Will adapt to extra moisture. pH 6.8-7.2, neutral to basic soils. If field sown early, a few plants may bloom first year from seed. Watering in summer, may extend the flowering season. No serious insect or disease problems.

bottom line: Field sow spring or dormant; seed has little or no dormancy.

greenhouse & garden: No treatment, easy to grow; or moist cold stratify or fall plant, drill or broadcast in spring, ¼” deep.

Description: Biennial/short-lived perennial, 1.0-2.0(3.0)’ tall, 1.0-1.5’ spread; leaves deeply cut; flowers drooping yellow to maroon, daisy-like rays around a dark brown conical disk, “Conehead”. N $2n = 28$.

Comments: status: Western native. phenology: Blooms 6,7,8. Collect seeds in se Wisconsin in October (he99). Finely divided leaves, rarely native with us, but common west. Attractive cut flower & interesting dried seed head. Landscape uses include meadows, native plantings, reclamation, roadside plantings, sunny borders, xeriscaping, & used for quick color in natural landscaping. Individual plants are a bit sparse, so in beds & borders, they are best massed. Successional, short lived, may flower first year from seed if planted early. Seed source strictly commercial.

Associates: Attracts butterflies, hummingbirds, & seed eating birds. Sp is of special value to native bees. Deer eat this plant, but the strong odor is said to repel deer; reported as deer resistant.

VHFS: Also known as, & often sold as *R columnaris* (Sims) D Don. Cv ‘Buttons & Bows’ with double ray flowers is available.

[*Rudbeckia columnaris* Pursh, not Sims]

CC Baskin & JM Baskin, 2002. Propagation protocol for production of container *Ratibida columnifera* (Nutt) Woot & Standl plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL:

<http://www.nativeplantnetwork.org> (accessed 20 March 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



Ratibida columnifera

Line drawing courtesy of Kentucky Native Plant Society.

Ratibida columnifera (Nuttall) Wootton & Standley forma ***pulcherrima*** (de Candolle) Fernald MEXICAN HAT, aka COLUMNAR PRAIRIE CONEFLOWER, DWARF RED CONEFLOWER, GREY HEADED CONEFLOWER, LONG-HEAD CONEFLOWER, RED HATS, REDSPIKE MEXICAN HAT, UPRIGHT PRAIRIE CONEFLOWER, (*pulcherrimus -a -um* very handsome, very or most beautiful.) Common name from resemblance of flowers to high-centered, broad brimmed, Mexican hat, or sombrero.

Habitat: Native to open limestone soils prairies & roadsides. distribution/range: More typical of Southwest uplands.

Culture: propagation: ①Easy to grow. Sow anytime (pots2000). ②“No pretreatment needed. Sow seeds on the soil surface at 70°F & water.” (ew12)

seed counts & rates: 480,213 live seeds (s&s nysstl01), 592,855 (pure seed s&s nysstl01), 737,000 (stock), 832,000 (appl02, ew12), 1,230,000 (gran) seeds per pound. For single sp plot, plant 0.8 oz per 1,000 sq ft (stocks). Pure stand plant 2 lb per acre (gran).

cultivation: Space plants 0.5-1.5'. Dry soils, full sun. Drought tolerant. Moderately coarse to moderately fine soils. Neutral to basic soils. Adapted to much of USA.

bottom line: Field sow spring or dormant; seed has little or no dormancy.

Description: Western native perennial forb, 12-24", with red-brown (purple brown) ray petals with yellow margins, mahogany red with yellow outline perennial.

Comments: status: phenology: Blooms July to October. Similar to the sp, may cross with the sp producing orange-petaled coneflowers. Attractive cut flowers & dried seed heads. Landscape uses include garden border & often used as quick color in native seedings, where it is short-lived.

Associates: Attracts butterflies, hummingbirds, & seed eating birds.

Ratibida pinnata (Ventenat) Barnhart *PA YELLOW CONEFLOWER, aka DROOPING CONEFLOWER, GLOBULAR PRAIRIE CONEFLOWER, GLOBULAR CONEFLOWER, GRAY HEADED CONEFLOWER, GRAY HEADED PRAIRIE CONEFLOWER, PINNATE PRAIRIE CONEFLOWER, (*pinnatus -a -um* pinnate, feathered, the primary division of a compound leaf, from Latin *pinnatus -a -um*, adjective, feathered, winged.) Upland

Habitat: Mesic, dry, hill, & gravel prairies, mesic & dry savannas. Mesic prairie sp, woodland openings, & limestone outcrops. distribution/range: “Prairies; common in the n $\frac{1}{4}$ of Illinois, occasional elsewhere (m14). A standard plant of Midwestern prairies & limestone glades, with a disjunct population in South Carolina Piedmont prairies.

Culture: propagation: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③Sow at 20°C (68°F), germinates in less than two wks (tchn). ④“10 days moist stratification

improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer” (pnnd). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.

seed counts & rates: 404,000 (jfn04), 410,000 (gran), 426,496 (wns01), 432,000 (pn02, aes10), 445,000 (sh94), 480,000 (pm), 503,326 (gna05), 551,976 (gna04), 567,854 (gnh02), 577,241 (gna03), 625,000 (stocks), 800,000 (gn), 1,000,000 (usda, ecs), 1,134,000 (lhn) seeds per pound. When planted alone, use 0.9 oz per 1,000 sq ft (stocks). Pure stand plant 5 lb (usda) or 6 lb per acre (gran). In mixes plant 0.031 to 0.50 lb pls per acre.

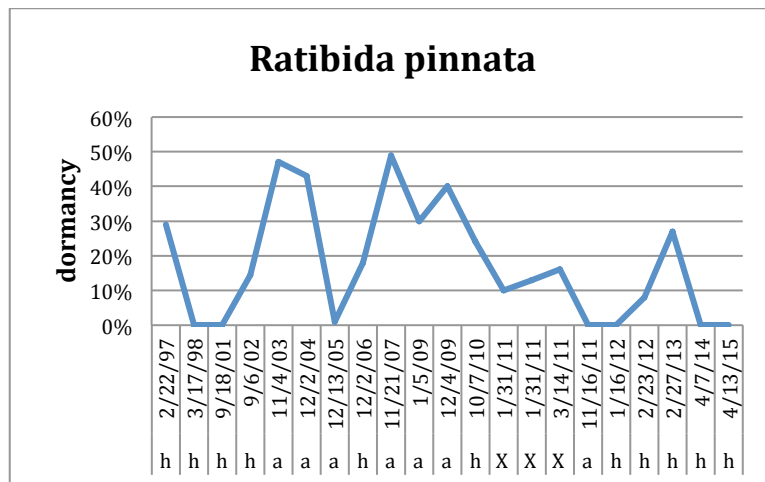
“*Ratibida pinnata* General prairie. Blooms early July to mid August; YELLOW. Harvest October. 4'; easy by all methods, SEEDLING TRANSPLANT, SPRING BROADCAST, blooming 2nd year & reliable. Too big & weedy except in broadcast seeding with close competition. Gross & weedy in appearance until the community stabilizes; then no problem.” (rs ma)

cultivation: Low to moderate water requirements, full sun. Adapted to wide range of soils. Will stand partial shade. Drought tolerant once established. Tolerant of loam, clay, or sandy soils, including poor, dry soils. No inundation tolerance. Nutrient load tolerance low to moderate. Siltation tolerance low. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance high. Fertility requirement medium. Salinity tolerance none, but noted as tolerant by AES (2010). Shade intolerant, full sun. “Neutral soils”, pH 5.6-6.8, or pH 6-7 “prefers calcareous soils that are neutral” (usda cs_rapi).

asexual propagation: Established garden plants can be divided in the spring.

bottom line: Sp can be spring or dormant seeded, but germination of some lots was significantly to strongly improved by dormant seeding. A rare instance where dormancy is declining. Germ 72.7, 71.5, 86, sd 18.1 r38-98 (60)%. Dorm 17.6, 14.5, 0.0, sd 16.5, r0.0-49 (49)%. Test 28, 28, 22, r20-78 days. (#21:4)**

greenhouse & garden: Establishes easily from seed. Field sow in spring or fall. Cold moist stratification at 33-38°F for 30 days often increases germination, but not essential. Easy from moist cold stratified seed (30 days).



Description: Native perennial herb; 14” minimum root; culms 18-48”; with 5-10 showy, drooping, yellow ray flowers around black or gray disk. Dry seed heads are aromatic. N 2n = 28.

Comments: status: Extirpated in Pennsylvania. phenology: Blooms 7,8,9. In northern Illinois, collect seeds in late August through October. Collect seeds in se Wisconsin in October - November (he99). Attractive cut flowers & dried seed heads. Landscaping uses include meadows, native plant gardens, prairie restorations, & sunny borders, makes attractive background, especially when massed. It is also useful in erosion control, good soil stabilizer in upper slope buffers. Tall, showy sp, initially aggressive from seed, but may fade from a planting in time. YELLOW CONEFLOWER is early successional in plantings & is not competitive with tall grasses in the long run. Seed source nursery production plots, original seed source railroad remnants Squaw Grove Twp, DeKalb & Big Rock Twp, Kane cos, Center Prairie near Princeton & Indian Boundary Prairie near Ohio, both in Bureau Co.

“There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as

occurring most constantly, and under greater diversity of soil and situation than any others, ... *Rudbeckia pinnata* Vent." *Ratibida pinnata* (Vent.) Barnh. as *Rudbeckia pinnata* Vent. (Short 1845).

Associates: Pollinated by bees & butterflies. Attracts butterflies & other insects, upland gamebirds, songbirds, & ungulates. Seeds are readily eaten by birds. Young growth palatable to grazers, but not the older woody stems. Reported to be deer resistant. Palatable to livestock, decreases under grazing.

VHFS: An "improved" selection is available.

[*Rudbeckia pinnata* Michx]



Ratibida pinnata

RUDBECKIA Linnaeus 1753 **CONEFLOWER, BLACK-EYED SUSAN, BLACK-EYED CONEFLOWERS**

Rudbeckia (rud-BEK-ee-a, rudd-BECK-kee-uh) Linnaeus honored the Swedish father & son, Olaus (Olof) Johannes *Rudbeck* the elder (1630-1702) & Olaus (Olof) Olai *Rudbeck* the younger (1660-1740), both professors of botany at Uppsala University in Sweden & predecessors of Linnaeus, who honored them with a genus name, writing "so long as the earth shall survive, each spring shall see it covered with flowers, the *Rudbeckia* will preserve your glorious name." *Rudbeckia* is a genus of about 15 (23) spp of North American annual, biennial, & perennial herbs having showy pedunculate flower heads with a hemispherical involucre, mostly yellow ray flowers, & a conical chaffy receptacle. Fruits are achenes, 4-angled; pappus none or a lacerate or toothed margin. *R amplexicaulis* is sometimes placed in the monotypic genus *Dracopsis* Cassini. X = 16, 18, 19.

Yellow flowers attract butterflies, upland gamebirds & songbirds. Nectar & pollen attract long-tongue bees, short-tongued bees, wasps, beetles, butterflies, & skippers. Two bee spp, *Andrena rudbeckiae* & *Heterosarus rudbeckiae*, are oligoleges (specialist pollinators) of *Rudbeckia* spp. RUDBECKIAS are host to or used by many other insects, including: *Chlosyne nycteis* SILVERY CHECKERSPOT, *Chlosyne gorgone* GORGON CHECKERSPOT, *Chlorochlamys chloroleuca* BLACKBERRY LOOPER MOTH feeds on petals, *Eupithecia miserulata* COMMON EUPITHECIA feeds on petals, *Synchlora aerata* WAVY-LINED EMERALD feeds on petals, *Papaipema nebris* COMMON STALK BORER MOTH bores through stalks, *Homoeosoma electellum* SUNFLOWER MOTH feeds on seeds & florets, *Epiblema carolinana* TORTRICID MOTH SP feeds on roots, *Epiblema tandana* TORTRICID MOTH SP feeds on roots, *Epiblema tripartitana* TORTRICID MOTH SP bores through stalks, feeds on seeds & florets, *Macrophya intermedia* SAWFLY SP. *Pantomorus cervinus* FULLER ROSE WEEVIL, *Halticus bractatus* GARDEN FLEAHOPPER, *Microrhopala excavata* LEAF-MINING BEETLE SP, *Paria thoracica* LEAF BEETLE SP, *Poecilocapsus lineatus* FOUR-LINED PLANT BUG, *Uroleucon ambrosia* BROWN AMBROSIA APHID, *Uroleucon rudbeckiae* GOLDEN GLOW APHID (list after Hilty).

Seeds ripen late summer to early fall. Seeds may germinate after 90 days storage at 70°, but cold moist stratification is more uniform. Code A or B.

Several species need rewritten, hirta, fulgida/speciosa Cf m&w

Rudbeckia amplexicaulis Vahl CLASPING CONEFLOWER, aka CLASPING-LEAF CONEFLOWER, (*amplexicaulis* -is -e claspings or encircling the stem, or stems clasped, when the petiole leaf is dilated at the base & embraces the stem; from Latin *amplexus*, from *amplector*, to wind around, surround, -i-, connective vowel used by botanical Latin, & Greek *καυλος*, *kaulos*, the stem of a plant.) The specific epithet & the common name refer to the cordate leaves clasping stem. Section *Dracopsis*. **Move to *Dracopsis*?**

Habitat: Drought tolerant, full sun & well-drained soils. distribution/range:

Culture: propagation: ①“No pre-treatment needed. Sow seeds just below soil surface at 70°F & water.” (ew12) ②In Mississippi, August to September seedlings germinated in September to October & overwintered as small plants. Seeds appear to have no dormancy. Seeds must be harvested soon after the receptacles become brown & wooly. (Grabowski 2001) Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Seed spread rate rapid. Easily established. May reseed itself on favorable sites, but typically not persistent beyond a few years.

seed counts & rates: 760,469 (gna07), 796,000 (appl02), 800,000 (ew12), 904,993 (Grabowski 2001), 922,000 (gran & stocks) 1,600,000 (usda) seeds per pound. Seeded alone plant 1.1 oz per 1,000 ft sq (stocks), 2-3 lb per acre (usda). Pure stand plant 3 lb per acre (gran), 4-5 lb pls per acre (Grabowski 2001).

cultivation: Space plants on 0.67-1.0' centers. Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance low. CaCO₃ tolerance medium. Drought tolerance high. Low moisture requirements. Fertility requirement low. Fire tolerance none resprout ability none. Salinity tolerance none. Shade intolerant. pH 6.0-7.5, neutral soils. Seldom used as a bedding plant. Remove spent blossoms.

bottom line: Plant early spring or dormant; very low dormancy rates. But why?

greenhouse & garden: Requires firm, clean, or scarified seedbed & good seed soil contact.

Description: Western native annual, 18-26", smooth stem, leaves oblong, with heart-shaped clasping base; inflorescence terminal, solitary; flowers rays yellow with reddish purple bases, with brown cone.

Comments: status: May be weedy or invasive in some parts of its range (SWSS 1998). phenology: Blooms summer to fall. Attractive cut flower. Landscape uses include quick color in native mixes, naturalized prairie or meadow plantings, & roadside seedings. Sp has become a problem in some agricultural crops.

Associates: Attracts butterflies.

ethnobotany: Used medicinally for earache, as a tonic, or diuretic.

VHFS: New nomenclature *Dracopis amplexicaulis* (Vahl) Cass.

JM Grabowski 2001. Propagation protocol for production of *Dracopis amplexicaulis* (Vahl) Cass plants; USDA NRCS - Coffeeville/Jamie L Whitten Plant Materials Center, Coffeeville, Mississippi. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 20 March 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



Dracopis amplexicaulis

Line drawings courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image

Rudbeckia fulgida Aiton *IN, NJ ORANGE CONEFLOWER, aka BLACKEYED SUSAN, BRILLIANT CONEFLOWER, EASTERN CONEFLOWER, ORANGE CONEFLOWER, SHOWY CONEFLOWER, (*fulgidus -a -um* fulgid, shining, brightly colored, gleaming, radiant, glittering, from Latin *fulgidus -a -um*, shining, gleaming, glittering, from *fulgēre*, to shine, in reference to the shining golden ray flowers.)

Habitat: distribution/range:

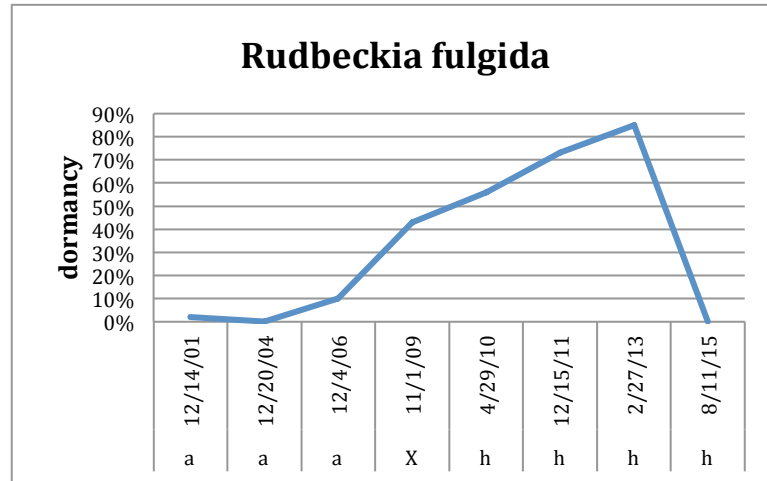
Culture: propagation: ①(Code C, D Ken Schaal). ②60 days cold moist stratification (pm09). No pre-treatment needed. Sow seeds just below soil surface at 70°F & water.” (ew12) ③Sow at 20°C (68°F), if no germination in 3-4 wks, move to +2 to +4°C (34-39°F) for 2-4 wks (tchn).

seed counts & rates: 496,000 (pm, jfn, ew12), 500,000 (ecs), 545,673 (gnh13), 548,488 (gnh11), 585,806 (gna04), 701,158 (gna06), 832,000 (gn) seeds per pound.

availability: Commercially available as seed, bare root plants, & potted plants. Nomenclature confusion with *R. speciosa* clouds the availability.

cultivation: Space plants 1.0-1.5'. Medium to dry soils, full sun to partial shade. Tolerates clay soils. Thin, rocky, or dry soils. Somewhat drought tolerant. Air pollution tolerant. Removing spent blossoms will extend blooming. Divide plants when clumps become crowded, approximately every three years.

bottom line: 50% of lots are significantly or strongly dormant, but 0.0-10 % dormant lots are known. Flipflop species. Flipflop, 50% no to slight dorm, 50% over 50% dorm. Crossover species? Germ 55.3, 54.5, na, sd 29.4, r12-91.5 (79.5)%. Dorm 33.6, 26.5, 0.0, sd 32.8, r0.0-85 (85)%. Test 28, 28, na, r20-38 days. (#8)**



Description: 2.0-3.0' tall, 2.0-2.5' spread; N 2n = ca. 76.

Comments: status: Var *fulgida* is rare, & var *umbrosa* is endangered in Indiana. Endangered in New Jersey.

phenology: Blooms 6-10. C3. ORANGE CONEFLOWER'S blooming period overlaps with ending of BLACK EYED SUSAN & SWEET CONEFLOWER blooms, & extends the golden-yellows in the garden for a few more weeks in late July into August. Sp is ever so slightly more vibrant gold colored than other *Rudbeckia* spp. Attractive cut flowers & dried seed heads. Landscape uses massed in perennial borders, rain gardens, pollinator gardens, cottage gardens, meadow plantings, naturalizing.

Associates: Pollinator friendly, attracts native bees & beetles. Butterfly nectar plant. Deer resistant. Walnut tolerant.

ethnobotany:

VHFS: Varieties include the following: ① *Rudbeckia fulgida* Ait var *deamii* (Blake) Perdue, DEAM'S CONEFLOWER, Illinois to Ohio, ② *Rf* Ait var *fulgida*, Missouri & Illinois & eastward, ③ *Rf* Ait var *spathulata* (Michx) Perdue, ④ *Rf* Ait var *palustris* (Eggert ex CL Boynt & Beadle) Perdue, PRAIRIE CONEFLOWER, Missouri to Texas, ⑤ *Rf* Ait var *speciosa* (Wenderoth) Perdue [*Rf* Ait var *sullivantii* (CL Boynt & Beadle) Cronq] grows over much of eastern US, & ⑥ *Rf* Ait var *umbrosa* (CL Boynt & Beadle) Cronq, east, west, & south of Illinois.

Available selections include 'Blovi' Viette's Little Suzy, 'City Garden', & 'Early Bird Gold'.

'Goldsturm' is a selection of *R. fulgida sullivantii*. True 'Goldsturm' must be vegetatively propagated. Some nurseries sell seed grown plants as 'Goldsturm' strain. 'Goldsturm' was selected by Heinrich Hegemann in the Czech republic in 1937. After World War II, it was introduced by Karl Foerster in Potsdam, Germany in 1949 & was designated as Perennial Plant of the Year in 1999 by the Perennial Plant Association. The Internet also spells this as 'Goldstrum'.



Rudbeckia fulgida Lubbs' back yard

Rudbeckia gloriosa hort. GLORIOSA DAISY, aka BLACK EYED SUSAN, (*gloriosus -a -um* glorious, noble, splendid, from Latin *gloriosus -a -um*, adjective, glorious, superb, full of glory; famous, renowned; boastful, conceited; ostentatious.)

