

GRAMINEAE

Part One

GRAMINEAE AL de Jussieu 1789 or POACEAE (R Brown) Barnhart 1895 GRASS FAMILY
ACHNATHERUM to ELYTRIGIA
Revised 13 July 2015

GRAMINEAE PART ONE

Achnatherum	Calamagrostis
Agropyron	Calamovilfa
Agrostis	Cenchrus
Alopecurus	Chasmanthium
Ammophila	Cinna
Andropogon	Dactylis
Anthoxanthum	Danthonia
Aristida	Deschampsia
Arrhenatheum	Diarrhena
Avena	Dichantherium
Beckmannia	Digitaria
Bouteloua	Distichlis
Brachyelytrum	Echinochloa
Bromus	Eleusine
Buchloë	Elymus
	Elytrigia

If it's flat and smooth,
it's little bluestem

If it's flat and fuzzy,
it's big bluestem

If it's round and smooth,
it's switchgrass

If it's round and fuzzy,
it's Indian grass

Ray Schulenberg

Grasses are a family of annual or perennial herbs (with annual culms), or woody shrubs & trees in some bamboos (the culms perennial), with approximately 670 genera & 10,000 spp, cosmopolitan. Plants with cylindrical, jointed, & often hollow stems, & 2-ranked leaves, each with a sheath, ligule, & blade. Individual flowers inconspicuous, with 2-6 stamens, 1 pistil, & 1-3 small scalelike tepals, or lodicules, with each flower enclosed by bracts (lemma & palea), the whole called a floret. Single or several florets are attached to an axis subtended by 2 nonfertile bracts or glumes; each floret produces a 1-seeded, achenial fruit,

a grain or caryopsis, occasionally achenes in some genera, the seed being encased in a ripened ovary. Largely wind pollinated. Some bamboos produce fleshy fruits.

Primitive grasses may have evolved 89 million years before the present (mybp) (some suggest 100-110 mybp), with conventional grasses known from the Paleocene-Eocene boundary, 55 mybp. Grasslike opal phytoliths are known from dinosaur coprolites from the Late Cretaceous (71-65 mybp) in India. Grasses were in adequate abundance to fuel the grazing mammal radiation of the Miocene. C4 photosynthesis originated in the mid-Miocene (16-12.5 mybp). C4 grasses may be less palatable than C3 grasses, with lower nitrogen content & more sclerenchyma ((1) formerly applied to stone-cells, sclereids; (2) afterwards proposed for bast or fiber cells, which are immensely thickened, with their protoplasm lost.) (Caswell et al 1973).

Worldwide family of over 10,000 spp, occurring over a wide range of moisture regimes. Grass communities form the climax vegetation in seasonally drier regions of the world. Grasses provide many important food, fiber, forage & technological plants.

Grasses provide valuable wildlife cover & nesting habitat for elk, deer, muskrats, game birds, songbirds, ducks, waterfowl, marsh birds, shorebirds, (rails, herons, marsh wren), small mammals, fish, reptiles, amphibians, & insects. Beetles eat pollen & roots. Grasses are larval hosts for many butterflies, including the browns, *Satyrinae*, & the related *Morphinae*. Rusts are common on grasses, & approximately 600 spp of smuts (*Ustilaginales*) are known to occur on grasses. Endophytic fungi are widely distributed among grasses, which influence the palatability of the foliage & seeds, the level of insect infestations, & the rate of vegetation decay. Endophytic fungi produce a number of alkaloids, including ergot alkaloids.

Grass noun. Probably from about 1150 *gras*, found in Old English *graes*, *gaers*, herb, plant grass (about 725, in *Genesis A*: earlier in the compound *graesgroeni* (grass green), cognate with the Old Frisian *gres*, *gers*, grass, Old Saxon *gras*, & Middle Dutch *gras*, *gars*, *gers*, Old High German, Old Norse, *gras* (modern German *Gras*), Old Icelandic *gras* herb, grass & Gothic *gras* herb, Old Teutonic **graso*”, from Old Teutonic root **gra-*: *grō*, source of Middle High German *grouse*, young plants, & green, grow; from Proto Germanic **grasan*, Old Aryan **ghrā*, to grow, from Indo-European **ghra-s*, *gras-*, & the root *grho*, whence Latin *grāmen*, grass.

Our grasses are wind pollinated & often have allergenic pollen. There are medical & legal implications in landscaping with these plants. Some cities have prohibited planting spp with allergenic pollen (MK O’Rourke & SL Buchman, 1986, Pollen yield from olive tree cvs Manzanillo & Swan Hill in closed urban environments. *Journal Amer Soc Hort Sci* 11:980-984). Be my guest & be a test case with nurse crops.

“Among the most predominant of the *Gramineae*, on the rich, dry, & rolling prairies are several spp of *Andropogon*, as *A furcatum*, *A ciliatum*, *A nutans*, *A scoparium*, &c, *Aristida tuberculosa*, *A stricta*, *A gracilis*, &c, *Elymus Canadensis*, (var *glaucifolius*), *E virginicus*, *E mollis*, &c, *Trichodium laxiflorum*, & *Vilfa heterolepis*. In flat & marshy situations these give place to various spp of *Panicum*, as *P geniculatum*, *P agrostoides*, *P dichotomum*, *P virgatum*, *P latifolium*, & the universally diffused *P crus-galli*, *Leersia Virginica*, & *L oryzoides*, *Spartina polystachya* & *S cynosuroides*. All these grasses in their young & tender states are eagerly devoured by cattle; as they become harder & less succulent by age, the coarser are rejected & the less tender are sought for. Among these, I believe, the *Vilfa*, before mentioned, is a general favorite, both for grazing & for hay. All of them, however, are cut promiscuously for this purpose, & when they occur, as frequently as they do in large natural meadows, occupying the ground to the almost entire exclusion of other vegetables, they yield a productive return to the labor of the mower; & well cured make excellent hay. Our horses, which had never before been accustomed to any other than the cultivated grasses, ate this natural hay with great avidity. The quality of these grasses, both for pasturage & mowing, is much improved by the burning of the prairies during the winter, which, destroying the dead & dry stems, affords a better & earlier bit in the spring, as well as a cleaner swath for the scythe: & by protecting certain portions of the prairie from the action of fire until spring or early summer, vegetation is then so much retarded by a ‘late burn,’ as the settlers call it, so as to afford good pasturage throughout the latter part of the season.” (Short 1845)



Getting Grass Seed the Hard Way

Photo by C Kenneth Pearse @ USDA-NRCS PLANTS Database. Provided by National Agricultural Library. Originally from US Forest Service. United States, UT, Ogden. 1940. Uncopyrighted photo.

ACHNATHERUM Palisot de Beauvois **RICEGRASS, NEEDLEGRASS** *Achnatherum* from Greek *achna* for chaff or scale & *ather*, awn, for the awned lemma. ①*Achnatherum calamagrostis*, Sow at 20°C (68°F), if no germ. in 4 wks, move to +1 to +4°C (33-39°F) for 4 wks (tchn).

Achnatherum hymenoides (Roemer & Schultes) Barkworth *MN INDIAN RICE GRASS, aka MOUNTAIN RICE, (*hymenoides* on one website, this is translated as of the winter, flowering in winter, but the root word is based on Greek *hymen*, a membrane, or a membrane-like structure, from Greek ὑμήν, ὑμένος, *hymen*, *hymenos*, thin skin, membrane, & -οειδης, *oides*, suffix for nouns, meaning like or resembling, meaning membrane-like, a probable reference to the lemma. Note in some references, this sp has many synonyms with the epithet *membranacea*, the Latin equivalent of Greek *hymenoides*. The roots *hymen-* membrane, and *hyema-*, winter, are sometimes confused. Latin *Hymen*, Greek Ἕμην, was the god of marriage, while Latin *hyemalis*, or *hiems*, refers to winter.)

N 2n = 46, 48. Endangered in Minnesota. Food source for Native Americans.

VHFS: *Achnatherum hymenoides* forms natural hybrids with other members of the *Stipeae*. [*Eriocoma hymenoides* (Roem & Schult) Rydb, *Eriocoma membranacea* Beal, *Oryzopsis hymenoides* (Roem & Schult) Ricker ex Piper, *Oryzopsis membranacea* Vasey, *Stipa hymenoides* Roem & Schult, *S membranacea* Pursh & Schultes, *S membranacea* Pursh]



Achnatherum hymenoides

Seed photos Jose Hernandez USDA-NRCS PLANTS Database. - Not copyrighted images. 2nd seed photo courtesy of Bend Seed Extractory, Seeds of Success, <http://seedsofsuccess.smugmug.com>

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AGROPYRON Gaertner 1770 **WHEATGRASS** *Agropyron*, also *Agropyrum* (*Agriopyrum*) wild wheat, from Greek *αγριος*, *agrios*, wild & *πυρος*, *pyros*, wheat, as in the second alternate spelling; alternately field-wheat, from Greek *αγρος*, *agros*, & *πυρος*, *pyros*. *Agropyron* is a widely distributed genus of chiefly perennial grasses with erect spikes of usually solitary several-flowered sessile spikelets. The synonyms of our local wheat grasses are too complex to list in detail here, but are very interesting to those who have been toilet trained at gunpoint. About 35 spp, widely distributed in temperate climates. Some spp are often infected with ergot. Also spelled *Agropyrum*. *Elytrigia*: Greek *elytron*, sheath, covering.

Linnaeus originally placed all wheatgrasses in *Triticum*, the WHEAT genus. Look fast folks, cause the name *Agropyron* may vanish before your eyes. *Agropyron*, *sensu strictu*, is now reserved for the introduced crested wheatgrass complex.

Perhaps it is good that *Agropyron*'s time is over. Exposure to such a large, complex genus at the start of any agrostology text has probably turned many budding botanists into engineers & accountants.

Agropyron cristatum (Linnaeus) Gaertner **CRESTED WHEATGRASS**, aka **FAIRWAY WHEATGRASS**, (*cristatus* -a -um (kris-TAH-tus) crested, comb-like, from Latin adjective *cristatus* -a -um, tufted, crested; having a comb or tuft on the head; plumed.)

Habitat: Occurs in reseeded hay-meadows & pastures. distribution/range: From Europe, known from Fulton & Jo Daviess counties & a highway planting on the Kennedy in Cook Co.

Culture:

Description: Light blue green perennial grass; from fibrous rootstocks; leaves rolled in the bud-shoot; sheaths not compressed, not keeled, glabrous or the lowest usually soft pubescent, slightly scabrous, dark green, split with margins overlapping; auricles present, 1.0-1.5 mm long, clawlike, not clasping; collar distinct, glabrous or ciliate, light green or yellow, V-shaped, divided; ligule membranous, 0.5-1.5 mm long, truncate, lacerate; blade 2.0-6.0 mm wide, 5.0-20 cm long, flat, tapering to a sharp point, pale bluish green; upper surface scabrous, conspicuously ridged & usually soft pubescent; lower surface smooth; margins scabrous; heads; spikes; N. key features: ①Sp is densely tufted; pectinately arranged spikelets. (Ilpin) ②Distinguished from *A repens* by its glabrous collar & its conspicuously ridged blades.

Comments: status: 🍄 phenology: Blooms C3. Used for fairways & lawns in western Canada.

Associates:

VHFS:



Agropyron cristatum

Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image

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AGROSTIS Linnaeus 1753 **BENTGRASS, CLOUD-GRASS, SPEAR-GRASS** *Agrostis* field-grass, growing in fields or pastures, from Old Greek *αγρος*, *agros*, a field, or Greek *Agrostis*, grass, from *agroteis*, grass, from Greek, *αγρωστις*, *agrostis*, field grass eaten by mules, variously ascribed to *Triticum repens* & *Cynodon dactylon*. *Αγρωστις*, *Agrostis*, was a name used by Theophrastus for a wild, *αγριος*, *agrius*, grass. About 100 (150-200) spp throughout the temperate & cool regions (35 in USA) having an open or contracted panicle with small one-flowered spikelets. Typically moisture loving plants. Mostly perennials, but three annual spp occur in the United States. $x = 7$.

This genus affords to the agriculturalist some of the most important objects of cultivation both for pasturage & artificial meadows, among these the *A stolonifera* with its numerous varieties is considered as the most useful.” (Nuttall 1818 v1)

Agrostis can be confused with *Calamagrostis*, but “there is no single character that distinguishes all spp of *Agrostis* from those of *Calamagrostis*. In general, *Agrostis* has smaller plants with smaller, less substantial lemmas & paleas than *Calamagrostis*, & tends to occupy drier habitats.” (M J Harvey in fna)

Agrostis capillaris Linnaeus COLONIAL BENTGRASS, aka BROWNTOP, HIGHLAND COLONIAL BENT, RHODE ISLAND BENT, (*capillaris -is -e* fine as hair, hair-like, slender.)

Habitat: Moist or moderately wet sites. Meadows & permanent pastures, lawns, dry, open ground.

distribution/range: Introduced from Europe. Occasionally escapes from lawns.

Culture: Plant 2 pls lbs per acre for pastures in fall, spring, or summer.

5,890,000 (ecs), 7,861,000 (rain02), 8,700,000 (gran) seeds per pound.

cultivation: Full sun. Low drought tolerance, moderate salt tolerance. Tolerates acidic & infertile soils. Best on medium to moderately fine textured soils. pH 5.0-7.5 (pH 6.0-7.0 preferred for lawns).

Description: Cool season, dark green, glabrous, tufted perennial bunchgrass, medium tall grass, 6 -12(-24)”; roots sometimes with stolons or short rhizomes, spreads by rhizomes or short rootstocks, 12” minimum depth; culms; leaves fine leaves, rolled in the bud-shoot; sheaths not compressed, glabrous, green or purplish, longer than internode on vegetative shoots, split with the hyaline margins overlapping; auricles absent; collar distinct, narrow, glabrous, light green, continuous or divided by the midrib, oblique; ligule membranous, short (0.3 - 1.2 mm long), truncate, entire or finely toothed, sparsely & minutely hairy on back; blade 1.5 - 3.5 mm

wide, 2.0-10 cm long, truncate at base, sharp-pointed, flat with margins rolling in towards the apex, involute in dry weather, dark green, dull or sometimes shiny on the under surface, distinctly ridged on the upper surface, slightly keeled on under surface; margins & upper surface scabrous; heads; spikes; N; key features: ① *A tenuis* can be distinguished from *A alba* by its short, truncate ligule, smaller size & darker & more delicate foliage (Nowosad et al 1936).

Comments: status: ♣ phenology: Blooms 6-9. C3. Forms a compact sod or appears slightly tufted. Turfgrass. Seed source commercial

Associates: Nutritious & highly palatable. Known to chemically inhibit Azalea, barberry, yew, & forsythia. (Chick & Kielbaso 1998).

VHFS: [*A alba* L var *vulgaris* (With) Thurb, *A capillaris* L, *A vulgaris* Thurb]



Agrostis capillaris

Agrostis elliotiana Schultes *OH AWNED BENT GRASS, aka ELLIOTT'S BENT, ELLIOTT'S BENTGRASS, (*elliotianus -a -um* honoring Stephen Elliott (1771-1830), South Carolina farmer, banker, legislator, natural historian, college instructor, & botanist.)

Habitat: Fields & scrublands & along roadsides. distribution/range: "It has a disjunct distribution, occurring in western North America in northern California & southern Arizona & New Mexico; in eastern North America from Kansas & Texas east to Pennsylvania & northern Florida; & in Yucatan, Mexico" (fna)

Culture:

Description: $N 2n = 28$. key features:

Comments: status: Presumed extirpated in Ohio. phenology: Blooms

Associates:

VHFS:

Agrostis gigantea Roth RED TOP GRASS, aka *AGROSTIDE BLANCHE*, BLACK BENT, (formerly as *albus -a -um* (AL-bus) from Latin white, *albus*, adjective, particularly a dull rather than a glossy white, or, dead white; pale; bright, a general white.) The common name from its usually reddish pyramidal panicles, which may occasionally be white. facw

Habitat: Apparently some possible native populations in fens, but widespread in degraded prairies & wetlands, with most populations introduced from Europe. Coastal marshes, roadsides. distribution/range: Native to the northern parts of the Old & New Worlds, but introduced over much of the United States. Its dubious nativity no doubt contributes to its popularity. Hopefully, REDTOP never gets pulled over in Arizona. Does REDTOP need a greencard?

Culture: No treatment needed. Small seeds light to germinate. Growth rate rapid. Seedling vigor high. Vegetative spread rate rapid. Moderate rate of spread from seed.

seed counts & rates: 4,850,000 (ecs), 4,851,200 (usda), 4,900,000 (gran), 4,990,000 (usda), 5,000,000 (stock), 5,469,000 (rain) seeds per pound. May cause biochemical problems when planted in soils with pesticide carry-over. Seed 1 lb pls per acre (gran). Seed in fall or spring. Drill 3 - 4 lb pls per acre (stocks). 0.75 to 1.0 per 1000 sq ft new seeding (for turf). 8-10 lbs per acre (usda 1937). Seed 1 lb per acre in fall or spring (rain). In mixes, use a maximum of 1-2 lbs per acre in mixtures. For pure stands, use 4-5 lbs per acre. Higher rates may be used in critical erosion areas, but REDTOP grows rapidly after seeding & high rates are not advised.

cultivation: 0-4,500', acidic to neutral soils. Will tolerate frequent flooding. Adapted to coarse, medium, & fine textured soils. Anaerobic tolerance medium. $CaCO_3$ tolerance none. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none, or low or moderate. Shade intolerant. pH 4.5-7.5 or 8.0, tolerates acidic soils.

bottom line: As a nurse crop, plant anytime.

Description: Dark green, glabrous, cool-season, perennial, native (in part) grass; roots rhizomatous, rhizomes to 25 cm, not stoloniferous, open to thick sod, fibrous root system, from long, vigorous, creeping rootstocks, minimum root depth 20"; stems fine, with erect or geniculate culms, 2.5-3.5'; leaves narrow, rolled in the bud-shoot; sheaths not compressed, not keeled, glabrous, smooth, green, longer than the internode on the basal shoots, split with margins overlapping; auricles absent; collar prominent, glabrous, pale green, V-shaped, usually oblique; ligule membranous, thin, 1.5-4.0 mm long, rounded to acute, lacerate, erose, or split, minutely retrorse hairy on back; blade 2.0-7.0 mm wide, 5.0-20 cm long, flat, tapering to a sharp point, prominently ridged on upper surface; midrib distinct below; surfaces scabrous or smooth; margins scabrous; reddish to white seed heads; $N\ 2n = 42$; key features: ① "This is a matted perennial with purple spreading panicle. It differs from var *palustris* by broader blades, erect culm with spreading purple panicle branches, & presence of rhizomes. Foliage is bluish-green." (Ilpin) ② "*A alba* is distinguished from *Phleum pratense* by the glabrous margins of collar, the absence of a notch at either side of ligule & by the prominently ridged upper surface of blade. It is distinguished from *A palustris* by the absence of long surface stolons & non-creeping habit. It has a longer ligule & broader blades in comparison to *A tenuis* & *A hiemalis*, respectively." (Nowosad et al 1936)

Comments: status: phenology: Blooms June 21-July 23, or June to September. C3. Aggressive, cool season sod forming weed. Formerly planted as a pasture grass, now a "temporary matrix" grass & erosion control. Wet, poorly drained soils. Establishes quickly for erosion control, excellent for erosion control. Establishes quickly in moist soil. Adapted to moist or moderately wet sites. Tolerates acidic soils, infertile soils, & periodic flooding. It is used as a crop on poor soils & worn out agricultural lands, & used for pasture & turf grass. Reputed to not be aggressive in mixes (???). Not good for xeriscaping, duh.! (pots). One of our most widely adapted grasses.

"We have considered this & the next (*A palustris*) as being native. This is common RED-TOP & is found in fields, yards & on roadsides." (ewf55)

Associates: Palatable & nutritious to livestock & wildlife, but not as palatable as timothy & Kentucky bluegrass. Better when hayed or grazed before seed heads form. Overall poor wildlife & forage values (rain).

ethnobotany: *Redtop pollen is known to cause seasonal allergic reactions in certain individuals.*

"This sp & *Phleum pratense*, in June & July, cause most of the hayfever cases in the eastern United States." (Ilpin)

VHFS: Formerly *Agrostis alba* Linnaeus. When Linnaeus described *A alba*, he was describing a sp of *Poa*, hence the *A alba* in the literature is not the *A alba* of Linnaeus. A more current, commonly used name is *Agrostis gigantea* Roth. There is also considerable confusion between REDTOP & CREEPING BENT, with somewhat circular definitions. REDTOP is often considered a nonstoloniferous, mostly rhizomatous, variety of CREEPING BENTGRASS, & CREEPING BENTGRASS is considered a stoloniferous variety of REDTOP, with references to *A alba* or *A stolonifera* not distinguishing between the spp.

Agrostis gigantea Roth is also known as BLACK BENTGRASS & is considered by some a weed in upland plantings.

[*Agrostis alba* auct non L, *A gigantea* Roth var *dispar* (Michx) Philipson, *A gigantea* Roth var *ramosa* (SF Gray) Philipson, *A palustris* Huds, *A nigra* With, *A stolonifera* L var *gigantea* Koch, *A stolonifera* L subsp *gigantea* (Roth) Schübl & G Martens, *A stolonifera* L var *major* (Gaudin) Farw] [*A alba vulgaris*]

'Streaker' is a certified Midwestern variety.

JH Carey, 1995. *Agrostis gigantea*. In: Fire Effects Information System, [Online].

U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, March 22]



Agrostis gigantea

Agrostis hyemalis (Walter) Britton, Sterns & Poggenburg HAIRGRASS, aka *AGROSTIDE D'HIVER*, FLY-AWAY GRASS, SOUTHERN HAIR GRASS, TICKLE GRASS, WINTER REDTOP, (*hyemalis* -is -e of winter, flowering in winter, which may be spelled *hiemalis* in older literature; Latin *hyemalis*, of winter, from *hiemalis*, of winter, wintery. The letter 'y' is a relative late addition to the Roman alphabet, which was used to accommodate Greek loan words, so *hiemalis* would probably be the older, more proper spelling.) FAC

Habitat: Dry, sandy soils, slightly acid, sandy soil; sterile, sandy acid, abandoned fields, old meadows & pastures where the competition is slight. Abandoned agricultural fields. "A common early grass of fields, farm lots, yards & roadsides." (ewf55) In the northern plains, wet meadows, seepage areas, ditches, stream banks, shores, & also in upland situations, often where alkaline. In northwest Illinois, this is an occasional weed of fallow ground & an agricultural wetland soil seedbank sp. distribution/range:

Culture: ①60 days cold moist stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

seed counts & rates: 1,360,000 (pm09), 9,669,674 (gnh09), 15,641,379 (gnh11) seeds per pound.

bottom line: 1/3 of lots benefit significantly to strongly from dormant seeding. Dormant seed for insurance. Flipflop species. Germ 60.3, 68.5, na, sd 32.5, r6.0-98 ((2)%). Dorm 20.7, 2.0, 0.0, sd 31.9, r0.0-87 (87)%. Test 34, 27, 27, r24-50 days. (#6)**

Description: A small tufted grass with slender, fine, soft, leaves, from basal rosettes, an open ground sp, perennials or facultative annuals; roots cespitose, not rhizomatous or stoloniferous; culms 0.5-1.0'; leaves; rolled in the bud-shoot; sheaths not compressed, slightly keeled, glabrous, smooth, pale green to white or purplish, split; auricles absent; collar narrow, inconspicuous, pale green; ligule membranous, 1.0-2.5 mm long, truncate or three-pointed, entire or finely lacerate, hairy on the back, blade 0.5-2.0 mm wide, 2.0-8.0 cm long, soft, very sharp taper-pointed, often inrolled or involute & hair-like when dry, glabrous, distinctly ridged & scabrous on upper surface, smooth & distinctly keeled on under surface; margins scabrous; heads; spikes; N 2n = 28. key features: ① "*Agrostis hyemalis* differs from *A scabra* in its smaller spikelets & anthers, more conspicuous culm leaves, & more clustered spikelets" (fna).

Comments: status: phenology: Blooms May 26-July 10. In northern Illinois, collect seeds in late June. Collect seeds in se Wisconsin in July - August (he99). Cool season, sod-forming. Readily grazed, but one of the least palatable redtops. According to Sw94, it frequently grows with *A scabra*, with specimens being intermediate. Seed source nursery farmed wetlands.

“Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies ... *Trichodium laxiflorum*” *Agrostis hyemalis* (Walt.) B.S.P. as *Trichodium laxiflorum* Michx. (Short 1845).

VHFS: Some authorities include *A scabra* Willd with this sp.



Agrostis hyemalis, mowed native stand, nail clipper for scale.

Agrostis perennans (Walter) Tuckerman * PA UPLAND BENT GRASS aka *AGROSTIDE PERENNANT*, AUTUMN BENTGRASS, THIN GRASS, TALL BENTGRASS, PERENNIAL BENTGRASS, (*perennans* perennial, Latin *perennans*, perennating, perennial, from *perenno*, to last many years; alternately growing constantly, through the year.) FAC

Habitat: In woods with no leaf or vegetative cover, moister acidic woods, floodplain woods with little vegetative cover (Swink & Wilhelm 1994). Roadsides, in fields, fens, woodlands, & periodically inundated stream banks (fna). Dry open ground or in light shade (ecs). Woods, thickets, open areas, stream banks. Open woods, thickets, rocky banks & dryish open soil. Adapted to fine & medium textured soils. Anaerobic tolerance high. CaCO₃ tolerance none. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.5-7.5. distribution/range: Widespread & common in eastern North America. It also grows from central Mexico to central South America.

Culture: Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate. 5,710,692 (gnae11), 8,000,000 (ecs) per pound.

bottom line: Seed is nondormant. Plant spring or dormant seed as a nurse crop. Consistently nondormant. Germ 84.2, 87, 94, sd 10.8, r60-94 (34)%. Dorm 0.0, 0.0, 0.0, sd 0.0, r0.0 (0.0)%. Test 27, 28, na, r13-38 days. (#9).**

Description: Decumbent, perennial grass, 1 to 3.5', mostly tufted; roots cespitose, not rhizomatous or stoloniferous, 8" minimum root depth; culms 20-80 cm, sometimes rooting at the lower nodes; leaves;

sheaths; auricles; collar; ligule; blade; heads; spikes; panicle; $N 2n = 42$. key features: ① This *Agrostis* is distinguished by its smooth panicle branches & its usually green panicle branches with 5-9 whorls of branches. ② “It is more tolerant of shade & moisture than *Agrostis scabra*, from which it differs in its later flowering, leafier culms, & its basal leaves that usually wither by anthesis” (fna).

Comments: status: Extirpated in Pennsylvania. phenology: Blooms August 1-October 23. **CHECK BLOOM DATE**. C3. May be short lived. Seed source commercial.