GLORIOSA DAISY is one of several colorful plants used as accent flowers or as quick color in a native seeding. Unfortunately, managing for accent flowers is in opposition to managing for the developing native species. Accent flowers are pretty weeds stifling native seedlings.

propagation: ①No pre-treatment needed. Sow seeds just below soil surface at 70°F & water. (ew12) 1,600,000 (ew12), 1,697,000 (appl02) seeds per pound.

Rudbeckia gloriosa hort is listed as a synonym of *R fulgida* var *speciosa*.

bottom line: Plant early spring or dormant; very low to non-dormant. But why?



Rudbeckia gloriosa

Rudbeckia 'Herbstsonne' AUTUMN SUN CONEFLOWER, aka AUTUMN SHINING SUN CONEFLOWER,

Habitat: Cultivated only. distribution/range:

Culture: propagation: Sow seed at 61-64°F/16-18°C in spring.

asexual propagation: Division in early spring or late fall or terminal cuttings.

cultivation: Full sun to partial shade, rich, moist, well-drained soils; moderately fertile, preferably heavy but well drained soil that does not dry out. Drought tolerant once established. Tolerates heat & humidity. Pollution resistant. Very cold hardy. Zones 5-9. Larger plants may need staking. Removing spent blossoms helps encourage new blooms. Companion plants include *Boltonia asteroides*, *Eupatorium purpureum* & *Verbesina alternifolia*.

bottom line:

Description: Native, erect herbaceous perennial forb selection; (4.0)5.0-6.0(7.0-9.0)' tall, 2.0-3.0(4.0)' spread; rhizomatous, clump-forming; ray flowers yellow (lemon yellow, bronze), 3.0-4.0" diameter, petals drooping, rays on lime-greenish cones; leaves large, deep green glossy deeply cut; key features:

Comments: status: phenology: Blooms June to August. Attractive cut flower. Landscape uses include mass plantings, rain gardens, meadows, & borders, especially the back of the border. Reported to be aggressively rhizomatous & to dominate planting beds. Apparently, this is another plant to place next to that nasty neighbor.

Associates: Attracts bees & butterflies, especially Monarchs. Attracts gold finches. Voles may feed on roots. Deer resistant. Rabbit resistant. Slugs & snails feed on young plants. Aphids, powdery mildew, rust, smut & leaf spots.

ethnobotany:

VHFS: Sold as a cultivar of either *Rudbeckia nitida* or *R laciniata*, however some authorities state that it is a hybrid between the two spp. Thanks to the Internet, this is seen as 'Herbstsonne' & 'Herbstsonne'.



Rudbeckia 'Herbstsonne'

***Rudbeckia hirta* Linnaeus** *NY BLACK-EYED SUSAN, aka BLACKIEHEAD, BROWN BETTY, BROWN DAISY, BROWN-EYED SUSAN, CONEFLOWER, GOLDEN JERUSALEM, POORLAND DAISY, YELLOW DAISY, YELLOW OX-EYE DAISY, (*hirtus -a -um* hairy, with short or stiffish hairs, hairy but shorter than hirsute, from Latin *hirtus*, rough, hairy, shaggy, or rude, rough, unpolished, uncultivated.) Facultative Upland

Habitat: Present in most native habitats, hill, gravel, sand, dry, mesic, & degraded prairies, roadsides, mesic to wet prairies. "Very flexible & adaptable sp, prefers dry, poor acid soil" (krr). Open woods, thickets, barrens, fields, & waste ground. Fields, roadsides, & open woods. Mesic or dry fields, prairies, open woods.

distribution/range:

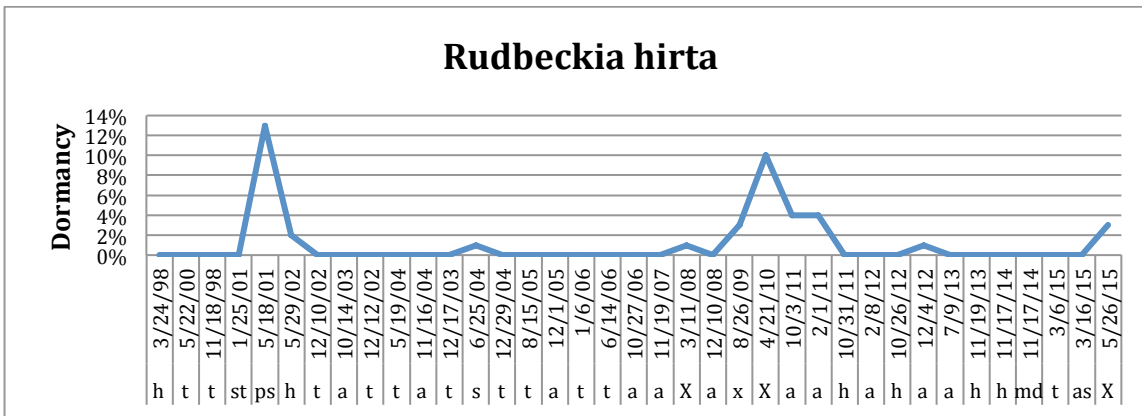
Culture: propagation: ①30 days cold moist stratification (pm09). ②"from transplants & moist stratified seed" KRR. ③"10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer" (pnnd). ④"No pre-treatment needed. Sow seeds just below soil surface at 70°F & water." (ew12) ⑤Sow at 20°C (68°F), if no germination in 3-4 wks, move to +2 to +4°C (34-39°F) for 2-4 wks (tchn). ⑥Sow spring to late summer, cover lightly (pots 2000). Growth rate rapid. Seedling vigor medium. Vegetative spread rate none.

seed counts & rates: 980,000 (cci), 980,800 (aes10), 1,254,144 (gna05), 1,280,000 (ew12), 1,384,732 (s&shsl02), 1,438,660 (gna04), 1,450,000 (stocks), 1,455,128 (gna06), 1,472,000 (pm02), 1,575,760 (usda), 1,575,600 (ecs), 1,600,000 (pn02, sh94) to 1,677,312 (wns01), 1,697,000 (appl02), 1,710,000 (gran), 1,760,000 (jfn04), seeds per pound. Broadcast 2 lb pls per acre in fall or early spring. Stocks recommends, when planted alone, 0.8 oz per 1,000 ft sq. Pure stand plant 2 lb pls per acre (gran). In mixes plant 0.125 to 0.3 lb pls per acre (us97).

cultivation: Place plants on 1.0-1.5' centers. When using greenhouse transplants, this sp will often behave as an annual, making transplants incredibly cost inefficient & absolutely pointless for native applications. Blooms first year from seed if planted in early spring. Medium to dry soils, full sun to partial shade. Adapted to wide range of soils, coarse to moderately fine soils, said to tolerate clay but best developed on sandy soils. Limited flooding tolerance. Nutrient load tolerance low to moderate. Siltation tolerance low. Anaerobic tolerance none. CaCO₃ tolerance none. Low to moderate water requirement. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none, but some tolerance noted by AES (2010). Full sun to partial shade, tolerates light shade. pH 6.0-7.0 (usda) or pH 4.5-7.5. Zones 3-7. Freely self sows in open soils. Deadhead to prolong bloom season or to prevent volunteers.

bottom line: Plant spring or dormant, zero to low dormant seed percentages typical. Germ 87.7, 89.5, 90, sd 6.7, r72-98 (26)%. Dorm 1.1, 0.0, 0.0, sd 2.8, r0.0-13 (13)%. Test 17, 14, r4-47 days. (#37:4)**

greenhouse & garden: Easy to grow. Easily established from seed. No pretreatment necessary, moist cold stratify may help.



Description: Native annual, biennial or short-lived perennial, especially short-lived when greenhouse grown. Semi-erect, 1.5-2.0' tall, 1.0-2.0' spread; fibrous roots, 10" minimum depth; leaves lance-shaped, 3.0-7.0" long, rough hairy; flowers large, yellow-orange sunflower-like with black or brown (chocolate brown) disks. N 2n = 38.

Comments: status: Var *hirta* is endangered in New York. BLACK-EYED SUSAN is also considered invasive in parts of its range (SWSS 1998). phenology: Blooms profusely 6,7,8,9. In northern Illinois, collect seeds in July - August. Collect seeds in se Wisconsin in September - October (he99). Attractive cut flower. Landscape uses include annual beds, grouped or massed plantings, naturalized areas, wildflower meadows, cottage gardens, native plant gardens, & borders; a nostalgic, old-familiar standard. Fibrous root system helps stabilize soils in erosion control plantings. Can be very aggressive if seeded heavily; can be early successional, in plantings it rarely persists in significant numbers. Good cut flowers, dried seed heads. Local stock seed source nursery production, genetic source Amboy Township, Lee Co.

"There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Rudbeckia hirta* L." (Short 1845).

Associates: Pollinator friendly. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Lepidoptera*, *Coleoptera*, *Hemiptera*. Attracts butterflies, nectar plant, & larval host for *Chlosyne nycteis*, Silvery Checkerspot Butterfly. Offers cover & food for songbirds & gamebirds, though it may be of limited food value. Deer resistant. Walnut tolerant. No serious insect or disease problems, but susceptible to powdery mildew. Young plants may be damaged by terrestrial gastropods, especially those with vestigial, internal shells. Rasp, rasp away with your radula!

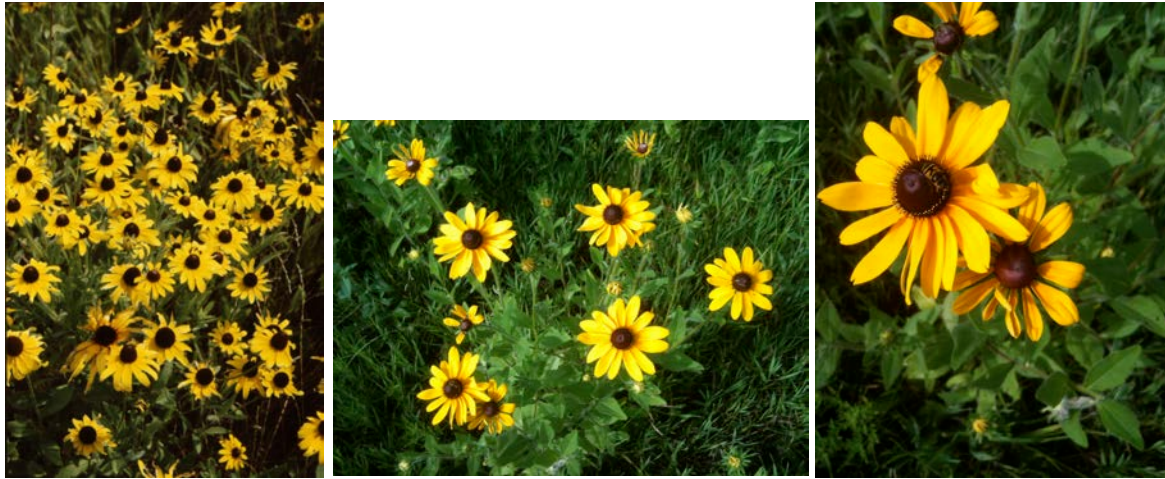
Ethnobotany: Used as medicinal beverage by Pottawatomie & Ojibwa (sm33, Gilmore 1933). Pottawatomie used as a dye (sm33).

VHFS: [*Rudbeckia hirta* L var *angustifolia* (TV Moore) Perdue, *R hirta* L var *floridana* (TV Moore) Perdue, *R hirta* L var *hirta*, *R hirta* L var *pulcherrima* Farw.]

'Indian Summer' is an improved selection with flowers 6-9" diameter.

'Irish Spring' has deep golden yellow rays with greenish disks.

'Prairie Sun' has yellow-tipped orange rays with green disks & was an All-American Selection winner in 2003.



Rudbeckia hirta

Rudbeckia laciniata Linnaeus CONEFLOWER FROM HELL, aka COYOTE UGLY CONEFLOWER, CUTLEAF CONEFLOWER, CUT-LEAVED CONEFLOWER, EXPLETIVE DELETED CONEFLOWER, FOYB CONEFLOWER, GREEN-HEADED CONEFLOWER, OUTHOUSE FLOWER, TALL CONEFLOWER, WILD GOLDEN GLOW, THE CONEFLOWER THAT ATE CLEVELAND, THE ROMANCE IS OVER CONEFLOWER, THE WHY DID I PLANT THIS CONEFLOWER?, *Gi'zuswe'bigwa'is*, "it is scattering" (Ojibwa) & boy does it! (*laciniatus* -a -um lacinate, torn, deeply cut, fringed, slashed or lacerated, cut into narrow divisions or lobes, jagged, from Latin *lacinia*, noun, small piece of cloth to be sewn on a garment for lapels, etc., & -atus, adjectival suffix for nouns, possessive of or likeness of something, with, shaped, made, generally referring to the deeply for cut leaves.)
facw+

Habitat: Urban floodplains. Also moist ground, wet savannas, upland swamps, fens, wooded alluvial bottoms, & floodplain thickets. distribution/range: Widespread sp with four regional varieties.

Culture: propagation: Unsuitable for other than large-scale plantings or urban floodplains! ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③"10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, early spring." (pnnd) ④"No pre-treatment needed. Sow seeds just below soil surface at 70°F & water. Slow to germinate." (ew11) ⑤Sow at 20°C (68°F), germination slow (tchn). Growth rate rapid. Seedling vigor medium. Vegetative spread rate moderate.

seed counts & rates: 203,314 (gn05), 207,022 (gnal03), 219,536 (gna06), 224,000 (pm01), 225,310 (gnh02), 240,000 (pn02&jfn04), 249,656 (gna04), 252,000 (ecs), 252,222 (usda), 283,200 (aes10), 283,504 seeds per pound.

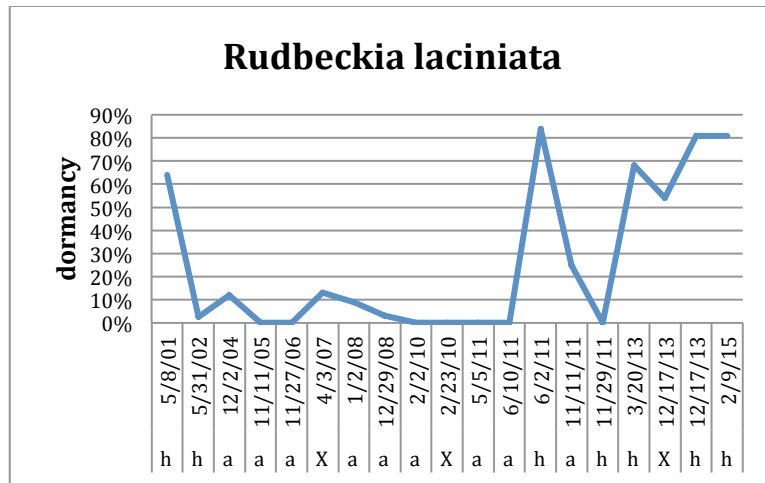
availability: Available as seed, bare root plants, & plugs. There may be seasonal shortages. Seed availability is somewhat cyclical due to short-lived production plots. Sp is strongly rhizomatous, & production beds fill in quickly & seed production declines.

asexual propagation: Division of mature plants any time with care.

cultivation: Not for the meek or timid gardener. Do not plant by the back door, or it might beat you in the house. Space plants 2.0-3.0'. Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance low. CaCO₃ tolerance medium. Drought tolerance high (?). Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 4.5-7.0. Medium to moist soils, full sun to shade. Calcareous soils. Not suited for small gardens or good neighbors. Plants quickly show heat & water stress.

bottom line: Field sow spring works 70% of lots. Seed tests indicate most lots have modest 0-13% dormant seed. But, ca 30% of lots have 54-84% dormancy. Dormant seed or cold moist stratify for insurance. Germ 52.1, 50, 27, sd 24.7, r7.0-95 (88)%. Dorm 26.1, 9.0, 0.0, sd 32.3, r0.0-84 (84)%. Test 25, 28, 28, r13-40 days. (#19:3)**

greenhouse & garden: Moist cold stratify or dormant seed in an unheated cold frame.



Description: WEEDY! Subshrub forb/shrub, aggressively rhizomatous, 4.0-10', tall, 3.0' spread; leaves 3-7 lobed; limp, yellow rays with green disk, 12" minimum root depth. $N 2n = 38$.

Comments: **status:** WEED. This is listed as a weed in Weeds of the North Central States (www.extension.uiuc.edu/~vista/html_pubs/WEEDS/list.html). **phenology:** Blooms 7,8,9,10. In northern Illinois, collect seeds in October - early November. Collect seeds in se Wisconsin in October - November (he99). One of the plants you put along the fence by the neighbor you don't like. Aggressively rhizomatous, highly competitive to the exclusion of other spp, phytotoxic??, & autotoxic. Some recommend this sp for wetland restoration, rain gardens, & erosion control. This aggressive sp should only be used in urban floodplains, urban streambanks, & bioremediation. Seed source nursery production with foundation stock from West Bureau Creek floodplain woods, near Wyanet, Bureau Co.

"There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Rudbeckia laciniata* L." (Short 1845).

Associates: Pollinator friendly. Butterfly nectar plant. Seeds are eaten by goldfinches. Deer resistant. Walnut tolerant.

ethnobotany: Used as medicinal plant by Ojibwa for indigestion & burns. Herb is said to be diuretic, tonic, & balsamic. (den28)

VHFS: Varieties are *R laciniata* L var *ampla* (A Nels) Cronq. [*R laciniata* L ssp *ampla* (A Nels) WA Weber] from the Rocky Mountain states, *R laciniata* L var *bipinnata* Perdue, Mid-Atlantic & parts of New England, *R laciniata* L var *digitata* (P Mill) Fiori CUTLEAF CONEFLOWER [*R laciniata* L var *humilis* Gray], *R laciniata* L var *heterophylla* (T&G) Fern & Schub se USA, *R laciniata* L var *laciniata* [*R laciniata* L var *hortensis* Bailey forty-four of the lower states.]

Double flowered garden plants are *Rudbeckia laciniata* cv '*Hortensia*', DOUBLE GOLD, aka outhouse flower, a Victorian era selection growing to 7.0', with fully double, 3.0" diameter drooping yellow flowers. 'Goldquelle' & 'Golden Glow' are hybrid selections of *R laciniata* X *R nitida*.



Rudbeckia laciniata in dappled shade with *Rubus occidentalis*, somewhat cute, BUT, do not give into the dark side!



Line drawings courtesy of Kentucky Native Plant Society. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* Not copyrighted image. Seed photo Steve Hurst - USDA-NRCS PLANTS Database - Not copyrighted image

Rudbeckia maxima Nuttall GREAT CONEFLOWER, aka CABBAGE LEAF CONEFLOWER, GIANT BROWN-EYED SUSAN, LARGE CONEFLOWER, (*maximus -a -um* (MAHK-si-mus) Latin superlative adj, the largest, very large.) Cabbage Leaf is a reference to the large basal leaves.

distribution/range: Native southeast & southwest of our area, central & southern USA, but introduced northward.

propagation: ① No pre-treatment necessary other than cold, dry stratification (pm09). ② “No pre-treatment needed. Sow seeds just below soil surface at 70°F & water.” (ew12) Sow at 20°C (68°F), if no germination in 3-4 wks, move to +2 to +4°C (34-39°F) for 2-4 wks (tchn).

seed counts & rates: 64,000 (pm, ew12) seeds per pound.

availability: Available as seeds & bare root plants.

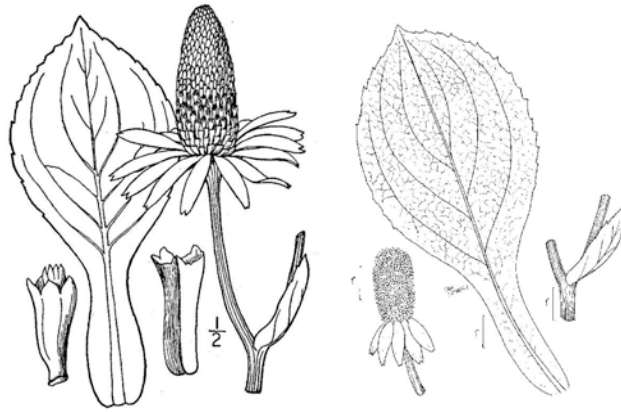
Full sun, mesic to dry (moist, well-drained, preferably organic) soils. Drought tolerant. Zone 4-9.

Young plants may be damaged by terrestrial gastropods. Self sows.

Native, erect, perennial forb; 5.0-7.0', 3.0-4.0' spread; basal leaves to 24" long & 10" wide, blue-green glaucous, yellow rays with elongated, dark brown disks, 2.0-6.0" long;

Blooms 6-7. Cut flowers & dried seed heads.

Attracts birds & butterflies. Gold finches are attracted to the seeds. Deer resistant.



Rudbeckia maxima

Line drawings courtesy of Kentucky Native Plant Society. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* Not copyrighted image.

Rudbeckia missouriensis Engelm ex CL Boynton & Beadle *IL MISSOURI CONEFLOWER, aka MISSOURI BLACK-EYED SUSAN, MISSOURI ORANGE CONEFLOWER, (*missouriensis -is -e* (mi-sur-ree-EN-sis) of, pertaining to, or from Missouri or the Missouri River.)

Habitat: Limestone or dolomite glades, barrens, bald knobs & rocky prairies in the Ozarks. distribution/range: Illinois south to Louisiana & Texas, primarily in Missouri & Arkansas.

Culture: propagation: ① Cold moist stratify 3-6 weeks or dormant seed outdoors. ② (Code C, D Ken Schaal).

seed counts & rates: 696,000 (easy), 672,000 (gni) seeds per pound.

cultivation: Space plants 0.67-2.0' centers. Mesic to dry, well drained soils in full sun. Needs calcareous soils. Low maintenance. Drought tolerant. Zone 5-8. Forms basal rosette first year. Do not plant with tall, aggressive neighbors. Fleshy roots are best left undisturbed. Does well in dry, rocky meadows. Suggested companions include native *Allium spp*, *Dalea purpurea*, *Echinacea pallida*, *Echinacea paradoxa*, *Oenothera macrocarpa*, *Phlox bifida*, *Silene regia*, *Sporobolus heterolepis*, & *Tradescantia bracteata*.

Description: Native, erect perennial forb, leaves & stems conspicuously hairy; 2.0-3.0' tall, 1.0-2.0' spread, stems branched; not stoloniferous, from a stout rhizome & thick fleshy roots; leaves skinny, hairy; ray flowers orange to yellow, not drooping, disk blackish (purple-brown),

Comments: status: Endangered in Illinois. phenology: Blooms June to October. C3. Often forms large colonies in the wild. Excellent cut flower. Landscape uses include beds or borders, cottage gardens, cut flower gardens, native plant gardens, naturalized plantings, prairie restorations, pollinator gardens, rock gardens, specimen plants, & xeriscaping. Sp has more, but smaller, flowers than *Rudbeckia hirta*.

Associates: Nectar & pollen attract long-tongue bees, short-tongued bees, wasps, beetles, butterflies, & skippers. Larval host for *Chlosyne nycteis* SILVERY CHECKERSPOT & *Chlosyne gorgone* GORGONE CHECKERSPOT, & caterpillars of several moth spp. Deer tolerant.

VHFS: [*R. fulgida* var *missouriensis* (Engelmann) Cronquist]

integrate the following with *fulgida*

Rudbeckia speciosa Wenderoth var **sullivantii** (CL Boynton & Beadle) LL Robinson SHOWY BLACK-EYED SUSAN, aka SULLIVANT'S ORANGE CONEFLOWER, (*speciosus -a -um* (spee-kee-O-sus) beautiful, showy, spectacular, splendid, good-looking; from Latin *speciosus*, adjective, beautiful, handsome, good-looking; attractive, appealing; presentable, respectable, imposing; spectacular, brilliant, impressive, splendid; *sullivantii* for William Starling *Sullivant*, 1803-1873.) [facw]

Habitat: Wet meadows, fens, & drier prairies. distribution/range:

Culture: propagation: ① Moist cold stratify or fall plant. ② 30 days cold moist stratification (pm09).

seed counts & rates: 433,600 (pm12), 496,000 (pm02, jfn04, ew12), 548,488 (gn11), 585,806 (gna04) seeds per pound.

availability: Available as seed, bare root plants, & plugs.

bottom line: Spring planting will give results, but 40% of lots may be significantly to strongly dormant.

Description: Erect perennial, 1.0-2.0', flowers yellow, plant often stoloniferous. "Rays usually becoming reflexed. A low, hemispherical, dark disk. Leaf venation may also be parallel." (Ilpin)

Comments: status: phenology: Blooms 7,8,9. Landscaping, calcareous soils. Genetic source Kane Co.

VHFS: New nomenclature this will be *Rudbeckia fulgida* Ait var *sullivantii* (CL Boynton & Beadle) Cronquist.

Rudbeckia subtomentosa Pursh * KY, MI, TN SWEET CONEFLOWER, aka BLACK EYED SUSAN, FRAGRANT CONEFLOWER, SWEET BLACK-EYED SUSAN, (*subtomentosus -a -um* somewhat hairy or somewhat downy, from Latin *sub*, below, under, almost, as in less so than a similar plant, & modern Latin *tōmentōsus*, with down or short hairs, pubescent, from the noun *tomētum*, *tomenti*, n, stuffing for cushions, pillows, & mattresses: wool, feathers, & *-osus*, adj suffix for nouns noting plenitude or notable development.) facu+

Habitat: Dry to moist prairies, moist woods & woodland edges & stream banks. Peat or wet sands, drainage ditches, wet open woods & thickets, sand prairies, prairie/woodland border. distribution/range:

Culture: propagation: ①Cold moist stratify or no treatment (wade95) ②"Moist cold treatment, or no pretreatment, or fall sow. Light cover. Very good to excellent germination" (mfd93) ③30 days cold moist stratification (pm09). ④Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ⑤"10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer." (pnnd) ⑥"No pre-treatment needed. Sow seeds just below soil surface at 40°F & water. Slow to germinate." (ew12) ⑦Sow at max 5°C (41°F), germination irregular, often several months (tchn). ⑧Cold moist stratify helps, no treatment, cuttings (pph).

seed counts & rates: 688,000 (pm01), 693,130 (gna06), 712,000 (ecs, ew12), 734,400 (aes10), ,000 (pn02, jfn04&sh94), 819,495 (gna06), 821,719 (gnh01), 826,960 (agr07), 850,984 (gna04), 958,617 (gna04), 991,266 (gnih03), 1,000,000 seeds per pound. In seed mixes, plant 0.063-0.50 pls lb per acre.

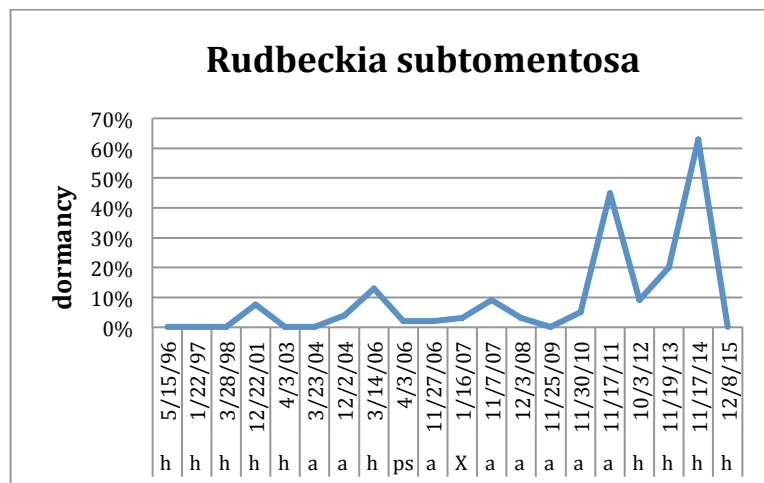
availability: Seeds, bare root plants, & plugs are available.

cultivation: Space plants 1.25-1.5'. Mesic, well-drained soils, full sun to partial shade. Somewhat drought resistant once established. Tolerates clay soils. Zone 4-8. No serious insect or disease problems. Tall plants may need some support.

asexual propagation: Division of mature clumps in spring, cuttings can be used.

bottom line: Field sow spring works 80% of lots. Seed tests indicate most lots have modest 0-13% dormant seed. But, ca 20% of lots have 45-63% dormancy. Dormant seed or cold moist stratify for insurance. Germ 77.6, 83.3, 90, sd 17.7, r27-96 (69)%. Dorm 9.3, 3.0, 0.0, sd 16 r0.0-63 (63)%, Test 25, 24, 15, r11-46 days. (#22).**

greenhouse & garden: Moist cold stratify helps some lots.



Description: Erect, herbaceous, perennial, native forb, 2.0-5.0' tall, 1.0-2.0' spread; leaves oval to elliptical, especially hairy below; flowers yellow, 1.5-4.0" across with purple-brown disk, bracts with whitish hairs near tips; key features: "Lower to all leaves 3-lobed to 5-7 parted, upper leaves usually simple. Disk of flower head dark brown-purple. Peduncles & at least the upper stem short-hairy or downy, leaves thick & firm,

usually densely short-hairy on lower surface; pales (receptacle chaff) short-tipped, short-hairy, glandular on back, glandular on margins also; rays yellow, 12-20; stout rhizome present.” (Ilpin)

Comments: status: Endangered in Kentucky. Probably extirpated in Michigan. Threatened in Tennessee.

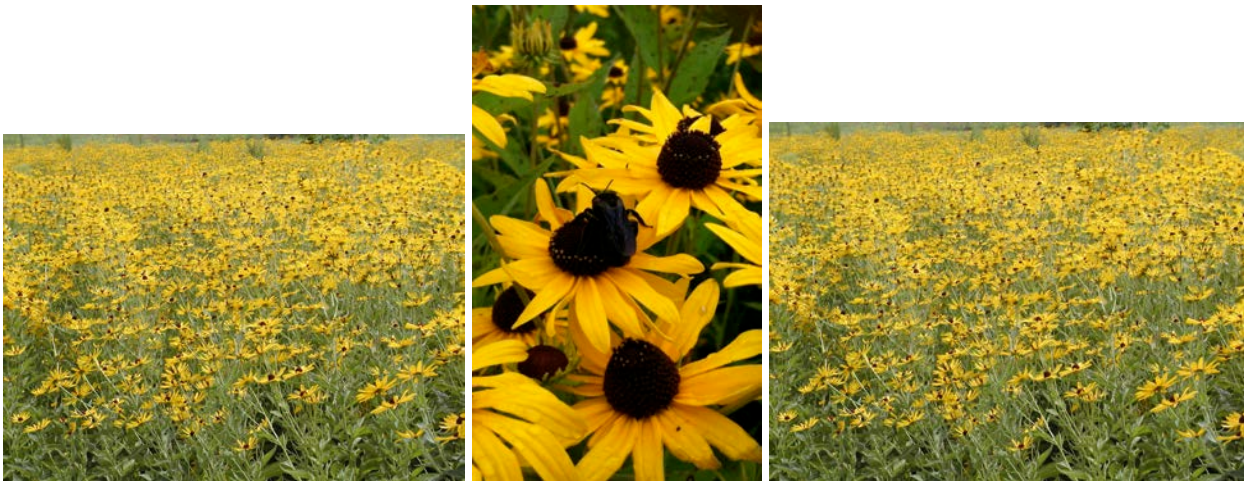
phenology: Blooms 7,8,9. In northern Illinois, collect seeds in September - October. Collect seeds in se Wisconsin in October (he99). Attractive, fragrant, cut flowers & interesting dried seed heads. Landscape uses include borders, cottage gardens, meadows, native plant gardens, pollinator gardens, prairie plantings, rain gardens, & specimen plants; a long-lived alternative to *Rudbeckia hirta*. Flowers have a fragrance some liken to licorice. Seed source nursery production, genetic source East Grove Township, Lee Co, Windrift Prairie Nursery, Ogle Co, & Kane Co (Horlock).

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob’s seeds were collected in DuPage, Kane, & Will cos. We traded seeds back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

“There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Rudbeckia subtomentosa*” (Short 1845).

Associates: Pollinator friendly. Sp of special value to native bees. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Lepidoptera*, *Coleoptera*, *Hemiptera*. Attracts butterflies, host & nectar. Provides food & cover for birds. Deer resistant.

VHFS: *Rudbeckia subtomentosa* ‘Henry Eilers’ 5.0-6.0’ tall with yellow ray flowers resembling quills, blooms midsummer to mid fall. The name honors its discoverer, Henry Eilers, accomplished nurseryman & restorationist from Litchfield, Illinois, who found the plant in a railroad prairie remnant in Montgomery Co, Illinois. The selection is similar to the sp, except the yellow rays are rolled instead of flat, giving a quill-like appearance; mesic, well-drained loams in full sun; tolerates heat & humidity; benefits from good air circulation; deadhead to prolong blooming.



Rudbeckia subtomentosa, & cv 'Henry Eilers'

Rudbeckia triloba Linnaeus * FL BROWN EYED SUSAN, aka BRANCHED CONEFLOWER, THINLEAVED CONEFLOWER, THREE LOBED CONEFLOWER, THREE LOBED RUDBECKIA, (*trilobus -a -um* three lobes, from Latin *tri*, prefix from *tres*, three, & Late Latin *lobus*, husk, pod, from Greek *λοβος*, *lobos*, lobe of the ear, liver, or lung, also a capsule or pod of a legume.) fac-

Habitat: Stream banks, edges of fens, moist bottomlands, wet prairies, & open woods. distribution/range: New England to Minnesota, south to Georgia & Oklahoma.

Culture: propagation: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③“10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer.” (pnnd) ④“No pre-treatment needed. Sow seeds just below soil surface at 40°F & water. Slow to germinate.” (ew11) ⑤Sow at max 5°C (41°F), germination irregular, often several months (tchn).

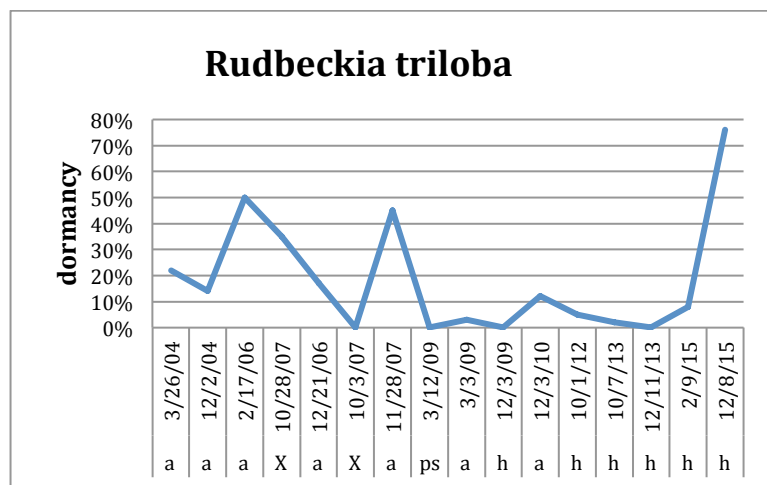
seed counts & rates: 505,850 (gna06), 528,000 (pn02; jfn04), 536,000 (ew12, aes10), 544,000 (pm12), 546,659 (gnaae04), 548,972 (gnaa04), 639,536 (agr07), 925,714 (gnh12) seeds per pound.

availability: Seed, bare root plants, & plugs are available. Seed is most cost effective.

cultivation: Space plants 1.0-1.5'. Prefers average, mesic, well-drained soils in full sun to partial shade, preferably high in organic material. Said to tolerate clay soil & a range of other soil types. Drought resistant once established. Zone 4-8. Plants may become leggy in deep shade. Deadhead to encourage more blooms or to prevent volunteer seeding. Young plants may be damaged by terrestrial gastropods (rasp, rasp).

bottom line: Plant spring or dormant. 25% of lots have significant to strong benefit from dormant seeding. The dormancy varies from zero to 76%. Germ 69.3, 77, 95, sd 26.2, r12-97 (85)%. Dorm 18.1, 10, 0.0, sd 21.7, r0.0-76 (76)%. Test 22, 21, 14, r11-38 days. (#16).**

greenhouse & garden: Moist cold stratify or dormant seeding helps. Self sows in favorable environments. Will naturalize in sandy woods.



Description: Native, erect, annual, biennial, or short lived perennial, (2.0)3.0-5.0', 1.0-1.5' spread; leaves rough on both sides, usually 3-lobed (sometimes 5-7 lobed), 6-12 yellow to orange ray flowers with dark brown (brown-purple) disks, flowers to 1.5" diameter. N 2n = 38, ca. 57, 57. key features: ①“Disc dark purple-brown. Leaves thin, sparsely longhaired underneath, upper stem with long spreading hairs. Pales (receptacle, chaff) sharp, pointed & glabrous.” (Ilpin) ②Differs from *R hirta* by more, but smaller flowers with fewer rays per head.

Comments: status: Endangered in Florida. phenology: Blooms 7,8,9,10. In northern Illinois, collect seeds in October - early November. Collect seeds in se Wisconsin in October - November (he99). Good cut flowers & attractive dried seed heads. Flowers are fragrant. Landscaping, shade gardens, pollinator gardens.

Comparatively short-lived. Seed source nursery production, genetic source West Bureau Bottoms, Bureau Co.

Associates: Pollinator friendly. Attracts butterflies, host & nectar. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Lepidoptera*. Reported as deer resistant.

VHFS: Ours is the widespread variety *triloba*. Variety *pinnatifida* T&G & var *rupestris* (Chickering) Gray are found in the se USA.



Rudbeckia triloba with *Eupatorium rugosum*, incipient woodland seeding

Line drawing courtesy of Kentucky Native Plant Society.

SENECIO Linnaeus 1753 **BUTTERWEED, GROUNDSEL, RAGWORT** *Senecio* (se-NE-kee-o) from New Latin, from Latin *senecio*, *senecion-*, old man, or Latin *senex*, *senic-*, old man or woman(?), groundsel (from its hoary pappus), for the fluffy white seed heads resembling the white hair of an old fart like me. The word *Senecio* is synonymous with the word *Erigeron*. As broadly defined, a large genus of 1500-2000 spp of herbs, shrubs, trees, vines & tender succulents. $x = 20, 22, 23$. Fruits are achenes, glabrous or pubescent; pappus simple, capillary, & copious. See also *Packera* Á Löve & D Löve. *Hasteola* is sometimes included in this genus, *sensu lato*.

Seeds may be hydrophilic. Dry briefly, clean, & store in a zip-lock bag in the refrigerator. Put it in a cool dry place (Traveling Wilburys).

Senecio congestus (R Brown) de Candolle **MARSH FLEABANE**, (*congestus -a -um* congested, crowded, pressed, brought together, closely packed together, literally a heaping together.)

distribution/range:

propagation: ①60 days cold moist stratification (pm09).

Annual



Senecio congestus

Line drawing courtesy of Kentucky Native Plant Society.

SILPHIUM Linnaeus 1753 **ROSINWEED** *Silphium* Latin *silphium*, pl *silphia*, from Greek σιλφιον, *silphion*, of North African or Semitic origin, in reference to an extinct, resinous, umbelliferous plant of the genus *Ferula*, sometimes seen as *F silphium*; not definitely identifiable as to sp but well known to the

ancient Greeks, Romans, & North Africans & used by them medicinally & as a spice or vegetable, from a name used by Apiculus & Pliny. It was said to have resinous sap. *Silphion* is pictured on ancient coins of the city of Cyrene, & was an important trade item. It is reported to have disappeared about Nero's time, with Nero receiving the last stem or root. The spice was replaced by Persian *laser*. It is assumed to be the same type of spice plant as *Ferula assa-foetida*, aka *Asafoetida*, *laserpitium*, *laser*, *lasar*, aka *silphium*. *Ferula* is Latin for giant fennel, also a rod of manumission, or a stick or cane especially one used to punish people, such as servants or students (from the stem of the fennel?). Tall, coarse, stout, resinous, North American perennial herbs, 12 (20-30) spp, having coarse heads of yellow flowers with fertile rays & the achenes broad, flat, obcompressed, crowned with a 2-toothed pappus. $X = 7$. Several spp are known as ROSIN WEED, which is a reference to the thick gummy sap that exudes from cuts on the stems.

According to Weakley (2007), the number of ray flowers per head (or achenes) can be useful in determining *Silphium* spp. (*The se USA has 22 taxa to consider. Illinois is lucky with only 5 highly distinctive spp.*)

The seeds ripen in late summer to early fall. Only the ray flowers set seed. The seed is surrounded by large fleshy chaff that resembles the seed. The genus in our area is propagated by moist cold stratify (10-30) or fall plant, easy from moist stratified seed & transplants. ①“30 days moist stratification necessary for germination. Field sow fall.” (pnnd) “Moist cold treatment or fall sow. Light cover. Good to fair germination. *S perfoliatum* has excellent germ.” (mfd93). ②Seedlings have very large cotyledons & may be transplanted at that stage. The roots quickly elongate. Code B (cu00). Seed tests reveal that *S laciniatum* & *terebinthaceum* almost always have slightly higher dormancy percentages than *S integrifolium* & *perfoliatum*. Yellow perennial sunflower-like flowers. Attracts butterflies, upland gamebirds, songbirds, & small mammals. Soil forming, deep-rooted erosion control.

“The different species of *Silphium* mentioned, exude from their (page 193) stems a pearly resinous matter, very in appearance and sensible properties to turpentine, and used for the same purposes” (Short 1845).

Silphium astericus Linnaeus var **trifoliatum** (Linnaeus) JA Clevinger WHORLED ROSINWEED, Dry soil, very rare; Hardin Co (m14).

[*Silphium atropurpureum* Retz ex Willdenow, *S trifoliatum* L, *S trifoliatum* Linnaeus var *trifoliatum*]

Silphium integrifolium Michaux *MI ROSIN WEED, aka PRAIRIE ROSINWEED, WHOLELEAF ROSINWEED, (*integrifolius -a -um* whole or entire leaf, by extension with leaf margins entire, having leaves with unbroken smooth edges, with undivided leaves, from Latin *integer*, adjective, entire, whole, complete; unbroken, unhurt; fresh, new, *-i-* connective vowel used by botanical Latin, & *folium*, *foli(i)*, n, noun, a leaf.) upl

Habitat: Wet, mesic, dry, & hill prairies, mesic & dry savannas. distribution/range:

Culture: propagation: ①60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③“Fall plant or cold stratify for 2 to 3 months for best results. Sow seeds just below the soil surface at 70°F & water.” (ew12) ④Sow at 4°C (40°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

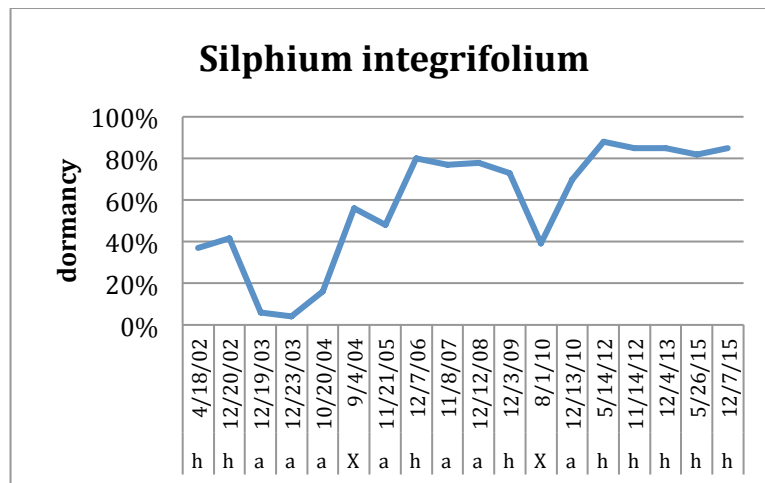
seed counts & rates: 18,816 (wns01), 19,200 (pm01), 26,167 (gnh02), 28,087 (gna05), 29,117 (gna04), 29,906 (gnh02), 30,790 (gna03), 31,246 (gna03), 41,000 (ecs), 41,064 (gnih06), 41,600 (ew12), 64,000 (pn02, jfn04, & sh94) seeds per pound.