VHFS: Variety *aestivalis* Vasey is known from Cook, Kenosha, & St Joseph Counties. Variety *perennans* is cespitose, has a stiffer inflorescence, & often grows in more open situations than variety *aestivalis*. [*Agrostis altissima* (Walt) Tuckerman, *A elata* (Pursh) Trin, *A oreophila* Trin, *A perennans* (Walt) Tuckerman var *aestivalis* Vasey, *A perennans* (Walt) Tuckerman var *elata* (Pursh) AS Hitchc, *A schweinitzii* Trin, *Cornucopiae perennans* Walt]

Agrostis scabra Willdenow [new nomenclature *Agrostis hyemalis* (Walter) Britton, Sterns & Poggenb var *scabra* (Willdenow) Blomq] FLY-AWAY GRASS, aka *AGROSTIDE SCABRE*, *FOIN FOU*, ROUGH BENTGRASS, TICKLE GRASS, (*scaber -bra -brum* scabrous, scabby, rough or gritty to the touch on account of numerous minute projections, from Latin *scaber*, scabby, rough.) FAC

Habitat: In habitats similar to *A hyemalis*, rocky morainic hills (sw94). distribution/range:

Culture: No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

seed counts & rates: 5,000,000 (ecs), 5,400,000 (wns01), 5,408,000 (aes10) seeds per pound.

cultivation: Fine to medium textured soil. Low drought tolerance, low salt tolerance. pH 6.0-8.0

Description: Bunchgrass to 3'; roots 12" minimum depth; key features:

Comments: status: phenology: Blooms June to November. Collect seeds in se Wisconsin in July - September (he99). Used for reclamation. Good in rain gardens.

“Later than the above (*A hyemalis*) but otherwise it is much the same & probably as frequent.”

(ewf55)

VHFS: [*A hyemalis tenuis*, *A hyemalis scabra*, *A hyemalis*]



Agrostis scabra

Agrostis stolonifera Linnaeus CREEPING BENT GRASS, aka CARPET BENTGRASS, SPREADING BENT GRASS, (*paluster -tris -tre* (pa-LUS-ter) marsh-loving, marsh-loving, of swamps, swamp loving, of marshes, or growing in bogs, bog-loving, from Latin *paluster -tris -tre* marshy, boggy, of swampy ground, from *palus*, *paludis*; *palustris* is often used as a masculine ending in plant names.) [obl]

Habitat: Widely planted for turf, but native in alkaline fens, along spring-fed, quality streams in a native context, & occasionally in drainage ditches in the Green River Lowland. Wet meadows, marshes, fields & roadsides. distribution/range: Known in the wild from Spring Slough & drainage ditches west of Green River, Osage Road, both in Whiteside Co.

Culture: No treatment necessary. Plant when moisture is favorable, early spring, June to July, or late fall. Medium rate of establishment.

seed counts & rates: 4,990,000 (cci), 6,129,000 (ecs), 6,305,556 (gnh06), 6,400,000 (gran), 6,500,000 (rainier02), 7,442,623 (gna07), 7,800,000 seeds per pound. Can be drilled 1/4" or broadcast & cultipacked, 2 to 3

pls lbs / 1000 ft. sq, or 0.5-1.0 lb / 1000 ft sq for *turf*. Plant 2 pls lbs fall, spring or summer for pasture (gran). Seed 2 – 3 lb/acre in fall or spring (rain).

cultivation: Grows well in moist sites. Medium to moderately fine textured soils. Acidic to neutral soils (gran). Sea level – 4,500'. Low drought tolerance, high acidity tolerance, low to moderate salinity tolerance. pH 5.0 – 7.5 (pH 6.0 – 7.0 preferred for lawns).

bottom line: As a nurse crop, plant anytime the general contractor says. Consistently nondormant. Germ 89.4, 89, 89, sd 4.1, r82-96 (14)%. Dorm 0.0, 0.0, 0.0, sd 0.0, r0.0-0.0 (0.0)%. Test 23, 23, 21-25 days. (#14)**

Description: Native (in part), cool season, prostrate, low-growing, medium to tall, perennial grass, 12-24+", glabrous; stoloniferous, sod former, sometimes with short rhizomes; long creeping stolons spreading along the surface of the ground, branching & rooting at the nodes; culm leaves flat & wide; leaves rolled in the bud-shoot; sheaths not compressed, not keeled, glabrous, smooth, pale green or purplish, shorter than or equaling the internode in length on the vegetative shoots, split with hyaline margins; auricles absent; collar distinct, glabrous, pale green, usually oblique; ligule membranous, thin, 1.5 to 3 mm long, rounded or obtuse, finely lacerate-toothed or entire, minutely hairy on the back; blade 1.5 to 4 mm wide, 3 to 10 cm long, erect, flat, tapering, distinctly ridged on upper surface, slightly keeled on lower surface, scabrous on the surfaces & margins. key features: ① "CREEPING BENT-GRASS & RED TOP are often considered as varieties of *A stolonifera* being very similar to RED-TOP in leaves & ligule & differing from it in habit of growth, the former producing long surface stolons & the latter rootstocks." (Nowosad et al 1936)

Comments: Cool season sod former, forming mats of foliage in moist situations. Calcareous, some varieties saline/alkaline tolerant, some tolerate acidic conditions. Good for erosion control & reclamation sites. This is the grass used on golf course putting greens. It escapes from the greens & does well in the water level fluctuation zone of golf course wetlands. Its long creeping stolons may reach 4 feet in one growing season. Used for lawns, pastures, meadows, & irrigated areas. Seed source commercial.

"Common in Killbuck Creek bottom in Winnebago & Ogle counties; less comm. on along other Winnebago Co streams." (ewf55)

According to a US EPA study in the Proceedings of the National Academy of Science, pollen from genetically modified Roundup resistant BENTGRASS, released by the good folks at Scotts & Monsanto, has been shown to travel 13 miles. Scotts thought the pollen would move 1000 feet. Fer sure, man.

Some fear the transfer of resistant genes to feral & wild *Agrostis* populations creating another Roundup resistant super weed. Bye-bye local ecotype BENT populations, hello ÜBERBENT.

Associates: Poor wildlife & forage values.

VHFS: According to Mohlenbrock (2014), this is *Agrostis stolonifera* Linnaeus var *palustris* Hudson. Formerly *Agrostis alba* Linnaeus var *palustris* (Hudson) Persoon. [*A alba* L var *maritima* (Lam) G Meyer, *A maritima* Lam, *A palustris* Huds, *A stolonifera*, *A stolonifera* (Linnaeus) var *palustris* (Huds) Farw, *A stolonifera* L var *compacta* Hartm]

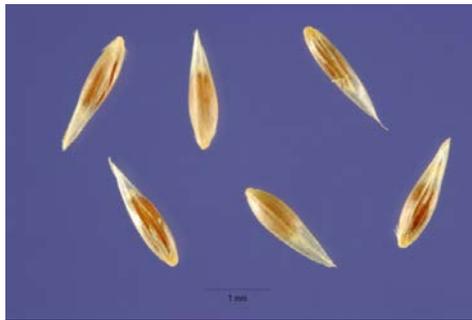
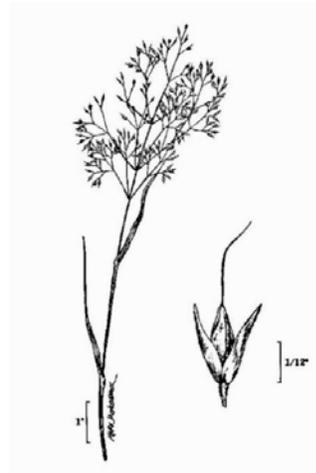




Agrostis stolonifera

Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image

Agrostis stolonifera



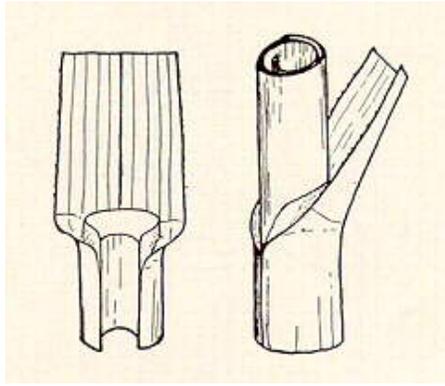
Agrostis stolonifera

2nd seed photo Bend Seed Extractory, Seeds of Success, <http://seedsofsuccess.smugmug.com>

Agrostis tenuis Sibthorp COLONIAL BENTGRASS, aka BROWN-TOP, RHODE ISLAND BENTGRASS, see ***Agrostis capillaris***

dark green, glabrous perennial spreading by short rootstocks, forming a compact sod or appearing slightly tufted. key features: *A. tenuis* can be distinguished from *A. alba* by its short, truncate ligule, smaller size and darker and more delicate foliage (now36)

[*Agrostis alba* L var *vulgaris* (With) Thurb, *A capillaris* L, *A vulgaris* Thurb]



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ALOPECURUS Linnaeus **FOXTAILS** *Alopecurus* (a-lo-pe-KEW-rus) From Greek *alopekourous*, fox tail grass, (*Polypogon monspeliensis*), from ἀλώπηξ, *alopex*, fox & οὐρά, *oura*, tail, the name for a grass with an inflorescence like a fox's tail. Genus of grasses found in temperate regions & having slender culms, flat leaves, & soft spikes.

Alopecurus aequalis Sobolewsky **SHORT-AWNED FOXTAIL**, (*aequalis -is -e* resembling, equal, like, uniform, from Latin *aequālis*, from *aequus -a -um*, level, even, just.) key features: Spike-like panicle, more slender than *Alopecurus pratensis*. 1,464,000 (aes10) seeds per pound. C3. Pollen is allergenic.

“Uncommon. Found by us only in a prairie slough at the intersection of Sandy Hollow & Alpine roads east of Rockford. Perennial.” (ewf55)

Alopecurus arundinaceus Sobolewsky **CREEPING FOXTAIL**, (*arundinaceus -a -um* (a-run-di-NAH-kee-us) reed-like, (rush-like?), having a culm, like tall grasses, from the Latin, (*h*)*arundo*, (*h*)*arundinis* f a reed, cane, & *-aceus*, resembles, like.)

Habitat: distribution/range: Native to Eurasia.

Culture: Plant 1-4 pls lbs in fall or spring. 786,000 (ecs), 900,000 (gran) seeds per pound.

cultivation: Medium to moderately fine soils. Tolerates acidic soil but best in neutral. Full sun. Low drought tolerance, moderate salt tolerance. pH 5.6-8.4 (ecs)

Description: Medium to tall grass cool season, long lived, strongly rhizomatous sod-former adapted to wet or periodically wet soils; roots 12” minimum depth; spikes yellow seed heads with black seeds; N. key features:

Comments: status: ♣ phenology: Blooms April to September. Tolerates acidic & salty soils. Very palatable & nutritious. Pasture grass for wet meadows. Food & cover for wildlife. Commercial varieties available.

VHFS: [*A ventricosus* Pers, non (Gouan) Huds.]

Alopecurus carolinianus Walter [*A geniculatus*] **ANNUAL FOXTAIL**, aka **MARSH FOXTAIL**, (*carolinianus -a -um* (ca-ro-lin-ee-AH-nus) of Carolina, Carolinian, of North or South Carolina, USA.) FACW

Habitat: Hydric soil seed bank sp, fallow fields, a benign weed. Occasionally a weed in native plant greenhouses.

availability: Seed is occasionally for sale, but it is not a stable item in the trade. It should not be specified in commercial restoration.

Description: Annual or perennial; key features: ① “Longer awns of the glumes distinguish this sp from *A aequalis*, while the shorter spikelets distinguish it from *A pratensis* (Ilpin).

Blooms 5, 6. C3. An occasionally specified wetland “nurse crop”. It is an early successional, wetland soil seed bank sp & prefers life in the wild.

“MARSH FOX-TAIL is an annual that we have found only in the slough marshes in Sugar River bottom.” (ewf55)



Alopecurus carolinianus

Alopecurus pratensis Linnaeus MEADOW FOXTAIL, (*pratensis is -e* (prah-TAYN-sis) of or growing in meadows, from Latin *pratensis -is -e*, adjective, growing or found in meadows, from *pratium, prati*, meadow, & *-ensis* adjectival suffix indicating country or place of growth or origin or else habitat, native to.)

Habitat: Meadows, open moist ground, often subject to temporary flooding. distribution/range: Native to Eurasia.

Culture: 575,000 (ecs), 580,000 (gran) seeds per pound. Plant 4-5 pls lbs in fall or spring.

cultivation: Moderate to fine textured soils, best in low lying clays & loams. Full sun. Low drought tolerance, low salt tolerance. pH 5.0-8.0 (ecs)

Description: Medium to tall, glabrous, cool-season, forming loose tufts of shoots, a bunch grass?, or rhizomatous sod former?, possibly slightly stoloniferous, 12" minimum depth; culms to 2'; leaves abundant dark green foliage, rolled in the bud-shoot; sheaths; not compressed, glabrous, green, sometimes purplish at base, split with the broad-hyaline margins overlapping; auricles absent; collar medium broad, glabrous, light green or yellow, divided, oblique; ligule coarse-membranous, faintly striate, 1.0 to 2.5 mm long, truncate to obtuse, entire, ciliate, undulate or oblique, puberulent on back, variable in shape & margin; blade 3 to 8 mm wide, 10 to 15 cm long, flat, taper-pointed, dull; upper surface scabrous & prominently ridged; midrib forming a slight keel on under surface; margins quite scabrous; heads; spikes; N. key features: ① "Spike-like panicles, flowers several weeks earlier than *Phleum pratense*, with which it can be confused (Ilpin). ② "*Alopecurus pratensis* may be distinguished from *Phleum pratense* by its more scabrous blade margins, absence of cilia on collar & absence of notches on the ligule." (Nowosad et al 1936)

Comments: status: ♣ phenology: Blooms April to September. C3. Seeded as a meadow or pasture grass.

VHFS: Commercial varieties available.

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AMMOPHILA Host **Marram Grass** *Ammophila* sand loving, from *ammophilus*, sand-loving, from Greek ἄμμος, *amos*, sand, *-o-*, connective vowel in botanical Latin, usually for Greek words, ancient Greek φίλος, *philos*, adjective loving, dear, from φιλοσεον, *philoseon*, loved; loving, friendly, fond, & *-us*, Latinizing suffix; also listed as from *fileiu (phila)*, love; for the fidelity to the sandy habitat. A small genus of coarse perennial grasses growing on sandy shores & dunes & having awnless flowers crowded into a long spikelike panicle. *Ammophila* is also a genus of sand-nesting, thread-waisted wasps.

Ammophila arenaria, sow at 20°C (68°F), if no germination in 3-4 wks, move to +1 to +4°C (33-39°F) for 2-4 wks (tchn).

Ammophila breviligulata Fernald *IL AMERICAN BEACH GRASS, *AMERIKANSKT SANDRÖR* (SW), aka AMERICAN MARRAM, BEACH GRASS, *GOURBET* (FC), *OYAT* (FC), MARRAM, MARRAM GRASS, PSAMMA, SEA SAND GRASS, (*breviligulatus -a -um* with a short ligula, from Latin *brevi*, short, *ligula, ligulae*, shoe strap or shoe tie; small spoon, & *-atus*, Latin suffix indicating possession, likeness of, or 'provided with'.) UPL

Habitat: Sands near Lake Michigan, other Great Lakes, & Atlantic Coast. One inland population is known near Eau Claire, Wisconsin.

Culture: Storage Behaviour: Orthodox; Thousand Seed Weight: 33.4166667g;

availability: The seed is not in the trade. Potted plants from The Natural Garden, bare root from Prairie Moon & Van Pines. So-called 'improved' east coast selections are available.

Description: key features: ① "Blades involute above, flat at the base; paniculate inflorescence contracted to appear spikelike; callus with a tuft of hairs" (Ilpin).

Comments: C3.

Associates: Pollen is allergenic.

VHFS: [*Ammophila arenaria* (L) Link, *A arundinacea*, *Ammophila champlainensis* Seymour, *Calamagrostis arenaria*]



Ammophila breviligulata

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ANDROPOGON Linnaeus **BLUESTEM, BEARD GRASS, BROOMSEDGE** *Andropogon* (an-dro-PO-gon) bearded-male, or man beard from Greek *ανδρο-πωγων*, *andro-pogon*, from *ανδρος*, *andros*, a man's, from *ανηρ*, *ανδρ-*, *aner*, *andr-*, man, male, & from ancient Greek *πωγων*, *pōgōn*, a beard, in reference to the many spp with long white hairs in the seed head, the awned male spikelet, or properly, the pubescent pedicels of the staminate spikelets. The common name BLUESTEM is for the bluish bloom near the nodes of the culms of some spp.

A large & almost cosmopolitan genus (about 150 spp Dayton et al 1937; 120 spp fina) of perennial grasses, widely distributed in the warmer parts of the world, with spikelike racemes having the flowers in pairs, one sterile & one fertile, rachis joints & pedicles often bear long silky hairs, stems are solid & pithy. Thirteen spp are native to North America north of Mexico, most of which grow in the SE USA. At one time, this was *Amphilophis*. Authors of some older works interpreted the genus name as grammatically neuter, ie "*furcatum*, *scoparium*".

"No pretreatment considered necessary. In my experience, moist cold treatment has been successful. Light cover. Excellent germination." (mfd93) Fresh seed does best with 2 weeks cold, then surface sow (jlh). Wind pollinated.

In the major grasses that we have had viability tested over the years, there is always a variation in the amount of dormant seed versus germinable seed. Most seed lots of grass have some percentage of dormant seed, which benefits from a cold period to break dormancy mechanisms. Cold moist treatment usually enhances germination of most grasses, activating that dormant portion of the lot. 10 days prechill is standard for AOSA testing many grass spp. However, for a good crop of most warm-season grasses, cold moist stratification is rarely needed & not recommended.

"The Four Horsemen of the Prairies": BIG BLUESTEM (*Andropogon gerardii* = *A furcatus*), LITTLE BLUESTEM (*A scoparius* = *Schizachyrium scoparium*), INDIANGRASS (*Sorghastrum nutans*), & SWITCHGRASS (*Panicum virgatum*) (<http://www.tarleton.edu/Departments/range/Home/home.htm>)

Andropogon gerardii Vitman BIG BLUESTEM, aka *BARBON DE GERARD*, BEARD GRASS, BLUEJOINT TURKEYFOOT, BLUESTEM, CROW FOOT, FORKED BEARD GRASS, FORKED SPIKE, RED HAY, TURKEY CLAW, TURKEY FOOT, TURKEYFOOT GRASS, *Muckodekanes*, small prairie (Ojibwa), (*gerardii* for Louis Gerard, French physician & botanist (1773-1819), who described the sp from cultivated plants grown in the south of France, hence the old synonym *Andropogon provincialis* Retz, "*habitat in Gallia meridionali*".) The stems of the plants are variously colored, green, blue-green, to purple. TURKEY FOOT is in reference to the shape of the inflorescence resembling a bird's foot. Facultative- Section *Andropogon*.

Habitat: A member of most native systems, limited only by shade & extremes of soil moisture. Primary or dominant sp of tall grass prairie. "Characteristic of the prairie, but found in many other situations" (Mosher 1918). Mesic prairie sp, hill, sand prairies, wet to mesic prairies, barrens, prairie soils, moist or dry, dry open ground. Dry open woods, co-dominant with little bluestem on calcareous hill prairie, sand plains, & old fields. Wet prairies & fens. Bottomland sites with well-drained soil. In Michigan, "a characteristic prairie

sp, but spreading along roadsides & railroads; in oak forests, jack pine plains, old fields, fens & sedge meadows. May be as tall as 3 m.” (rvw11)

Culture: Easy by seed. ①No pre-treatment necessary other than cold, dry stratification (pm09). No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ②“No pre-treatment needed. Sow seeds just below soil surface at 70°F & water. Slow to germinate.” (ew12) ③Sow at 20°C (68°F), germination slow (tchn).

seed counts & rates: 114,762 (gna03), 130,000 (cci, gran, wns01), 131,008 (jfn04), 131,200 (pn02, aes10), 133,451 (gnh01), 144,000 (ecs), 145,000 (sh94), 145,600 (ew12), 152,002 (gnihk02) 158,547 (gnaae04), 160,000 (pm), 163,075 (gnh06), 165,000 (apple, stock), 167,993 (gna05), 186,608 (agr04) seeds per pound. Some experts recommend 75% BIG BLUESTEM & 25% INDIAN GRASS in dry to mesic plantings. Genesis does not recommend this heavy percentage with this sp. What ever the seeding rate, BIG BLUE will dominate the planting in time. If you have one BIG BLUE plant per acre in a de novo seeding, in ten years it will dominate the planting. You may wish to add this sp after your planting has achieved a desirable level of diversity, say in year 10+. CCI recommends seeding 5 to 8 pls lbs per acre in April or May, plant 0.25- 1.0” deep, deeper on coarse soils (1” deep in the arid Southwest where there is no water!). Broadcast 1pls lb per 1800 sq ft or drill 10 pls lb per acre. Plant 7-8 pls lbs in summer (gran). 8-10 lbs per acre (ecs). USDA (1997) recommends 2 pls lbs per acre in mixes. In diverse restorations in *in situ* soils, we recommend 0.25 lb pls per acre, or approx 1 pls seed per ft sq. Less may be even more advantageous.

“*Andropogon gerardii* Moist to dry; general prairie. Blooms August to early September; STAMENS MAROON. Harvest October. 6'; all methods work; successful by ALL METHODS; blooms 1st year if sown early. Slowly forms large sods. An essential warm-season grass; good fall color. Best-known prairie grass, warm-season, Strong competitor; delicate forb seedlings may be overwhelmed.” (rs ma)

cultivation: Space plants 1.5-2.0' on center. Thrives on well-drained soils. Moderately acid & saline tolerant, better in neutral to basic soils. Can withstand periodic flooding & high water tables. Moderately fine to coarse soils. Clay soils tolerant. Prefers moist soil. Not tolerant of urban flooding. Anaerobic tolerance medium. Drought tolerance high, nutrient load tolerance low, salt tolerance low to medium, siltation tolerance low, shade intolerant. Wide pH range, pH 6.0-7.5 Full sun. (Cochrane & Iltis, 2000)

bottom line: Plant spring or dormant, but spring plantings develop more readily due to less weed pressure. Germ 60.8, 64, 88, sd 27.7, r5.0-97 (92)%. Dorm 29, 22, 0.0, sd 27.9, r0.0-90 (90)%. Test 29, 28, 27, r1-50 days. (#46)**

greenhouse & garden: No treatment works well, cold moist stratify may help some seed lots with slightly improved & uniform germination for plant production. You can fall plant for germination in April-May, but spring planting is better. In spring, plant from April to June. Successional restoration, light, KNO3. Does well in pure stands or in mixed plantings.

Description: Perennial, warm-season, tall, columnar, bunch grass, long-lived, bunchy; roots short rhizomatous, but eventually sod-forming, 20” minimum depth; culms 4.0-8.0(-10+'), young shoots are flattened at base, lower leaves & sheaths covered with silky hairs, 0.5 ” wide blue-green leaves; 3+-parted stout, purplish seed heads, “turkey foot or crow foot”; bronze to steely gray-blue inconspicuous flowers; fruit is a hairy grain; N 2n usually 60, may also be 20, 40, 70, 80, or 90. key features: ①“One of the most robust *Andropogons* of Illinois, with longest fertile spikelets. Spikelets in pairs; one sessile & perfect, the other pedicellate & staminate or sterile.” (Ilpin)

Comments: Blooms July to September. C4. In northern Illinois, collect seeds in September - October. Collect seeds in se Wisconsin in October - November (he99). Attractive dried seed heads, attractive orange to maroon fall color. Warm season, ornamental, good light reddish-purple / russet (burgundy) fall color, useful in erosion control & reclamation work in sand & gravel pits, roadsides, used to stabilize soil & slow surface runoff & increase infiltration. Useful for upland slope buffer stabilization & rain gardens. Aggressive, self seeds. Seed source farm production & restored prairies, Bureau (Center Prairie & De Pue hill prairie), Lee, & Ogle Counties (Nachusa), Lake Co, Chicago Botanic Garden, Cook Co, & undifferentiated northern Illinois. Several commercial varieties & ornamental selections are available.

“Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies.” *A. gerardii* Vitman as *Andropogon furcatus* Muhl. ex Willd. (Short 1845). (“*furcatum*”)

“A tall coarse grass growing in large tufts on practically all prairies high & low. (*A. furcatus* Muhl)” (ewf55)

Associates: Butterfly host plant, for larval host *Anatryone logan* DELAWARE SKIPPER, *Atryone arogos* AROGOS SKIPPER, *Atrytonopsis hianna* DUSTED SKIPPER, & *Hesperia metea* COBWEB SKIPPER. Attracts

upland game birds, songbirds, small mammals. Provides quail cover. Upland game birds & songbirds eat the seeds, small mammals eat seeds & leaves, & deer eat the leaves & stems. Provides food, nesting cover, & general cover for wildlife. Excellent palatability & very productive forage. Good pasture & hay, palatable to cattle, deer & elk, well liked by cattle. Also reported as deer resistant. Tolerant of growing under walnut trees.

ethnobotany: Used as medicinal plant by Ojibwa for indigestion (den29). Also used for indigestion by Omaha-Ponca. Found in Ohio cave textiles by Whitmore. Ashes used Navaho Evilway blackening (jlh). VHFS: Formerly *A furcatus* Muhlenberg ex Willdenow (*habitat in America boreali*). [*A provinciale* Retz, *A provincialis* subvar *furcatus* (Muhl ex Willd) Hack, *Leptopogon furcatus* (Muhl ex Willd) Roberly]. *A gerardii* hybridizes with *A hallii*, some treat the two as conspecific subsp.



Andropogon gerardii, with old sod from a plowed under production plot

Andropogon hallii Hackel *IA SAND BLUESTEM, aka HALL'S BLUESTEM, (honoring Elihu Hall, (1822-1882), American explorer & botanist who discovered the plant.) upl Section *Andropogon*
Habitat: Sand prairies. Generally on sandier sites than BIG BLUESTEM. Coarse to moderately coarse soils.
distribution/range: Rare east of the Missouri River, two native stands, one at Rasmussen's Sand Prairie in Gold Township, west of Manlius, Bureau Co. The colony was discovered by Don Pretzsch, former District Conservationist, Bureau Co SWCD. Don transplanted a small clump to McCune Sand Prairie, near the south parking lot. Sp is an Altithermal relict east of the Mississippi with an adventive occurrence at an airport in Gary, Lake Co, Indiana (Birkenholz et al 1980, sw94). Mohlenbrock (2014) considers the population adventive. It is also recorded from an inventory for Lost Mound, Carroll Co, by Gleason. A second native population is near Muscatine Iowa, north side of power plant. It is also mapped from central Iowa & the Loess Hills.

Culture: No treatment works well, cold moist stratify may help some seed lots with slightly improved & uniform germination for plant production. You can fall plant for germination in April-May, but spring planting is better. In spring, plant from April to June. Successional restoration-light-KNO₃.

seed counts & rates: 113,000 (stock, gran, wns01), 125,000 (cci) seeds per pound. *A hallii* hybrid has 144,000 (pm) seeds per pound. Seed 4 to 6 pls lbs per acre no later than mid-summer. Broadcast 1pls lb per 1300 sq ft. or drill 16 pls lb per acre (stock). Plant 7-8 pls lbs per acre in late spring (gran).

bottom line: Plant spring or dormant, but spring plantings develop more readily due to less weed pressure.