“*Silphium integrifolium deamii* General prairie. Blooms mid July to late August; YELLOW. Harvest late September. 5'; all methods work well; SEEDLING TRANSPLANT, SPRING BROADCAST, FALL BROADCAST. Blooms 2nd year, reliable; too weedy for garden or for #1 in field; use #2 or #3 with much grass. With us this has been the weediest of all the plants we call "prairie".” (rs ma)

cultivation: Space plants 1.0-2.0'. Mesic to dry soils, full sun to light shade. Tolerates clay soil.

bottom line: Dormant seed is necessary. Dormancy has been between 40-80+% for a decade.

Crossover species. Germ 30.3, 22.5, 15, sd 20.5, r4.0-73 (69)%. Dorm 58.4, 71.5, 85, sd 27.7, r4.0-88 (84)%. Test 33, 33, 39, r25-41 days. (#18:2).**



Description: 2.5-5.0', fibrous rooted, ray florets 20-36+ (12-20 Wood), 2n = 14. key features: ①“Plants with alternate leaves are suspected hybrids of *S integrifolium* & *S astericus*. Broad corymb, leaves scabrous on both surfaces -with a short woody rhizome - may also have creeping rhizomes. Achenes obovate, winged, with a deep, narrow apical sinus.” (Ilpin) ②“Scabrous; leaves sessile, ovate-lanceolate; scales squarrous; achenes roundish, broadly winged, with 2 long teeth” (Wood)

Comments: status: Threatened in Michigan. phenology: Blooms 7,8,9. In northern Illinois, collect seeds in mid September to mid-October. Collect seeds in se Wisconsin in September - October (he99).

Attractive cut flowers, landscaping, specimen plantings, tall borders, wildlife food plots, & naturalizing, can be an aggressive seeder. Seed source nursery production, genetic source Lee Co, & DuPage, Kane, & Will (Horlock) Cos.

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob's seeds were collected in DuPage, Kane, & Will cos. We traded seeds back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

“Of frequent occurrence.” *S. integrifolium*. (Short 1845).

Associates: Pollinated by long-tongued bees, short-tongued bees, & *Diptera*. Attracts butterflies & seed-eating birds, including goldfinches. Provides cover & food for wildlife. Reported to be deer resistant.

One person's biodiversity is another person's pathogen. Some years ago, a ROSINWEED production plot developed rust with pustules on the lower side of the leaves. Older leaves had large black pustules, and the newer leaves had light brown pustules. Small yellow to black spots were visible on the upper leaf surface at the pustule sites. The rust was caused by *Puccinia silphia*, an autoecious rust specific to *Silphioms*. It has no other hosts. (Pataky & Siegel 2007, personal communication)

VHFS: Includes var *deamii* Perry. Clevenger in fna places *deamii* & *neglectum* in synonymy with variety *integrifolium*.

Illinois has (3)4 varieties, var *deamii* Perry, DEAM'S ROSINWEED, var *integrifolium*, var *laeve* Torr & Gray, & var *neglectum* Settle & TR Fisher. Describe Illinois varieties. Var *gattereri* Perry grows in Tennessee.

Old botanics list variety “*ternatum*, stems 6-sided; leaves ternately verticillate. Prairies, with the common form; apparently connecting this with *S trifoliatum*, from which it is nevertheless distinct.” (Wood)



Silphium integrifolium

Silphium integrifolium Michx **deamii** Perry DEAM'S ROSIN WEED, upl
Clevenger in fna places this in synonymy with variety *integrifolium*.

Silphium laciniatum Linnaeus *MI, OH COMPASS PLANT, aka POLAR PLANT, ROSINWEED, (*laciniatus* -a -
um lacinate, torn, deeply cut, fringed, slashed or lacerated, cut into narrow divisions or lobes, jagged, from
Latin *lacinia*, noun, small piece of cloth to be sewn on a garment for lapels, etc, & *-atus*, adjectival suffix for
nouns, possessive of or likeness of something, with, shaped, made, generally referring to the deeply cut
leaves.) The common name is from the tendency of the basal leaves to orient their long axis north to south,
positioning the least amount of leaf surface area to the sun in the hottest part of the day. This aspect, plus the
hairiness, the deeply cut leaves, & the deep taproot are all drought adaptations for life in the Prairie Peninsula.
The hairs lessen the movement of dry air over the leaf; the cut leaves reduce the surface area exposed to sun &
wind; & the taproot accesses deep, subsoil moisture. The common name ROSINWEED is from the copious
resin in & on the plant. During controlled burns, lumps of resin on the stems produce small columns of smoke
from smoldering plants. Upland

Habitat: Mesic & dry prairies, mesic prairie soil. Mesic prairie sp, not tolerant of artificial inundation in urban
restorations, but tolerates seasonally high waterlevels in natural areas such as sedge meadows & wet prairies.

distribution/range:

Culture: propagation: ①60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of
cold moist stratification (he99). ③“Fall plant or cold stratify for 2 to 3 months for best results. Sow seeds just
below the soil surface at 70°F & water.” (ew12) ④Sow at 4°C (40°F) for 12 wks, move to 20°C (68°F) for
germination (tchn).

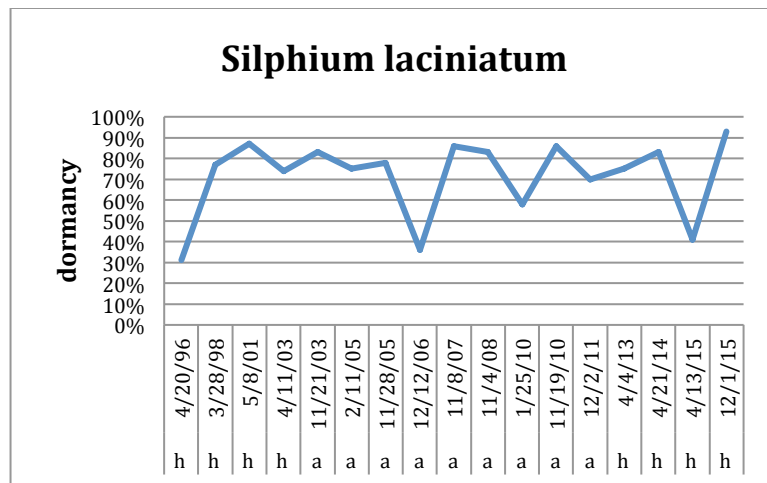
seed counts & rates: 7760, 10,400 (pn02, jfn04 & sh94), 10,560 (pm,ew12), 11,200 (aes10), 11,792
(gna04), 12,271 (gna06), 13,511 (gn03), 14,188 (gna05), 14,598 (gnh02), 24,640 (wns01) seeds per pound. In
mixes, plant 0.03 to 0.188 lb pls per acre (us97), or 0.31-0.25 lb pls per acre (gni).

cultivation: Space plants on 1.5-3.0' centers. Tolerates clay soil. Wet mesic to dry soils, full sun to
light shade. Nutrient load tolerance low, salt tolerance not available, siltation tolerance low. Full sun. pH 4.5-
7.5. Container grown plants are preferable to bare root material for ease of installing & establishment. Bare
root plants are better for specimen plantings & gardens.

“*Silphium laciniatum* General prairie. Blooms late June to early August; YELLOW. Harvest
early October. 6'; easy by #1 & #2, SEEDLING TRANSPLANT, SPRING BROADCAST; blooming 3rd
or 4th year; has only one true leaf 1st year. Adult leaves much prized for arrangements.” (rs ma)

bottom line: Dormant seed only. Modest field establishment from spring seeding is potentially
possible 1 year in 10. Germ 19.5, 15, 7.0, sd 16, r4.0-60 (56)%. Dorm 71.5, 77, 83, sd 18.2, r31-93 (62)%.
Test 33, 33, 38 r25-40 days. (#17:1).**

greenhouse & garden: Seed laboratories may use 10 prechill before a germination test. Easily
established from seed. Fall seed or moist cold stratify 10-60 days @ 33-38°F prior to planting. Although they
are large seeded, *Silphium* seeds have some photodormancy & can be planted too deeply. Light cover only;
0.5" of cover will be too much for some seeds, & will impair germination. Once established, & without
competition, self sows prodigiously.



Description: Perennial herb, 4.0-10', taprooted, ray florets 27-38, yellow; $N 2n = 14$. **key features:** ①“The upper stem produces a gummy substance during flowering. Leaves deeply pinnatifid, extending well up the stem; phyllaries coriaceous in age, long-acuminate. Woody tap root.” (Ilpin) ②“very rough, with white, hispid hairs; scales ovate, appendaged, & squarrous at the apex.” (Wood)

Comments: **status:** Threatened in Michigan. Endangered in Ohio. **phenology:** Blooms 5-9. C3. In northern Illinois, collect seeds in September - early November. Collect seeds in se Wisconsin in October (he99). Interesting cut flowers, attractive dried seed heads, ornamental, deeply-lobed, basal foliage. Useful in landscaping, specimen plantings (may need staked), herbaceous borders, wildlife plots, long-term erosion control, & upper slope buffer stabilization. Slowly growing plant, usually only one or two leaves the first year, some protection may help. Once established, a very aggressive seeder in open habitats, too aggressively for gardens & small plantings. Seed source nursery production, genetic source railroad remnants & restored prairies, central & eastern Bureau Co, & College of DuPage (Bellmont Prairie).

Short recognized both *S. laciniatum* and *S. gummiferum* as species. The latter is a synonym. “There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *S. gummiferum*.” As *Silphium gummiferum* Ell (Short 1845). “Of frequent occurrence.” *S. laciniatum*. (Short 1845).

Associates: Pollinated by long-tongued bees, short-tongued bees, *Diptera*, & *Lepidoptera*. Songbirds eat seeds. Attracts butterflies, provides nectar *Hesperia ottoe* OTTOE SKIPPER, & food source for *Silphium* weevil. Deer graze foliage, but also reported as deer resistant. Walnut tolerant.

VHFS: Add varieties.



Silphium laciniatum, world champion plant with 28 flowering stems with the BCSWCD board & Don Pretzsch, & the 1975 forb line (photographed in 1990)

Silphium perfoliatum Linnaeus *MI, CT CUP PLANT, aka CARPENTERS WEED, COMMON CUP-PLANT, INDIAN CUP, RAGGED CUP, *Akun'damo*, watcher, or spy (Ojibwa), (*perfoliatum* -a -um perfoliate, with the leaves joined around stem, as though the stem were growing through the leaves, or with a leaf-like appendage through which the stalk passes, from Latin *per-*, a prefix, through, extra, very, & *foliatus* -a -

um, adjective, provided with or having leaves.) fac-

Habitat: Flood plains, wet meadows, wet & mesic savannas, fens, open woods & low ground.

distribution/range:

Culture: propagation: ①60 days cold moist stratification (pm09). ②Sow at 4°C (40°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

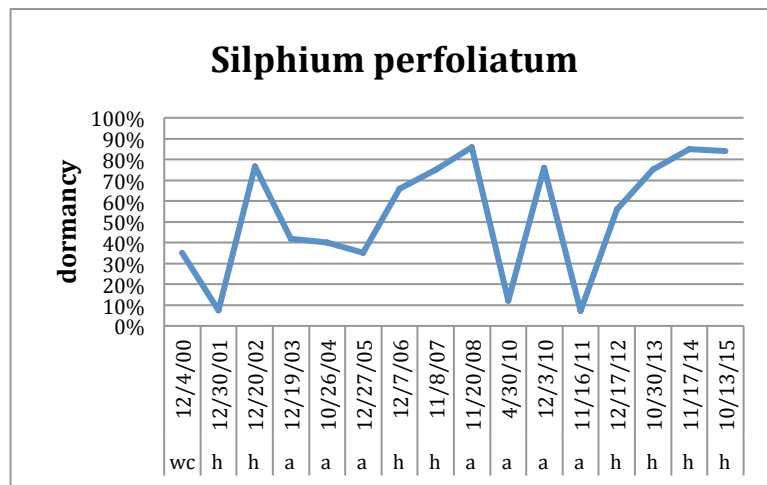
③USDA (1997) recommends the seed be stratified for twelve weeks & then sown at 24 to 32°F for four to eight weeks, & then moved to 68°F for germination, or sown in a greenhouse as soon as ripe. Cold moist stratification is a process that occurs from near 34°F to about 40°F, not below freezing. Even though the temperatures are low, there are still chemical & physiological changes occurring within the seed, but liquid water is key. Hard freezing moistened seeds is usually harmful. Moist seeds freeze in nature, but it is a gradual process, occurring over hours or days, not like slamming that seed bag in the freezer. Bill Carter at Prairie Moon recommends placing seeds in a Styrofoam six-pack cooler & placing the cooler in the freezer to slow the freezing process, simulating a natural slow freeze speed (personal communication).

Growth rate slow, according to USDA, but not so here in the Corn Belt. Seedling vigor medium. Vegetative spread rate slow.

seed counts & rates: 22,400 (pn02&sh94), 22,783 (gna03), 24,547 (gna05), 28,024 (gnh02), 28,199 (gnh01), 31,015 (gnh06), 33,600 (jfn04, aes10), 100,000 (usda, ecs) seeds per pound.

cultivation: Space plants on 2.0-2.5' centers. Wet to mesic soils, full sun to shade (woodland). Tolerant of fine textured soils. Tolerant of clay soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 6.0-8.0.

bottom line: Dormant seed best. Dormancy mechanisms vary from year to year, strong field germ from spring seeding is possible 4 out of 19 years. Flipflop species. Strongly dormant of late (2011). Germ 41.1, 42, 49, sd 28.6, r7.0-93 (76)%. Dorm 50.5, 56, 35, sd 29.5, r0.0-86 (86)%. Tests 30, 30, 27, r17-42 days. (#16:3)**



Description: Erect perennial, 3.0-8.0'; stems square & opposite; toothed leaves with their bases united around the stem. One-inch golden-yellow flowers, with only the ray flowers fertile, rays 12-20; achenes broadly obovate, winged, emarginate; N 2n = 14.

Comments: status: Threatened in Michigan. In Connecticut, this plant is considered potentially invasive & is banned. phenology: Blooms 7,8,9. In northern Illinois, collect seeds in September - October.

Collect seeds in se Wisconsin in October (he99). Unusual cut flowers & bold texture in large, dried arrangements. Useful in the landscape, specimen plantings, rain gardens & vegetated swales, wetland & savannah restoration, herbaceous borders, & wildlife food plots, may be aggressive. A developing stand of CUP PLANT looks a lot like a patch of rhubarb or burdock. Monocultures decline in vigor in 3-4 years. As isolated plants age, they form fairy rings. Seed source nursery production, genetic source Green River woods south of Harmon, Green River Lowland, Lee Co.

Associates: Attracts butterflies, bees, & hummingbirds. Songbirds, including goldfinches, eat the seeds. Provides wildlife food & cover & nectar. Birds are said to drink water from the 'cups'. Reported to be

deer resistant. Sensitive to herbicide ♂ drift & seed set is sensitive to insect damage. This plant is used on a limited scale as livestock forage.

ethnobotany: Used as medicinal plant by Ojibwa (sm32). Ojibwa medicine for hemorrhages, plant tonic, diaphoretic, & diuretic (den28).

VHFS: Var *connatum* (L) Cronq, CARPENTER'S WEED, grows from Maryland & West Virginia to North Carolina. [*Silphium connatum* L, *S perfoliatum* L ssp *connatum* (L) Cruden, *S scabrum* Moench, non Walt.]



Silphium perfoliatum, 1st year basal leaves, cupped-leaves, & production plot

Silphium pinnatifidum Elliott PINNATIFID DOCK,

Recognized by Mohlenbrock (2014) as a species.

[*Silphium terebinthinaceum* Jacquin var. *pinnatifidum* (Elliott) Gray]

Silphium speciosum Nuttall

“Native to w US; adventive along a railroad, Lake Co (m14).

[*Silphium integrifolium* Michaux var. *laeve* Torrey & Gray]

Silphium terebinthinaceum Jacquin *IA PRAIRIE DOCK, aka BASAL-LEAVED ROSIN-WEED, DOCK ROSIN-WEED, PRAIRIE BURDOCK, PRAIRIE ROSINWEED, (*terebinthinaceus* -a -um resinous, from Latin *terebinthus*, from Greek *terebinthos*, & -inus, for the terebinth tree, a small European tree, *Pistacia terebinthus*, yielding Chian turpentine, a yellow to brown semi fluid oleoresin. *Terebinthus* evolved into the Middle English *terebentyne*, *terbentyne*, & ultimately *turpentine*.) Facultative (-)

Habitat: Wet meadows, mesic & dry prairies, & mesic savannas. Mesic or dry prairie soil. Wet prairie or sedge meadow sp, may tolerate 0-6” of flooding for short periods in spring. distribution/range: PRAIRIE DOCK is not native to parts of northwest Illinois, including Whiteside Co. In Iowa, only a few counties on the Mississippi River.

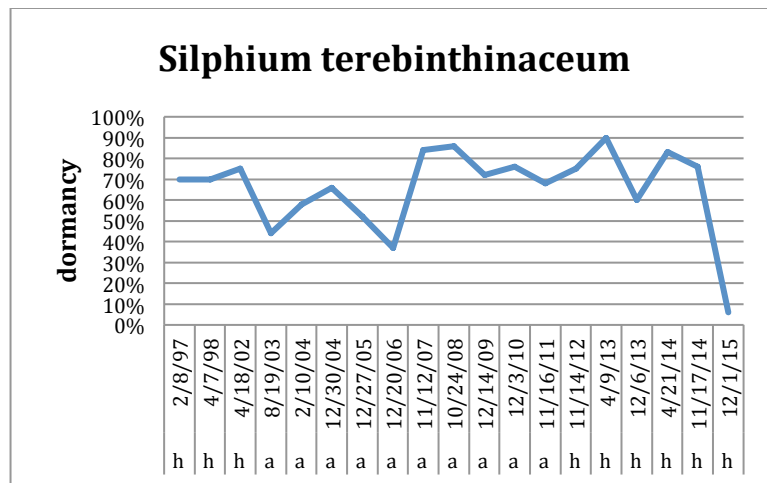
Culture: propagation: ①60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③“No pre-treatment needed. Sow seeds on soil surface at 70°F & water. Slow to germinate.” (ew12) ④Sow at 20°C (68°F), germination slow (tchn).

seed counts & rates: 16,000 (pm01), 17,000 (ecs), 17,600 (pn02, jfn04, aes10), 19,275 (gna05), 19,952 (gna04), 20,407 (gna04), 20,627 (gna06), 20,800; 20,892 (gnh02), 24,060 (gnaL03), 24,640 (wns01), 25,316 (gn00), 35,826 (gnaag04) seeds per pound. In mixes plant 0.03 to 0.188 lb pls per acre (us97).

“*Silphium terebinthinaceum* General prairie. Blooms early July to early September; YELLOW. Harvest early October. 7', easy by #1 & #2, SEEDLING TRANSPLANT, SPRING BROADCAST; blooming 3rd year; only 1 true lf 1st year, flowers 3rd year. Adult leaves used for arrangements.” (rs ma)

cultivation: Space plants on 1.5-2.0 centers. Mesic soils, full sun to partial shade. Tolerates clay soils. Nutrient load low to moderate, salt tolerance low, siltation tolerance low to moderate. pH 4.5-7.5.

bottom line: Dormant seed only. Adequate field establishment from spring seeding potentially possible 1 year in 20. Anomalously low dorm (6%) 2015 crop year. Germ 23.9, 19, 6.0, sd 19.6, r6.0-90 (84)%. Dorm 65.7, 70, 70, sd 19.5,r6.0-90 (84)%. Test 31, 32, 37, r17-39 days. (#19:2).**



greenhouse & garden: Easy from seed. Sow fresh seed in fall with light cover, or cold moist stratified seed in spring.

Stratified seed planted in late summer will produce bare root transplants for following spring. Use transplants in early spring or summer, but not fall for field establishment, or stratified seed in spring for the greenhouse. (The Prairie Garden?)

Description: Erect, herbaceous, perennial, native forb, exuding resin; 4.0-8.0(-10)'; deep taproot, stems to 9-12'; large, heart-shaped basal leaves; ray florets yellow, 17-29 (fna), 13-21 (fh), or about 20 (Wood), achenes narrowly 2-winged; N 2n = 14. key features: "Leaves dentate-serrate, obtuse, scabrous; scales roundish & oval; rays about 20. (Wood)

Comments: status: phenology: Blooms July to September. In northern Illinois, collect seeds from mid-September to mid October. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers & dried seed heads; large leaves are used in dried arrangements. Landscaping, specimen plants, herbaceous borders, rain gardens, & savanna gardens. The unusual basal leaves provide a bold textural statement in late spring & early summer until they are hidden by grasses. Useful in upper slope buffer stabilization. Can be an aggressive self-seeder. Seed source nursery production, genetic source mesic railroad remnant near Amboy, Lee Co, railroad remnants near Big Rock, Kane Co, restored prairies near Princeton & Ohio, Bureau Co & College of DuPage & DuPage, Kane, & Will (Horlock) Cos.

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob's seeds were collected in DuPage, Kane, & Will cos. We traded seeds back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

"Of frequent occurrence." *S. terebinthinaceum* Jacq. (Short 1845).

The taproot is like a huge mutant carrot. It is very impressive to watch the rapid, daily development of the new formed inflorescence, growing several inches per day.

Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, & *Diptera*. Attracts butterflies & other insects. Attracts Ruby-Throated Hummingbird & seed-eating birds, including Goldfinches. Reported as deer resistant. Palatable to grazers. Walnut tolerant.

VHFS: Sp hybridizes with *S laciniatum*. Includes var *lucy-brauniae* Steyerm, LUCY BRAUNS' ROSINWEED, known from Illinois, Kentucky, Mississippi, & Ohio. [Expand discussion](#)



Silphium terebinthinaceum, 200 cell seedlings, & plant with damaged stem & a seldom seen axial flower shoot.

Silphium trifoliatum WHORLED ROSINWEED, (*trifoliatum* -a -um (tri-fo-lee-AH-tus) three leaved, from Latin *tri-*, three, *foliatus* leaved, from *folium* leaf, & *-atus*, Latin suffix indicating possession, likeness of, or 'provided with'.)

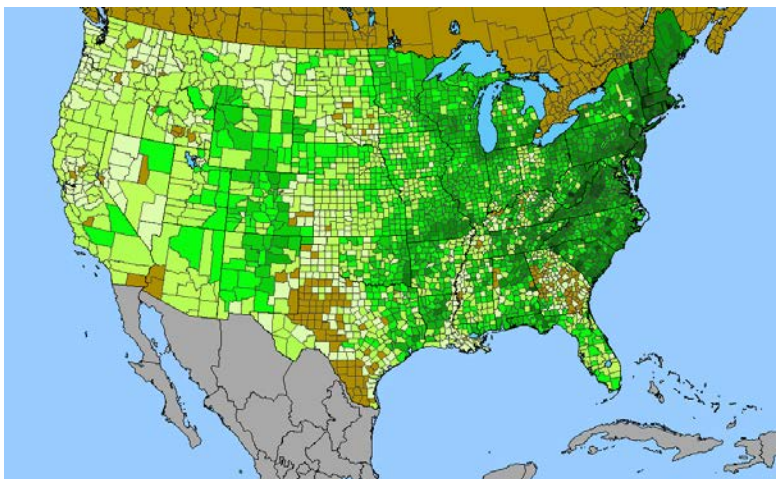
distribution/range:

propagation: ①60 days cold moist stratification (pm09).

Rays 12-16; achenes oval, with 2 short teeth; key features: "Stems glabrous, cauline leaves lanceolate, on very short petioles, in 3s or 4s; achenes oval" (Wood).

SMALLANTHUS Mackenzie ex Small 1933 **BEARSFOOT** *Smallanthus* for John Kunkel Small, 1869–1938, American botanist. A genus of 20 spp of annuals, perennials, & shrubs of tropical, subtropical, & warm temperate United States, Mexico, & South America, with one. See *Polymnia* in part. x = 16.

SOLIDAGO Linnaeus 1753 **GOLDENROD** *Solidago* from Latin *solido*, *solidare*, to make whole or strengthen, for its medicinal properties; New Latin, from Medieval Latin *solidago*, an herb reputed to heal wounds, from Latin *solidare*, *solidari*, to unite, to make whole, from *solidus*, solid, whole, & *-ago*, resembling or becoming, referring to its vulnerary, or healing properties. "The name *Solidago* was a mediæval synonym of *Consolida*, whence 'Consound' has also sometimes been erroneously used as a book-name of spp of the composite genus to which *Solidago* is now applied, or of *Senecio* confounded with it." (oed) A genus of 80-100 herbaceous spp *sensu strictu*, primarily of North America, with a few spp in South America, Macronesia, & Eurasia (77 in North America north of Mexico, 8 in Mexico, 4 in South America, & 6–10 in Europe & Asia). Fruits are achenes with the pappus simple, capillary, scabrous. In some texts, the inflorescence is called the array. x = 9. Formerly *Actipsis* Rafinesque, *Aster* Linnaeus subgenus *Solidago* (Linnaeus) Kuntze, *Leioligo* Rafinesque, *Oligoneuron* Small. (Semple & Cook in fna).



Density gradient of native spp for *Solidago* within the US (data 2011). Darkest green (23 spp. Fayette Co, VA) indicates the highest spp concentration. ©BONAP

Again, some terrible, not necessarily new, subgeneric names are no longer waiting in the wings, but now center stage. Many authors have split *Euthamia* & *Oligoneuron* (& others) from *Solidago*. These names are finally becoming part of northern Illinois' typically anachronistic plant taxonomy. This treatment separates *Euthamia* Nuttall ex Case GOLDENTOP & *Oligoneuron* as separate genera. (Are we the only ones to see the irony in *Euthamia* Nutt ex Case, or Nutt Case, nut case?)

Seeds ripen in the fall. Collect seeds when the heads brown & the pappus start to expand. Moist cold stratify or fall plant gives most consistent germination. Code B. 4-6 node stem cuttings in late spring root easily. Most spp can be divided in the spring. (cu00)

Yellow flowers attract butterflies, upland gamebirds, songbirds, & small mammals. Upland gamebirds eat leaves. Songbirds eat seeds. Aquatic & terrestrial furbearers eat foliage & plants. Small mammals eat seed heads & foliage. Deer eat plants. Various lace bugs, leafhoppers, seed beetles, leaf beetles, & *Lygus lineolaris* TARNISHED PLANT BUG feed on the plant. Flowers provide nectar for *Satyrium edwardsii* EDWARD'S HAIRSTREAK & *Danaus plexippus* MONARCH. Known to chemically inhibit sugar maple, red pine, tulip poplar, & black cherry. (Chick & Kielbaso 1998). A commonly referenced 'herbally' used sp is *Solidago virgaurea* [*S brachystachys*] of Europe (sow at 20°C (68°F), germinates in less than two wks (tchn)).

THIS GENUS DOES NOT CAUSE ALLERGIES! The pollen of all goldenrods is too heavy & sticky to be blown about, & is transported by insects. The showy-flowered goldenrods flower the same time as the wind-pollinated RAGWEEDS *Ambrosia* spp. This misconception is constantly reinforced by over-the-counter allergy medication manufacturers in their TV commercials & local TV meteorologists giving the pollen count. (In 2007, there were several *Solidago* spp in the seed mixes for Sherman Hospital in Elgin, but the Brain Trust involved eliminated them from the project. They had a chance to fight public ignorance, but caved. This is our informed & enlightened medical system, & a native consultant who buckled & sold out to the man for the almighty dollar. Amen!)



Goldenrods are sometimes treated unkindly. (used without permission because its hilarious)
http://www.jcsemples.uwaterloo.ca/sol_altissima_criminalis.jpg

Moth caterpillars

Moth Spp

Scientific Name

Agrappa oxygramma

Archips purpurana

Catabena lineolata

Choristoneura parallela

Common Name

Sharp-Stigma Looper Moth

Tortricid Moth sp.

Fine-Lined Sallow

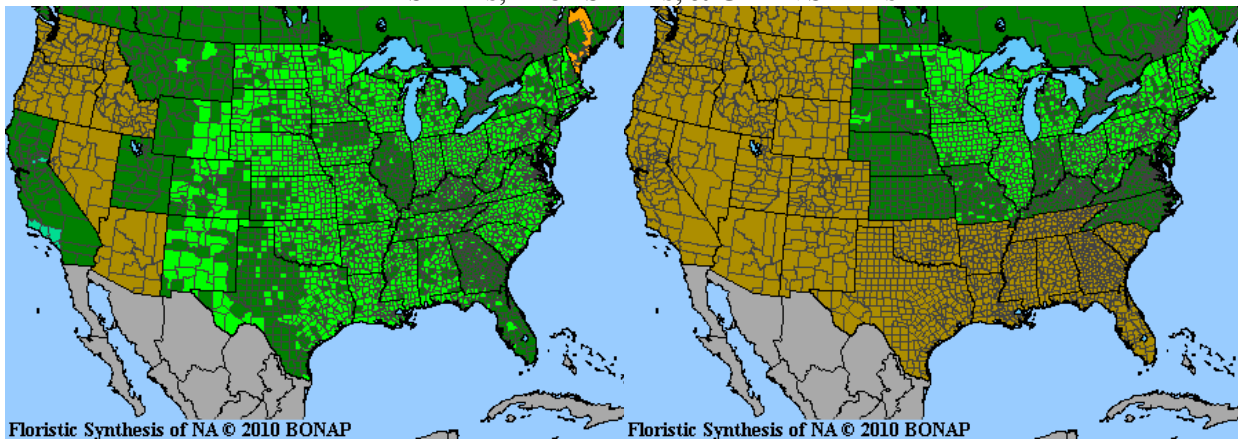
Spotted Firmworm Moth

Copyrighted Draught

<i>Cucullia asteroides</i>	The Asteroid
<i>Cucullia convexipennis</i>	Brown-Hooded Owlet
<i>Eucosma dorsisignatana</i> *	Tortricid Moth sp.
<i>Eupsilia devia</i>	Lost Sallow
<i>Eusarca confusaria</i>	Confused Eusarca
<i>Gnorimoschema gallaesolidaginis</i>	Goldenrod Gall Moth
<i>Leuconycta diphteroides</i>	Green Leuconycta
<i>Lithacodia carneola</i>	Pink-Barred Lithacodia
<i>Phragmatobia fuliginosa</i>	Ruby Tiger Moth
<i>Platynota idaeusalis</i>	Tufted Applebud Moth
<i>Platysenta videns</i>	White-Dotted Groundling
<i>Pleuroprucha insularia</i> **	Common Tan Wave
<i>Pseudoplusia includens</i>	Soybean Looper Moth
<i>Schinia mundina</i> **	Goldenrod Flower Moth
<i>Trichotapha flavocostella</i>	Gelechiid Moth sp.
<i>Xanthotype urticaria</i>	False Crocus Geometer

*caterpillars eat roots, **caterpillars eat flowers from
www.illinoiswildflowers.info/prairie/tablex/table53.htm

RED STATES, BLUE STATES, & GREEN STATES



Bio-geopolitics of *Solidago altissima* & *S canadensis*

Judging from the distribution of these taxa in Illinois, Indiana, n Iowa, & Missouri, taxonomic opinions can have bio-geopolitical overtones. Note botany free Georgia.

Solidago altissima Linnaeus TALL GOLDENROD, aka GOLDENROD, LATE GOLDENROD, *VERGE D'OR HAUTE*, *A'djidamo'wano*, squirrel tail (Ojibwa), (*altissimus* -a -um (al-TIS-i-mus) highest, very high, very tall, tallest, superlative of *altus*, from Latin *altus*, adj, high; deep or profound; shrill; lofty, noble; deep rooted; far-fetched; grown great, & *-issimus*, suffix denoting most so, to the greatest degree; most-, -est.) Subsection *Triplinerviae*.

Habitat: Open disturbed habitats. distribution/range:

Culture: propagation: ①Seeds germinate after about 60 days of cold moist stratification (he99). ②Sow at 20°C (68°F), germinates in less than two wks (tchn).

bottom line: Sow anytime, this sp will prevail, wanted or not, sown or not. Germ 53-57%. Dorm 0.0-26%. Test 23-35 days.**

Description: Tall WEED, flowers yellow; terminal paniculiform inflorescence, pyramidal; flowers secund; stems & branches densely pubescent; leaves lanceolate, sessile; three linear leaf veins; forms large colonies, rhizomatous. key features: ①“The short hairs of the leaves can give fresh plants a gray-green tone not seen in *S canadensis* var *canadensis*.” (fna)

Comments: status: Potentially invasive, very weedy. phenology: Blooms 8-10. Collect seeds in se Wisconsin in October - November (he99). 2,250,000 (jfn04), 6,394,366 (gna05), 10,088,888 (gnaer03) seeds per pound. Use of this plant should be limited to landfills & bioremediation sites.

“A tall late flowering sp that is common in moist places in fence-rows, thickets, etc.” (Fell 1955)

Associates: This is the goldenrod that often has large insect galls on the mid to distal stems, unlike the similar *S canadensis*. Spherical galls are caused by *Eurosta solidaginis*, GOLDENROD GALL FLY (said to also use *S gigantea*).

Ethnobotany: Used as medicinal plant by Ojibwa for cramps (den28).

VHFS: Mohlenbrock (1986) & Freckmann Herbarium lump this with *S canadensis*. [*Solidago canadensis* L var *scabra* T&G, alternately *S canadensis* L var *scabra* (Muhl ex Willd) T&G; *S scabra* Muhl ex Willd.]

FNA maintains this as a valid sp with the primarily eastern ssp *altissima*, $N 2n = 36, 54$, & the primarily Great Plains ssp *gilvocanescens*, $N 2n = 18, 36$.



Solidago altissima, a very second-rate flower.

Line drawing courtesy of Kentucky Native Plant Society. Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image.

Solidago arguta Aiton *IL, OH, PA, TN FOREST GOLDENROD, aka ATLANTIC GOLDENROD, CUT-LEAF GOLDENROD, SHARP-LEAVED GOLDENROD, (*argutus* -a -um Latin for sharp, fine pointed, sharply toothed, serrated, from Latin *argutus*, that which becomes acute to the senses: sharp, fiery, shrill, clear, pungent, pointed.)

Habitat: Wooded areas. distribution/range: Rare in Illinois, Jackson, & Union cos.

Culture:

Description: Erect, herbaceous, perennial, native forb; clump forming from caudex; stems tall, 2-4', stems & branches glabrate below, pubescent above; leaves ovate, the lower winged, petiolate; one feathered leaf nerve; terminal paniculiform inflorescence, divergent; yellow flowers, secund; $N 2n = 18, 36$. key features: “Basal leaves are broadly ovate & in a rosette; other leaves are dark green, rather thick.” (Ilpin)

Comments: status: Endangered in Illinois. Presumed extirpated in Ohio. Variety *harrisii* is Endangered in Pennsylvania. The synonym *S tarda* is of Special Concern in Tennessee. phenology: Blooms September-October.

Associates:

VHFS:



Solidago arguta

Line drawing courtesy of Kentucky Native Plant Society.

Solidago bicolor Linnaeus WHITE GOLDENROD, aka SILVER ROD, *VERGE D'OR BICOLORE*, (*bicolor*, *bicolorus* *bicolor* two colored, bicolored.) Section *Solidago* subsection *Squarrosae*.

Habitat: Dry woods, dry meadows, wooded banks, & shale barrens. Open or wooded habitats.

distribution/range: Rare in Illinois, Alexander, Clark, Coles, Cook, Jackson, LaSalle, McHenry, Marion, St. Clair, Union, & Wabash cos.

Culture:

Description: Erect, herbaceous, perennial, native forb; clump-form from caudex; stems short, 2' or less, stem & branch surfaces pubescent; lower leaves oblanceolate, winged, petioled, upper elliptical, sessile, one feathered leaf vein; inflorescence narrow, axillary racemiform or terminal racemiform; silver-white flowers, not secund; $N 2n = 18$. Similar to *S hispida*, but rays whitish.

Comments: status: phenology: Blooms July to October. Grows well in poor soils.

VHFS:



Solidago bicolor

Line drawing courtesy of Kentucky Native Plant Society.

Solidago caesia Linnaeus *WI BLUE-STEM GOLDENROD, aka AXILLARY GOLDENROD, WOODLAND GOLDENROD, WREATH GOLDENROD, (*caesius -a -um* caesius caes'ius (classically KIES-ee-us, as in German *Kaiser*, or SEES-ee-us, locally SEE-zee-us) caesious, blue-gray, light grayish blue, lavender blue, light grey, from Latin *caesius -a -um*, bluish grey of the eyes, bluish gray, or dull, milky blue, lavender blue, or grey blue.) Subsection *Glomeruliflorae*.

Habitat: Wooded areas, rich woods, & sandy black oak savannas. Moist forested slopes. Rich or rocky woods, bluff bases & ledges. distribution/range: Eastern, central, southwest Illinois, & Whiteside Co.

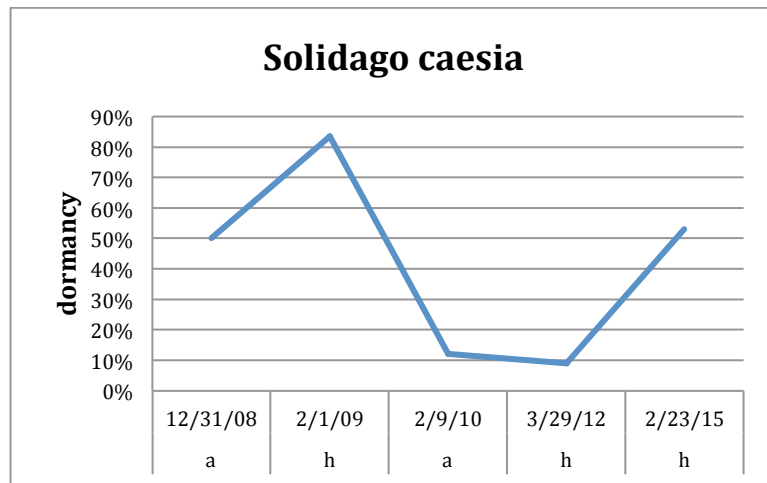
Culture: propagation: ① Sow at 20°C (68°F), germinates in less than two wks (tchn). Growth rate moderate. Seedling vigor medium. Vegetative spread rate slow.

seed counts & rates: 618,000 (ecs), 700,000 (usda), 1,472,727 (gnh11), 1,952,699 (gna10), 3,338,235 (gnh15), 8,750,000 (jfn04) seeds per pound.

availability: Limited Midwestern commercial availability as seeds & plants. NE Illinois & Pennsylvania ecotype seeds are available.

cultivation: Tolerant of fine & medium textured soils. Clay soil tolerant. Anaerobic tolerance none. CaCO₃ tolerance medium. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 5.5-7.0. Plants will grow in rich soils in full sun, but may become chlorotic in hot dry years. Augment full sun beds with compost.

bottom line: Dormant seeding is best. Lightly scratch seed into *in situ* woodland soils. Flipflop species. In light of the seed availability, best established from plugs. Germ 48.5, 41, na, sd 31.1, r9.5-86 (76.5)%. Dorm 41.5, 50, na, sd 27.9, r9.0-83.5 (74.5)%. Test 34, 33, na r27-44 days. (#5).



greenhouse & garden: Easy from seed, moist cold stratify or dormant seed in an unheated coldframe, have prop stock germ tested before planting untreated seed in greenhouse.

Description: Erect, herbaceous, perennial, native forb; clump-forming from caudex, 8" minimum root depth; stems 1.0-2.0', bluish, stem & branch surfaces glabrate, glaucous; leaves narrowly lanceolate; one feathered leaf vein; inflorescence axillary racemiform; flowers yellow with bluish stems, flowers not secund; 2n = 18.

key features: ① "Plant is easily recognized by glaucous stem with waxy bloom." (Ilpin) "Disk florets are perfect, ray florets are pistillate, & both fertile. Rhizomes at least are short & stout, caudex-like; may also be long & creeping." (Ilpin)

Comments: status: Endangered in Wisconsin. phenology: Blooms 8-10. In northern Illinois, collect seeds in early November. Genetic source DuPage Co.

Associates: Walnut tolerant.

VHFS: Includes var *axillaris* (Pursh) House. Heads few, in dense short axillary clusters, much exceeded by the long thin leaves; upper leaves often entire. [*Solidago axillaris* Pursh, *S caesia* L var *axillaris* (Pursh) Gray, *S caesia* L var *caesia* L [superfluous autonym]]





Solidago caesia, full sun & dry woods with ripe seed .

Line drawing courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image.

Solidago canadensis Linnaeus CANADA GOLDENROD, aka COMMON GOLDENROD, GOLDENROD, GRACEFUL GOLDENROD, TALL GOLDENROD, (*canadensis -is -e* (kan-a-DEN-sis) of or from Canada or the north-east USA, of Canadian origin. Epithet formerly capitalized.) Subsection *Triplinerviae*.