Description: Tall, warm-season, sod former, 3.0-5.0(7.0)'; white, extremely hairy seed heads similar to *A gerardii*, but plants are more strongly rhizomatous. Sheath & leaf blades are smooth & hairless, $N 2n = 60$ (usually), occasionally 70 or 80, or 70, 100. key features: ① Distinguished from BIG BLUESTEM by the densely hairy branches of the flowering heads. The foliage is more gray & waxy than that of BIG BLUESTEM, with more prominent rhizomes.

Comments: status: phenology: Blooms 7,8,9. Ilpin lists this as C3. Attractive dried seed heads, landscaping. Golden-yellow to reddish-brown color. Excellent palatability & very productive, useful in grazing programs on sandy range sites. Useful in erosion control on sandhills & blowouts. Upland game birds & songbirds. Long-lived, warm season, tall grass, spreading by rhizomes, forms open sod.

Commercial varieties are available.

DE Birkenholz, RC Anderson, & AJ Katz. 1980. A relict & disjunct population of *Andropogon hallii* Hack in Illinois. *Castanea* 45:9-16.



Andropogon hallii in western Bureau Co

Andropogon virginicus Linnaeus *IA BROOM SEDGE, aka BROOMGRASS, BROOMSAGE, BROOMSEDGE BLUESTEM, BROOMSTRAW, CHALKY BLUESTEM, SAGEGRASS, VIRGINIA BEARD GRASS, WISKEY GRASS, WISKU GRASS, YELLOW BLUESTEM, (*virginicus -a -um* virgin'icus (vir-JIN-i-kus) pertaining to, of or from Virginia, USA, Virginian.) facu- Section *Leptopogon*.

Habitat: Old fields. Grows best in rather sterile soils (Mosher 1918). Old fields, hillsides, open ground with dry infertile soil. Full sun. High drought tolerance, no salt tolerance. pH 4.9-7.0. distribution/range: Ranges from the SE USA to northern South America, & is established in California, Hawaii, Japan, & Australia. Absent in northwest Illinois. Native east & south of our area.

Culture: ①No treatment. Or sow at 20°C (68°F), germination slow (tchn).

seed counts & rates: 250,000 (jfn04), 260,000; 800,000 (usda, ecs) seeds per pound. In 2012, initial results show this seed is debeardable (1,653,750 (gnhe11) seeds per pound), becoming a user-friendlier product. We recommend debearding on a per job basis only, until the potential effects of mechanical damage, dehydration, &c are realized & evaluated. Debearded seed demands a reconsideration of seeding rates, seed costs, & specification writing.

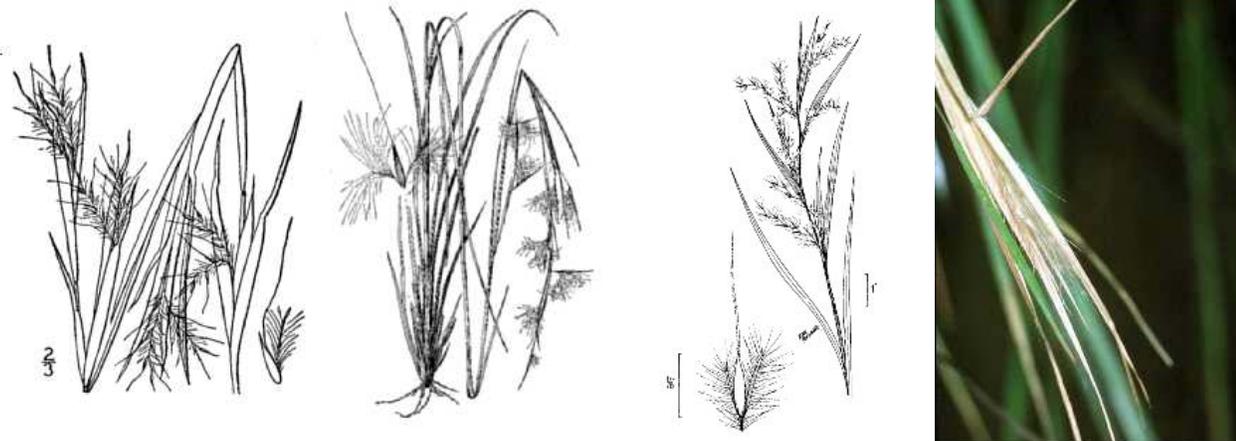
bottom line: Limited data shows dormant seeding is strongly required in most lots. Fluffy seed must be incorporated or it will blow away. Surface sow debearded seed. Flipflop species. Germ 50, 53, na, sd 31.8, r6.0-88 (82)%. Dorm 43.3, 42.5, na, sd 29.6, r6-82 (76)%. Test 37 days.**

greenhouse & garden: Dormant seeding may be of some benefit. Seed must be incorporated or it will blow away.

Description: Erect, perennial, bunch grass; 14" minimum root depth; culms to 3'; N 2n = 20. key features: ①"Sp is tufted. Pedicellate spikelet is undeveloped with only the villous pedicels present; upper sheaths are somewhat inflated; culms are mostly glabrous; racemes are enclosed only at their bases; awns are nearly straight. Racemes are inserted singly & appearing alternate." (Ilpin)

Comments: status: Native USA, but locally adventive. phenology: Blooms 8. C4. Sp is used as "native" nurse crop in some Eastern restorations. The light, fluffy seed is wind dispersed. The seed looks like LITTLE BLUESTEM cross-pollinated by GOOSE DOWN. Seed source commercial sources. Looked upon as a weed due to its tendency to invade pastures, replacing desirable plants (*the plow & cow weed mentality that is often seen in many state weed laws, but they may be right this time*). Our closest observed population is a mowed roadside, Illinois Rt 40, west side, just north of Peoria, small rise just south of Singing Woods Road (one has to beat the politically-nepotistic, drooling, neanderthalic, knuckle-dragging, mower-jockeys to see it), though sw94 has it mapped in many of the Chicago area counties.

VHFS: [*A dissitiflorus* Michx] Hybridizes with *A glomeratus* & *A longiberbis*. Ours is the widespread & weedy variety *virginicus*. Two other varieties are known.





Andropogon virginicus Rt 40, north of Peoria, 2012 culms in June 2013. Some seeds were still intact. Last photo Dunn Mt, NC.

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image. Roadside & NC photos courtesy James Maximus Alwill.

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ANTHOXANTHUM Linnaeus **SPRING GRASS, HONEWORT** *Anthoxanthum* New Latin, yellow-flower, from Greek ἄνθος-, *anthos*-, flower, & ξανθός, *xanthos*, from Greek χανθος, *khanthos*, yellow, for the spikelets at anthesis. A genus of European grasses with contracted panicles, the spikelets consisting of one fertile floret & two sterile glumes below it. The local native species *Hierochloa odorata* (Linnaeus) Palisot de Beauvois is sometimes placed in this genus as *Anthoxanthum hirtum* (Schrank) Y Schouten & Veldkamp (w12).

Anthoxanthum odoratum Linnaeus **SWEET VERNAL GRASS**, (*odoratus -a -um* (o-do-RAH-tus) Latin scented, odorous, fragrant, sweet-smelling.)

Habitat: Open fields, meadows, growing in poor soils. Meadows, open woods & pastures, best in sandy loams. pH 4.5-6.0. distribution/range:

Culture: 738,000 (ecs) seeds per pound.

Description: Cool season, bright green, perennial, bunch grass with tufted stems; with short rootstocks; leaves rolled in the bud-shoot; sheaths not compressed, slightly glabrous or sometimes pubescent; margins hyaline, overlapping when young; auricles absent or reduced; collar broad, pale green, divided, often dilated & frilled with long dense hairs on the margins; ligule membranous, about 2 mm long, obtuse to truncate, ciliate; blade 3 to 8 mm wide 4 to 20 cm long; flat, bright green, hairy especially near base; upper surface ridged; margins scabrous, sparsely hairy at base; N; key features: ①Distinctive sweet odor which becomes more pronounced as the plant dries.

Comments: status: ☛ phenology: Blooms ? Sweet fragrance when crushed. A slender European grass that is often planted with other grasses for its fragrance; narrow spikelike panicles in early spring. The odor is due

to the Coumarin content.

VHFS:



Anthoxanthum odoratum

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ARISTIDA Linnaeus **NEEDLE GRASS, POVERTY GRASS, THREE-AWN GRASS, TRIPLE-AWN GRASS, BEARD GRASS, WIREGRASS** *Aristida* New Latin awned, from the Latin *arista*, awn, or a beard of grain, for conspicuous awns creating a barley-like appearance. A genus of usually perennial grasses, 250-300 spp of tropical to warm temperate regions, with one-flowered spikelets & a hard sharp-pointed lemma terminating in three awns. 29 spp grow in North America north of Mexico. *Aristida* grows throughout the world in dry grasslands, savannas, sandy woodlands, deserts, & open weedy habitats. Their presence usually indicated disturbed or abused soils. The divergent awns aid in wind & animal dispersal. They are generally considered poor forage, potentially harmful to grazing animals, but they may be important spring grazing in some areas. Quail & small mammals eat the seeds. x = 11, 12.

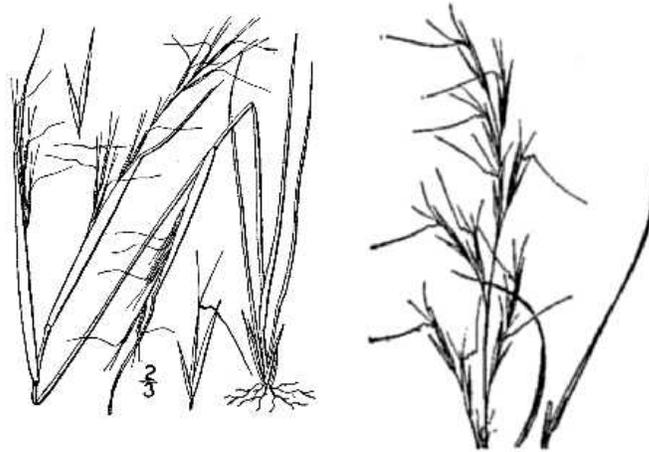


Aristida sp, Foley Prairie

Aristida basiramea Engelman ex Vasey **FORK-TIP THREE AWN, aka FORKED THREE-AWN, ARISTIDE À RAMEAUX BASILAIRES**, (*basirameus* -a -um Latin much branched from the base, from Latin *basis*, Greek βάσις, *basis*, foundation, pedestal, foot, base, & *ramus*, *rameus* of or belonging to branches, boughs.)

Habitat: Sand barrens, sandy prairies, sandy old fields, open sandy BLACK OAK woods, & bluffs. Slopes below cliffs, sandstone & granite outcrops, roadsides, railroad tracks, barrow pits & quarries, waste ground, annual.

“Uncommon on the high prairie south of Harrison & in the sand area south of Rock Cut.” (ewf55)



Aristida basiramea

Aristida longespica Poiret *CT, IN, MI SLENDER THREEAWN, aka SLIMSPIKE THREEAWN, THREE AWN, (*longispicus -a -um* New Latin, long-spiked, having long spikes, from Latin *longus -a -um*, long; tall; tedious, taking long time, & *spica, spicae* f, Latin a spike; an ear of grain; a tuft.)

Description: Annual native grass.

Comments: status: Special Concern in Connecticut, rare in Indiana, threatened in Michigan.

“Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies.” *Aristida longespica* Poir as *A. gracilis* Ell. (Short 1845).

VHFS: [*Aristida gracilis* Elliott, *A longispica* Poir var *longispica* Poir, orth var]



Aristida longispica

Aristida necopina Shinnery *OH [Alternate nomenclature *Aristida longespica* Poiret var *geniculata* (Rafinesque) Fernald] FALSE ARROW FEATHER, (*necopinus -a -um* unexpected, from Latin adjective, *nēcōpīnus, a, um*, adjective, unexpected, not expecting, unsuspecting.)

Habitat: South-facing, dry-mesic prairies.

Description: Small bunchgrass. Annual?

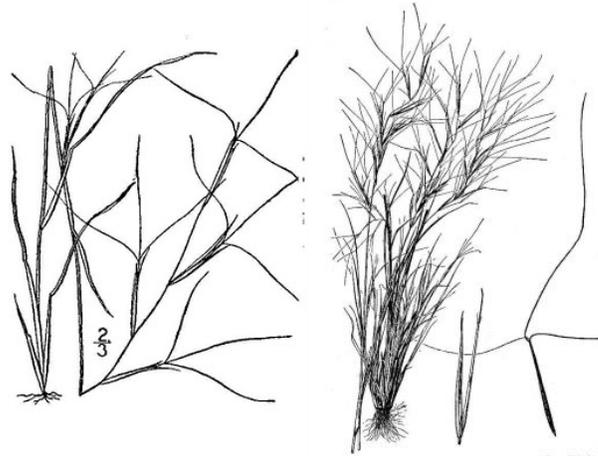
Comments: status: Endangered in Ohio. Very ornamental, attractive pumpkin orange fall color. Self sows in open, sandy soils. Grows on south side of Trash Knob, Nachusa Grasslands, Lee Co.

VHFS: [*Aristida geniculata* Raf, *A intermedia* Scribn & CR Ball var *necopina* (Shinnery) Mohlenbr, *A necopina* Shinnery, *A intermedia* Scribn & CR Ball, *A longispica* Poir var *geniculata* (Raf) Fern, orth var]



Aristida necopina (*Aristida longespica* Poir var *geniculata* (Raf) Fernald)

Aristida oligantha Michaux PRAIRIE THREEAWN, (*oliganthus -a -um* few-flowered, bearing few flowers, from Greek ὀλίγος, *oligos*, small, few, little, & ἄνθος, *anthos*, flower.) Annual "Common in sterile soil, on railroad ballast, etc" (ewf55).



Aristida oligantha

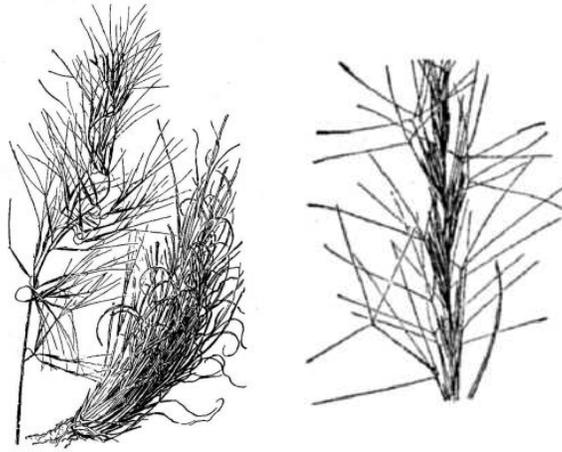
Aristida purpurea Nuttall PURPLE THREE AWN, (*purpureus -a -um* (pur-PEWR-ree-us) purple, reddish-purple, from Latin *purpureus -a -um*, adj, purple colored, dark red, dark brown, clad in purple, gleaming, bright, beautiful, from *purpura*, the mollusc yielding the dye Tyrian purple, & *-eus -a -um*, adjectival suffix used to impart the characteristics of material or color or resemblance in quality; alternately from Greek for purple, from ancient Greek πορφύρα, *porphura*, shellfish yielding the dye Tyrian purple.)

Habitat: Extremely drought tolerant. distribution/range: Known from Lee Co., Illinois. A widespread sp with 7 varieties.

Culture: 260,000 (wns01) seeds per pound.

Description: Small bunchgrass to 1', annual/perennial; each seed has three awns, hence the common name. Summer seed heads are a cloud of purple, seeds can lodge in pets paws & ears!

VHFS: Illinois material is var *nealleyi* (Vasey) Allred, BLUE THREEAWN.



Aristida purpurea 2) var *nealleyi*

***Aristida purpurascens* Poir.** “Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies.” *Aristida purpurascens* Poir. as *A. stricta sensu* Engelmann, &c. *non* Michx. (Short 1845).

***Aristida tuberculosa* Nuttall** *CT, IN, MA, MI, MN, NH BEACH THREE AWN, aka BEACH NEEDLEGRASS, BEACH THREE-AWNEED GRASS, SEABEACH NEEDLEGRASS, SEASIDE THREEAWN, (*tuberculosus -a -um* tuberculate, having tubercles, with tubercles or bumps, covered with small warty nodules.)

Habitat: Dry sands, sand prairies & sand barrens. “... sandy fields, hills, pinelands, & disturbed areas. Along the Atlantic coastal fringe, it grows on maritime dunes; inland it is associated with xeric pine-oak sandhills” (fna). distribution/range: Native to Atlantic coast from Massachusetts to Mississippi, & from Lake Michigan to Minnesota.

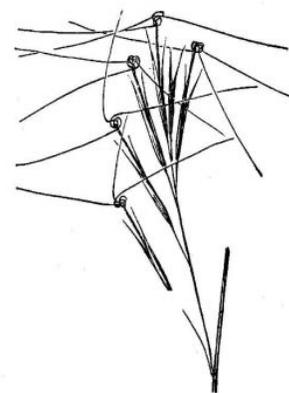
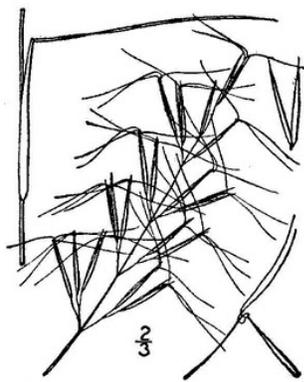
Description: Erect, annual grass; culms 40-100 cm; N 2n = unknown. key features:

Comments: status: Endangered in Connecticut & New Hampshire. Rare in Indiana. Special Concern in Minnesota. Threatened in Massachusetts & Michigan. phenology: Blooms

This unusual grass is known from the side of the farm lane to Richard Longenecker’s Prairie (a former owner) east of Rock Falls, Lee Co, north side of Rock Island Road (Dixon Avenue). Numerous other rare sand spp have been found there, including *Hudsonia tomentosa* & *Polygonella articulata*. Also known from a sand prairie south of Thomson, Illinois, growing with *Cyperus grayoides*.

“Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies.” *Aristida tuberculosa* Nutt. (Short 1845).

BS Collins, & GR Wein 1997. Mass allocation & self-burial of *Aristida tuberculosa* florets. *Journal of the Torrey Botanical Society* 124:306-311.



Aristida tuberculosa

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ARRHENATHEUM Palisot de Beauvois **FALSE OATGRASS** New Latin, from Greek *arrhen-*, *arrhēn* male, masculine, & *ather-*, *athēr* awn; from the awned staminate lemma; akin to Sanskrit *arsati*, it flows, *sabha*

bull, Latin *ros dew*. A genus of Eurasian (Mediterranean & east Asian) grasses that have 2-flowered spikelets, the first floret staminate & awned from the back & are naturalized in cooler parts of North America

Arrhenatherum elatius (Linnaeus) Palisot de Beauvois ex JS Presl & C Presl TALL OAT-GRASS, aka TALL MEADOW OAT, TUBER OATGRASS, (*elatior, elatus* Latin comparative adj, taller, higher, more lofty; evidently taller than a similar plant.)

Habitat: distribution/range:

Culture:

Description: Tall, loosely-tufted perennial, resembling oats; roots; culms; leaves; rolled in the bud-shoot; sheaths; not compressed, keeled, glabrous or very sparsely hairy, green, split with overlapping margins auricles absent; collar broad, glabrous, pale green or yellow, divided, generally oblique; ligule membranous, white, 1.5-2.5 mm long, truncate to obtuse, generally finely toothed or entire, minutely hairy on back; blade 3 to 10 mm wide, 10-50 cm long, flat, soft, sharp-pointed, glabrous, ridged on upper surface, smooth on under surface, keeled at midrib; margins slightly scabrous; heads; spikes; N. key features: ①“*Arrhenatherum elatius* is distinguished from *Phleum pratense* by its truncate, puberulent, ciliate-toothed ligule & absence of retrorse cilia on the collar. It is distinguished from *Alopecurus pratensis* by its less scabrous blade margins, more truncate ligule & thinner sheaths which are keeled but never reddish at the base.” (Nowosad et al 1936)

Comments: status: ● Variety *bulbosum* is considered weedy or invasive by some authorities (Whitson et al 1996). phenology: Blooms ? Introduced into North America for use as forage, especially in moist soils.

“Locally abundant on roadsides in cultivated areas.” (ewf55 as *A elatius* (L) Mert & Koch).

Associates:

VHFS: Also seen as *A elatius* (L) J&K Presl [*Arrhenatherum avenaceum* Beauv, *Avena elatior* L]

Variety *bulbosum* (Willdenow) Spenner, TUBER OATGRASS, ONION, COUCHGRASS, has the base of the culm as a series of moniliform corms ca 1 cm in diameter. TUBER OATGRASS was cultivated for its edible “tubers” in Bronze Age Europe. (w07)



Arrhenatherum elatius 4) variety *bulbosum*

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AVENA Linnaeus 1753 **OATS, AVOINE** *Avena* (a-VAY-na, locally a-VEE-na) name from the old Latin name for Oats, from *avena, avēna*, oats nourishment, akin to Lithuanian *avia* oats, Russian *oves*. A genus of widely distributed annual grasses having a loosely paniculate inflorescence, lemmas 2-toothed & usually awned near the apex, & deeply furrowed grains enclosed in the glumes & sometimes adherent to them. There are approximately 55 (27 or 29) spp native to Europe, the Mediterranean, North Africa, & central & western Asia. The genus has a grain crop spp & significant weed spp. $x = 7$. $N 2n = 14, 28, 42, 48, \& 63$. 2, 4, 6, 7, & 9 ploid. C3. Intergeneric hybrids with *Arrhenatherum*. Hybrids between *A fatua* & *A sativa* are common in plantings of cultivated oats. *Pooideae; Poodae; Aveneae*.

Avena fatua Linnaeus WILD OATS, aka FLAXGRASS, OATGRASS, WHEAT OATS, (*fatuus -a -um* fat'uus (FAT-yoo-us) empty, barren, insipid, from Latin adjective *fatuus -a -um*, foolish, silly, idiotic, simple, insipid, worthless, from the noun *fatuus, fatui*, or *fatua, fatuae*, a fool.)

Habitat: distribution/range: Native to Europe & central Asia.

Culture: Seldom purposely grown. Growth rate rapid. Seedling vigor high. Vegetative spread rate none. 12,000 (usda) seeds per pound.

cultivation: Adapted to coarse, medium, & fine textured soils. Anaerobic tolerance none. CaCO₃ tolerance high. Drought tolerance medium. Fertility requirement low. Salinity tolerance low. Shade intolerant. pH 6.0-7.5.

Description: Roots 8" minimum depth; WILD OATS have no auricles; $N 2n = 42$. key features: ① "Spikelets are 3-flowered; lemmas pubescent, with a bent awn." (Ilpin) ② Seedlings have counter-clockwise leaf twist.

Comments: status: ☛ This sp is considered invasive by some authorities (Assorted authors. 200_. State noxious weed lists for 46 states; CEPPC1999, SWSS 1998, Whitson et al 1996). phenology: Most seeds germinate in within 2 years, but may remain dormant in the soil for 7 or 8 years.

Associates:

VHFS: [*Avena fatua* L var *glabrata* Peterm, *A fatua* L var *vilis* (Wallr) Hausskn, *A hybrida* Peterm ex Reichenb pp]



Avena fatua

Avena sativa Linnaeus OATS, aka CULTIVATED OATS, NAKED OATS, SEED OATS, SPRING OATS, FALL OATS, WINTER OATS, (*sativus -a -um* (sa-TEE-vus) Latin cultivated, sown, planted; that which is sown or planted for crops.)

Habitat:

Culture: Seed 60+ lbs per acre in spring in our area as a crop. Ernst says 90 lb per acre as crop, 30 lb per acre as nurse crop. Often erroneously called a cover crop. 12,800 (aes10), 14,000 (rain), 15,774 (Jerry Oats 2011), 17,189 (SDCIA 2004) seeds per pound.

cultivation: Tolerates range of soil types, prefers dry soil. Medium salinity tolerance, low acid tolerance, pH 5.3 to 8.5.

Description: Introduced annual bunchgrass, cereal (surreal?) crop for animal & human food (*shades of Wilford Brimley*) 1.0-4.0', cool season. $N 2n = 42$.

Comments: ☛ Heads out 2 months after spring seeding, very good erosion control, & cover crop for spring or fall seedings.

Yes Virginia, there really are WINTER OATS or FALL OATS. South of our area & in the Pacific states, WINTER OATS are planted as we plant WINTER WHEAT. Our winters are too severe for 'WINTER OATS' to overwinter, but maybe after 8 years of George W Bush & continued Republican head-in -the sand attitude towards climate change, give it ...

Associates: Good wildlife value, provides food for large & small mammals, & upland birds. Very good forage value.

VHFS: [*Avena byzantina* K Koch, *A fatua* L subsp *sativa* (L) Thell, *A fatua* L var *sativa* (L) Hausskn, *A sativa* L var *orientalis* (Schreb) Alef]



Avena sativa

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BECKMANNIA Host **SLOUGH GRASS** *Beckmannia* after Johann *Beckmann* (1739-1811), professor at Goettingen (Göttingen), botanist, & author of one of the first botanical dictionaries. Two spp of the temperate Northern Hemisphere, the sp native in our area is an annual, the Eurasian sp is perennial. One was originally described as a *Phalaris*, the other as a *Panicum*. Taxonomy makes strange bedfellows. Spikelets are arranged in one-sided spikes. Spikelets fall with the glumes attached. $x = 7$.

Beckmannia syzigachne (Steudel) Fernald *IL, MI AMERICAN SLOUGHGRASS, aka *BECKMANNIE À ÉCAILLES UNIES*, BECKMAN'S SLOUGH GRASS, SLOUGH GRASS, 蔴草 *WANG CAO*, WESTERN SLOUGHGRASS, (with scissor-like glumes, or Greek *syzygos*, joined, & *achene*, achene.) (cv 'Egan' honoring William A Egan, the 1st & 4th Governor of Alaska.) obl

Habitat: Around ponds, swamps, & ditch banks. Adapted to saline & alkaline soils. distribution/range: Native to North America & temperate Asia.

Culture: ①No pre-treatment necessary other than cold, dry stratification (Prairie Moon 2009). No treatment, saturated soils, in a monoculture, plant 16 pls lbs in fall or spring. 238,000 (for the variety Egan, gran), 788,879 (gna11), 1,100,000 (wns2001), 1,150,000 (gran) seeds per pound.

bottom line: Test data show only slight to modest dormancy. Plant spring or dormant. Germ 54, 54, na, r41-67 (26)%. Dorm 9.0, 9.0, na, r4.0-14 (10)%. Test 29 days.**

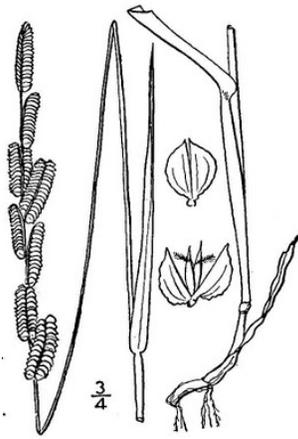
Description: Cool-season, coarse, robust annual or short-lived perennial, 1.5-3.0', the variety is a sod-former & may develop short rhizomes, but the sp is tufted; basal leaves have cross veins intersecting longitudinal veins at right angles forming rectangles; inflorescence is a closed panicle; $N 2n = 14$.