Habitat: Moist to dryish thickets, roadsides, clearings, & slopes. Open disturbed habitats. Mesic prairies, roadsides, & open fields. distribution/range:

Culture: propagation: ①Seeds germinate after about 60 days of cold moist stratification (he99). ②Sow at 20°C (68°F), germinates in less than two wks (tchn). Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid.

seed counts & rates: 1,926,400 (wns01), 2,240,000 (ew12, aes10), 2,250,000 (jfn04), 2,873,418 (gnh13), 4,600,000 (usda, ecs), 5,401,230 (gnhe14), 8,107,142 (gnia10) seeds per pound.

cultivation: Space plants on 2.0-3.0' centers. Mesic to dry soils, full sun to partial shade. Not particular about soil, likes a little extra water (pots 2000). Tolerant of coarse, medium & fine textured soils. Anaerobic tolerance medium. CaCO₃ tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant. pH 4.8-7.5.

bottom line: Sow anytime, any method, this species will prevail, wanted or not, sown or not. Germ 44.1, 42, na, sd 23.8, r22-88 (66)%. Dorm 44.1, 54, na, sd 26.2, r4.0-70 (66)%. Test 26, 29, na, r15-35 days.**

greenhouse & garden: Spreads rapidly, binds soil, easy from stratified seed or transplants.

Description: Tall, erect, herbaceous, perennial, native WEED; colonial, rhizomatous, 12" minimum root depth; stems 1-4 (-5,7)', stems & branches glabrate below, pubescent above; leaves narrowly lanceolate, sessile; three linear leaf veins; with terminal paniculiform flower clusters, pyramidal; flowers golden yellow, secund;

Comments: status: Considered invasive in some parts of the country (Uva et al 1997; Whitson et al 1996)

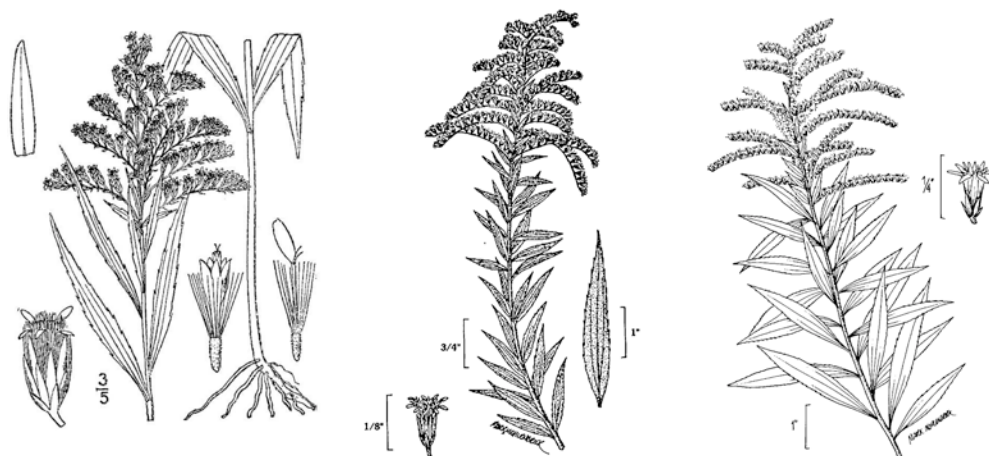
phenology: Blooms 8-9. Collect seeds in se Wisconsin in October - November (he99). "Exciting & vigorous" (pots), but we don't need that kind of excitement. Use of this plant should be limited to erosion control, landfills, & bioremediation sites, or possibly Monarch corridors.

Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Lepidoptera*, *Coleoptera*, *Hemiptera*. Minor food value to upland birds & large & small mammals. Reported as deer resistant.

CANADA GOLDENROD is the host of *Rhopalomyia solidaginis* GOLDENROD GALL MIDGE. The small fly grub causes the stem to cease elongating, producing a flower-like cluster of leaves. The LEAF CLUSTER GALL or BUNCH GALL, aka ROSETTE GALL, FLOWER GALL, in turn provides habitat for small spiders & other midges. ROSETTE GALL is said to be an indicator sp, occurring only on *S canadensis*.

ethnobotany: Flowers used as medicinal beverage by Pottawatomie. Species has shown antimicrobial properties, particularly against *Salmonella typhimurium* (Frey & Meyers 2010).

VHFS: Includes var *scabra* (Muhl) T&G (?) & var *hargerii* Fern.



Solidago canadensis, also a very second rate species

Line drawing courtesy of Kentucky Native Plant Society. Second & third line drawings Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image. Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

Add *S drummondii*

Solidago flexicaulis Linnaeus ZIG ZAG GOLDENROD aka BROAD-LEAVED GOLDENROD, *VERGE D'OR À TIGE ZIGZAGUANTE*, *A'djidamo'wano*, squirrel tail (Ojibwa) (*flexicaulis* -is -e New Latin pliant-stemmed, with a flexuous stem, with a bent stalk, from *flexus*, *flexus* m, Latin noun, turning, winding; swerve; bend; turning point, & Latin noun *caulis*, *caulis* m., from the Greek *καυλος*, *kaulos*, the stem or stalk of a plant; usual spelling was *colis* or *coles*, or *kaulos*, the shaft.) facu Subsection *Glomeruliflorae*.

Habitat: Wooded areas. Mesic savanna, mesic woodland, rich woods, thickets, cool slopes, limey soils, shades calcareous springy places, & shallow soils over dolomite or limestone. **distribution/range:**

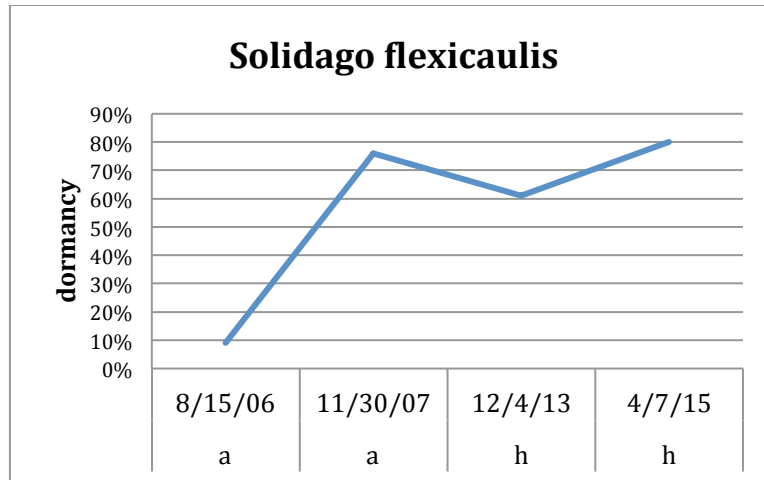
Culture: propagation: ①Cold moist stratify for 60 days & sow in cool soil, small seeds need light. (Wade) ②“Moist cold treatment or fall sow, light cover, very good germination. (mfd93) ③60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ④Seeds germinate after about 60 days of cold moist stratification (he99).

seed counts & rates: 1,310,245 (gna09), 1,344,000 (pm01, jfn04, aes10), 1,392,638 (gnabdp06) seeds per pound.

cultivation: Space plants on 0.8-1.5' centers. Clay soil tolerant. Calcareous soils. Rhizomatous, can be somewhat aggressive in a wildflower garden, but there are a lot worse problems than too much *S flexicaulis*. With that same quality, it forms a shaded ground cover when planted on 0.8' centers. Plants grown in full sun may “burn out” in a few years of northern Illinois weather.

bottom line: Dormant seeding is best. Limited data indicate the dormancy mechanisms vary & very early spring plantings may be successful some years. Lightly scratch seed into *in situ* woodlands.

Flipflop species. Germ 31.8, 20.5, na, sd 26.7, r9.0-77 (68)%. Dorm 56.5, 68.5, na, sd 28.3, r9.0-80 (71)%. Test 30, 30, na, r24-37 days. (#4:2)**



Description: Medium tall, 1.0-2.0(3.0)'; colonial, rhizomatous; stems & branches glabrate below, pubescent above; lower leaves ovate, winged, petiolate, upper lanceolate; one feathered leaf vein; axillary racemiform inflorescence; flowers yellow, not secund; N 2n = 18, 36. **key features:** ①“Sp is easily recognized by green, non-glaucous stem & broadly ovate leaves abruptly contracted to a winged petiole.” (Ilpin)

Comments: **status:** **phenology:** Blooms 8,9,10. In northern Illinois, collect seeds in October - early November. Collect seeds in se Wisconsin in October - November (he99). Good in the landscape, shade gardens & shady ground cover. Seed source nursery production plots, with original sources from West Bureau Creek, near Wyanet & Coal Hollow, both in Bureau Co.

“It has an angled zig-zag stem & serrated leaves that have winged petioles. It grows on wooded banks, ledges & outcrops & begins to flower early. In mesophytic situations, as the maple woods on Newburg road, it is more robust, more stoloniferous & begins to bloom later. (*S flexicaulis* L)” (ewf55)

Associates: Attracts butterflies. Reported as deer resistant. Walnut tolerant.

Ethnobotany: Used as medicinal beverage by Pottawatomie & Ojibwa (sm33, den28). Ojibwa medicine for diseases of women (den28).

VHFS: [*Doria flexicaulis* (L) Lunell, *Solidago flexicaulis* var *ciliata* DC, *S flexicaulis* var *latifolia* (L) Pursh, *S latifolia* L, *S scrophulariifolia* Mille]





Solidago flexicaulis

Line drawing courtesy of Kentucky Native Plant Society. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image.

Solidago gigantea Aiton LATE GOLDENROD, aka GIANT GOLDENROD, SMOOTH GOLDENROD, *VERGE D'OR GÉANTE*, (*giganteus* -a -um very large, giant, gigantic, unusually high, higher than the type, from Latin *giganteus* -a -um, adjective, of or belonging to giants, gigantic, from -ēus, a Greek adjectival suffix indicating a state of possession or 'belonging to', or 'noted for'.) Facultative Wet Subsection *Triplinerviae*.

Habitat: Open, sunny, disturbed habitats. Wet meadows, damp thickets, alluvial or rich soil, moist ground.
distribution/range: Common throughout Illinois.

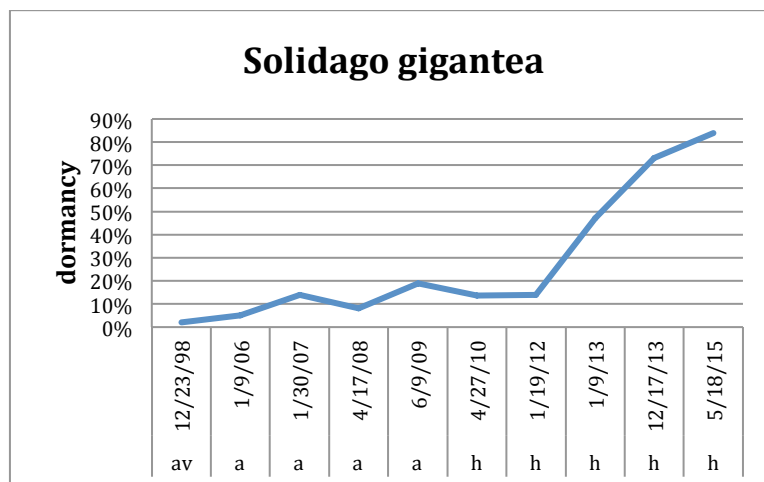
Culture: propagation: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③Sow at 20°C (68°F), germinates in less than two wks (tchn). Growth rate moderate. Seedling vigor high. Vegetative spread rate none?.

seed counts & rates: 700,000 (usda, ecs), 4,628,571 (gnh12), 5,040,120 (gnh11), 5,279,069 (gna05), 6,048,000 (aes10), 6,305,555 (gna06) seeds per pound. Us97 has a mix seeding rate of 0.125 lb pls per acre, but due to the aggressive rhizomatous nature of this sp, & the very high seed count, this is ill advised.

asexual propagation: Division of mature clumps is possible.

cultivation: Moist to saturated soils. Nutrient load tolerance moderate to high, siltation tolerance moderate. Tolerant of medium & fine textured soils. Anaerobic tolerance low. CaCO₃ tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 4.0-8.0.

bottom line: Plant dormant for insurance, Genesis seed test data indicate slight to modest dormancy in 75% of lots, with 47-73% dorm in others. Flipflop species. Germ 53.2, 60, 73, sd 25.7, r9.0-82 (73)%. Dorm 28, 14, 14, sd 27.9, r2.0-84 (82)%. Test 32, 28, 26, r26-50 days. (#10:1)**



greenhouse & garden: Cold moist stratify 60 days, small seeds need light. Cool soils; seed germinates quickly.

Description: Tall, weedy perennial, native forb; forms large colonies, rhizomatous, 16-inch minimum root depth; stems 3.0-6.0(-8.0)', stems & branches glabrous & glaucous; leaves lanceolate, sessile; three linear leaf veins; terminal paniculiform inflorescence, pyramidal; yellow flowers, secund; $2n = 18, 36, 54$.

“similar to *S canadensis* but stems have no real hairs & the bracts greener.” (fh)

Comments: Blooms July to October. In northern Illinois, collect seeds in late September - early November. Collect seeds in se Wisconsin in October - November (he99). Useful in wetland restoration, used in upper shoreline zones, streambank stabilization, & vegetated swales. Can be aggressive & form monocultures, very weedy, similar to the closely related *S canadensis*. Hexaploid in prairies. Seed source Spring Slough, Whiteside Co, & nursery production. Production patches soon fill in & become unproductive at year 3 after planting.

“There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Solidago serotina* Ait.” *Solidago gigantea* Ait. as *S serotina* Ait. (Short 1845).

“A common tall goldenrod which has a long flowering period beginning earlier than the above (*S altissima*).” (ewf55)

Associates: Provides nectar for butterflies. Provides cover for small mammals & songbirds. In a Wisconsin pine plantation, water extracts of leaves from *Prunus serotina* BLACK CHERRY, *Rubus idaeus* RED RASPBERRY, *Eurybia macrophylla* BIGLEAF ASTER, *Lonicera tatarica* TATARIAN HONEYSUCKLE, *Solanum dulcamara* CLIMBING NIGHTSHADE, & *Solidago gigantea* GIANT GOLDENROD reduced red pine height growth, number of secondary needle fascicles, weight increments of roots & shoots, & radicle elongation of red pine seedling (Norby & Kozlowski 1980).

Eurosta solidaginis GOLDENROD GALL FLY is said to cause galls on GIANT GOLDENROD.

ethnobotany: Flowers used as medicinal beverage by Pottawatomie & Menominee (sm23, 33).

VHFS: Includes var *serotina* (Kuntze) Cronq [*Aster latissimifolius* (P Mill) Kuntze var *serotinus* Kuntze, *Solidago gigantea* Ait ssp *serotina* (Kuntze) McNeill, *S g* Ait var *leiophylla* Fern, *S g* Ait var *pitcheri* (Nutt) Shinners, *S g* Ait var *serotina* (Kuntze) Cronq, *S g* Ait var *shinnersii* Beaudry, *S ×leiophallax* Friesner, *S pitcheri* Nutt, *S serotina* Ait, non Retz, *S serotinoidea* Á&D Löve]





Solidago gigantea

Line drawing courtesy of Kentucky Native Plant Society. Second & third line drawings Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image. First photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

Solidago hispida

Rare in Illinois, Alexander, Jackson, & Union cos. Largely absent from the Prairie Peninsula.



Solidago hispida

Line drawing courtesy of Kentucky Native Plant Society.

Solidago juncea Aiton EARLY GOLDENROD, aka GOLDENROD, PLUME GOLDENROD, SHARP-TOOTHED GOLDENROD, *VERGE D'OR JUNCIFORME*, YELLOW TOP, *A'djidamo'wano*, squirrel tail (Ojibwa), (*junceus -a -um* from Latin *junceus -a -um*, made of rushes, juncus-like, like a rush; stiff.) upl Section *Solidago* subsection *Junceae*.

Habitat: Open disturbed habitats. Mesic to slightly dry black soil prairies, sand & gravel prairies; dry oak savanna, open areas of rocky upland woods, thickets, old fields, & sunny waste ground, where it is the earliest goldenrod to bloom. (Hilty 2002-08) “Dry; prairies, woods, inland sands; in sandy, loamy soil” (fh) Open sandy soils & disturbed areas, fields” (fna). distribution/range:

Culture: propagation: ①Cold moist stratify 60 days, small seeds need light. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09) ②(Code C, G Ken Schaal) ③Seeds germinate after about 60 days of cold moist stratification (he99). ④Sow at 20°C (68°F), germinates in less than two wks (tchn).

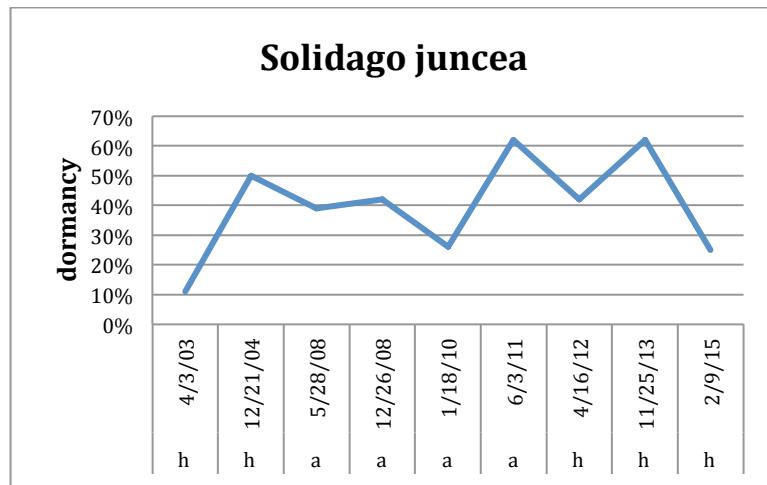
seed counts & rates: 2,250,000 (jfn04), 2,538,000 (ecs), 2,837,500 (gna09), 3,200,000 (gn), 3,847,458 (gnam11), 4,123,181 (gnh11), 4,536,000; 4,640,000 (pm10), 4,989,010 (gnih02) seeds per pound.

asexual propagation: Division of mature clumps.

cultivation: Tolerant of acidic soil (he99)

bottom line: Dormant seeding is best. Test data indicate significant to strong dormancy most years. Germ 50.3, 30, 34, sd 15.2, r30-71 (41)%. Dorm 39.9, 42, 42, sd 16.1, r11-62 (51)%. Test 28, 28, 28, r21-36 days.**

greenhouse & garden: Easy by stratified seed or transplants.



Description: Medium to tall, 1.0-2.0(-2.5)'; from a short caudex, occasionally slim horizontal rhizomes or stolons in sandy soils; yellow flowers 4-12 ray florets; terminal paniculiform inflorescence, not pyramidal; flowers secund; stems & branches glabrous; leaves lanceolate, sessile; one linear leaf nerve; basal leaves sharply toothed; clump forming from caudex. N 2n = 18.

Solidago juncea is the only goldenrod in Illinois with a near or complete absence of hairs on the stems & leaves, presence of winged leaflets above the leaf axils, & an inflorescence that flares outward not upward (Hilty 2002-08).

Comments: status: phenology: Blooms 6,7,8, the first goldenrod of the season to bloom. In northern Illinois, collect seeds in mid-October - early-November. Collect seeds in se Wisconsin in October (he99). Cut flowers, landscaping, soil binding. Plume-like blooms. Spreads rapidly from rhizomes or vegetative offshoots, aggressive in small plantings. Seed source nursery plantings, genetic source Kane, DuPage, & Will cos.

“Our common early goldenrod which grows mostly in prairie situations.” (ewf55)

Associates: Flowers attract long-tongued bees, short tongued bees, wasps, flies, butterflies, moths & beetles. Larval host for many moth spp. Provides cover for *Cirrhophanus triangulifer* GOLDENROD STOWAWAY MOTH. GREATER PRAIRIE CHICKEN, deer, groundhog & cottontail rabbit, & livestock may eat the foliage. Seeds may be eaten by EASTERN GOLDFINCH, TREE SPARROW, & SWAMP SPARROW.

ethnobotany: Used as medicinal plant by Ojibwa for convulsions & diseases of women (den28).

VHFS: Includes *f scabrella* (T&G) Fern.



Solidago juncea

Line drawing courtesy of Kentucky Native Plant Society.

Solidago missouriensis Nuttall *MI MISSOURI GOLDENROD, aka MISSOURI BASIN GOLDENROD, PRAIRIE GOLDENROD, (*missouriensis* -is -e (mi-sur-ree-EN-sis) of or from Missouri or the Missouri River.) Section *Solidago* subsection *Junceae*.

Habitat: Dry prairies, gravels, & rocky slopes. Dry, open woods. distribution/range: Sp has expanded its range eastward along railroads.

Culture: propagation: ①Cold moist stratify 60 days. ②(Code C, G Ken Schaal). ③Seeds germinate after about 60 days of cold moist stratification (he99). ④Sow at 20°C (68°F), germinates in less than two wks (tchn). 1,472,000 (sh94), 5,600,000 (gn), 6,013,245 (gna05) seeds per pound.

bottom line: Limited data indicate dormancy mechanisms vary. Dormant seeding can be strongly beneficial. Germ 22-42%. Dorm 7.0-56%. Test 34-36 days.**

greenhouse & garden: Easy from stratified seed or transplants. Moist cold stratify or dormant seed in an unheated coldframe, have prop stock germ tested before planting untreated seed in greenhouse.

Description: Perennial from cord-like rhizomes, colonial, sometimes clump from a caudex; stems 0.5-3.0(3.5)', leaves with 3 obvious nerves (2 parallel to midvein) stem leaves diminishing in size upward. $2n = 18, 36$. Diploid in the prairies. key features: Distinguished by plant mostly hairless, 3-nerved proximal leaves, upper leaves mostly smaller, & the usual thin, elongate rhizomes.