Comments: status: Endangered in Illinois. Threatened in Michigan. phenology: Blooms mid spring. C3 In Montana, seeds are collected in August. Excellent for riparian reclamation. Commercial variety 'Egan' is available, which behaves as a short-lived perennial, & is suitable for use in the western United States. 'Egan' was developed from genetic material collected near Fairbanks, Alaska, but its behavior as a short-lived perennial leads one to consider the possibility of some Eurasian *Beckmannia eruciformis* (Linnaeus) Host genetic material is in Alaska. Beringia, continental shelf, & all that Pleistocene yada yada. Wynia & Boe, (1984) found the native sp to over winter in several plots & nurseries at Brookings, South Dakota & was at least a short lived perennial in some instances.

Provides good forage.

A Boe & R Wynia, 1985. Germination, forage yield, & seed production of AMERICAN SLOUGHGRASS (*Beckmannia syzigachne*). Journal of Range Management. 38:114-116.

http://plants.usda.gov/plantguide/pdf/pg_besy.pdf



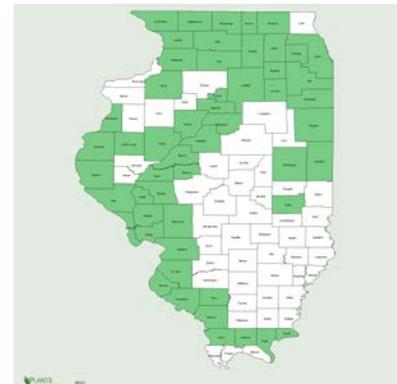
Beckmannia syzigachne

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BOUTELOUA Lagasca y Segura **GRAMA, GRAMA GRASS, GRAMMA, GRAMMA GRASS, MESQUITE GRASS** *Bouteloua* for the brothers Claudio (1774-1842 or 1848) & Estaban (1776-1813) *Bouteloua* Agraz, Spanish botanists. Cited in one reference as after Claudia *Bouteloua* (1774-1842), Spanish horticultural writer. The common name is from Spanish *grama*, coarse grass, from Latin *gramina*, plural of *gramen* grass, so saying gramma grass is like saying pizza pie. A large North American (or New World) genus (about 40 spp) distinguished by one-sided spikes. There are approximately fifty spp from the United States to Argentina. Upland game birds & songbirds eat seeds. Terrestrial furbearers (esp rabbits), small mammals, & deer eat the plant. $\times = 10$. Formerly known as *Atheropogon* Muhl & *Eutrania* Trin.

BLACK GRAMMA stems root at the nodes.

Bouteloua curtipendula (Michaux) Torrey *CT, KY, MI, NJ, NY, PA SIDE-OATS GRAMA, aka *CHUI SUI CAO*, *GRAMA-AZUL* (PB), MESQUITE GRASS, *NAVAJITA BANDERILLA* (SP), *STORT MOSKITGRÄS* (SW), TALL GRAMA, TALL GRAMA GRASS, (*curtipendulus -a -um* hanging down somewhat, or short-hanging, from Latin *curti-*, short, & *pendulus*, hanging, hanging down) The seeds are borne in two rows on one side of the seed stalk, hence the common name SIDE-OATS. Upland Habitat: Dry & sand prairies, hill prairies, dry savanna, prairie soils, dry woods, dry hills, & bluffs. Mesic to dry prairie & savanna. distribution/range: Prairies, dry hills; occasional in the n ½ of the statel rather common on the bluffs bordering the Mississippi River from Jo Daviess to Alexander cos (m14). Known but not mapped from Bureau Co. According to Weakly (2012) this spp ranges into Central & South America. Cultivated in China.



Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination, or sow at 20°C (68°F), germinates in less than two wks (tchn). Germinates easily, no treatment.

Storage Behaviour: Orthodox p; Thousand Seed Weight: 1.30g. ①0.93036; (RBG Kew); Seed; *Seed weights reported may include minor covering structures; ②0.5028; (RBG Kew); Seed; *Seed weights reported may include minor covering structures; ③0.5552; (RBG Kew, Wakehurst Place); Seed; *Seed weights reported may include minor covering structures; ④0.33; (Jurado et al 2001); Seed excluding 'dispersal structures'; oven dry; ⑤4.18; (Tilman 1997); Seed. (RBG Kew WP)

Seed dormancy persists even after 5 years dry storage at room temperature (Major 1972). ①88 % germination; pre-sowing treatments = seed scarified (covering structure removed); germination medium = 1% agar; germination conditions = 25°C, 8/16; (RBG Kew WP). ②82 % germination; ; germination medium = 1% agar; germination conditions = 15°C, 8/16; (RBG Kew, WP). ③100 % germination; ; germination medium = 1% agar; germination conditions = 25°C, 8/16; (RBG Kew, WP). ④100 % germination; pre-sowing treatments = seed scarified (shallow incision in pericarp alongside proximal to distal ridge above embryo); germination medium = 1% agar; germination conditions = 20°C, 8/16; (RBG Kew WP)

seed counts & rates: 90,700 (gnh02), 91,680 (gnh06), 96,000 (pm02), 106,323 (gna04), 109,901 (gna03), 121,523 (gna06), 123,200 (ew12), 128,000 (pn02, aes10), 128,000 (sh94), 143,000(cci), 150,000 (jfn04), 159,000 (ecs), 159,200 (usda), 190,000 (wns01), 191,000 (anon81, gran, stock), 200,000 seeds per pound.

In a recommendation for the arid southwest, one source recommends drilling seed 0.75" deep in spring or early summer, 3 to 5 pls lbs per acre. (Curtis? *This depth and seeding rate is not advisable in the high rainfall, weed-infested ag soils of the TALL grass prairie*) Anon 1981 says broadcast at 23-33 lbs per acre or drill 15-33 lbs per acre (also not advisable!). Plant 3-4 pls lbs in summer (gran not advisable). Broadcast 1 lb pls per 2,200, or drill 10 pls lbs per acre (Stocks getting closer). USDA (1997) recommends 5 pls lbs per acre in mixes. On small projects, plant 2-3 pls lbs per 1000 ft sq, for reclamation plant 30 pls lbs per acre (pots). Genesis does not generally recommend this sp in monocultures in Illinois, but in spring plant 12 pls lbs per acre on live, *in situ* soils, & 20+ pls lbs per acre on rebuilt urban soils. One Chicago-area practitioner specifies SIDEOATS turf at 200 pls lbs per acre; I guess they should keep on practicing until they get it right.

availability: Available as seed, bare root plants, & plugs. Seed is usually available, but local ecotype seed may be scarce by late spring. Plants may sell out late summer.

"Bouteloua curtipendula Dry prairie. Blooms early August; STAMENS SCARLET. Harvest early October. 2;' methods #1 & #2. Successful by SEEDLING TRANSPLANT & SPRING BROADCAST. Highly ornamental bunch grass, though with little fall color. Highly ornamental structure, though fall color is drab; flowers late 1st year." (rs ma)

asexual propagation: Divisions work well in small gardens.

cultivation: Space plants on 1.25-1.5 centers. Performs best on coarse to medium textured, well-drained soils, on uplands or slopes. No inundation tolerance. CaCO₃ tolerance high. Drought tolerance medium to high. Nutrient load tolerance low. No or moderate salt tolerance, but AES (2010) notes some tolerance. Siltation tolerance low. Shade intolerant. Wide pH range neutral to basic soils, 5.5-7.8,

bottom line: Plant spring or dormant, but spring plantings have less weed pressure & develop more readily. Germ 72.1, 79.5, 80, sd 18.7, r34-95.5 (61.5)%. Dorm 16, 9.0, 0.0, sd 18.2, r0.0-70 (70)%. Test 34, 23, 21, r13-46 days. (#47).**

Description: Warm season, moderately drought-tolerant, weakly-rhizomatous, bunchy perennial sod-former, native grass, moderately tall grass, 1.5-2.5(-3.0)'; minimum root depth 12"; stems smooth with purple nodes; leaf sheath prominently veined with few soft, long hairs; fine-leafed, edges of leaves have scattered hairs with bulbous bases; oat-like seed heads hanging on one side of stem, small purplish flowers; N 2n = (20), 40, 41-103. In our area we have *B curtipendula* var *curtipendula* with 2n = 40, 41-66. Also 2n = 28, 35, 40, 42, 56, 70 (Flora of China).

Comments: status: Endangered in Connecticut, New Jersey, & New York. Special concern in Kentucky. Threatened in Michigan & Pennsylvania. phenology: Blooms July to September (IL). In northern Illinois, collect seeds in late August - early September (± Labor Day). Collect seeds in se Wisconsin in August - October (he99). Long-lived perennial, generally a bunch grass, but some plants (northern or eastern US strains) will form loose sod. Will spread from seeds or short rhizomes gradually increase the clump size. (There are some ancient, massive clones at McCune Sand Prairie, over 20 feet in diameter.) Not as drought tolerant as BUFFALO GRASS or BLUE GRAMMA, but more so than most native grasses. Highly palatable during spring & summer. Nutritious & palatable grass for grazing, tolerates some grazing. SIDEOATS is day length sensitive, do not use southern strains or seed sources! They are sensitive to winterkill, but one has to consider that pesky global warming, so ... The old timers speak of early western genetic plantings having died out over time. Some consider this sp as a temporary matrix, & this may be a valuable insight, compared to some of the "temporary" crap that is being used.

Useful for erosion control, & in drier regions as grass between trees in orchards. Dense root system useful on steep slopes for erosion control, & mine revegetation. Non-aggressive warm season grass for wildflower plantings. Somewhat ornamental, great for xeriscaping. To 2 feet tall, but it is very open & airy, virtually transparent with only curly basal leaves. I have photographed our 2 & 4 year-old grandsons (24" & 36") in a mature, solid stand of side oats in August, & you can see the cuffs of their jeans (*vide infra*). A ripening, pure stand has an attractive purple cast for about 2 weeks (*for purple waves of grain, for amber mountains majesty*), before it unfortunately fades as the seed ripens. Many commercial varieties are available. Some western & southern varieties will eventually die out in northern Illinois. Local seed source is nursery production from genetic sources Kane, DuPage, & Will cos (Bob Horlock) & Lee & nursery remnants, Tampico Twp, Whiteside Co.

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 Counties. We traded back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

B. curtispindula is partially apomictic, meaning local populations have genetics that do not vary as a function of distance. With this sp, distance-based ecotype job specifications are just as helpful as a fart in a space suit.

“Common on sand, dry, prairies & in dry woods. Very showy when in flower.” (ewf55)

Associates: Provides cover & attracts grassland birds. Birds eat the seeds; quail habitat & minor quail food. Reported as deer resistant. Valuable winter forage for livestock & wildlife.

VHFS: Subsp *caespitosa* (cv Haskell) is noted in some catalogs (*not* *Midwestern*, *it is more southern Rockies, Texas & Mexico*). Ours is variety *curtispindula*. [*Andropogon curtispindulus* (Michx) Spreng ex Steud, *Atheropogon curtispindulus* (Michx) E Fourn, *Chloris curtispindula* Michx, *Cynodon curtispindulus* (Michx) Raspail, *Dinebra curtispindula* (Michx) P Beauv, *Eutriana curtispindula* (Michx) Trin]

E Jurado, E Estrada, & AT Moles, 2001. Characterizing plant attributes with particular emphasis on seeds in Tamaulipan thornscrub in semi-arid Mexico. *Journal of Arid Environments*, 48(3):309-321.

RL Major, 1972. Seed dormancy of side-oats gramagrass *Bouteloua curtispindula* (Michx). *Dissertation Abstracts*, 33B: 531.

D Tilman, 1997. Community invasibility, recruitment limitation, and grassland biodiversity. *Ecology*, 78:81-92.





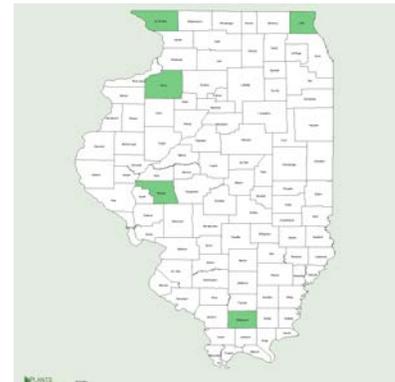
Bouteloua curtipendula, kid tested, kid approved!

Bouteloua dactyloides (Nuttall) JT Columbus See *Buchloë dactyloides* (Nutt) Engelm)

Bouteloua gracilis (Willdenow ex Kunth) Lagasca y Segura ex Griffiths or just (HBK) Lag. BLUE GRAMA, aka EYELASH GRASS, *GE LAN MA CAO*, MESQUITE GRASS, (*gracilis* -is -e slender, gracefully slight in form.) The common name is from the blue cast of a maturing stand. Upland

Habitat: Dry sand prairies, dry prairies, & sand hills. The most drought resistant of the major grasses of the Great Plains. distribution/range: Long considered barely native to northwest Illinois, reported from Lost Mound (Savanna Army Depot), near Savanna, Carroll Co, where the jackrabbits used to roam. “Sand flats, very rare; Carroll, Champaign, Dupage, Henry, Jo Daviess, Lake, & Morgan cos; also adventive at a strip mine in Williamson Co (m14).

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②“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) ③Sow at 20°C (68°F), germinates in less than two wks (tchn).



seed counts & rates: 640,000 (pm, ew12), 710,000 (ecs), 712,000 (cci), 746,711 (gnam05), 756,000 (kaste10), 825,000 (anon, stock, gran, wns2001), 850,000 seeds per pound. No treatment, 1 to 1.5 lbs pls /acre, drill 1/4 to 1/2” in April to mid-May. Anon 1981 for some reason recommends broadcasting 60-80 lbs./acre or drilling 40-60 lbs per acre, but importantly notes use may be limited in Illinois! Broadcast 1 pls lb per 3000 sq ft or drill 1 pls lb per 6000 sq ft. Granite says plant 2-3 pls lbs per acre in summer for pastures. Sow up to 2 months before first frost. For turf, sow 3-4 pls lbs per 1000 sq ft. Monocultures 10 pls lbs per acre (ecs). For reclamation, 30 pls lbs per acre (pots). BLUE GRAMA is a very light seed, & must be raked in or mulched, or it may blow away.

availability: Available as seed with good commercial availability.

cultivation: Space plants 1.0-1.25’. Dry soils, full sun to partial shade. Thrives on medium textured, well-drained sites. Does better than most grasses on sandy or alkaline soils. Best on medium to medium fine textured soils. Neutral to basic soils. Shade intolerant. High drought tolerance, moderate salt tolerance.

Once established as lawn, mow zero to 2-3 times per year. Formerly, this sp was included at 1 pls lb per acre with BUFFALO GRASS for a low maintenance turf in Illinois.

bottom line: Plant spring or dormant, but spring plantings have less weed pressure & develop more readily. Some lots are significantly dormant. Germ 69.9, 78.5, na, sd 23.8, r28-95 (67)%. Dorm 19.3, 12.5, 43, sd 18.9, r0.0-62 (62)%. Test 21, 21, na, r14-27 days.**

Description: Warm season, drought tolerant, long-lived, fine-leaved, perennial, bunch type native grass, short to medium, 0.5-2.0’; from fibrous roots, part sod forming, 16” minimum depth; sheath hairless except for a few long hairs at junction of leaf blade, leaf blades are hairless, thin, giving very fine textured turf; with white-purplish, flag-like spikelets on each stem, which curl when dry, the rachis does not extend beyond the seeds; N 2n = 20, 28, 35, 42, 60, 61, 77, 84.

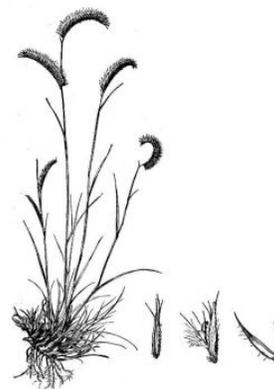
Comments: Blooms 7,8,9. Taller than BUFFALO GRASS & a little more drought-tolerant. Usually a bunch grass, or open-sod former, but can form dense sod under close grazing or mowing. Grows in bunches in the

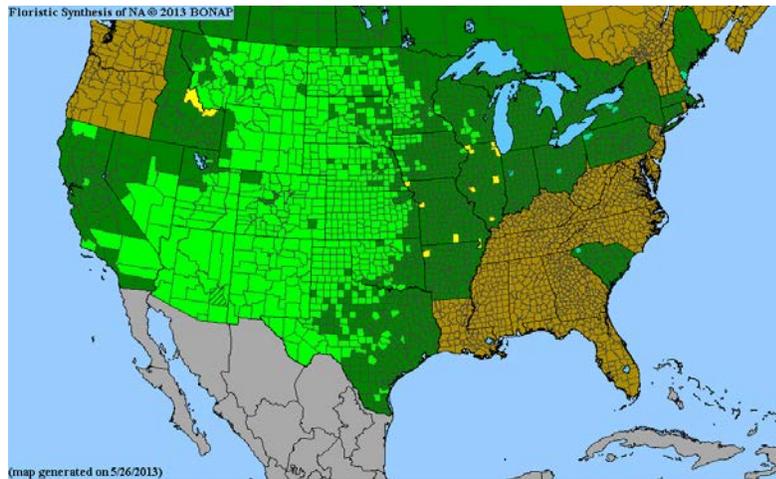
south, but as a sod-former in the north, at high elevations, or when frequently watered or grazed. Highly palatable, cures well as standing hay. Very resistant to grazing, highly palatable, & nutritious year round. non-competitive in our area. Can be a good lawn grass. Now used with BUFFALO GRASS for low maintenance turf, but more adaptable & useful in the arid west. Pots notes easy to establish, cold hardy, pest & disease free (in El Paso & not the one on Rt 251). Useful in erosion control, roadside plantings. Provides food for wildlife. Recommended (further west) for range seeding, recreation areas, & highway medians. Several improved varieties are available, but many are of southern or southwest genetic origin.

Associates: Larval host of *Hesperia leonardus* LEONARD'S SKIPPER.

ethnobotany: Allergenic pollen?

VHFS: Basionym *Chondrosium gracile* Kunth. [*Actinochloa gracilis* (Kunth) Willd ex Roem & Schult, *Atheropogon gracilis* (Kunth) Spreng, *Bouteloua gracilis* (Kunth) Lag ex Steud, *Eutriana gracilis* (Kunth) Trin]





Bouteloua gracilis

Bouteloua hirsuta Lagasca y Segura HAIRY GRAMA, aka GE LAN MA CAO, HAIRY GRAMA GRASS, (*hirsutus* -a -um (hir-SOO-tus) hirsute, hairy, covered with hair, with straight hairs, having long distinct hairs, rough, stiffly hairy, from Latin for rough, shaggy, bristly, prickly, hirsute, or rude, unpolished.)

Habitat: Open, somewhat disturbed areas with no competition in dry, sand, & limestone prairies. Open sterile soils with no competition.

Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ②Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

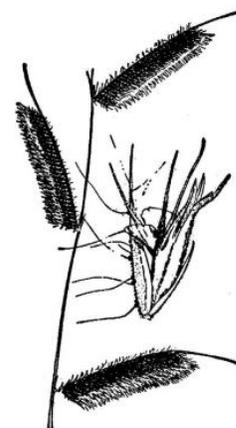
seed counts & rates: 800,000 (wns01), 976,000 (aes10), 980,000; 1,120,000 (pm) seeds per pound.

availability: Seed is of limited availability, local ecotype even tighter. Plants should be custom or contract grown.

Description: Erect, perennial grass, 0.25 - 0.62', the rachis extends beyond the seed; $N 2n = 20, 40, 50, 60$, with numerous dysploid numbers also reported.

Comments: status: phenology: Blooms 7,8,9. In northern Illinois, collect seeds in October. Collect seeds in se Wisconsin in September - October (he99). Tiny, warm-season, bunch grass, non-competitive.

VHFS: Ours is *B hirsuta* subsp *hirsuta*. Basionym *Chondrosium gracile* Kunth. [*Actinochloa gracilis* (Kunth) Willd ex Roem & Schult, *Atheropogon gracilis* (Kunth) Spreng, *Bouteloua gracilis* (Kunth) Lag ex Steud, *Eutriana gracilis* (Kunth) Trin]





Bouteloua hirsuta

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BRACHYELYTRUM Palisot de Beauvois **SHORTHUSK** *Brachyeletrum* from Greek *brachys*, short & *elytron*, *elutron*, cover, husk for the small glumes. A small genus of one or two spp in North America & one in eastern Asia, *B japonicum* (Hackel) Matsumura ex Honda, (contrary to Ilpin). The Asian sp, when included in *B erectum*, is variety *japonicum* Hackel, or subsp *japonicum* (Hackel) T Koyoma & Kawano. *B japonicum* is native in Japan, Korea, & southeastern China. The disjunct distribution suggests a Laurasian origin. Many plant spp exhibit this classic disjunct distribution. C3. Has been placed in the *Agrostidae*, *Arundinoideae*, *Pooideae*, *Stipoideae*, or sometimes in its own monogeneric tribe, the *Brachyelytreae*, but at least closely allied to the *Bambusoideae*. Molecular phylogenetic study has indicated that, *Brachyelytrum* is in a sister-group of the subfamily *Pooideae*, which includes barley, wheat, & oats. $x = 11$. $N 2n = 22$. 2 ploid. *B aristosum* is generally more northern than *B erectum*. The ranges of the native spp overlap, & they may grow close together, but no mixed populations or hybrids have been found.

CS Campbell, PE Garwood, & LP Specht, 1986, Bambusoid affinities of the north temperate genus *Brachyelytrum* (Gramineae), Bulletin of the Torrey Botanical Club, vol 113, no 2 pp 135-141.

Lemmas hispid, hairs 0.2–0.9 mm long, visible at 10× magnification; anthers 3.5–6 mm long; awns 13–17(20) mm long. . Lemmas strongly hispid, the hairs 0.3–0.8 mm long in the middle portions of the lemma; more strongly (5–) 7–9-nerved lemmas, at least the larger florets ca. 10–12 mm long & 1–1.6 mm wide, anthers more than 5 mm long, & fewer than 10 cilia per 5 mm of leaf margin ... *B erectum*

Lemmas scabrous, scabrules 0.08–0.14(0.2) mm long; anthers 2–3.5 mm long; awns (14)17–24(26) mm long; Lemmas scabrous to hispidulous, the hairs up to 0.2 mm long in the middle portions of the lemma; typically has 3–5-nerved lemmas, florets ca. 8–10 mm long (excluding awn) & 0.7–1.3 mm wide, anthers not over 4 mm long, & more than 15 cilia per 5 mm of leaf margin. ... *B aristosum*

(the above after fna, & *MICHIGAN FLORA ONLINE*. AA Reznicek, EG Voss, & BS Walters.

February 2011. University of Michigan. Web. December 17, 2011.

<http://michiganflora.net/genus.aspx?id=Brachyelytrum>)

Brachyelytrum aristosum (Michaux) Trelease (or as (Michx) Branner & Coville) NORTHERN SHORTHUSK, aka BEARDED SHORTHUSK, LONG-AWNED WOOD GRASS,

Habitat: Moist woods & moist forests. Moist to dry deciduous forests, lowland forests, moist thickets, sandy pine forests, & coniferous swamps. distribution/range: Known from Michigan, Wisconsin, & Iowa, New England & the Appalachians (special concern in Tennessee). Its absence from Illinois may be a taxonomic accident, as many Illinoisans see this genus as monospecific. This taxon is not in Mohlenbrock (2014).

Description: From knotty rhizomes; $N 2n = 22$.

VHFS: [*Brachyelytrum aristosum* (Michx) Trel var *glabratum* Vasey ex Millsp, *B erectum* (Schreb ex Spreng) Beauv var *glabratum* (Vasey ex Millsp) Koyama & Kawano, *B erectum* (Schreb ex Spreng) Beauv var *septentrionale* Babel, *B septentrionale* (Babel) G. Tucker]

MICHIGAN FLORA ONLINE. AA Reznicek, EG Voss, & BS Walters. February 2011. University of Michigan. Web. December 17, 2011. <http://michiganflora.net/species.aspx?id=2024>

Brachyelytrum erectum (Schreber ex Sprengell) Palisot de Beauvois (or (Roth) P Beauv) LONG-AWNED WOOD GRASS, aka BEARDED SHORTHUSK, *BRACHYELYTRUM DRESSÉ*, FALSE BROME, FALSE DROPSEED, SOUTHERN SHORTHUSK, (*erectus -a -um* Latin upright, erect, perpendicular.) upl

Habitat: Mesic savannas & mesic woodlands, moist woods, & forests. Occasionally in soils over limestone. Moist to slightly dry, high quality deciduous woodlands without a history of disturbance. Rich deciduous forests & drier oak or oak-hickory stands. distribution/range: Lake of the Woods, Ontario, east to Newfoundland, & in the United States from Minnesota to New England & south to the Gulf Coast & Florida (fna). Occasional throughout Illinois. Several populations are known in Springdale Cemetery in Peoria.

Culture: Dormant seed or moist cold stratify. ①Campbell, Garwood, & Specht (1986) surface sterilized the seed with a weak solution of commercial bleach & cold moist stratified it for 60 days at 40°F (4°C).

Storage Behaviour: Orthodox; Orthodox Storage Conditions: 90 % viability following drying to mc's in equilibrium with 15 % RH and freezing for 3 weeks at -20C at RBG Kew, WP. Thousand Seed Weight: 6.5564g; (RBG Kew WP); Seed; *Seed weights reported may include minor covering structures.

Germination 90 % germination; pre-sowing treatments = imbibed on 1% agar for 5 weeks at 20°C, then seed scarified (covering structure removed); germination medium = 1% agar; germination conditions = 10°C, 8/16; material provided by Chicago Botanic Garden (CBG). (RBG Kew WP.)

seed counts & rates: 39,467 (gn02), 45,300 seeds per pound.

availability: Sp is not in the native seed trade. Seeds & plants of this sp are not even marginally in the native plant trade.

bottom line: Sow seeds in metal flats in fall, cover flats with hardware cloth, place in lathehouse or unheated cold frame. Germination will occur in second spring.

cultivation: Light shade, mesic soils, loamy to sandy loam.

Description: Native, plus or minus erect, from knotty rhizomes; culms 1.0-2.5', erect, not branched; leaves; sheaths; heads; spikes; N 2n = 22. key features: ①“Versus immature *Bromus*, this sp has a single flower.” (Ilpin) ②This plant can be positively identified by the shattered venation in the leaves.

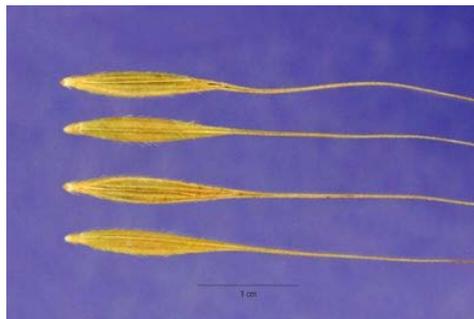
Comments: status: phenology: Blooms 6,7 (5-8). Cool season, bunching, useful in woodland landscaping, shade gardens, near woodland paths, an American complement to a Midwestern Oriental garden. An unusual woodland grass with quite attractive foliage, resembling native bromes but the spikelets are single flowered, & the lemmas & awn are unusually long. Once you have seen the perpendicular foliage, the sp has a 50-foot, 20+ mph *gestalt*. In some texts, this is placed in the *Bambusoideae*, providing us with a native bamboo that grows in northern Illinois. Indeed, the foliage may invoke such an image. Cross-pollinated.

“An uncommon grass which we have found in Ashley Forest preserve & in Andrus woods on Mulford road near Harrison avenue road.” (ewf55)

Associates: Attracts butterflies. Larval host of *Enodia anthedon* NORTHERN PEARLY EYE. The awns stick to fur, & the seeds are (were) probably distributed by mammals.

VHFS: Basionym *Muhlenbergia erecta* Schreb. [*Agrostis erecta* (Schreb) Spreng, *Brachyelytrum aristatum* var *engelmannii* A Gray, *B aristosum* var *glabratum* Vasey, *B erectum* ssp *erectum* (Schreb) P Beauv, *B erectum* var *erectum* (Schreb) P Beauv, *B, erectum* var *glabratum* (Vasey) T Koyama & Kawano, *Dilepyrum erectum* (Schreb) Farw, *Muhlenbergia brachyelytrum* Trin, *M erecta* Muhl, *M, erecta* Schreb]

MICHIGAN FLORA ONLINE. AA Reznicek, EG Voss, & BS Walters. February 2011. University of Michigan. Web. December 17, 2011. <http://michiganflora.net/species.aspx?id=2025>





Brachyelytrum erectum

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BROMUS Linnaeus 1753 **BROME** *Bromus* (BROH-mus) New Latin, from Latin *bromos, bromi*, m., a name used by Pliny for oats from ancient Greek name for oat, originally from βρώμα, βρόμος, *broma, bromos*, food, also βρώμος, *bromos*, oats. A large genus of annual, biennial, & perennial grasses native to temperate & cool regions, having large, often-drooping spikelets & lemmas usually awned near the 2-toothed apex. Depending on how the spp are defined there are between 100 & 400 spp in the genus. There are 52 spp in northern North America, with 28 spp native. Only three introduced spp are perennial. $x = 7$.

No pretreatment considered necessary. "In my experience, moist cold treatment has been successful. Light cover. Good germination." (mfd93). Years ago, an old, east-coast turf salesman told me the germination of *B inermis* is said to improve after storage but our seed test data show serious decline in viability during storage in some native bromes. They don't carry over well. Buy BROME seed as they vote in Chicago, early & often.

An examination of the use of spp names for Midwestern native BROMES is confusing at best, & might make you crazy. If you seek clarity, never ever speak of *Bromus purgans* in specifications.

Native BROME seeds have availability cycles, good for a few years as fields come into production & but the fields quickly senesce, and availability becomes tight to nonexistent. Early 2011 through spring 2014, availability is very bad.

Inflorescence spreading or drooping, blades (3-)4-17 mm broad; backs of all lemmas glabrous (lemmas pubescent only on the margins in the lower 1/2-1/3 of the lemma), anthers 1–1.4 mm long; upper glumes 7.1–8.5 mm long; leaves 5-8 per culms, the blades not auriculate at base..... *B ciliatus*

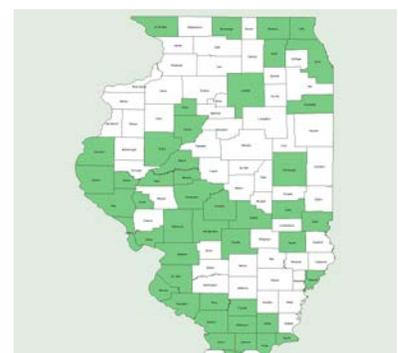
Awns 1.5–3 mm long; anthers 1.5–2.5 mm long; glumes pilose or densely appressed pubescent; lemmas not strongly keeled; cauline leaves 3-5(-6) in number; awns 1-3 mm long; ligules 0.5–1 mm long..... *B kalmii*

Inflorescence spreading or drooping, blades (3-)4-17 mm broad; culms with 9–20 nodes (leaves 10-20 per culm, blades auriculate at base), collars & throats densely pilose; auricles 1–2.5 mm long on most lower leaves..... *B latiglumis*

1st glume 1-veined, second glume 5 or 7-nerved, upper glumes within a panicle consistently 5-veined; glumes pilose or densely appressed pubescent; lemmas not strongly keeled; cauline leaves 6-8 in number; collars with a dense line of hairs; lower sheaths often sericeous; awns 5-8 mm long; ligules 0.4–1 mm long
..... *B nottowayanus*

Inflorescence spreading or drooping, blades (3-)4-17 mm broad; lemmas pubescent throughout on the back or glabrous; leaves 5-8 per culms, the blades not auriculate at base; ligules 0.5–2 mm long..... *B pubescens*

Bromus ciliatus Linnaeus FRINGED BROME, aka *BROME CILIÉ*, CANADA BROME GRASS, FRINGED BROME-GRASS, FRINGED WOODLAND BROME, (*ciliatus* -a -um (ki-lee-AH-tus, commonly si-lee-AH-tus) ciliate, with marginal hairs, fringed with hairs like an eyelash or eyelid.) [obl] section *Bromopsis*



Habitat: Moist soil in natural meadows & in open woods. Wet meadows, marshes, & sedge meadows. Woods, clearings, & meadows, often with rocky soils. Moist open woods, rocky slopes, disturbed areas near bogs. distribution/range: Open woods; common throughout the state (m14).

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99)

seed counts & rates: 99,008 (jfn04), 104,753 (gnm07), 114,142 (gnha12), 122,160 (brocil33L54), 160,000 (pm), 236,000 (ecs), 283,200 (aes10), 283,500 seeds per pound.

cultivation: Shade tolerant. Low drought tolerance. Low salt tolerance. pH 5.5-7.5.

bottom line: Best dormant seeded, but spring plantings have less weed pressure & may develop more readily. 50% of lots are significantly dormant. Flipflop species. Germ 53.3, 64, 64, sd 27.9, r7.0-90 (83)%. Dorm 24.5, 24.5, 2.0, sd 23.5, r1.0-78 (77)%. Test 36, 35, na, r18-57 days.**

greenhouse & garden: Dry storage 40° (180 days) or moist cold stratify (30 days), seeds need light to germinate, shallow cover.

Description: Native, tall, perennial grass; roots; culms 1.5-4.0'; leaves rolled in the bud-shoot; sheaths not compressed, not keeled, retrorsely pilose, closed to within 1 cm of summit; auricles absent; collar narrow, distinct, glabrous, pale green, divided by midrib; margins sometimes constricted; ligule coarse-membranous, short (0.5 to 1 mm long), truncate, entire or slightly lacerate; blade 4 to 10 mm wide, 8 to 20 cm long, flat, tapering to a sharp point, soft-pubescent, dark green, slightly ridged on upper surface; midrib distinct on under surface; margins scabrous; heads; spikes spikelets tinged with green-to purple bronze; $N 2n = 14$. key features: "Most Illinois specimens have middle & upper sheaths which are retrorsely pilose." (Ilpin) "This sp is distinguished from *B tectorum* by its shorter ligule, & from *B inermis* by its longer pubescent sheath & blade" (now36).

Comments: status: phenology: Blooms 6,7. C3. Collect seeds in se Wisconsin in July - August (he99). Attractive dried seed heads. Cool season, bunching, short-lived, often flowering first year. Seed source nursery production, originally from Rockyford Road Wetland, Lee Co, & Santa Fe RR wetland, Marshall Co. "A common native sp." (ewf55)

Associates: Pollen may be allergenic.

VHFS: Includes the var *intonsus* Fernald. [*Bromus ciliatus* var *ciliatus*, *Bromopsis ciliata* (L) Holub]



Bromus ciliatus

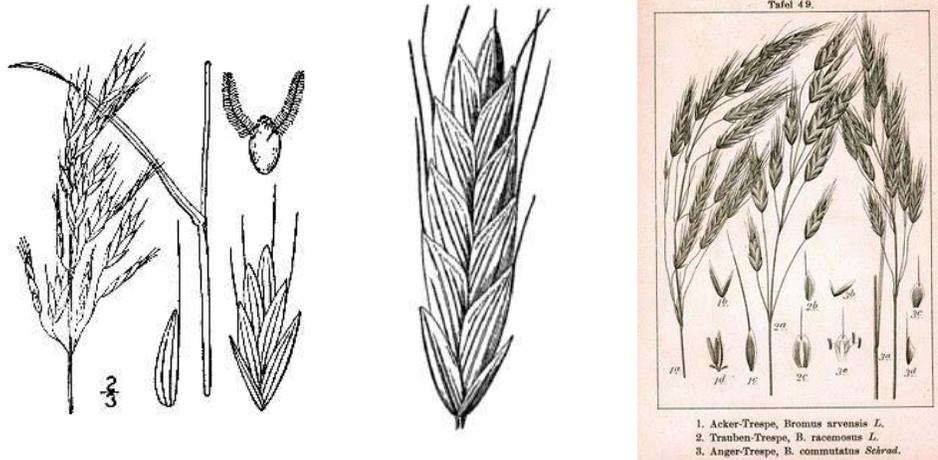
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. 2nd line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. Line drawing 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. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image.

Move to *B. racemosus*

Bromus commutatus Schrader MEADOW BROME, aka HAIRY CHESS, (*commutatus -a -um* changed or changing, altered, alteration; close to another sp.) “A common introduced sp.” (ewf55)

Native to the Baltic region of Europe. $N 2n = 14, 28, 56$. ♣

Now included in *B. racemosus* by some authors.



Bromus commutatus

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. 2nd Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. Color illustration Jacob Sturm, Johann Georg Sturm - *Deutschlands Flora in Abbildungen* (1796). Copyright expired. Source: www.biolib.de.

Bromus inermis Leysser SMOOTH BROME, aka AWNLESS BROME GRASS, *BROME INERME*, HUNGARIAN BROME, (*inermis -is -e* unarmed, as without thorns or awns, defenseless, denude of thorns, in reference to the lack of awns.) Section *Bromopsis*

Habitat: Best on moderately coarse to moderately fine soils. Best on well-drained, fine-textured soils, especially loose, sandy loams. Somewhat acid tolerant, but best on neutral or basic soils. Used extensively in northern parts of US for early season pastures. Full sun. Moderate drought tolerance. Low salt tolerance. pH 5.5-8.0. **distribution/range:** Native to Eurasia.

Culture: 125,000 (gran), 135,000 (stock), 142,000 (ecs) seeds per pound. Plant 8 pls lbs per acre in fall or spring. Drill 10-12 pls lbs per acre in spring or fall. Drill 10-12 lbs per acre in spring or fall (Stocks).

Description: Introduced, cool season, moderately drought tolerant, long-lived perennial vigorous sod-former, introduced grass; roots rhizomatous, creeping, scaly rootstocks, 12” minimum depth; culms medium tall 1.5-3’; leaves rolled in the bud-shoot; sheaths not compressed, slightly or not at all keeled, glabrous or the lower rarely sparse-pubescent, scabrous, closed to near the summit; auricles absent or rarely rudimentary; collar narrow, glabrous, light green, divided; ligule membranous, short (about 0.5 mm long), obtuse, entire or slightly lacerate; blade 4 to 12 mm wide, 15 to 40 cm long, flat, tapering to a sharp point, glabrous but sometimes minutely pubescent on both surfaces, dark green, almost ridgeless above, slightly keeled below, margins scabrous; $N 2n = 28, 56$. **key features:** ① “Spikelets are purplish or bronze-colored at maturity” (Ilpin). ② Distinguished from the other spp of *Bromus* by its glabrous, or nearly glabrous, sheaths & blades (now36).

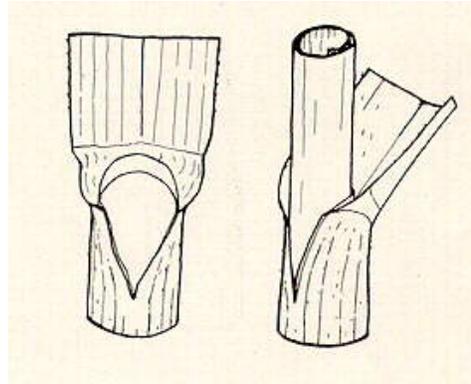
Comments: status: ♣ Introduced & widely planted. **phenology:** Blooms May to July. C3. Adapted to deep soils. Tolerant of light shade. Very productive, but persistent & weedy. Starts growth in early spring. Ripens by early summer, abundant late-summer & fall regrowth. Aggressive, rhizomatous root system that tends to become sodbound without proper management. Said to be aggressive in the pasture, as it may tend to crowd out other spp over time. Never, ever plant with warm season grasses or wildflowers. Native species may be interseeded into burned brome fields.

Broadcasting or no-tilling seed into burned stands of *B inermis* works well with many spp. Plugs also work well in burned & mowed brome stands. Mow or weed-eat the brome very short before installing the plugs.

Some moist years, this grass is more appropriately called *Bromus enormous*. “A common introduced sp which has escaped from cultivation” (ewf55).

Associates: Pollen may be allergenic. Highly palatable to livestock when green. Fair palatability to wildlife. Known to chemically inhibit *Populus* spp. (Chick & Kielbaso 1998).

VHFS: “Sp forms long awns (less than or equal to 2 mm) in Illinois; it may be labeled *forma aristatus* (Schur) Fern in some collections.” (Ilpin)



Bromus inermis

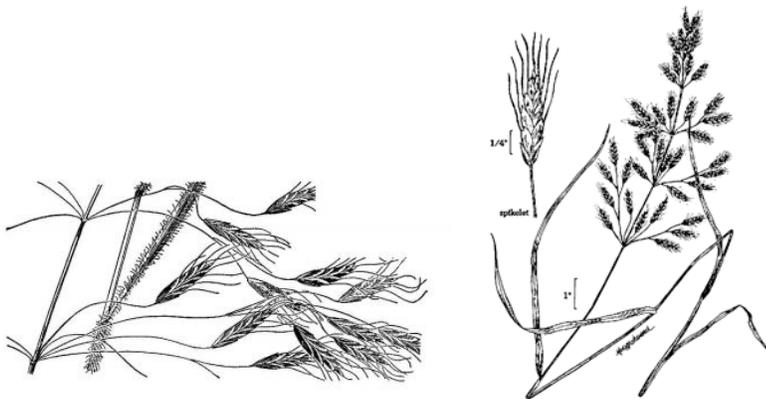
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. 2nd line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. Line drawing of collar area from Nowosad et al 1936, courtesy <http://www.caf.wvu.edu/~forage/library/index.htm>

Bromus japonicus Thunberg JAPANESE BROME, (*japonicus -a -um* New Latin Japanese, of or from Japan.)

“A locally abundant grass which was introduced from Europe.” (ewf55)

Native to Asia & central & southeastern Europe. N 2n = 14. ♀

Some authorities include this in *Bromus arvensis* L.



Bromus japonicus

1st Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. 2nd Line drawing Mark Mohlenbrock, USDA-NRCS

Bromus Kalmii A Gray *ME, MD, NH PRAIRIE BROME, aka ARCTIC BROME, *BROME DE KALM*, KALM BROME, KALM'S BROME GRASS, WILD CHESS, EAR-LEAVED BROME (in error?), (*kalmii* (KAL-mee-eye) after Pehr Kalm (1715-1779), Finnish student of Linnaeus who traveled in North America & discovered *Bromus kalmii*.)
fac Section *Bromopsis*

Habitat: Mesic prairies & calcareous fens. Sandy, gravelly, or limestone soils in open woods & calcareous fens. In the eastern US, it grows in shale woodlands & barrens. distribution/range: North central & northeastern United States & adjacent Canadian provinces. Dry woods, sandy soil, not common; confined to the n ½ of Illinois, also Calhoun Co (m14).

Culture: ①No pre-treatment necessary other than cold, dry stratification (Prairie Moon 2009). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) Growth rate rapid. Seedling vigor medium. Vegetative spread rate none. Spreads slowly from seed.

seed counts & rates: 128,000 (pm, ew12, aes10), 145,000 (usda), 148,003 (gnim06), 150,456 (gnam12), 189,000; 200,619 (gnam07), 210,771 (gnam04) seeds per pound.

"Bromus kalmii General, alkaline prairie. Blooms July; spikes furry. Harvest early October. 2'; easy by methods #1 & #3; #2 not tried. Successful by SEEDLING TRANSPLANT, SPRING BROADCAST, & FALL BROADCAST. Cool-season; no fall color, little fuel; flowers 2nd year. Must be carefully distinguished from weedy bromes." (rs ma)

cultivation: Space plants 1.25-1.5'. Mesic soils, full sun to partial shade. Adapted to coarse & medium textured soils. Anaerobic tolerance low. CaCO₃ tolerance medium. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 5.7-7.0.

bottom line: Test data indicate most lots can be seeded spring or dormant, but occasional lots strongly require dormant seeding for effective establishment. Flipflop species. Germ 61.8, 73, 73, sd 25.8, r3.0-95 (92)%. Dorm 26.3, 18, 0.0, sd 26.9, r0.0-81 (81)%. Test 27, 27, 27, r14-35 days. (#18)**

greenhouse & garden: Easy from seed, moist cold stratify 30 days or dormant seed in an unheated coldframe for insurance, have prop stock germ tested before planting untreated seed in greenhouse. Seeds need light to germinate.

Description: Perennial; not rhizomatous; culms 1.5-2.0'; leaves; sheaths; auricles; collar; ligule; blade; heads; spikes; N 2n = 14. key features: ①Distinctive for its few leaves, usually 3-4 clustered near the base, & the spikelets large & approximate to one another in a narrow nodding panicle.

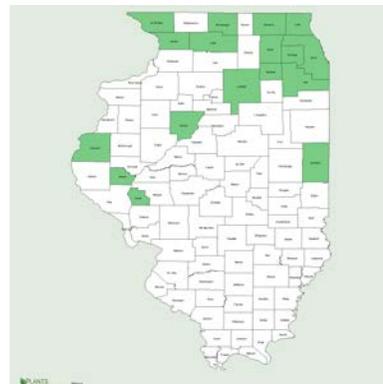
Comments: status: Possibly extirpated in Maine. Endangered in Maryland & New Hampshire. phenology: Blooms 6,7. C3. In northern Illinois, collect seeds in late July - August. Collect seeds in se Wisconsin in July - August (he99). Attractive dried seed heads. Landscaping & naturalizing, short, cool-season, bunch grass with grayish blue leaves, the maturing stems bending gracefully under the weight of the seed heads. May be short-lived, behaving as annual or biennial in the nursery. Genetic source Spring Slough, Hume & Montmorency Twps, Whiteside Co, & fen, Campton Twp, Kane Co.

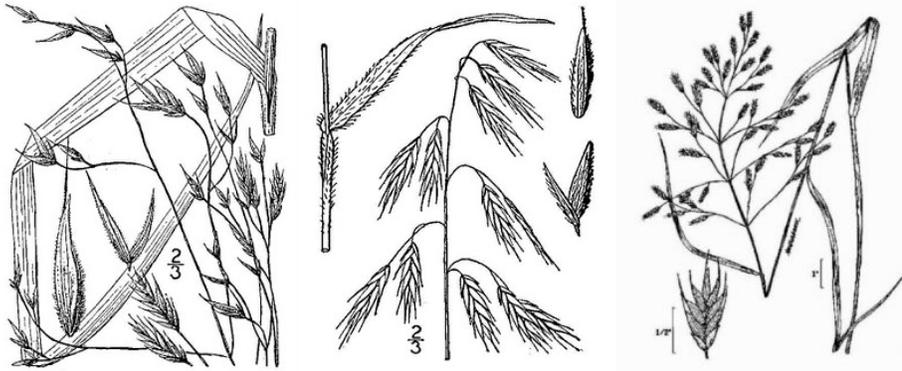
"An uncommon native perennial sp that is found mostly in the sand area." (ewf55)

Associates: Butterfly larval host. Songbirds, game birds, & small mammals eat seeds. Walnut tolerant.

ethnobotany:

VHFS: "This is in the herbarium of Linnaeus under the name of *B. ciliatus*, but is not the plant he described; thence has arisen much confusion" (Gray 1876). [*Bromopsis kalmii* (Gray) Holub, *B purgans* auct non L [misapplied] *B ciliatus* L var *laevigulumis* Scribn ex Shear, *B purgans* L, *nom rejic*, *B purgans* L var *laevigulumis* (Scribn ex Shear) Swallen.





Bromus kalmii

1st & 2nd line drawings Britton & Brown (1913) courtesy of Kentucky Native Plant Society. 3rd 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. 4th Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted.

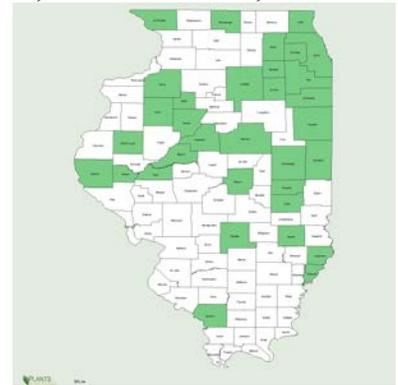
Bromus latiglumis (Shear) AS Hitchcock (or (Scribn ex Shear) Hitchcock *MD EAR-LEAVED BROME, aka AURICLED BROME, BROAD-GLUMED BROME, *BROME À LARGES GLUMES*, EARLYLEAF BROME, FLANGED BROME, FLANGED WOODBROME, HAIRY WOOD BROME, LEAFY WOODLAND BROME, NODDING BROME, RIVERBANK BROME, WILD BROME GRASS, WOOD CHESS, (*latiglumis -is -e* broad-glumed, from Latin *latus -a -um*, adjective, broad, wide, & *glūma* (rare) hull, husk of grain.) facw- section *Bromopsis*

Habitat: Mesic savanna, thickets, & moist open woodlands. Rich alluvial thickets & woodlands. Limestone soils. Shaded or open woods, along streambanks, & on alluvial plains & slopes. Overgrown shady railroad slopes in a conservative railroad remnant east of Red Oak Road with *Gentiana flavida/andrewsii* & *Parthenium integrifolium*. We have seen this persisting as one of the last native plants on the Rock Island RR row west of Toulon in the deep shade of *Acer negundo*.

distribution /range: Moist, open woods, occasional in north ½ of Illinois, rare in the s ½ (m14). Plants at Barry Taylor's savanna north of Spoon River may be this or the next sp. Some individuals were next to & overhanging the cornrows & may have had an extra boost of anhydrous ammonia. Known but not mapped from Bureau Co.

Culture: Late fall or winter sown seed in unheated cold frame or placed in walk-in cooler works well for us. Light soil cover. Dry storage 40°F (180) or moist cold stratify (30 days), seeds need light to germinate, shallow cover. 107,101 (gnh07), 108,082 (gna05), 113,400; 114,820 (gnh13), 118,537 (gnh03), 163,984* (agre11), 168,836 (gnh12) seeds per pound. Availability is cyclical, good for a few years as fields come into production & then as the fields senesce, availability becomes tight to nonexistent. Early 2011 through late winter 2013, availability is very bad.

bottom line: Spring seeding works most years, but 30% of lots significantly need cold moist stratification. Several non-dormant lots are known. Flipflop species. Strongest dormancy 2014 crop, crossover species? Germ 67.4, 81, 98, sd 27.9, r12-98 (86)%. Dorm 18.9, 4.0, 0.0, sd 24.8, r0.0-80 980)%. Test 30, 31, 34, r22-41 days. (#16).**



Description: Perennial native grass; not rhizomatous; culms 2.5-4.5(7.0)', 9-20 nodes; leaves dense leafy growth; $N 2n = 14$. key features:

Comments: status: Endangered in Maryland. phenology: Blooms 7,8,9. C3. In northern Illinois, collect seeds in late September - early November. Attractive dried seed heads, landscaping. May be short-lived. Not for the meek & timid, may grow to 4.0-6.0'. Seed source nursery production from Gerdis' B&N railroad prairie Walnut Twp, & West Bureau bottoms, Wyanet Twp, both in Bureau Co, maybe a couple of genes here & there from the old Rock Island line east of Toulon, west of Rt 78, Stark Co. Il, & Chicago Botanic Garden. Seed production plots do well in full sun for several years & may be thick enough to combine, BUT they are short lived. Modestly self sows, moving about the woods on its own. Not competitive with *B. inermis* in full sun, but few C3 native grasses are. Do not plant in savannas or open woods that have aggressive introduced grasses or native warm season grasses.

"An uncommon native perennial that is found mostly in open woods. Edges of woods on Cunningham Road west of Rockford, on Mulford Road east of Rockford, & east of Harrison." (ewf55)

Associates: Pollen maybe allergenic.

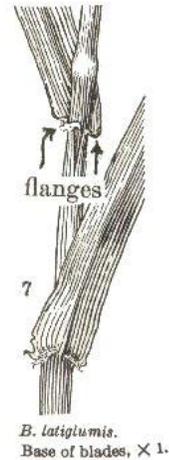
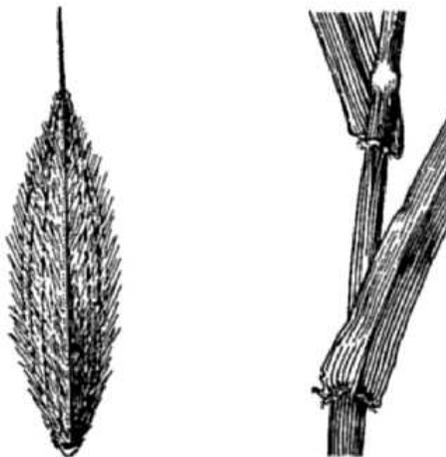
VHFS: This sp is easier to identify & grow than to scientifically name. "Wagnon (1950) says that the plant being treated herein as *B latiglumis* should be called *B purgans*." (sw94) *Bromus purgans* Linnaeus is considered a *nomen confusum* by Voss (1972) & a *nomen rejiciendum* by Gleason & Cronquist (1991).

Ilpin's comment "It (*B purgans* L) is referred to by Swink & Wilhelm as proper name for plants of *B pubescens* Muhl" is confusing as hell. (A 3rd edition comment? Ya think in 20 years the INHS could update ILPIN. Come on. Such is the state of the prairie in The Prairie State.)

[*Bromus altissimus* Pursh, *B purgans* L, *B purgans* auct non L [misapplied]] [*B ciliatus sensu* Baum, non L, *B purgans sensu* Wagnon, non L]

Forma *incanus* (Shear) Fern has decumbent, weak, sprawling culms, densely hairy sheaths, & heavy panicles. Mohlenbrock (2014) includes the form with the species.

Generally, the common name EAR-LEAVED BROME conveys the concept of this sp. Unfortunately, this common name is also used for *B racemosa* L in Jones & Bell (1974). You may now see this listed as LEAFY WOODLAND BROME, *Bromus purgans*.





Bromus latiglumis

1st 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. 2nd & 3rd drawings USDA-NRCS PLANTS Database / Hitchcock, AS. (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 4th drawing by Agnes Chase from Norman C Fassett's Grasses of Wisconsin.

Bromus nottowayanus Fernald *MD VIRGINIA BROME, aka NOTTOWAY BROME GRASS, NOTTOWAY RIVER BROME, NOTTOWAY VALLEY BROME, SATIN BROME, (*nottowayanus* -a -um New Latin, from the Nottoway River, Valley, & County in Virginia, ultimately from the Cheroenhaka (Nottoway) Indian Tribe. The local Algonquian Tribes referred to the Cheroenhaka as “Nadawa,” which soon developed into Nottoway.)