Comments: status: Threatened in Michigan. phenology: Blooms July to August (September). C3. Collect seeds in se Wisconsin in October (he99). Soil binding, spreads rapidly by rhizomes. One of the earliest goldenrods to bloom. May be very similar to *S juncea* & hard to distinguish. Colonies may produce comparatively few flowering culms.

“*Solidago glaberrima* Martens. A common early prairie goldenrod. Being markedly stoloniferous it tends to form large patches. (*S missouriensis* var *fasciculata* Holzinger)” (ewf55)

Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Coleoptera*, & *Hemiptera*.

ethnobotany: Listed as edible to humans but a minor livestock poison. Seconds on salad anyone?

VHFS: In Britton & Brown (1913), this is *S glaberrima*. Known to hybridize with *S juncea*.



Solidago missouriensis

Line drawing courtesy of Kentucky Native Plant Society.

Solidago nemoralis Aiton OLD-FIELD GOLDENROD, aka COMMON GOLDENROD, DYER'S-WEED GOLDENROD, DWARF GOLDENROD, FIELD GOLDENROD, GRAY GOLDENROD, GRAY-STEMMED GOLDENROD, PRAIRIE GOLDENROD, *VERGE D'OR DES BOIS*, (*nemoralis* -is -e (ne-mor-RAH-lis) of or growing in woods or groves, sylvan, from Latin *nemoralis*, adjective, of or in a wood or grove; nemoral, pertaining to or living in a forest or wood.) upl

Habitat: Open, often somewhat disturbed habitats. Mesic, dry, hill, & sand prairies, dry-mesic & dry savanna, open woods & old fields. distribution/range:

Culture: propagation: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09) ②Seeds germinate after about 60 days of cold moist stratification. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. Seeds

need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ③“No pre-treatment needed. Sow seeds on soil surface at 60°F & water.” (ew12) ④Sow at 20°C (68°F), germinates in less than two wks (tchn). Growth rate rapid. Seedling vigor high. Vegetative spread rate none.

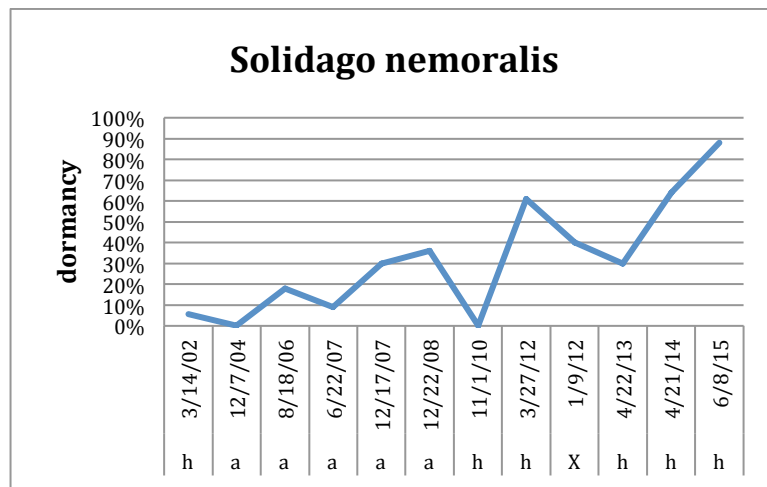
seed counts & rates: 1,008,000 (usda, ecs), 1,312,000 (sh94), 1,835,579 (gnh02), 2,198,547 (gna04), 2,864,353 (gn03), 3,840,000 (jfn04), 4,240,000 (ew12), 4,536,000; 4,495,050 (gnhm10), 4,544,000 (aes10), 4,562,813 (gnap06), 4,800,000 (pm02) seeds per pound. In mixes plant 0.063-0.25 lbs pls per acre (gni).

cultivation: Space plants on 1.0-2.0' centers. Dry soils, full sun to partial shade. Tolerant of coarse & medium textured soils. Said to tolerate clay soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade intolerant. pH 6.5-7.5. Sp loses its charm when planted in rich soils.

asexual propagation: Easy by division of mature plants.

bottom line: Genesis seed test data indicates dormancy varies widely. Spring plant is successful 5 out of 8 years, but some lots strongly benefit from dormant seeding. Germ 57.6, 59, 55, sd 25.6, r7.0-97 (90)%. Dorm 31.8, 30, 0.0, sd 26.7, r0.0-88 (88)%. Test 33, 35, 35, r24-40 days. (#13)**

greenhouse & garden: Cold moist stratify 60 days, small seeds need light. Cool soils, successional restoration, dry stratified seed works sometimes.



Description: Erect, herbaceous, perennial, native forb; from a branching caudex & rhizomes; short, stems 1.5-2.5'; flowers yellow; terminal paniculiform inflorescence, narrowly pyramidal; flowers secund; stem & branch surfaces finely pubescent, puberulent; lower leaves oblanceolate, winged, petioled, upper elliptical, sessile; one feathered leaf vein; clump-form from caudex. key features: ①Plants are gray-green, flower clusters often arch downward, flowers secund (fh).

Comments: status: Sp may be a weed of economic impact in some western states. phenology: Blooms 8,9,10. In northern Illinois, collect seeds in mid-October - mid-November. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers & dried seed heads, attractive arching stems. Landscaping, specimen plantings, xeriscaping, green roofs, low dry meadows, dry savanna gardens, erosion control on sandy soils. This sp with *Sorghastrum nutans* are quite attractive in early fall (*vide infra*). Grows well in dry sterile soils. Seed source nursery production originally from remnant sand or gravel prairies, Green River Lowland, Hamilton Twp, Lee Co & Rock River Hills, Nachusa Twp, Lee Co.

“There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Solidago nemoralis* Ait.” (Short 1845).

“Common in such dry places as high prairies, gravel hills, & sand areas. It is quite variable. It has a long flowering period which at times begins as early as late July & lasts until November.” (ewf55)

Associates: Attracts butterflies. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Lepidoptera*, *Coleoptera*, & *Hemiptera*. Minor food value to large & small mammals & upland birds.

VHFS: Includes var *longipetiolata* (Mack & Bush) Palmer & Steyem & var *decemflora* (DC) Fern, the later is reduced to synonymy by some.

① Var *nemoralis* synonyms are *S nemoralis* Ait ssp *haleana* (Fern) GW Douglas, *S nemoralis* Ait var *haleana* Fern. ② Var *longipetiolata* synonyms include *S decemflora* DC, *S longipetiolata* Mackenzie & Bush, *S nemoralis* Ait ssp *decemflora* (DC) Brammall, *S nemoralis* Ait ssp *longipetiolata* (Mackenzie & Bush) GW Douglas, *S nemoralis* Ait var *decemflora* (DC) Fern, & *S pulcherrima* A Nels.

FNA recognizes ssp *nemoralis*, 2n = 18, 36, of open areas & open woods in the eastern deciduous forest, & ssp *decemflora* (DC) Brammall ex Semple, 2n = 36, of the Midwestern prairies & Great Plains.



Solidago nemoralis, remnants & production

Line drawing courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image.

Solidago ohioensis see *Oligoneuron ohioense*.

Solidago patula Muhlenberg ex Willdenow *IA SWAMP GOLDENROD, aka ROUGH-LEAVED GOLDENROD, ROUND-LEAF GOLDENROD, SPREADING GOLDENROD, (*patulus* -a -um *pátulus* from Latin *patulus*, adj, wide open, gaping, wide-spreading.) obl Section *Solidago* subsection *Argutae*.

Habitat: Fens, wet ground, & riparian prairies. distribution/range:

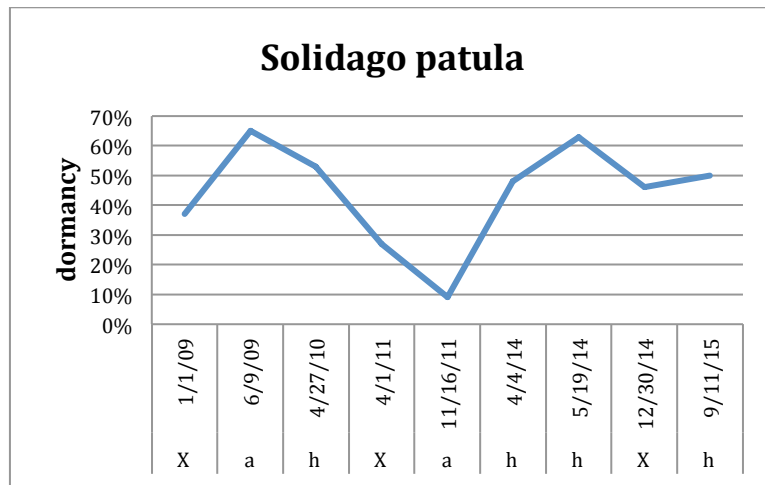
Culture: propagation: ① Cold moist stratify 60 days, small seeds need light, cool soils (wade) ② “Moist cold treatment or fall sow, light cover, fair germination.” (mfd93). Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.

seed counts & rates: 700,000 (usda, ecs), 768,189 (gnaer11), 1,150,000 (jfn04), 1,207,477 (gne07), 1,746,154 (gnhs14) seeds per pound.

availability: Sp is available on a limited basis as seed & plugs.

cultivation: Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance high. CaCO₃ tolerance medium. Drought tolerance low. Fertility requirement low. Salinity tolerance none. Shade tolerance intermediate. pH 4.5-7.0.

bottom line: Dormant seed only. Test data indicate a significant to strong dormancy rate. Flipflop species. Germ 27.6, 21, 12, sd 19.6, r2.0-61 (59)%. Dorm 44.2, 48, na, sd 16.7, r9.0-65 (56)%. Test 23, 22, na, r16-34 days. (#8:0)**



Description: Erect, herbaceous, perennial, native forb; 6-inch minimum root depth; stems 3.0-5.0', attractive yellow flowers; key features: ① “*Solidago patula* is readily recognized by the angled stem & the sharkskin-like texture of the adaxial surface of the leaves.” (fna)

Comments: status: Endangered in Iowa. phenology: Blooms 8,9,10. Wetland restoration, calcareous, self sows.

Associates: Butterfly nectar source.

VHFS: Var *patula*, NORTHERN ROUGHLEAF GOLDENROD, grows over the eastern US, & var *strictula* Torr & Gray grows south & east of our area. [*Solidago salicina*???





Solidago patula, fen, at the base of the Illinois River bluffs

Line drawing courtesy of Kentucky Native Plant Society. Second & third line drawings Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image. First Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

Solidago petiolaris Aiton PETIOLED GOLDENROD, aka DOWNY RAGGED GOLDENROD, (*petiolaris* -is -e petioled, being stalked, with a leaf stalk, with a long leaf stalk, from scientific Latin *petiolaris* (Linnaeus *Philosophia Botanica* (1763) 108), from *petiolus* n. & *-āris, -āre*, stem *-āri*, a suffix meaning of the kind of, belonging to.) Subsection *Thyrsiflorae*.

distribution/range: Rare in Illinois, Alexander, Jackson, Johnson, Massac, Monroe, Pope, Saline, & Union cos. Southern Illinois is at the northeast edge of this sp range.

Culture: propagation: ① (Code C, G Ken Schaal). 1,008,000 (gni) seeds per pound.

N 2n = 18, 36, 54.

VHFS: Illinois has the western variety *angusta* (T&G) A Gray. The sp is southeastern. In Britton & Brown (1913), this is *S lindheimeriana*.



Solidago petiolaris angusta

Line drawing courtesy of Kentucky Native Plant Society.

Solidago ptarmicoides see *Oligoneuron album*.

Solidago puberula Nuttall *KY, OH DOWNY GOLDENROD, aka DUSTY GOLDENROD, *VERGE D'OR PUBÉRULENTE*, (pubérulus)

Habitat: Open or part shade. distribution/range: East of our area.

Culture: propagation: ① Sow at 20°C (68°F), germinates in less than two wks (tchn).

Description: Short, 2' or less; clump-form from caudex; lower leaves oblanceolate, winged, petioled, upper elliptical, one feathered leaf vein; terminal paniculiform inflorescence, narrow; flowers yellow not secund;

Comments: status: Special concern in Kentucky. Endangered in Ohio. phenology: Blooms September-October.

Associates: Special value to native bees & honey bees.

VHFS:



Solidago puberula

Line drawing courtesy of Kentucky Native Plant Society.

Solidago riddellii see *Oligoneuron riddellii*.

Solidago rigida see *Oligoneuron rigidum*.

Solidago rugosa P Miller (or Aiton) ROUGH GOLDENROD, aka BITTERWEED, EARLY WRINKLE-LEAF GOLDENROD, ROUGH-STEMMED GOLDENROD, TALL HAIRY GOLDENROD, WRINKLELEAF GOLDENROD, *VERGE D'OR RUGUEUSE*, (*rugosus* -a -um *rugosus* (roo-GO-sus) *rugose*, wrinkled, rough; covered with wrinkles, or thrown into wrinkles, from Latin *rugosus*, adjective, full of wrinkles, folds, or creases, from *ruga*, wrinkle.) FAC+ Section *Solidago* subsection *Venosae*.

Habitat: Open disturbed habitats. Found in thickets surrounding marshes & in dunes where the soil is sandy or peaty, in bogs, & in sterile acidic habitats. Acidic gravelly seeps. It is also known from shallow soils over sandstone.

“Usually in dry soil, in fields, and along roadsides, Newf to W Ont, south to Fla & Tex” (nlb05). distribution/range: Ssp *aspera* is native in sw Illinois near the Mississippi & Ohio rivers (Ozarkian?) and in Indiana near the tip of Lake Michigan. **This is not native in northern ½ of Illinois, especially the Chicago metro area, & should not be planted here.** (However, Kartesz

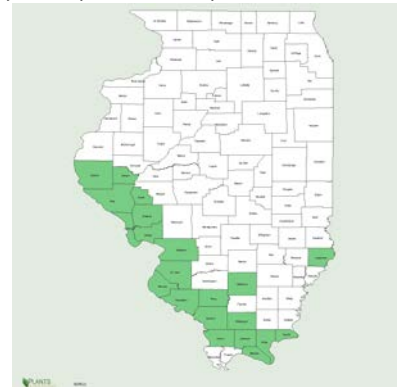
(2013) maps the sp from Kankakee & Iroquois cos.) Cultivars in a flower bed, ok. Native prairie plantings no! A pox on thee! Introduced in Wisconsin.

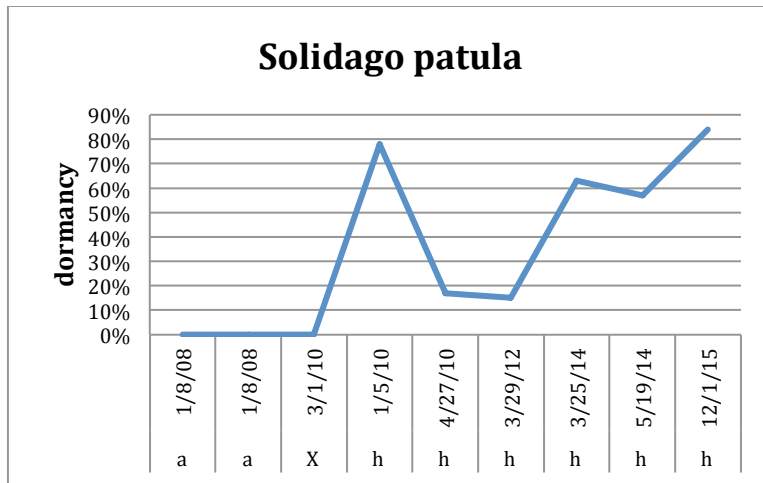
Culture: propagation: ①Seed from Maine was said to need no treatment, but also said viability is low (results self-reinforcing & inconclusive perhaps?), store dry seed at 40° F (van der Grinten 2001). Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid. Spreads slowly by seed.

seed counts & rates: 1,000,000 (usda, ecs), 1,480,000 (jfn04), 2,832,000 (gnh11), 4,989,010 (gnh10), 5,279,070 (gnhs14) seeds per pound.

cultivation: Tolerant of coarse & medium textured soils. Anaerobic tolerance low. CaCO₃ tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance medium. pH 5.0-7.5.

bottom line: Spring seeding worked with 5 out of 9 lots, but strongly dormant of late. 84% dormancy is known. Flipflop species. Not native in northern Illinois (or not). Germ 53.4, 61, na, sd 33.2, r8.0-88 (80)%. Dorm 34.9, 17, 0.0, sd 33.2, r0.0-84 (84)%. Test 26, 25, 25, r19-38days. (#9:0).**





Description: Tall *weedy* perennial (emphasis added), rhizomes long creeping, forms large colonies, 12-inch minimum depth; stems to 3.0-6.0'; stem & branch surfaces densely pubescent, coarse; leaves ovate, sessile; one feathered leaf vein; terminal paniculiform inflorescence, widely branched or divergent; yellow flowers, secund; 2n = 18, 36, 54.

Comments: Blooms mid August to October.

The use of this sp in restoration in Chicago is a blatant example of the total lack of biogeographical integrity (or insight or oversight) of many native plant nurseries & the unfounded, blind faith of cut & paste landscape architects / native consultants. Have any of you ever opened that copy of Swink & Wilhelm? Did you flunk map interpretation? Dumb bunnies want local ecotype, they preach the importance of EPA regional ecotypes, but they will plant anything beyond its range for the all mighty buck, just because someone is too lazy to open a book & customize a seed mix. Hallelujah!

VHFS: In Britton & Brown (1913), *Solidago rugosa* Mill ssp *aspera* (Aiton) Cronquist is called *Solidago drummondii*. Known to regularly hybridize with *S sempervirens*, which is another damn good reason to not plant either sp in northern Illinois.

“*Solidago rugosa* is highly variable in size, array shape, & hairiness. It is similar to members of the *S canadensis* complex; it differs in not having 3-nerved leaves.” (fna) Sw94 note several varieties from near the south end of Lake Michigan. There are two ssp & five varieties.

Solidago r P Mill ssp *rugosa*; *S r* P Mill ssp *rugosa* var *rugosa*;

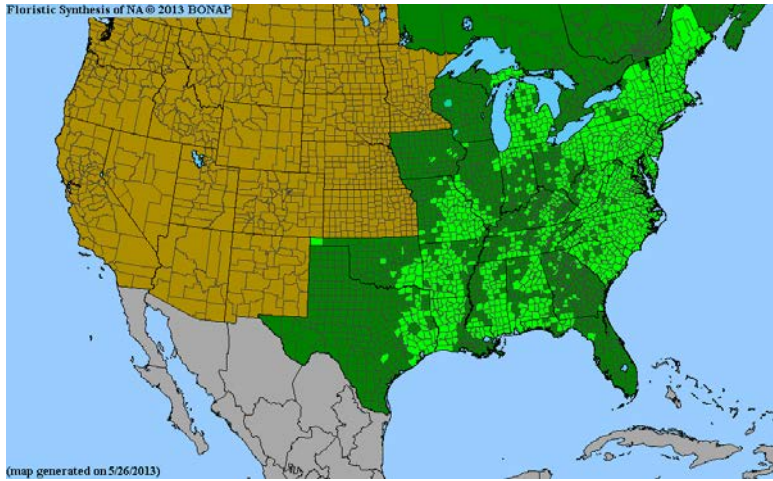
Solidago r P Mill ssp *rugosa* var *sphagnophila* Graves, Special concern in Connecticut.

Endangered in New York.

Solidago r P Mill ssp *rugosa* var *villosa* (Pursh) Fern.

Solidago r P Mill ssp *aspera* (Ait) Cronq Endangered in New York [*S r* P Mill var *celtidifolia* (Small) Fern.]





Solidago rugosa

Line drawing courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image.



Solidago rugosa aspera

Line drawing courtesy of Kentucky Native Plant Society.

Solidago sciaphila ES Steele *IL, WI CLIFF GOLDENROD, aka DRIFTLESS AREA GOLDENROD, SHADOWY GOLDENROD, (*sciaphilus -a -um* shade loving, from Greek *skia* shadow, (*scia* for umbrella), Sanskrit *chāyā* color, shadow, & *phelein*, to love.) Section *Solidago* subsection *Squarrosae*

Habitat: Sandstone, limestone, or dolomite bluffs, ledges, & cliffs. Shaded or exposed dolomite cliffs.

distribution/range: Mostly near the Mississippi River, in Illinois, Iowa, Minnesota, & Wisconsin. In Illinois, Carroll, Jo Daviess, LaSalle, & Ogle cos, on the Illinois & Rock rivers. Northwest Illinois is the southeast limit of this sp distribution.

Culture: ☉Cold moist stratify 60 days, small seeds need light (pm09). 1,280,000 (pm01) seeds per pound.

Description: From a branched, thick, woody caudex. $N 2n = 36$. Inflorescence is a thyrses. This sp differs from *S. speciosa* by having proximal leaves obviously serrate.

Comments: status: Threatened in Illinois. Special Concern in Wisconsin. phenology: Blooms August-September. C3.



Line drawing courtesy of Kentucky Native Plant Society.

Solidago sp as *Gi'ziso 'muk'ki*, sun medicine, Ojibwa medicine for fever, ulcers, & boils & noted as calendar flower. (den28)

Solidago sempervirens Linnaeus SEASIDE GOLDENROD, aka SALT-MARSH GOLDENROD, *VERGE D'OR TOUJOURS VERTE*, (*sempervirens* semper'virens (sem-PER-vi-rens) literally ever green or always green, hence retaining leaves in winter, from Latin *semper*, always & *virens*, present participle of *virēre*, to be green.) Section *Solidago* subsection *Maritimae*.