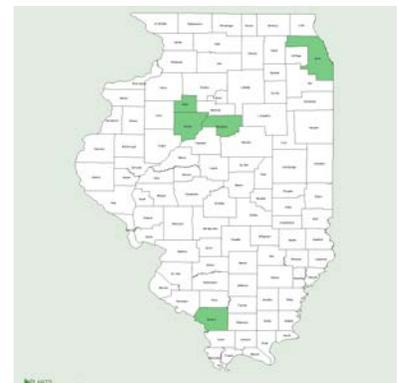
Habitat: Damp, shaded woods, in ravines & near streams. In the se USA, “moist forests, along moist stream bottoms” (w11). In Michigan “rich hardwood forests, usually near streams, but often above the lowest, wettest river bottoms; occasionally in drier forests on banks & slopes” (Reznicek et al 2011). distribution/range: Moist wooded ravines, rare in Illinois, Adams, Cook, Jackson, Peoria, Stark, Woodford, & Peoria counties (m14). From MD, VA, & NC, west to TN, IL, IN, MO, & AR. As this has been confused with *B pubescens* & *B latiglumis*, its range is poorly known.

Culture: Sp is not in the native seed trade.

Description: Perennial with or without rhizomes; culms 5-9 nodes; N 2n =14.

key features: ① “The only sp of *Bromus* with first glume 1-nerved, & second glume 5-7 nerved” (Ilpin) ② “This sp is readily distinguished from *B pubescens*

in the field by the satiny sheen to the undersurface of the leaf (which, however, appears uppermost due to the 180 degree twist that leaves of so many grasses show). In addition, the flowering season is later, with anthesis in southern Michigan being in mid- to late July, versus usually mid- to late June for *B pubescens*. See McKenzie & Ladd (1995) for more information. In the herbarium, distinctions are more difficult. The satiny sheen can be very hard to discern & the pubescence is also somewhat variable. The



often cited glume venation differences do not work well with Michigan material.” (rvw11)
Comments: status: Endangered, extirpated in Maryland. phenology: Blooms June-August.

Associates:

VHFS: [*Bromopsis nottowayana* (Fern) Holub] Some authors include this in *B pubescens*. Eaton (1829) notes var *canadensis*, which has one very hairy, 7-nerved valve to each corol, & a short bristle.

P M McKenzie & D Ladd, 1995. Status of *Bromus nottowayanus* (*Poaceae*) in Missouri. Missouriensis 16: 57-68.

MICHIGAN FLORA ONLINE. AA Reznicek, EG Voss, & BS Walters. February 2011. University of Michigan. Web. April 28, 2012. <http://michiganflora.net/species.aspx?id=2835>



Bromus nottowayanus

Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted.

Bromus pubescens Muhlenberg ex Willdenow (or plain old Muhl, or plain old Willd, or Linnaeus!) *ME, NH WOODLAND BROME, aka CANADA BROME, CANADA BROME GRASS, COMMON EASTERN BROME, HAIRY BROME-GRASS, HAIRY WOOD BROME GRASS, HAIRY WOODLAND BROME, HAIRY WOOD CHESS, ARCTIC BROME (?), (*pubescens* becoming hairy, slightly hairy, downy, pubescent, with soft downy hair, from Latin *pubescens*, *pubescent*, from *pubesco*, *pubescere*, *pubui*, to reach physical maturity or reach puberty, become pubescent, from *pubes*, youth, men; hair that appears at puberty, & *-escens* (like *-ascens*) Latin adjectival suffix from *-escent*, -ish, -becoming, indicating a process of becoming, often translated as the English suffix -ish.) facu+, section *Bromopsis*

Habitat: Mesic savannas, mesic forests, roadsides in oak woods, generally on rocky slopes. distribution/range: Moist, open woods; common throughout the state (m14).

Culture: ①30 (21) 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) ③Though they chose not to do so, they note two weeks moist cold stratification at 45°F improves the uniformity of germination of many spp of cool season grasses (Davis & Kujawski 2001). Moist cold stratify (30 days). Seeds need light to germinate, shallow cover.

seed counts & rates: 93,995 (gnam), 112,154 (gnam04), 113,400; 113,600 (aes10), 115,008 (jfn04), 119,395 (gnam07), 121,600 (pm, ion), 128,466 (gnh02), 135,300 (gna2m04) seeds per pound.

availability: Availability is cyclical, good for a few years as fields come into production & then as the fields senesce, availability becomes tight to nonexistent, with pricing changing by an order of magnitude. Early 2011- early 2014, availability is limited, but about as good as it gets, from one or two growers.

bottom line: Best dormant seeded, 1/3 of lots strongly require cold moist stratification, early spring plantings work 7 years out of 10. Flipflop species. Crossover species. Germ 58.1, 80, na, sd 37, r4.0-98 (94)%. Dorm 26.5, 3.0, 0.0, sd 33.5, r0.0-83 (83)%. Test 32, 31, 29, r20-38 days (#19).**

greenhouse & garden: Easy from seed, moist cold stratify 14-30 days or dormant seed in an unheated coldframe for insurance, have prop stock germ tested before planting untreated seed in greenhouse.

Description: 1.5-3.0, N 2n = 14. key features:



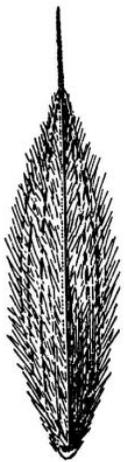
Comments: status: Possibly extirpated in Maine. Threatened in New Hampshire. phenology: Blooms 6,7,8. C3. In northern Illinois, collect seeds in mid-July - August (September). Collect seeds in se Wisconsin in July - August (he99). Attractive dried seed heads, woodland & savanna landscaping, bunching cool season grass. Non-competitive & short-lived. Seed source nursery production, original genetic source mesic savanna remnants near Princeton, Bureau Co & Hennepin, wooded bluffs, Putnam Co, & Peoria Co, DuPage, Kane & Will counties (TNG), & Chicago Botanic Garden.

“A native found occasionally in damp woods as in Ingersol Park west of Rockford & in the woods west of Roscoe.” (ewf55, as *B purgans* L) Fell (1955) lists *B ciliatus*, *B kalmii*, *B latiglumis*, & *B purgans* for Winnebago Co.

Associates: Attracts butterflies (larval host).

VHFS: [*Bromopsis pubescens* (Muhl ex Willd) Holub, *B purgans* L] *Bromus ciliatus* L var *laeviglumis* Scribn ex Shear, *B. pubescens* Muhl ex Willd var *laeviglumis* (Scribn ex Shear) Swallen, *B purgans* auct non L [misapplied], *B purgans* L var *laeviglumis* (Scribn ex Shear) Swallen]

KM Davis & JL Kujawski 2001. Propagation protocol for vegetative production of container *Bromus purgans* plants (Container seedlings), Beltsville - National Plant Materials Center, Beltsville, Maryland. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 9 March 2007). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery. Vedlkamp {J Torrey Bot. Soc. 136-137; 2009)



Bromus purgans

Seed Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted.

Bromus secalinus Linnaeus RYE BROME, aka *BROME DES SEIGLE'S* (*secalinus -a -um* resembling Rye, *Secale*, from Latin *secāle*, rye.) “A common introduced weedy annual.” (ewf55)
Native to Europe. N 2n = 28. ♀





Bromus secalinus

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. 2nd line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. 3rd line drawing public domain from Hippolyte Coste - *Flore descriptive et illustrée de la France, de la Corse et des contrées limitrophes*, 1901-1906. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image.

Bromus tectorum Linnaeus DOWNY BROME-GRASS, aka CHEATGRASS, DOWNY CHASS, (*tectorum* tector'um (tek-TORE-um) of roofs or houses, by extension, growing on roofs or houses, from Latin *tectum*, *tectum*, n., roof, ceiling, or house, & the genitive plural suffix, *-orum*, of or belonging to.)

Habitat: distribution/range: Native to Europe.

Culture: Uncultured.

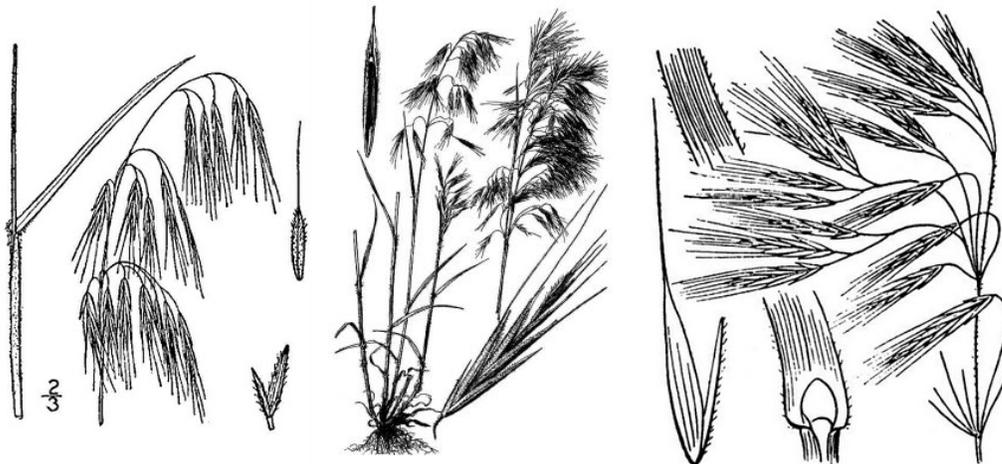
Description: Slender, tufted annual; roots; culms; leaves rolled in the bud-shoot; sheaths not compressed, keeled, softly pubescent, pale green, often pink or purple tinged, split part way only; auricles absent; collar pubescent, pale, narrow, distinct, usually divided; ligule membranous, 1.5-2.5 mm long, truncate, lacerate or coarsely ciliate near apex; blade 4.0-8.0 mm wide, 5.0-12 cm long, flat, softly pubescent, sharp pointed, pale green; margins pilose; heads; spikes; $N 2n = 14$. key features: Distinguished from *B ciliatus* by its longer ligule & from *B inermis* by its pubescence (Nowosad et al 1936).

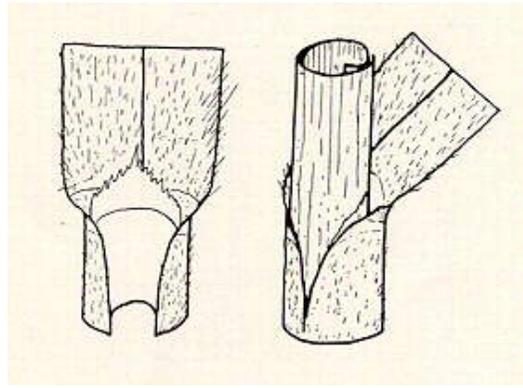
Comments: status: ☛ phenology: Blooms

“A very common, weedy, early flowering introduced annual.” (ewf55)

Associates:

VHFS:





Bromus tectorum

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. 2nd Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. 3rd line drawing public domain from Hippolyte Coste - *Flore descriptive et illustrée de la France, de la Corse et des contrées limitrophes*, 1901-1906. Seed photos Steve Hurst & Jose Hernandez USDA-NRCS PLANTS Database. - Not copyrighted image. Line drawing of collar area from Nowosad et al 1936, courtesy <http://www.caf.wvu.edu/~forage/library/index.htm>

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BUCHLOË Englm. **BUFFALO GRASS** New Latin, a contraction of *Bubalochloë* from Latin *būbalus*, Greek βούβαλος, *boubalos*, buffalo, or Greek *bous*, cow, ox or head of cattle, & χλοή, *khloë*, young grass, similar to Greek *khloos*, light green. A monotypic genus of perennial stoloniferous, sometimes mat-forming, grasses having pistillate & staminate spikelets borne on the same or separate plants, the pistillate in sessile capitate clusters & the staminate in elongated one-sided racemes. A monotypic genus. C4. x = 10.

A recent study (Columbus 1999) recommends including BUFFALOGRASS in the genus *Bouteloua*, as *Bouteloua dactyloides* (Nuttall) JT Columbus, as in w12. BONAP (2010) maps this as a *Bouteloua*. The new terminology started appearing in specifications as of 2009.

The two dots over the ‘ë’ is a diaeresis (also dieresis), indicating the ‘oe’ is not a diphthong, but the two vowels are pronounced in separate syllables, as in naïve or coöperate. Diaereses were formerly much more common in English.

Buchloë dactyloides (Nuttall) Engelmann *IA (more properly *Bouteloua dactyloides* (Nutt.) JT. Columbus) BUFFALO GRASS, aka *BISONGRÄS*, *BÜFFELGRAS*, *CAPIM-ERVA-DE BUFFALO*, *ZACATA BÚFALO*, EARLY MESQUITE, *HERBE AUX BISONS*, (*dactyloides* finger-like, or resembling *Dactylis*, ORCHARD GRASS; from Greek δακτυλος, *dactylos*, finger, & *-oides*, like, resembling, perhaps because of leaf shape or for resemblance of the male flowers to the inflorescence of *Dactylis*, orchard grass.) facu- *Chloridoideae*

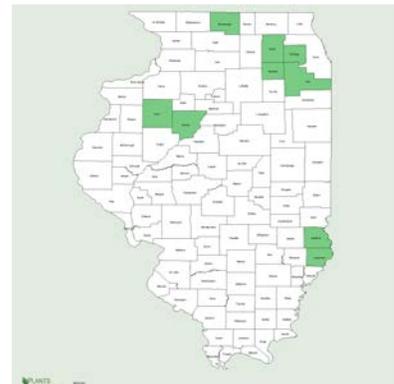
Habitat: Dry prairies, typically in clay soils. Dominant grass in the short prairies, interstitial understory in taller prairies; rare eastward.

BUFFALOGRASS is the most important constituent of the short-grass prairie.

distribution/range: More common west, but a rare native at least in part in Illinois, found in Crawford, DuPage, Kane, Kendall, Knox, Lawrence, Peoria, Will, & Winnebago counties. There are a few populations in Illinois that are considered native. Jones (1958) considered the stand in Springdale Cemetery, City of Peoria, as native (see last photo). Neil Snow (in fna) considers all records from east of the Mississippi to be recent introductions. Illinois is the eastern most extent of this sp range, but it is adventive in Georgia, Mississippi, & Virginia. Considered adventive in Wisconsin. As the popularity of low maintenance turf & salt tolerant roadside plantings increases, so will this sp escape & increase its range.

Culture: ① “No pre-treatment needed. Sow seeds just below soil surface at 70°F & water.” (ew12) ② Sow at 20°C (68°F), germinates in less than two wks (tchn). Growth rate moderate. Seedling vigor high. Vegetative spread rate rapid. Spreads slowly from seed. Dry storage 40°, KNO₃, moist cold stratify (45 days)-light.

seed counts & rates: 40,000 (cci) burrs per pound, 56,000 (gran, wns01), 57,600 (pm) seeds per pound. 275,000 (cci), 335,000 (ecs), 335,360 (usda) seeds per pound. Pasture seeding rate 8-10 pls lbs / acre (4-8 lbs gran seed in spring!). Lawn seeding rate 2-4 pls lbs per 1000 sq ft sown when soil temperatures are warm enough to insure germination. Reclamation seeding rate in arid southwest, 40 pls lbs per acre in spring, summer or fall (Pots



2000). Turf seeding rate 3-4 pls lbs per 1,000 sq ft (Pots 2000). Seeding rate for Bison, residential lawns, athletic fields, commercial sites, parks & recreation 1-3 pls lbs per 1000 ft sq (43-129 lbs per acre), soil stabilization, 10-20 pls lbs per acre; for pasture or range, highway, right of ways 6-8 pls lbs per acre (rate not recommended at all in Illinois). Genesis recommends 4 pls lbs per 1000 square feet in Illinois, period.

cultivation: Space plants on 0.5-1.5' centers. Adapted to medium & fine textured soils. Anaerobic tolerance high(?). CaCO₃ tolerance high. Drought tolerance high. Fertility requirement medium. Salinity tolerance high. Shade intolerant. pH 6.5-8.0, neutral to basic soils. It is common to read that *Buchloë* does not like sandy soils, but our experience in Illinois is to the contrary.

Useful as a low maintenance turf, but it is more suited to more arid areas, with 10-25 inches of precipitation, than to the 35"+ of precipitation of northern Illinois. When established, forms a sage-green lawn, green late spring to early fall, & beige the remainder of the year. It is tolerant of drought, cold winters, poor soil, & foot traffic. *Buchloë* is immune to pests & most diseases, unless watered & fertilized too much. BUFFALOGRASS may go dormant in hot dry summers, but will green up when rains return. BUFFALOGRASS also turns brown as the weather cools in the fall & does not green up until warm weather, well after your neighbors KENTUCKY BLUEGRASS is bright green. Sp is establishment management intensive, regardless of race, color or creed. It does not compete well with weeds & aggressive grasses like BLUE GRASS & BERMUDA GRASS. These must be eliminated before establishing BUFFALO GRASS. Durable once established, but needs dormant season weed control almost annually in the high rainfall TALL grass prairie. Broadleaf weed & C3 grass invasion must be herbicide managed annually. A December dormant seeding is know to have been successful in north central Illinois, but do not try this at home. Plant when temperatures are warm enough for germination and rain is likely.

bottom line: Seed mid-late spring only. Seed is typically pretreated to break dormancy. Germ 72.7, 86, 90, sd 23.4, r28-95 (67)%. Dorm 17, 7.0, 43, sd 18.7, r0.0-62 (62)%. Test 21, 21, na, r14-27 days.**

greenhouse & garden: Do not sow untreated seed & expect much first year germination. Commercial seed is given a sodium hypochlorite treatment to break down the seed coat or potassium nitrate to improve germination. Treated seed is died green. Slow growing, slow to establish, even slower to germinate if not treated with potassium nitrate. With adequate moisture, germination occurs in 14 to 21 days. Dry storage 40°, KNO₃, moist cold stratify (45 days)-light.

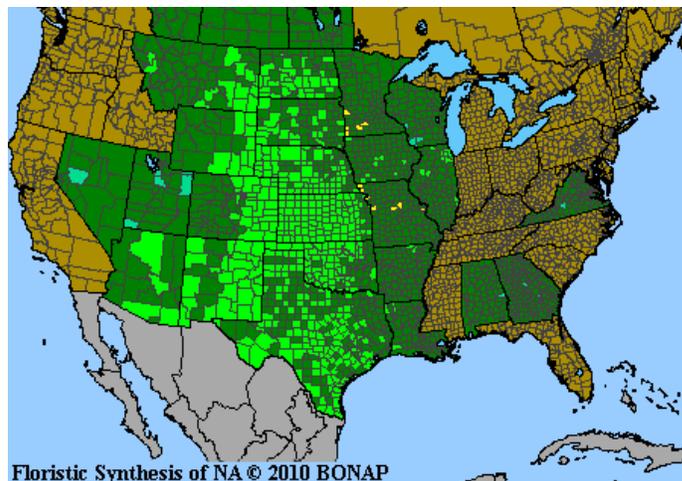
Description: Short, warm season, long-lived perennial, sod forming, native grass, with vigorous stolons, 4-8" tall. (*In some references, it is said to have rhizomes, but many bunch grasses have very short, almost imperceptible rhizomes.*) 12" minimum root depth. N 2n = 20, 40, 56, 60. 2, 4, 6 ploid.

Comments: status: This sp is considered invasive in some parts of its range (SWSS 1998). phenology: Blooms 7,8. C4. Tolerates grazing well & stoloniferous habit (runners) helps soil stabilization. *Buchloë* has been successfully established on many saline/alkaline roadsides in the metropolitan Peoria area, & appears to be thriving with neglect in compacted, droughty, alkaline, man-made soils.

Where it is native, the sp is an important source of forage for wildlife & livestock.

Associates: Larval host for *Hesperia viridis* GREEN SKIPPER. Seed is eaten by birds & leaves are used for nesting material. An important dry-land pasture grass, it is extremely palatable to livestock & wildlife, but said by Martin et al (1951) to be of low food value to large mammals & upland birds. Said to be deer resistant.

VFHS: In Britton & Brown (1913), this sp is *Bulbis dactyloides*. [*Antheplora axilliflora* Steud, *Bouteloua mutica* Griseb ex E Fourn, *Bulbilis dactyloides* (Nutt) Raf ex Kuntze, *Calanthera dactyloides* (Nutt) Kunth ex Hook, *Casiostega dactyloides* (Nutt) E Fourn, *Casiostegia hookeri* Rupr ex Munro, *Lasiostegia humulis* Rupr ex Munro, *Sesleria dactyloides* Nutt, *Sesleria dactyloides* Nutt (basionym)] TEXOKA & COMANCHE are forage varieties & under favorable conditions, may reach 12". Apparently, for deep-seated, psychological reasons, all male or all female strains have been developed to eliminate the offending sexual organs, or to force the buying public to buy 'designer' grasses as cloned plants.



Buchloë dactyloides

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image. 2nd line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA

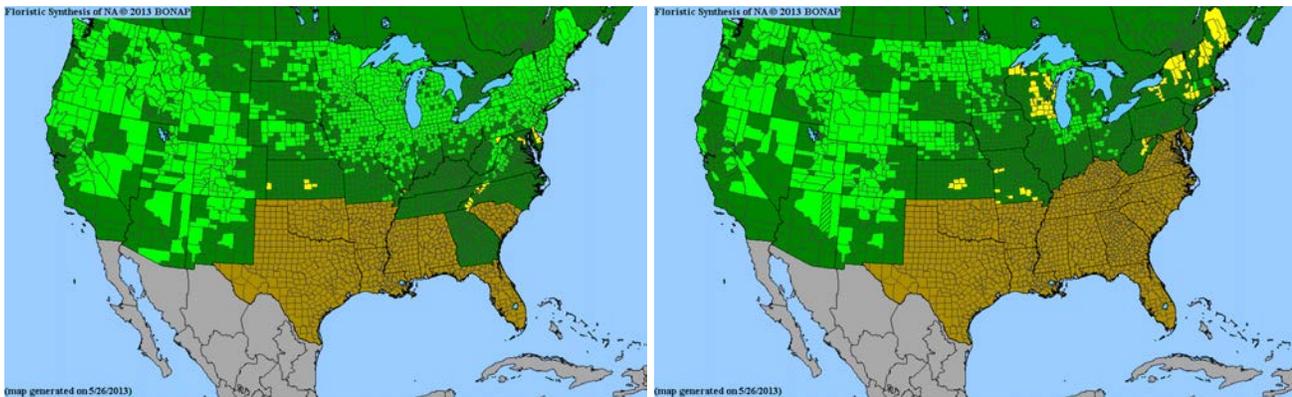
Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. 5th photo by Jock Ingels, Springdale Cemetery, Peoria, Illinois. 6th photo, one plant on sand, Tampico, on a dewey morning. (Note, BuffaloGrass does not grow on sand! Hmm.)

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CALAMAGROSTIS Adanson **REED BENTGRASS, REED GRASS, SMALL REED** *Calamagrostis*, *calamagrostis*, *calamagrostis* (kal-ah-mah-GROS-tis) reed grass, New Latin, compounded name from *Calamus* & *Agrostis*, from Latin *calamus*, from Greek *καλαμος*, *kalamos*, reed, cane, & Latin *agrostis*, grass, couch grass, from Greek *αγρωστις*, *agrostis*, field grass eaten by mules, variously ascribed to *Triticum repens* & *Cynodon dactylon*, green provender, or perhaps a dog's tooth grass, perhaps from *agros*, field. *Triticum repens* is a very old name for QUACK GRASS. Alternately *calamo* may be from Greek mythological figure *Kalamos*, the son of *Maiandros* (*Meander*), god of the Meander River. Our word acre has its root in Latin *ager* & Greek *agros*. *Calamagrostis neglecta* is susceptible to infection by ergot, which is poisonous to livestock (Kingsbury 1964 in Ilpin)

A genus of about 230 spp in the north & south temperate zones. ①“No pretreatment is considered necessary in my experience, (Mary Fisher Dunham) moist cold treatment has worked well. Very light cover. Very good germination.” (mfd93) ②*Calamagrostis arundinacea*, *brachytrichia*, & *epigejos*, Sow at 20°C (68°F), if no germ. in 3-4 wks, move to +1 to +4°C (33-39°F) for 2-4 wks (tchn).

BONAP (2013) maps *C canadensis* & *C stricta* from Illinois. Mohlenbrock (2014) lists *C canadensis* & *C inexpansa* as native in northern Illinois, and *C stricta* as adventive in disturbed soil in n Illinois.



Calamagrostis canadensis & *C stricta* respectively

Calamagrostis canadensis (Michaux) Palisot de Beauvois **BLUE JOINT GRASS**, aka **BLUEJOINT**, **BLUEJOINT REEDGRASS**, **CANADA BLUEJOINT**, **CANADIAN REEDGRASS**, **MARSH PINEGRASS**, **MARSH REEDGRASS**, **MEADOW PINEGRASS**, (*canadensis* -is -e (kan-a-DEN-sis) of Canada or NE USA) Obligate

Habitat: Wet meadows, wetland & riparian sites. Swamps & meadows.

“BLUEJOINT GRASS is common in marshy places & along ditches throughout the county.” (ewf55). distribution/range:

Culture: ①No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③“No pre-treatment needed. Sow seeds just below soil surface at 70°F & water.” (ew12) Sow immediately outdoors. Short viability seed will germinate in the spring (tchn).

seed counts & rates: 1,512,000 (jfn04, aes10), 2,270,000 (gran), 2,992,000 (ew12), 3,057,239 (gnhm02), 3,098,976 (gnh11), 3,266,187 (gna04), 3,413,534 (gna05), 3,837,000 (ecs), 3,847,456 (gnh07), 4,124,352 (agr09512), 4,323,810 (gnma07), 4,480,000 (pm, wns01), 4,540,000 (gnhran02) seeds per pound. In western montane pastures, plant 2 pls lbs per acre in fall or spring (gran) (extremely cost prohibitive with local seed sources). In mixes, plant 0.032-0.063 pls lbs (fluffy seed) per acre (us97), but plugs are far more cost effective.



cultivation: Space plants 2.0-3.0+. In properly prepared soils, or especially in rich, *in situ* soils, BLUE JOINT may spread aggressively by rhizomes. One source recommends plugs or divisions on 0.5-1.5" centers, but wider centers are possible in the long term. In *in situ*, rich, wet-mesic to wet, Corn Belt soils, plant on 34-foot centers for solid stand in 15 years (Yes, Virginia, thirty four foot centers, not 3-4 foot or ¾ foot centers, plan ahead, think ahead; this stuff runs like a banshee).

Best in medium coarse to moderately fine soils, acid to neutral soils, somewhat tolerant of basic soils; prefers saturated soils. Humus soils. Tolerates temporary spring flooding, up to 6". Low drought tolerance. Not tolerant of permanent flooding. Nutrient load tolerance low. Salt tolerance low to none. Siltation tolerance moderate. Full sun. pH 4.5-8.0. In many constructed wetlands, plugs are more successful than direct seeding, but plugs may spread slowly due to compacted, substandard soils.

Individual populations vary widely in seed production from year to year. Seed viability may be low in some lots that are not hulled. Established stands may be mowed in alternate years for maintenance (USDA 1997).

bottom line: Seed early spring or dormant, most lots have low percentage dormant seeds. Ca 25% of lots have dormancy of 20-70%, but the high seed count gives the illusion of great germination. Flipflopish, with crossover tendencies. Germ 61.2, 56, 52, sd 19.9, r24-96 (72)%. Dorm 19.2, 12.5, 0.0, sd 21.2, r0.0-70 (70)%. Test 29, 27, 27, r22-40 days. (#33).**

greenhouse & garden: Hulled seed needs no treatment, & can be dry stored in the refrigerator for 1-2 years. Easy from dry stored seed in the green house. When field sown, soil should be moist to saturated when at normal hydrology, but not inundated. Small seeds should be sown (broadcast or hydroseeded) not drilled. Light, shallow cover or on top of the soil, division of mature plants. Cold moist stratification was recommended in the past with non-hulled seed, suggesting that germination inhibitors may be in the husks.

Description: Perennial tall grass cool season, sod forming, robust; 16" minimum root depth; culms 2.5-4.0(5.0)', blue green foliage, inflorescence "brown".

Comments: Blooms May to June. In northern Illinois, collect seeds in early June- late July. Collect seeds in se Wisconsin in September - October(?) (h99). Used in wetland restoration, natural landscaping. It has a tendency to be aggressively rhizomatous when planted in rich soil. Useful for erosion control in upper shoreline zones & vegetated swales. Great in moist rain gardens. Performs well at low & high elevations. Sp can be a dominant grass in the northern part of its range. Seed source nursery production with genetic source drainage ditches & remnant wetlands, Green River Lowland, Hamilton Twp, Lee Co, Tampico Twp, Whiteside Co, & Gold twp, Bureau Co.

One fall (early Indian summer to be exact) many years ago, Tom Beissel & I were scouting Green River Wildlife area prior to combining the warm season grass stands, when we saw Randy Nyboer. Randy claimed to be harvesting *Calamagrostis canadensis*, claiming a remontant bloom for the sp. In fact, he claimed a better seed crop in the fall than in the spring. I have only once found intact inflorescences in the fall, in a drainage ditch west of Yorktown, E 2900th St, several years ago (subsequently dredged & destroyed). They were the best & largest seed of this sp I have ever seen. I wonder if this was actually a sp of *Muhlenbergia* that Randy & I were picking?

Where BLUE JOINT grows in local drainage ditches, it is more commonly a plant of the upper reaches of the ditches, where the water is cool, clean, sediment free, & seldom flooded except in season.

Associates: Waterfowl eat seeds. Deer & muskrats graze new growth. Provides food & cover for muskrats, deer, & moose. "Said to make excellent hay" (Mosher 1918). Good forage producer & highly palatable when young, but poor palatability when mature.

VHFS: [*Calamagrostis canadensis* var *robusta* Vasey] **Describe varieties.**

SOURDOUGH, a Western commercial variety strongly rhizomatous, establishes easily, good soil stabilizer, very cold hardy.



Calamagrostis canadensis

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image. 2nd Line drawing AS Hitchcock, (rev A Chase). 1950. *Manual of the grasses of the United States*. USDA Miscellaneous Publication No. 200. Washington, DC 1950. USDA-NRCS PLANTS Database, image not copyrighted. 3rd 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. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image.

***Calamagrostis inexpansa* A Gray *brevior* (Vasey) Stebbins** [new nomenclature *Calamagrostis stricta* (Timm) Koeler rev *inexpansa* (Gray) CW Greene] *CT, ME, NH, NY, VT, WI BOG REED GRASS, aka BENTGRASS, NARROW-LEAVED REEDGRASS, NEW ENGLAND NORTHERN REED GRASS, NEGLECTED REED BENT-GRASS, NORTHERN REEDGRASS, POND REED BENT-GRASS, REED BENTGRASS, REED GRASS, SLIMSTEM REEDGRASS, (*inexpansus* -a -um unexpanded; *brevior* shorter, from Latin comparative adjective from *brevis*, short; little, -ior, comparative suffix, more so, to a greater degree.) facw+

Habitat: Wet meadows, moist marly or peaty ground. Wet meadows, shallow marshes, springs, boggy areas, shores & stream banks. In drier habitats than *C canadensis*, ranging to mesic prairies. **distribution/range:** “Wet ground, rare; confined to the n 1/3 of Illinois (m14). Known from mesic-dry mesic Pioneer Cemetery, Camp Grove, also growing along the south fence in the lower part of County Line Prairie (Foley Prairie to you johnny-come-latelys), Lee Co, north of Hannaman.

Culture: Clone, aggressively rhizomatous in rich soils. Seed needs no treatment, preliminary data indicate the hulled seed is nondormant. Growth rate moderate. Seedling vigor low. Vegetative spread rate moderate (the USDA said with an extreme talent for understatement).

seed counts & rates: 2,480,000 (aes10 as *C stricta*), 3,546,875* (gnih2009), 5,300,000 (usda), 9,072,000 seeds per pound. Its like Brylcreem, a little dab’ll do ya.

cultivation: In sites with *in situ*, rich, wet-mesic to wet, Corn Belt soils, plant on 20+ foot centers for solid stand in 15 years (yes, twenty foot centers, not 2.0 foot centers, plan for the long term, think ahead). Adapted to fine & medium textured soils. Anaerobic tolerance high. CaCO₃ tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance medium. Shade tolerance intermediate. pH 5.5-8.0. Said to do well in poorly-drained acidic soils.

bottom line: Seed can be sown spring or dormant, but stand establishment best from plugs (2010, due to availability). Germ 87.5, 86.8, na, r77-98 (22)%. Dorm 3.5, 3.5, na, r0.0-7.0 (7.0)%. Test 28 days.**

Description: 2.0-4.0' Resembles *C canadense*, stems more erect & stout, foliage glaucous, leaf blades stiff, often involute, & panicle is contracted, dense, somewhat beige to brown colored. Most native plant buffs are not aware there are several *Calamagrostis* spp in the Midwest; this sp is easily mistaken for *C canadensis* &

is probably more common than thought.

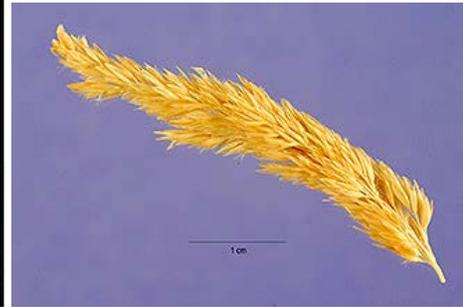
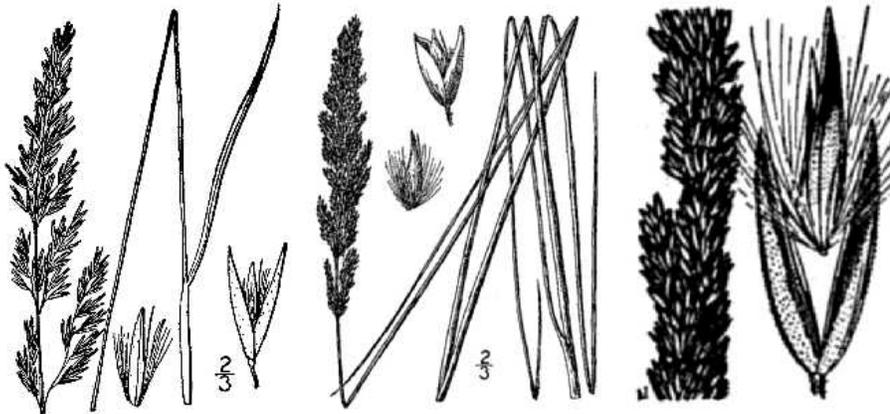
Comments: status: Special Concern in Connecticut & Wisconsin. Endangered in Maine, New Hampshire, & Vermont. Threatened in Michigan & New York. phenology: Blooms 6,7. In northern Illinois, collect seeds in late June- early July. Landscaping, just as attractive as those pedigreed *Calamagrostis* varieties, but aggressively spreading, so don't plant near anything special. Useful in wetland restoration, wetland & mesic slope erosion control, rain gardens, pond margins, cool season, aggressive, sod former.

"Not uncommon in the Sugar River & Coon Creek area & along drainage ditches east of Durand."

(ewf55)

VHFS: This grass is often referred to as *Calamagrostis stricta* (Timm) Koeler ssp *inexpansa* (Gray) CW. Greene, for which the USDA lists 21 synonyms, including *C crassiglumis* Thurb, *C fernaldii* Louis-Marie, *C lacustris* (Kearney) Nash, *C neglecta* (Ehrh) Gaertn.

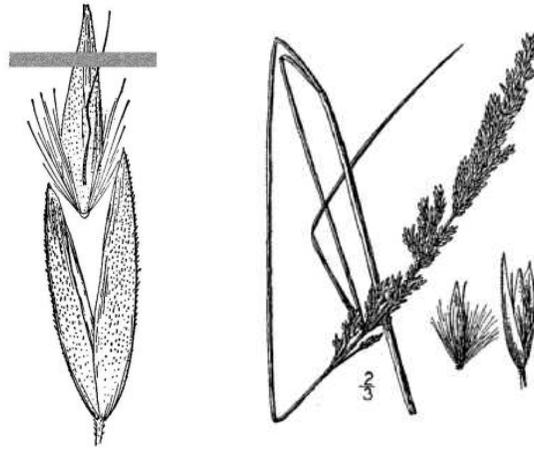
Mohlenbrock (2014) maintains this species in n Illinois, including the variety within the species.



Calamagrostis inexpansa

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

Calamagrostis lacustris (Kearney) Nash *NH, MI NORTHERN REEDGRASS, aka POND REED BENT-GRASS, Considered a synonym of *Calamagrostis stricta* (Timm) Koeler ssp *inexpansa* (Gray) CW Greene. See *C inexpansa*.

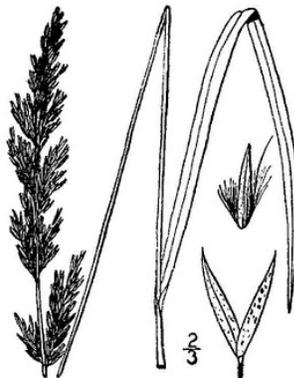


Calamagrostis lacustris

Calamagrostis stricta (Timm) Koeler *MI NARROW LEAVED REEDGRASS, aka NARROW HAIRGRASS, NEGLECTED REED-GRASS, NORTHERN REEDGRASS, REED GRASS, SLIMSTEM REEDGRASS,

Mohlenbrock (2014) considers this species native north of Illinois, adventive in n Illinois in disturbed soils, and a synonym of *C neglecta* (Ehrhart) Gaertner, Mey, & Scherb.

Considered by some as a synonym of *Calamagrostis stricta* (Timm) Koeler ssp *inexpansa* (Gray) CW Greene. See *C inexpansa*. Also native in Scandinavia. 1,400,000 (usda) seeds per pound.



Calamagrostis stricta

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CALAMOVILFA Hackel [or (A Gray) Hackel ex Scribner & Southworth] **SANDREED** *Calamovilfa* Greek *καλαμος*, *kalamos*, reed, & *Vilfa*, an old name for another genus of grass; alternately *calamo* may be from Greek mythological figure *Kalamos*, the son of *Maiandros* (*Meander*), god of the Meander River.

Calamovilfa is native to eastern & central North America & consists of five (4) spp. *Calamovilfa* superficially resembles *Calamagrostis* & *Ammophila* in gross characteristics, & has been placed close to them in the tribe *Agrostideae* by Hitchcock (1951), but they differ in important characteristics. *Calamovilfa* is related to *Sporobolus*, with both having a fruit unlike most grasses with its pericarp free from the seed coat. The fruit is an achene, not a caryopsis (Gould & Shaw 1983). Molecular phylogenetics suggest *Calamovilfa* should be included in *Sporobolus* (Ortiz-Diaz & Culham 2000). C4.

(<http://herbarium.usu.edu/webmanual/info2.asp?name=Calamovilfa&type=treatment>). x = 10. N 2n = 40.

Calamovilfa longifolia (Hooker) Hackel var **magna** Scribner & Merrill *WI PRAIRIE SANDREED, aka BIG SANDGRASS, LONG-LEAVED REED GRASS, PRAIRIE SANDGRASS, SANDREED, SAND-REED GRASS, (long leaved, *longus* for long, extended, & *folius* for leaves) upl *Chloridoideae*

Habitat: Dry sand prairies & sand savannas. Loose sands, abundant on the shores of Lake Michigan, well drained sites, especially deep sands. distribution/range: Variety *magna* grows on dunes & sandy shores around Lakes Superior, Michigan & Huron, with outlying stations in sand or sandy soils. Known from

Illinois, Indiana, Iowa, Michigan, Ohio, New York, Pennsylvania, Wisconsin, & Quebec. Variety *longifolia*, from the interior plains, is considered adventive in Wisconsin & Michigan.

Culture ①No pre-treatment necessary other than cold, dry stratification (pm09). Growth rate moderate.

Seedling vigor medium. Vegetative spread rate rapid. Spreads slowly by seed.

seed counts & rates: Variety *magna* 133,333 (gni02) (Lake Michigan shoreline ecotype), 144,000 (pm06), 210,380 (gnhs06), 225,198 (gnhs14) seeds per pound. Western seed counts, probably from the var *longifolia*, not var *magna*; 226,800 to 273,000 (gran, wns2001), 274,000 (cci, usda) seeds per pound. Plant 3-4 pls lbs per acre in spring. On small projects, seed 1 lb pls per 1000 sq ft, or 10 pls lbs per acre for reclamation (pots). Drill 4 to 7 pls lbs per acre in early to mid spring, doubling rates for harsh erosive sites. Actual seeding rates will vary by region & with the degree of seed processing, hence seed quality as provided by the seed producer. Seed must be planted at a depth that insures adequate moisture, but does not preclude seedling emergence.

cultivation: Adapted to coarse & medium textured soils. Anaerobic tolerance none. CaCO₃ tolerance high. Drought tolerance high. Fertility requirement high. Salinity tolerance low. Shade intolerant. pH 5.6-8.4, somewhat tolerant of acidic & basic soils. Sp is highly rhizomatous & not suited to small plantings or gardens. Increase by division of mature clumps in spring, taking caution for the very sharp rhizomes.

bottom line: Variety *magna* germinates well in the greenhouse after dry stratification, but Genesis test data indicates that some lots benefit greatly from cold moist stratification (23-88% dormant seed). Germ 24.9, 21.5, na, sd 17.4, r5.0-48 (43)%. Dorm 56.9, 53, na, sd 21.9, r23-88 (65)%. Test 24, 26, na, r17-29 days.**

Description: Perennial, native grass; 4.0-6.0' tall, warm season, spreading underground by long, strong rhizomes, open sod-former with 18' long beige seedheads (spikelets usually with a brownish cast). Old, large clones flower & fruit only on the edge of the clone. N 2n = 40, ca. 60.

Comments: status: Threatened in Wisconsin. phenology: Blooms 7,8,9. In northern Illinois, collect seeds in mid-September - October. SANDREED is a C4 grass, but it resumes growth earlier in spring than most warm season grasses (there are several types of C4 metabolism?). Landscaping, very attractive, but not for use in small plantings. The dense wiry root system provides good erosion control in sandy soils. Great Plains genetic material is subject to rust when grown in regions of high rainfall. Dangerously sharp, long scaly rhizomes; use caution when transplanting or dividing. Drought resistant, competitive. Seed source lower Lake Michigan. Several commercial, western varieties are available.

Associates: Moderately palatable to livestock & wildlife in late spring to early summer, can be important forage on winter ranges. Songbirds & small rodents eat seed.

VFHS: from fna:

Most spikelets overlapping no more than 1 other spikelet, usually with a brownish cast var *magna*

Most spikelets overlapping 2-3 other spikelets, usually without a brownish cast var *longifolia*

According to Mohlenbrock, all Illinois material is variety *magna* (a large robust form with large, open panicles), even our stuff out here in God's Country (northwest Illinois sand country). According to the USDA (<http://plants.usda.gov/java/profile?symbol=CALO>), the sp & the variety overlap in Illinois, Indiana, Iowa, Michigan, & Wisconsin. The sp is generally western, with the variety Midwestern, extending east along the shores of the Great Lakes to Lake Erie in New York.

Mosher (1918) reports an 1882 Eggert specimen from St Clair Co as the typical form. The typical form of this sp was described in Saskatchewan & is a less robust plant with a narrow, strict panicle.

Kim Anderson, 1993, Two pioneer dune grasses: *Calamovilfa longifolia* & *Agropyron dasystachyum*. Biological Station, University of Michigan (UMBS)



Calamovilfa longifolia. Last photo showing boy flowers & girl flowers on the same flower do not flower at the same time.

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CENCHRUS Linnaeus **BURGRASS, SANDBUR, SANDSPUR** *Cenchrus* New Latin, from Greek κενχρος, *kenchros*, millet, an ancient Greek name for *Setaria italica*; probably akin to Latin *frendere* to grind. A genus of about 16 spp, mostly tropical & subtropical. The compound fruit is an *anthesomum*.

The spikelets of *Cenchrus* are subtended by an involucre of spines &/or bristles which in most spp are fused into a bur. Bristles are narrow-based & terete. The spines are broad-based & somewhat flattened (not terete) in basal cross section. (w12)

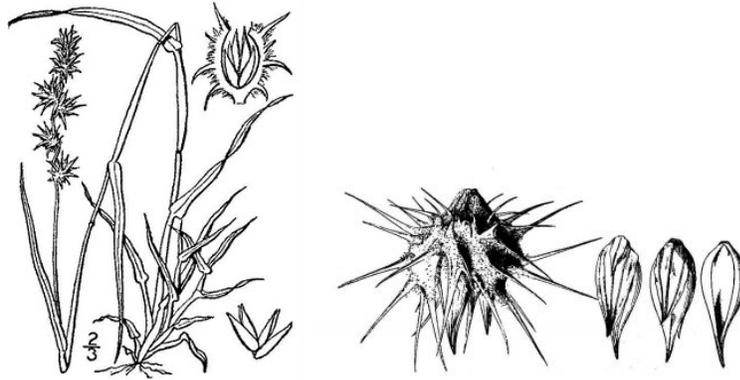
Cenchrus longispinus (Hackel) Fernald *ME, NH, NOX SANDBUR, aka BURR GRASS, COMMON SANDSPUR, FIELD SANDBUR, INNOCENT-WEED, NORTHERN SANDSPUR, (*longispinus -a -um* long-spined, having long spines.) "Sandy soil & sandy roadsides. (*C pauciflorus* Benth.)" (ewf55)

Comments: status: Threatened in Maine & New Hampshire. Noxious weed in California & Washington.

phenology: Blooms ? The seeds are spread by endozoochory.

"Six to ten thousand plants *Cenchrus*, none more than six inches high, sometimes grow on a single quadrat ten feet square, & a third of them produce seeds" (Hart & Gleason 1907).

VHFS: [*Cenchrus longispinus* (Hack) Fern, *C pauciflorus* Benth.]



Cenchrus pauciflorus

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CHASMANTHIUM Link formerly included in *Uniola* Linnaeus **SEA OATS, SPRANGLE GRASS, SPIKE GRASS, WOOD OATS** *Centotheceae* *Chasmanthium* is an old Latin name for a plant, from Greek *khasma*, yawn, gapping, & *anthos*, flower, for the gaping glumes that expose the grain. A small genus (5 spp), endemic to south east North America, of showy perennial grasses having ample panicles of 2-edged spikelets of which the lowermost glumes are empty & including several that are valued as sand stabilizers. x = 12.

One source states there are 9 spp of *Chasmanthium*, all American spp, & 9 spp of *Uniola* from North, Central, & South America. (*Uniola* New Latin, from Late Latin, a kind of plant, probably from *unio* oneness, unity, union, alternately from the Latin *unione glumarum*, meaning united bracts, apparently a reference to the spikelets). Some current usage limits *Uniola* to a sp in Florida & a sp that ranges from Mexico to Ecuador.

Chasmanthium latifolium (Michaux) HO Yates *MI NORTHERN SEA OATS, aka BROAD LEAF CHASMANTHIUM, BROAD LEAF UNIOLA, BROAD LEAF WOOD-OATS, CREEK OATS, FISH-ON-A-POLE, INDIAN SEA OATS, INDIAN WOODOATS GRASS, INLAND OATS, RIVER OATS, SEA OATS, SPIKE GRASS, SPRANGLE GRASS, WILD OATS, (*latifolius -a -um* (la-tee-FO-lee-us) flat-leaved, wide-leaved, broad leaved, from Latin *latus -a -um*, adjective, broad, wide, *-i-*, connective vowel used by botanical Latin, *folium*, leaf) facw *Centotheceae*

Habitat: Moist soil, rocky streambanks, rare, on shaded, open floodplains. Alluvial soils, rich woods, or rocky slopes along steams, especially in limestone areas. distribution/range: Common in southern ½ of Illinois, rare or represented by escaped or cultivated specimens only north half. Illinois is on the northern edge of this plant's range. In our area, not native north of Fulton & Mason counties, but for reasons known

only to landscape architects & “restoration ecologists” it is still specified as native in northern Illinois seed mixes (it is attractive & has a good Chicagoland coefficient). It is a rare native near the southeast tip of Lake Michigan, but not in the Illinois counties. Perhaps if someone actually opened their copy of Swink & Wilhelm ... an epiphany perhaps?

Culture: ①60 days cold moist stratification (pm09). ②Moist cold stratify Ken Schaal, works fine. ③Sow at 23°C (73°F), germinates in about two wks (tchn). Growth rate moderate. Seedling vigor medium. Vegetative spread rate moderate.

seed counts & rates: 64,000 (pm, ew12), 90,000 (usda, ecs), 94,000, 96,141 (gnih02), 104,854 (gnhe11), 120,000 (pn02, jfn04), 125,850 (gnhe14) seeds per pound.

cultivation: Space plants 1.5-2.0' on center. Mesic soils, light shade to woodland. Anaerobic tolerance medium. CaCO₃ tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant, but will tolerate full sun in rich soils. pH 5.0-7.0. (or 6.0-8.0.) It does not naturalize from seed on our farm, but is known to rapidly do so south of our area, as close as Kewanee. Paul James, the ‘Gardening by the Yard’ guy has noted this sp aggressively self-sows in his yard in Tulsa, Oklahoma. In our experience, it is only half-hardy & short-lived. May need staking or other support.

bottom line: Dormant seeding is best for field establishment, with 60% of lots significant to strongly dormant, but essentially non-dormant are known. Flipflop species, with crossover tendencies. C & S Illinois only. Germ 42.3, 39.3, 5.0, sd33.6, r5.0-89 (84)%. Dorm 44.3, 52, 0.0, sd31.7, r0.0-82 (82)%. Test 36, 37, 37, r28-42 days. (#13).**

greenhouse & garden: Easy from seed, moist cold stratify 60 days or dormant seed in an unheated coldframe for insurance, have prop stock germ tested before planting untreated seed in greenhouse. We have had good germination with outdoor treatment. A fall 2006 seed test showed a lot that was nondormant.

Description: 2.0-4.0'. Clump-forming, upright to narrow arching. 10” minimum root depth. Large flat ornamental, drooping spikelets of flattened “oats” & broad leaves. N 2n = 48. key features: ①“This genus is unique among most grasses in having the lower 1-5 lemmas sterile. This is the only sp in Illinois. Spikelets are flattened, large (15-40 mm long, to 20 mm wide).” (Ilpin)

Comments: status: Threatened in Michigan. phenology: Blooms 8,9. Works well in fresh & dried flower arrangements. Highly ornamental, attractive in the landscape, but it is marginally hardy in northwest Illinois & can be short lived. Seed heads reddish or purplish-bronze in late summer. Copper fall color turning salmon to brown by winter. An old friend once described the seeds as “elephant-sat-on flat”. Seed source hunting club near Sanganois Conservation Area, Mason Co. Flowers are sometimes cleistogamous.

Associates: *C latifolium* is a larval host of *Amblyscirtes linda* LINDA'S ROADSIDE-SKIPPER (southern Illinois), *Amblyscirtes vialis* COMMON ROADSIDE-SKIPPER, *Amblyscirtes belli* Bell's ROADSIDE-SKIPPER (southern Illinois), & *Enodia anthedon* NORTHERN PEARLY EYE. SEA OATS is of minor food value for large & small mammals & upland birds. Songbirds & occasionally northern bobwhite quail eat seeds. Foliage is palatable to grazers & browsers.

ethnobotany: The seeds have been used to make bread, biscuits, flour, & mush. (Kunkel 1984, Moerman 1998)

VHFS: [*Uniola latifolia* Michx, *U palmeri* Vasey]





Chasmanthium latifolium Ornamental planting Keewanee, Illinois, north side of 2-story building, with self sown seedlings in bark mulch.

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CINNA Linnaeus 1753 **WOODREED, SWEET REED GRASS** *Cinna* of uncertain origin, a Greek name used by Dioscorides for a kind of grass, cf Latin *Cinna*, -ae, colleague of Marius, poet friend of Catullus. Name unexplained (Gray). *Cinna* was a surname of the Cornelia gens, one of the best connected families and the most influential gens of Republican Rome. The -na ending suggests an Etruscan origin, but is possibly derived from *cincinnatus* -a um or *cincinnus* -a -um, with curly hair. (*Latin words of unknown origin are often said to be of Etruscan origin*). About 4 spp of temperate Eurasia, North America, & South America. x = 7.

Cinna arundinacea Linnaeus **COMMON WOOD REED**, aka *CINNA ROSEAU*, INDIAN REED, REED GRASS, STOUT WOODREED, SWEET WOODREED (*arundinaceus* -a -um (a-run-di-NAH-kee-us) reed-like, (rush-like?), having a culm like tall grasses? in one source, from the Latin, (*h*)*arundo*, (*h*)*arundinis* f a reed, cane, & -aceus, resembles, like.) facw

Habitat: Wet savannas, wet woodlands, thickets. Woods, swamps, wet meadow. distribution/range:

Culture: ① “Moist cold treatment or fall sow” (mfd93). Growth rate moderate. Seedling vigor medium.

Vegetative spread rate none. Seed spread rate moderate.

seed counts & rates: 785,467 (gnhm13), 897,233 (gnaae06), 907,200 (aes10), 965,957 (gna06), 1,040,000 (pm), 1,493,421* (gnh02) seeds per pound.

availability: Sp is short-lived in production beds, hence availability of feast or famine.

cultivation: Adapted to coarse, medium, & fine textured soils. Anaerobic tolerance medium. CaCO₃ tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 4.0-8.5. Plants in full sun are short lived.

bottom line: Spring planting works well, with many lots nondormant, however 1/3 of lots benefit significantly to strongly from dormant seeding. Flipflop species. Crossover species. Germ 54.6, 60, 60, sd 28.4, r11-88 (77)%. Dorm 20.4, 0.0, 0.0, sd 32.8, r0.0-83 (83)%. Test 34, 35, na, r24-44 days. (#14)**

greenhouse & garden: We have had luck fall planting this one, but some lots may only require cold dry storage prior to seeding. Easy from seed, moist cold stratify 30 days or dormant seed in an unheated coldframe for insurance, have prop stock germ tested before planting untreated seed in greenhouse.

Description: Bunch grass, 2.5-4.0 (5.0)', 16" minimum root depth. N 2n = 28.