Habitat: Saline, open, disturbed habitats. distribution/range: Originally a coastal sp but introduced in Illinois, Michigan, Ohio, & Ontario. "On salt marshes, sea beaches, along tidal rivers, and in sandy soil near the sea, N.B. to Fla. & Mex. Also in Bermuda." (nlb05)

Culture: propagation: No. Why? ☉Sow at 20°C (68°F), germinates in less than two wks (tchn). 700,000 (usda) seeds per pound.

Description: Erect, herbaceous, perennial, native-somewhere-but-not-here, forb; clump-form from caudex; stems to 3' or more, stem & branch surfaces glabrous; leaves lanceolate, subclasping; one feathered leaf vein; terminal paniculiform inflorescence, pyramidal; flowers yellow; flowers secund; 2n = 18.

Comments: status: phenology: Blooms August to September. This is an interesting plant that lends color to the saline roadsides in metro Chicago. We had hoped to include it in a salt mix for roadsides & salty detention. But, it seems to be leaving the salt zone for the cloverleaf infields & will be a new invasive. For years, it was on I-80 in the south side of Chicago, then crept to the DuPage River, & in 2005 isolated plants are between I-39 & State Route 351, on I-80 near LaSalle. Westward Ho! 2007 heading south on Rt. 251. 2008, Bettendorf, Iowa. 2009 firmly established at I-80 & 251. 2011 Iowa 80 truck stop. Coming soon to a roadside near you.

Associates: Insect pollinated, pollen yields are generous, & pollen may be allergenic (Ilpin).

VHFS: [*Aster sempervirens* (L) Kuntze] Known to regularly hybridize with *S rugosa*, which is another damn good reason to not plant either in northern Illinois. **Varieties.**



Line drawing courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image.

Solidago simplex Kunth ssp **randii** (Porter) Ringius var **gillmanii** (A Gray) Ringius RAND'S GOLDENROD,



Solidago simplex randii

Line drawing courtesy of Kentucky Native Plant Society. "Do I make you Randy baby?"

Solidago speciosa Nutt *MD ☞ SHOWY GOLDENROD, aka NOBLE GOLDENROD, *O'zawa'bigwun*, yellow flower (Ojibwa), (from Latin speciosus *speciosus -a -um*, adj, beautiful, handsome, good-looking; attractive, appealing; presentable, respectable; spectacular, brilliant, impressive, splendid; showy, public; plausible, specious.) upl Section *Solidago* subsection *Squarrosae*.

Habitat: Open habitats. Hill, sand, dry, dry mesic prairies & sand savannas, & dry, open woods. Occasional in mesic prairies. Prairie soils, dry open places, sandy soils, thickets, open woods. Inland sands & loamy sands. distribution/range:

Culture: propagation: ①Prairie Moon recommends 60 days cold moist stratification & light. ②“Moist cold treatment or fall sow. Will germinate with dry cold storage. Prefers cooler soils, sow in early spring or late fall. Light cover. Very good to excellent germination.” (mfd93). ③60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ④Seeds germinate after about 60 days of cold moist stratification. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ⑤Sow at 20°C (68°F), germinates in less than two wks (tchn). “30 days moist stratification required for germination. Field sow fall.” (pnnd). ⑥“No pre-treatment needed. Sow seeds on soil surface at 60°F & water.” (ew12).

Variety *jejunifolia* “30 days moist stratification necessary for germination. Field sow fall.” (pnnd)

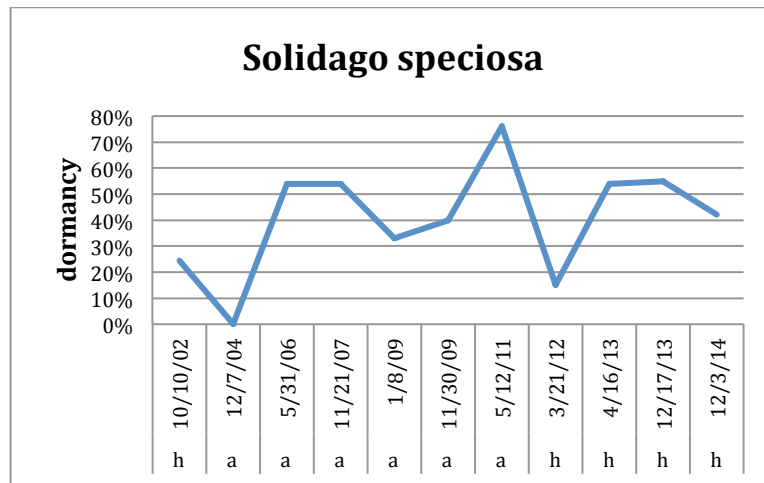
seed counts & rates: 989,106 (gnhm02), 1,481,240 (gnam06), 1,512,000 (lhn), 1,520,000 (pm), 1,600,000 (ew12), 1,664,000 (aes10), 1,680,000 (pn02, jfn04, sh94), 1,894,592 (wns01), 2,408,488 (gna04), 2,492,308 (gnh11) seeds per pound. In seed mixes plant 0.31-0.25 lb pls per acre (gni).

asexual propagation: Division of mature clumps.

cultivation: Space plants on 1.5-2.0' centers. Dry mesic to dry soils, full sun to partial shade.

bottom line: Dormant seed only. Although modest stand establishment is possible by spring seeding, our seed testing confirms most lots require or significantly benefit from dormant seeding. Germ 43.4, 41, na, sd 23.4, r14-89 (75)%. Dorm 40.7, 42, 54, sd 20.5, r0.0-76 (76)%. Test 29, 27, 27 r20-52 days. (#11:2)**

greenhouse & garden: Easy from seed, moist cold stratify or dormant seed in an unheated coldframe, have prop stock germ tested before planting untreated seed in greenhouse. Cool soils. SHOWY GOLDENROD will self-sow in open, sandy soils.



Description: Erect, herbaceous, perennial, native forb; clump-form from stout woody caudex; stems 1.5-3.0', stem & branch surfaces glabrate below, pubescent above; leaves lanceolate, sessile; one feathered leaf vein, terminal paniculiform inflorescence, branches racemiform; flowers yellow, not secund; key features: ①Stems often reddish, phyllaries slightly sticky, inflorescence coarsely hairy, leaf not hairy. (fh).

②“Handsome when in flower, long spires of yellow flowers & pale green foliage.” (Ilpin)

Comments: status: Threatened in Maryland. phenology: Blooms 8,9,10. In northern Illinois, collect seeds in mid-October to mid-November. Collect seeds in se Wisconsin in October (he99). Attractive cut & dried flowers, landscaping, xeriscaping, well drained rain gardens. Said to become aggressive, but we have not seen this, & we all have bigger fish to fry. Sp does self sow on fire-managed sandy soils. With the calyx colored, this is our showiest goldenrod of dry soils. “This is one of the most ornamental plants of the genus” (Nuttall 1817 v2). On poor, dry soils, *S speciosa* is the showiest of the genus, with tight, candle-flame-like inflorescence atop reddish stems, with the clump maintaining a nice tight, candelabra shape. If planted on average to good soils, it becomes misshapened, & looks like the butt-ugly, weedy spp, *S canadensis* & *S altissima*, which is better than a stick in the eye, but by how much? Not a lot! Seed source nursery production, genetic source Nachusa Twp, Lee Co.

“There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Solidago speciosa* Nutt.” (Short 1845).

“A common late flowering goldenrod, perhaps our most attractive, growing in open woods, sandy places, on prairies & railroads. We were unable to find it in suitable places in Stephenson but it grows in the other neighboring counties. The var *rigidiuscula* T & G is less common, is rather later in flowering & while growing in the same places as the sp, it keeps to its own patches.” (ewf55)

Associates: Pollinated by long-tongued bees, other *Hymenoptera*, & *Lepidoptera*. Said by IDNR to provide food for terrestrial & aquatic furbearers, but have you ever seen a muskrat, otter, or beaver in a

sandy hill prairie? Provides food for deer, upland game, songbirds, & small mammals. Also said to be deer resistant.

Composites are an alternate host for *Coleosporium* Pine Needle Rust. ☹️ Cattle & horses ingesting plants infected with *Coleosporium* spp fungi may become ill & die. *Solidago speciosa* & other *Solidago* spp may have a component that causes hemolytic anemia.

ethnobotany: Used as medicinal plant by Ojibwa for lung trouble; herb astringent & styptic (den28).

VHFS: Formerly *Solidago rigidiuscula* Porter. Midwestern material is all ssp *speciosa*, with two well-defined varieties, a third probable.

rewrite varieties per m14.

Var *speciosa* is native to the central & eastern United States. [Synonyms *Solidago conferta* P Mill & *S harperi* Mack] Plants tall, robust, & broad-leaved. $N 2n = 18, 36, 54$

Var *rigidiuscula* Torr & Gray, is native in much of the central United States. [Synonyms *Solidago rigidiuscula* (Torr & Gray) Porter; *S speciosa* Nutt var *angustata* Torr & Gray] Western portions of the deciduous forest & adjacent prairies, glades further east. Plants shorter, inflorescence more compact elongate. $N 2n = 18$.

Var *jejunifolia* (Steele) Cronq, native to the upper Midwest. [Synonyms *Solidago jejunifolia* Steele, *S uliginosa* Nutt var *jejunifolia* (Steele) Boivin] Plants with relatively few leaves, more open paniculiform inflorescence from Illinois, Indiana, Michigan, Minnesota, & Wisconsin. Many herbarium specimens are actually *S uliginosa* or hybrids with that sp.



Solidago speciosa, note open form inflorescence in mesic soil specimen (lower right), approaching banality. Bugs dig it.

Last photo courtesy of James Tiberius Alwill.



Solidago speciosa & variety *rigidiuscula*

Line drawings courtesy of Kentucky Native Plant Society.

Solidago tenuifolia see *Euthamia caroliniana* (Linnaeus) Greene ex Porter & Britton.
Euthamia tenuifolia (Pursh) Nutt var *tenuifolia*.

Solidago uliginosa Nuttall NORTHERN BOG GOLDENROD, aka GOLDENROD, *VERGE D'OR DES MARAIS*, (*ūlīgīnōsūs*, *uliginosus* -a -um of wet or marshy places, growing in wet places, from Latin *uliginosus*, adjective, full of moisture, wet, moist, damp, marshy, from *uligin-*, *uligo* moisture, marshiness, from *udus*, *uvidus* damp, moist.) Section *Solidago* subsection *Maritimae*.

Habitat: Swamps, bogs, & marshes. Acidic or calcareous bogs. distribution/range:

Culture: propagation: ① Sow at 20°C (68°F), germinates in less than two wks (tchn).

Description: From a long branched caudex. N 2n = 18, 36.

Comments: status: phenology: Blooms 8,9.

BOG GOLDENROD is highly variable in stem height & the size of the flower cluster, which are greatly influenced by growing conditions. Plants from the center of a bog are more slender than plants from the edge of a bog. (fna, Ilpin)

S. uliginosa Nutt. is known south to Peoria, Tazewell, & Woodford cos, but it is not native south of the Peoria region, or to the south ½ of Illinois, where Short travelled. Sp must have been encountered near Peoria. "There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, ... *Solidago neglecta*." *S. uliginosa* Nutt. as *Solidago neglecta* Torr. & Gray. (Short 1845).

"Uncommon in boggy places in Coon Creek bottom & rare in Kishwaukee River bottom below Cherry Valley. We have seen it in a small prairie bog near Irene in Boone Co. Its flowering time is rather early." (ewf55)

Associates: ethnobotany: Root used as medicinal plant by Pottawatomie (sm33).

VHFS: Includes var *linoides* (T&G) Fern.

"Sp has more slender plants from bog center treated by some authors as *S uniligulata*, & the more robust plants from bog edge as *S neglecta*." (Ilpin) Over 20 synonyms listed in fna.



Line drawing courtesy of Kentucky Native Plant Society. Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image. Second line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image

Solidago ulmifolia Muhlenberg ex Willdenow *ME, VT ELM-LEAVED GOLDENROD, aka ELM LEAVED GOLDENROD, ELMLEAF GOLDENROD, PALMER'S GOLDENROD, upl (*ulmifolius -a -um* elm-shaped leaves, *Ulmus*-leaved, from the classic Latin name for an elm, *ulmus*, *ulmi*, f, & *folium*, *foli(i)*, n., noun, a leaf.) Section *Solidago* subsection *Venosae*. The common name & the specific epithet are referring to the coarsely toothed, elm-like leaves.

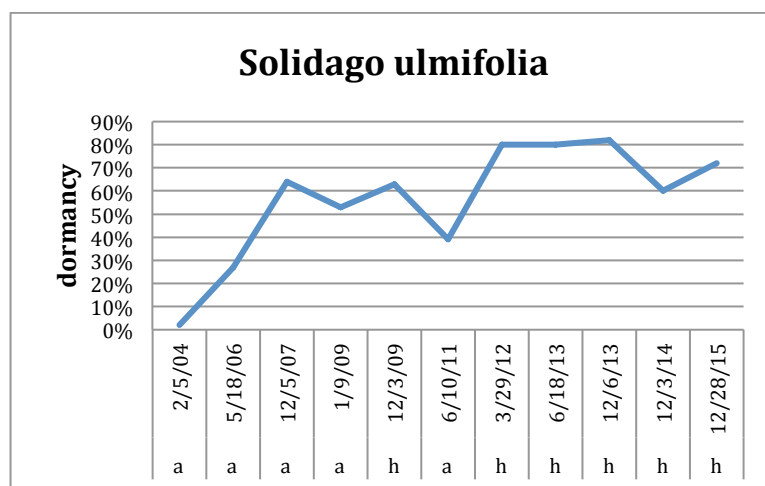
Habitat: Dry savannahs, dry woodlands, & limestone glades. Moderately disturbed woodlands. In the se USA, it grows in rocky forests & woodlands, especially on mafic & calcareous substrates (w08).

distribution/range:

Culture: propagation: ①“Moist cold treatment, or fall sow. Light cover. Very good germination.” (mfd93) ②Cold moist stratify 30 days [60 days pm 2009], small seeds need light (Wade nd). ③Seeds germinate after about 60 days of cold moist stratification (he99).

seed counts & rates: 1,512,000, 2,080,000* (pm01), 3,163,763 (gnam06), 3,185,965 (gna04), 3,286,956 (gnh11), 3,440,000 (aes10), 3,543,750 (gnh13) seeds per pound.

bottom line: Genesis seed tests confirm the need for dormant field seeding or cold moist stratification for greenhouse crops, most lots are significantly to strongly dormant. Germ 31.7, 20.0, 14, sd 22.8, r11-86 (75)%. Dorm 56.5, 63, 80, sd 23.9, r2.0-82 (80)%. Test 23, 29, na, r19-52 days. (#11:0)**



Description: 2.0-3.0', from a branching caudex. N 2n = 18.

Comments: status: Possibly Extirpated in Maine. Endangered in Vermont. phenology: Blooms 8,9,10. In northern Illinois, collect seeds in mid-October - mid-November. Collect seeds in se Wisconsin in October - November (he99). Seed source nursery woods, with original sources from West Bureau Creek, Wyonet & Coal Hollow, both in Bureau Co, & Williamsfield. Attractive cut flower. A tall savanna

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goldenrod, impressive in massed plantings, but not for the woodland/savanna meek & timid. It will grow in full sun, good soils, but in the heat & rain of 2010, our full sun patch slowly parboiled. “Common, mostly in the edge of woods. The long arching racemes are attractively conspicuous from midseason until late fall.” (ewf55)

Associates: Attracts butterflies.

ethnobotany:

VHFS: [*Aster ulmifolius* (Muhl ex Willd) Kuntze]



Solidago ulmifolia

Line drawing courtesy of Kentucky Native Plant Society.

Move to Oligoneuron.

X **SOLIDASTER** H R Wehrh (so-li-DAS-ter) Intergeneric hybrid of *Aster* & *Solidago*.

×**Solidaster luteus** (Everett) ML Green ex Dress *Aster ptarmicoides* X *Solidago* sp. (*luteus* -a -um (LOO-tee-us) yellow, a distinct yellow, a full yellow; pale yellow, from Latin adjective *luteus* -a -um, yellow; saffron; of mud or clay; good for nothing.)

propagation: ① Sow at 18-22°C (64-71°F) for 2-4 wks, move to +2 to +4°C (34-39°F) for 4-6 wks, move to 5-12°C (41-53°F) for germination. Very poor germination. (tchn).

STOKESIA L'Héritier de Brutelle **STOKESIA, STOKES ASTER** *Stokesia* for Dr. Jonathan Stokes M D, (1755–1831), English physician, botanist, & author. A monotypic genus of southeast North America.

The seeds are the size of a small sunflower seed & ripen in late summer to fall. Plants are moderately self sterile (70-80% sterile seed), so plant 2 individuals for seed production. Cold moist stratify. Code B. 2" winter root cuttings stuck vertically work well. (cu00)

End Asters Part Three

Endnotes & abbreviations. The following math functions violate Abbey's 1st Law, which see.

++ The listed numbers are seed count mean, seed count median, seed count mode, seed count standard deviation, seed count max, seed count min, seed count range.

** The listed numbers are Germ mean, germ median, germ mode, germ standard deviation, germ range (range); Dorm mean, dorm median, dorm mode, dorm standard deviation, dorm range (range); Test mean, test median, test mode, test range. (#germ test : tz etc)

Reference abbreviations May 04 2014

CEPPC California Exotic Pest Plant Council

CIPC California Invasive Plant Council

SEPPC Southeast Exotic Pest Plant Council

SWSS Southern Weed Science Society

RBG Kew RBG Kew, Wakehurst Place

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aes10 (AES 2010)
 afvp (Atlas of Florida Vascular Plants)
 anef (Angelo & Boufford: Atlas of New England flora)
 apl (Applewood)
 asfg (Audubon Society Field Guide)
 wade (Alan Wade, nd, various years, 95, &c)
 bsh (Baker Seed Herbarium, California)
 bb02 (Baskin & Baskin 2002, 2001, &c.)
 nlb05 Britton 1905
 cb03 (CC Baskin 2003, 2001, &c.)
 crfg California Rare Fruit Growers
 csvd (Currah, Smreciu, & Van Dyk 1983)
 tchn tomclothier.hort.net (-4°C 24°F stratification being corrected)
 cu00 (or cu02, &c, Cullina 2000, 2002, 2008)
 nd91 (Norm Deno, 1991, 1993)
 den28 (Densmore 1928)
 do63 (Dobbs 1963)
 mfd93 (Mary Fisher Dunham 1993)
 dh87 (Dirr & Heusser 1987)
 drwfp (Directory of Resources on Wildflower Propagation)
 ecs (Ernst Conservation Seeds catalog)
 ew12 (Everwilde 2012) also ew11
 ewf55 (Egbert W Fell 1955)
 ewf59 (Egbert W Fell 1959)
 fh (Robert W Freckmann Herbarium)
 fina (Flora of North America project)
 foc (Flora of China online)
 fop (Flora of Pakistan online)
 gni (Genesis Nursery, Inc)
 gc63 (Gleason & Cronquist 1963, 1991)
 gran (Granite Seeds)
 he99 (Heon et al 1999)
 hk83 (Hartman & Kester 1983)
 hpi (Hill Prairies of Illinois
 (Hilty website))
 Ilpin (Illinois Plant Information network)
 jf55 (Jones & Fuller 1955)
 jlh (JL Hudson, Seedsman, (if the phone doesn't ring its me))
 kpw (Kansas Prairie Wildflowers)
 krr (Kenneth R Robertson)
 lbj (Lady Bird Johnson Wildflower Center Native Plant Information Network)
 m14 (Mohlenbrock 2014) also m86, m99, m02, m05, m06, &c
 mbg (Missouri Botanic Garden)
 msue (Michigan State University Extension)
 nae Native American Ethnobotany (Moerman, University of Michigan Dearborn)
 now36 (Nowosad et al 1936)
 nyfa (New York Flora Atlas)
 orgph (Ontario Rock Garden Hardy Plant Society)
 ppc (Philips Petroleum Company)
 pots (Plants of the Southwest 2000)
 pm09 (Prairie Moon 2009) also pm02, pm11, &c
 pnnd (Prairie Nursery no date)
 pph (Prairie Propagation Handbook)
 ppi (Prairie Plants of Illinois)
 psdg (Plants of South Dakota Grasslands)

pug13 (plants.usda.gov accessed 2013, 2014)
oed Oxford English Dictionary online
rain (Ranier Seeds)
rrn97 (Reeseville Ridge Nursery 1997)
rvw11 (Reznicek et al 2011)
rs ma (Ray Schulenburg Morton Arboretum)
rhs Royal Horticultural Society
sh94 (Shirley Shirley 1994) & don't call me Shirley
sk08 (Stuppy & Kessler 2008)
sm23 (Smith 1923) also sm32, sm33, sm28, &c.
sw79 (Swink & Wilhelm 1979)
sw94 (Swink & Wilhelm 1994)
tlp (Time Life Perennials)
tlw (Time Life Wildflowers)
tpg The Prairie Garden
uconn (UConn Plant Database)
us97 (USDA 1997)
w12b (Weakley Nov 2012) also w07-12
wfatp (Vance & Vance 1979)
wfn (Wildflowers of Nebraska)
wfnp (Wildflowers northern prairies)
ws92 (Wilhelm & Swink 1992)
w73 (Alphonso Wood 1873)
ry64 (Richard Yarnell 1964)
yy92 (Young & Young 1992)
Reliquum etiam non scriptum est.