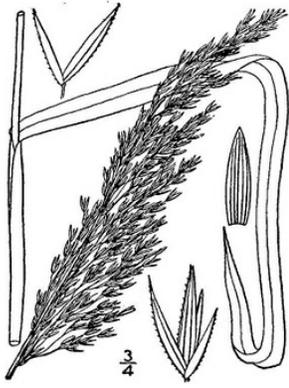
Comments: Blooms 7,8,9. C3. Forms open sod. Attractive seed heads suitable for use in fall bouquets.

Short-lived in full sun, rich soils. Seed source row cropped nursery production, genetic source West Bureau bottoms, Wyandot, Coal Hollow, Bureau Co, & Kane Co.

“Stems single or a few. Usually in wet woods, at times along sloughs & drainage ditches.” (ewf55)

Associates: Provides food for wildlife.

VHFS: [*Cinna arundinacea* L var *inexpansa* Fern & Grisc]



Cinna arundinacea

1st photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

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COLEATAENIA Grisebach 1879 From Greek *koleos*, sheath, and *tainia*, ribbon, fillet, band. A genus of 8 sp of perennial grasses of s North America and the West Indies to South America.

Panicum sections *Agrostoides* and *Tenera* have been transferred to the genus *Coleataenia* Grisebach 1879. “Named as *Sorengia* by Zuloaga, Scataglini, & Morrone (2010), but this name proved to be illegitimate, and was replaced by *Coleataenia* (Soreng 2010)” (w12b). See *Panicum* in part.

DACTYLIS Linnaeus 1753 **COCKSFOOT, COCKSPUR, ORCHARDGRASS** *Dactylis* Greek δάκτυλος, *daktylos*, finger, for the stiff, finger-like branches of the panicle. A genus of perennial grasses having the 2- to 6-flowered spikelets arranged in a one-sided panicle. Two or three spp native to Eurasia.

Dactylis glomerata Linnaeus ORCHARDGRASS, aka COCK’S FOOT GRASS, DEW GRASS, (*glomeratus -a -um* glomerate, clustered in a head, club-shaped, from Latin *glomero, glomare*, to form into a sphere, or a rounded heap.) The common name is for the grass’ use in orchards.

Habitat: Meadows, waste places, & roadsides. Tolerant of wide range of soil & climatic conditions, used throughout most of the USA. Naturalized in open fields, meadows, & roadsides. “A very common early grass of fields & roadsides.” (ewf55) distribution/range:

Culture: Best seeded in spring, but can be successfully late summer seeded.

seed counts & rates: 470,000 (ecs), 650,000 (stock) seeds per pound. Drill 6-8 pls lbs per acre (stocks) Drill 2-3 lb pls per acre in spring (gran). Plant 5-10 lb per acre.

cultivation: Best in medium to moderately fine textured, well drained soils. Some to moderate shade tolerance making it popular in orchards. Moderate shade tolerance. Not tolerant or low saline tolerant. Neutral to acidic soils. pH 5.5-8.2.

Description: Coarse, tufted, glabrous, long-lived, cool-season, perennial, introduced grass, medium to tall, 2-4’; from a dense root system, 12” minimum depth, variously described as bunch (stocks) or sod forming (gran), culms; leaves folded in the bud-shoot; sheaths much compressed, keeled, glabrous, green on upper part but very pale green or white on lower part, split part way, closed below; auricles absent; collar broad, distinct, glabrous, yellowish green, divided by the midrib; ligule membranous, white, 2.0-8.0 mm long, truncate, usually with awn-like point at apex, ciliolate, sometimes split to base; blade to 12 mm wide, 8.0-40 cm long, flat, V-shaped in cross-section near base, sharply keeled below, gradually tapering to an acute point, not ridged but with a deep furrow over the midrib, pale green, sometimes glaucous; margins almost smooth or scabrous; heads; spikes; N. key features:

Comments: 🍀 Highly productive & palatable to livestock & wildlife. Used in rangeland & pasture improvement, primarily in mixes with other grasses & legumes. In seed, it is coarse & unpalatable. Tolerant of grazing pressure. Also works well in erosion control mixes.

Associates: Larval host of *Thymelicus lineola* EUROPEAN SKIPPER (or Skipperling).

ethnobotany: ORCHARDGRASS is known to cause seasonal allergic reactions in certain individuals.





Dactylis glomerata

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

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DANTHONIA AP de Candolle **OATGRASS** *Danthonia* New Latin, irregular from Étienne *Dantheine*, (or M Danthione) of Marseilles, France, 19th century botanist & New Latin *-ia*. A large genus of tufted erect perennial grasses chiefly of the southern hemisphere & North America with narrow leaves & small terminal panicles or racemes of densely crowded florets. About 20 spp in northern hemisphere. $X = 6$, or 9 (?). $N 2n = 18, 36, \& 48$. 2- & 4-ploid.

Danthonia compressa Austin ex Peck *MI FLAT OAT GRASS, aka FLATTENED OAT GRASS, MOUNTAIN OAT GRASS, (*compressus -a -um* Latin compressed, flattened, pressed together.)

Attractive specimen plants.

Comments: Endangered in Michigan.



Danthonia compressa

Danthonia intermedia Vasey *MI WILD OAT GRASS, aka TIMBER OATGRASS, (*intermedius -a -um* intermediate between two forms, as in shape or color, indicating that a sp was halfway between two other spp in regard to one or more characteristics; a space between two parts; or in reference to a hybrid being intermediate between its parents.)

Comments: Special Concern in Michigan.



Danthonia intermedia

Danthonia spicata (Linnaeus) Palisot de Beauvois ex Johann Jakob Roemer & JA Schultes POVERTY OAT GRASS, aka CURLY GRASS, CURLY OAT GRASS, POVERTY DANTHONIA, POVERTY GRASS, WILD OAT GRASS, (*spicatus -a -um* (spee-KAH-tus) with flowers in a spike, spicate, bearing a spike, from Latin *spicatus*, past participle of *spico*, I grow ears, spikes, like wheat or corn (in an Old World sense).) upl

Habitat: Dry & sand savannas, oak openings, dry, poor sandy or gravelly soils. Does not like competition, not found in fertile soils or bold companions. Dry, nutrient-poor oak savannas, old fields, & grassland openings. "Common in dry woods. Rock Cut & Seward's Bluffs Forest Preserves." (ewf55) This sp is an indicator of poor nutrient & poor moisture regimes. It may become a dominant in depleted pastures.

distribution/range: Widespread native grass.

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③Moist cold stratify (Ken Schaal). ④"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) ⑤Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn). Moist cold stratify or dormant seed. Acid scarification is recommended by some for pretreating large lots of seed. Potassium nitrate treatment has also been shown effective.

POVERTY OATGRASS seed is said to be highly dormant & may form a long-term (decades) soil seed bank (dormancy in soil due to possible photodormancy?). This seed bank may persist after all aboveground populations are gone, but will be stimulated by fire or other disturbances. (Scheiner 1989) Some populations may be drought dependent, not fire dependent. Reproduces by seed & by tillering.

seed counts & rates: 449,600 (ew12), 522,740 (gnam06), 546,988 (gnam04) seeds per pound.

cultivation: Space plants 0.50-0.75'. Dry soils, full sun to partial shade. Tolerates pH as low as 4.5-4.7.

bottom line: Seed early spring or dormant, most lots have low percentage dormant seeds (2.0%), but a recent lot is strongly dormant (80%). This species should be spot-seeded in likely microhabitats & not included as a component in general seed mixes. Flip flop, potential crossover species. Germ 70.8, 87.5, na, sd 32.9, r14-94 (80)%. Dorm 21, 2.0, 2.0, sd 34.1, r0.0-80 (80)%. Test 29, 28, na, r27-31 days. (#4)**

greenhouse & garden: Seed needs no treatment other than cold dry. Moist cold stratify or dormant seed may provide quicker & more uniform germination.

Description: Perennial, light green, bunching, native grass, 0.75-2.0'; culms; leaves folded in the bud shoot; sheaths not compressed, not keeled, usually pilose-pubescent, pale green to white, split to base; auricles absent; collar narrow, continuous, with longhairs on margins, lighter in color than the blade; ligule a fringe of hairs 0.2-1.2 mm long; blade 2.0-3.0 mm wide, basal leaves 5.0-15 cm long, not keeled, very sharply pointed, flat with margins becoming involute in dry weather, twisted & curled when dead, generally sparsely pilose but often glabrous; upper surface dull green or glaucous, ridged near midrib; under surface bright green, sometimes glossy, not ridged; margins slightly scabrous; heads; spikes; N. key features:

Comments: status: phenology: Blooms 5,6. C3. In northern Illinois, collect seeds in late June- early July. In southeast Wisconsin, collect seeds in September (?). Although it grows in 46 states, *Danthonia* is extremely poorly represented in the seed trade. It is sold as packets by a native nursery near St. Louis, or as Minnesota ecotype. Local Illinois seed is sometimes available. Non-competitive, short-lived. This sp

produces normal chasmogamous flowers & almost-basal, cleistogamous flowers that are beyond the reach of cattle & rarely grazed. Seed source DeKalb Co.

Associates: *Danthonia spicata* is considered obligately mycorrhizal (Darbyshire & Cayouette 1989). Over much of its range, *D spicata* is infected by the epiphytic fungus *Atkinsonella hypoxylon* (*Balansiae*). *A hypoxylon* is specific to *Danthonia*. (Clay 1994)

“Uninfected *D spicata* produce two flower types. Potentially outcrossed, wind pollinated chasmogamous flowers are produced at the tip of the reproductive stalk. Obligately self-fertilized cleistogamous flowers are produced in the axils of the leaf sheaths along the reproductive stalk. In infected plants, a fungal sclerotium, or “choke,” is produced at the initiation of host plant flowering & causes abortion of all but a few infected cleistogamous seeds at the base of the much-reduced reproductive stalk. Plants infected by *A hypoxylon* often have higher growth rates than uninfected plants & so this symbiosis is generally considered mutualistic.” (Diehl 1950, Clay 1984, 1990a in McCormick et al 2001) McCormick et al (2001) found that infection may be disadvantageous in stressed plants & may lead to death during extreme stress.

POVERTY OAT GRASS is of minor food value to upland birds, but of poor palatability to most wildlife. It is grazed by cattle when it is young, but it soon becomes wiry, tough, & unpalatable.

VHFS: [*Avena spicata* L, *Danthonia spicata* (L) Beauv ex Roemer & JA Schultes var *longipila* Scribn & Merr, *D spicata* (L) Beauv ex Roemer & JA Schultes var *pinetorum* Piper, *D thermalis* Scribn]

K Clay, 1994, Hereditary symbiosis in the grass genus *Danthonia*, New Phytologist. 126: 223-231

SJ Darbyshire & J Cayouette, 1989, The Biology of Canadian Weeds. 92. *Danthonia spicata* (L)

Beauv in Roem & Schult Canadian Journal of Plant Science. 69: 1217-1233.

MK McCormick, KL Gross, & RA Smith, 2001, *Danthonia spicata* (*Poaceae*) & *Atkinsonella hypoxylon* (*Balansiae*): environmental dependence of a symbiosis, American Journal of Botany 88(5), 903-909



Danthonia spicata

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DESCHAMPSIA Palisot de Beauvois **HAIRGRASS** *Deschampsia* Deschamp'sia (deh-SHOMP-see-a) named for Jean Louis Auguste Loisleur-Deslongchamps, a French botanist (1774-1846 (1849?). A genus of

perennial grasses of cold & temperate regions having loose or compact panicles with 2-flowered spikelets. There are over 50 (40) spp of temperate & cold regions, mainly in the Northern Hemisphere. ☉*Deschampsia caespitosa* & *flexuosa*, sow at 20°C (68°F), germination slow (tchn).

Deschampsia caespitosa (Linnaeus) Palisot de Beauvois subsp ***glauca*** (Hartman) Hartman TUFTED HAIR GRASS, aka SMALL-FLOWERED TICKLE GRASS, (*caespitosus -a -um* (locally ses-pi-TO-sus, classically kes-pi-TO-sus) growing in tufts, tufted, clumped, clump-forming, from *caespes*, a turf, sod; or field; *glaucus*, gray, bluish-green or gray, covered with 'bloom', from Latin *glaucus -a -um* bluish- or greenish-gray, from Greek γλαυκός, *glaukos*) The specific epithet is also spelled *cespitosa*. obl The common name is a reference to the fine, hair-like leaf blades growing in a dense tuft.

Habitat: Intermittent wet spots in old dolomite quarries, calcareous seeps, cool limy springs, moist sites. For var *glauca*, shores, mountains, & damp, often calcareous soils (Fernald). distribution/range: Along creeks and in swamps, rare; confined to extreme ne Illinois (m14). A complex circumboreal sp.

Culture: ☉No treatment other than cold dry stratification. May self sow. ☉ISTA germination methods include 3 day prechill & potassium nitrate.

cultivation: 1,085,349 live seeds (s&s sta labs), 1,423,059 pure seeds (s&s sta labs), 1,474,026 (gnhe14), 1,706,767 (gnawn07), 2,496,000 (aes10), 2,500,000 (gran, wns01) seeds per pound. Drill 2-3 lb pls per acre in fall (gran). Commercial seed, often of questionable nativity, is readily available.

cultivation: Zones 4-9. Average, medium, to well-drained soils in partial shade. Best in moist soils high in organic matter. Best in medium to moderately fine soils. Neutral to acidic soils. Tolerates acidic soils. Trim old foliage & shoots back in late winter. Companion plants hostas & ferns.

bottom line: Most lots have low percentage dormant seeds (0-2.0%), or are non-dormant. Germ 80.9, 89.5, 92, sd 26.7, r2.0-96 (94)%. Dorm 10, 0.0, 0.0, sd 28.7, r0.0-96 (96)%. Test 30, 28, na, r14-44 days. (#10:0)**

Description: Cool-season, leafy, densely tufted, medium tall perennial bunchgrass; forms low, dense tussock to 16", spread 1.0-2.0'; culms 2.0-3.0';

Comments: Blooms late May to late June (7-9 Missouri).

Landscaping, commonly sold as an ornamental grass & can be used as a ground cover. Grows well in modest shade, but does not flower in dense shade. Sp can be used as shaded specimen plantings, shaded groupings, or massed in woodland gardens or naturalized areas. Shady borders, shaded rock gardens, or moist areas along ponds & streams. Inflorescence is showy, with shades of gold, silver, purple, & green, in a cloud of subtle colors above the foliage. Seed stalks turn yellowish tan after flowering as the seed ripens, providing winter interest. Foliage is semi-evergreen as far north as St. Louis.

Associates: Larval host of *Thymelicus lineola* EUROPEAN SKIPPER (Skipperling). Attracts birds. Very palatable to livestock & wildlife. No serious disease or insect problems.

VHFS: [*Deschampsia caespitosa* (L) P Beauv var *glauca* (Hartm) Lindm, non Regel, *D glauca* Hartm] The wide-ranging var *glauca*, bluish green, with a lax, diffuse panicle. A veritable profusion of improved (no less) selections are available, even in pink!





Deschampsia caespitosa

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

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DIARRHENA Palisot de Beauvois **BEAKGRAIN, TWINGRASS** *Diarrhena* from Greek δι-, *di-*, for δίς-, *dis-*, twice, & ἀρρην-, *arrhēn*, male, referring to the two anthers; or ἀρρηνής, *arrhenes*, rough, for the two scabrous keels of the upper paleae. Perennial grasses of rich woods, two (one) spp in eastern North America, $x = 10$, four spp in eastern Asia, $x = 19$, sometimes separated as *Neomolina* Honda.

Diarrhena in e North America has been traditionally treated as a species with 2 varieties, *D americana* var *americana* & *D americana* var *obovata* Gleason. In Illinois, var *americana* is rare & known from rich woods in Alexander, Hardin, Jackson, Pope, & Union cos, while var *obovata* is known from low, shaded woods, moist ledges, & base of limestone cliffs throughout the state. The varieties are often treated as the species *D americana* Palisot de Beauvois, EASTERN BEAKGRAIN, & *D obovata* (Gleason) Brandenburg, WESTERN BEAKGRAIN. (M14)

rewrite as **D obovata**

Diarrhena americana Palisot de Beauvois *MD, MI, WI (NY, PA) BEAK GRASS, aka AMERICAN BEAKGRAIN, TWIN OATS, (*americanus* –a -um (a-me-ri-KAH-nus) of the New World, American; *obovata* inverted ovate, egg-shaped with the large end up.) [facu]

Habitat: Mesic red oak savannas, wet savannas, & mixed deciduous forests. “Sp is distributed in low, shaded woods; moist ledges & base of limestone cliffs” (Ilpin). In southern Michigan, this grows in floodplain forests, as was noted by Pepoon (1927) for the Chicago area. distribution/range: Almost all of material in Illinois is var *obovata* Gleason.

Culture: ①60 days cold moist stratification. Seeds germinate most successfully in cool soil (pm09). 40,000 (pm), 43,243 (gni), 47,292 (gnh01), 47,361 (gna05), 48,000 (agr09222), 48,364 (gnh03), 49,168 (agr09), 50,487 (gna04), 52,744 to 53,120 (jfn04), 62,423 (gna05) seeds per pound.

cultivation: Prefers rich moist soils. Partial shade to full shade.

bottom line: Seed test data indicates dormant seeding is absolutely necessary, dormancy from 38% to 96%. Sp has a modest increase in dormancy over the past decade. Typically strong dormancy, >89% since 2008 crop. Germ 10.1, 4.0, 4.0, sd 13.3, r0.0-54 (54)%. Dorm 78.2, 88, 90, sd 17.2, r38-96 (58)%. Test 33, 32, 32, r25-42 days. (#17).**

greenhouse & garden: Easy from seed, moist cold stratify 60 days or dormant seed in an unheated coldframe for insurance, have prop stock germ tested before planting untreated seed in greenhouse.

Description: Erect perennial, native grass, 1.5-3.0'; spreads vegetatively by shallow rhizomes & can form large clones; N 2n = unknown. key features: The relatively long, shiny leaves with an off-center midnerve & unusually shaped bottlenose seeds are distinctive. “Sp has a distinctive "bottle-shaped" grain (beaked caryopsis). Versus variety *americana*, this plant is smaller & glabrous. According to one author, this is "one of the more handsome woodland grasses.”” (Ilpin)

Comments: status: Endangered in Maryland & Wisconsin. Threatened in Michigan. phenology: Blooms 7,8. Late flowering, but a cool-season grass, staying green into late fall. In northern Illinois, collect seeds in late September - November. Useful in landscaping, savanna restoration, ornamental, shady ground cover when planted on 1.0' centers, & shaded slope erosion control. “These plants keep their shining dark green foliage well into winter & sp is recommended as a ground cover in shady gardens & slopes” (Ilpin). Excellent woodland prescribed burn fuel. Seed source nursery production, originally from Lawton’s Woods, Concord twp, near Buda, & Bureau Creek bluff slopes near Lake Arispie, Arispie Twp. Persists & spreads by roots & seeds in well drained black sands, but is not tolerant of *Actinomeris* or *Agastache spp.* competition.

O'Connor & Penskar (2004) suggest the large seeds are an adaptation for dispersal by floodwaters, but we have never seen this in a floodplain. In fact, one local population near Buda (BYOU-duh, not BOO-duh) grows along a glacial meltwater channel that has not served as a floodplain in about 17,000 years. It does grow on the lower slopes of the south-facing, lower Bureau Creek bluffs, which may be in the 5000-year flood plain (presettlement context, not post-Bush administrations context), but we do not see a significant dispersal advantage. They can't tread water.

Associates: No serious insect or disease problems. Wild turkeys eat seeds. Restoration ecologists drink Wild Turkey, or should.

VHFS: [*Diarrhena diandra*, *Diarina festucoides* Raf, *Korycarpus arundinaceus* Zea ex Lag]

Our material, & most of the material in northeast Illinois, all Michigan & Iowa material is var *obovata* Gleason, which some authorities call *D obovata* (Gleason) D M Brandenburg, OBOVATE BEAKGRAIN. This taxon is endangered in New York & Pennsylvania. $N 2n = 60$.

The two taxa grow in similar habitat & their ranges overlap, but there are no reliable intermediate specimens. *D americana* grows in rich, moist woods from Missouri to Maryland & south to Oklahoma & Alabama. Its range is primarily to the east of the range of *D obovata*. *D obovata* also grows in rich woodlands from South Dakota to Ontario & New York & south to Texas, Tennessee, & Virginia. It is most common in the prairie states. Both taxa are recognized by <http://www.vplants.org/> a Virtual Herbarium of the Chicago Region.

DM Brandenburg, JR Estes, & SL Collins. 1991. A revision of *Diarrhena* (*Poaceae*) in the United States. Bull. Torrey Bot. Club 118:128–136.

RP O'Connor & MR Penskar. 2004. Special Plant Abstract for *Diarrhena americana* (American beak grass). Michigan Natural Features Inventory. Lansing, MI. 3 pp.





Diarrhena americana, last photo *Diarrhena* turf, red oak woods, Buda.

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DICHANTHELIUM (AS Hitchcock & Chase) Gould **ROSETTE GRASS, WITCH GRASS** From Greek *di*, twice & *anth*, flowering, referring to the two flowering periods of many spp. The rosette-forming Panicums. These grasses often form basal winter rosettes of leaves with short ovate to lanceolate blades that are often very different from the cauline leaves. Approximately 72 spp, 34 in US & Canada. X = 9.

“within *Panicum*, *Dichantheium* can be distinguished at the subgeneric level by the following set of characters: lax inflorescences; ellipsoidal to obovoid spikelets; upper glume & lower lemma usually 7-11 nerved; upper antherium apiculate or shortly crested, & simple papillae on the lemma & palea. Anatomically, all spp are non-kranz or C3, with the outer parenchymatous sheath lacking specialized chloroplasts” (Zuloaga, Ellis, & Morrone 1993).

Please refer to the discussion in the genus introduction in Flora of the Southern and Mid-Atlantic States, November 2012 version, by Alan S. Weakley, available at <http://www.herbarium.unc.edu/flora.htm>

Dichantheium plants perennial; basal leaves form winter rosette; photosynthesis C3; primary panicles terminal, developing April-June or July, at least partially chasmogamous, secondary panicles June to fall, partially or totally cleistogamous.

Panicum plants annual or perennial; no basal rosette; photosynthesis C4 or C3(?), primary panicles terminal or axillary, appearing after mid-summer, chasmogamous.

Dichantheium X scoparioides (Ashe) Mohlenbrock PANIC GRASS,

Habitat: distribution/range:

Culture:

Description: Native perennial grass:

Comments: status: phenology: Blooms 6-10. C3.

Associates:

VHFS: [*Panicum scoparioides* Ashe, *P villosissimum* Nash var *scoparioides* (Ashe) Fern]

Dichantheium acuminatum (Swartz) Gould & Clark ***fasciculatum*** (Torr) Freckm PANIC GRASS, (*acuminatus -a -um* Latin acuminate, long-pointed, pointed, tapering to a narrow point, with a long, narrow & pointed tip, from Latin *acumen*, *acuminis*; *fasciculatus -a -um* fascicula'tus (fa-sik-yoo-LAY-tus) Latin *fasciculatus*, fascicled, clustered, in close clusters or bundles, banded, in bundles, from *fasiculus*, little bundle, little packet, & *-atus -ata -atum*, possessive of or likeness of something.)

Habitat: distribution/range: All Illinois counties.

Culture:

Description: Native perennial grass;

Comments: status: phenology: Blooms 5-11. C3.

Associates:

VHFS: [*Panicum lanuginosum* Ell, *P lanuginosum* Ell var *implicatum* (Scribn) Fern, *P subvillosum* Ashe] add (?) *P lanuginosum* Ell var *fasciculatum* (Torr) Fisch & Lall.

Dichanthelium acuminatum (Swartz) Gould & Clark **lindheimeri** (Nash) Gould & Clark PANIC GRASS, (*acuminatus -a -um* Latin acuminate, long-pointed, pointed, tapering to a narrow point, with a long, narrow & pointed tip, from Latin *acumen*, *acuminis*; *lindheimeri* for Ferdinand Jacob *Lindheimer* (1801(?)–1879), German intellect, botanist, & expatriate, then moved to Texas.)

Habitat: distribution/range:

Culture:

Description: Native perennial grass;

Comments: status: phenology: Blooms 5-11. C3.

Associates:

VHFS:

Dichanthelium boreale (Nash) Freckmann *IL NORTHERN PANIC GRASS, (*borealis -is -e* (bo-ree-AH-lis) northern, of the North wind, of the North, from Latin *boreas*, *boreae*, from Greek βορρᾶς, *boreas*.)

Habitat: Marshy prairies. distribution/range: Cook & Lake cos. Illinois is at the southern limit of this sp range.

Culture:

Description: Native perennial grass; N 2n = 18.

Comments: status: Endangered in Illinois. phenology: Blooms C3.

Associates:

VHFS: [*Panicum boreale* Nash]

Dichanthelium boscii (Poiret) Gould & Clark NOT COMMONLY CALLED, aka BOSC'S PANICGRASS, *PANIC DE BOSC*, section *Dichanthelium*

Habitat: Semi-open areas in dry oak-hickory woods. distribution/range:

Culture:

Description: Native perennial grass; forming small clumps; N 2n = 18, 36. key features:

Comments: status: phenology: Blooms primary panicles chasmogamous April through June, sometimes again in the fall; secondary panicles partially cleistogamous July through September. C3.

Associates:

VHFS: [*Dichanthelium boscii* (Poir) Gould & CA Clark var *molle* (Vasey) Mohlenbrock, *Panicum boscii* Poir, *P boscii* Poir var *molle* (Vasey) AS Hitchc & Chase]

Dichanthelium boscii (Poiret) Gould & Clark var **molle** (Vasey) Mohlenbrock (*mollis -is -e* soft, soft hairy, tender, pliant, supple, usually meaning pubescent like velvet, from Latin *mollis*, adjective, swaying, swinging; pliant, tender, easily moved; soft, graceful, delicate.)

Habitat: distribution/range: Known from four counties in southern Illinois.

Culture:

Description:

Comments: status: phenology: Blooms 6-10. C3.

Associates:

VHFS: [*Panicum boscii* Poir var *molle* (Vasey) AS Hitchc. & Chase]

Dichanthelium clandestinum Linnaeus (Gould) BROAD-LEAVED PANIC GRASS, aka DEER TONGUE, DEER-TONGUE GRASS, CORN GRASS,

Habitat: Moist shaded ground where soils are sandy & somewhat acid, drier sandy soils, & near streams in shady areas. Anaerobic tolerance medium. CaCO₃ tolerance low. Drought tolerance high. Fertility requirement low. Salinity tolerance low. Shade tolerance intermediate. pH 4.0-7.5.

Culture: Seed 10 lbs per acre alone. Low seedling vigor. Moderate growth rate. 45,008 (jfn2004), 280,000 (usda, ecs) seeds per pound.

Description: Native perennial grass, or plants annual, without creeping rootstocks, plants generally smooth throughout; key features:

Comments: status: phenology: Blooms June to September. C3. Good for erosion control in acid mine spoils.

Associates: Provides food & cover for wildlife.

VHFS: [*Panicum clandestinum* L, *Dichanthelium clandestinum* (L) Gould]

Dichanthelium columbianum (Scribner) Freckmann *IL HEMLOCK PANIC GRASS,

Habitat: distribution/range: In Illinois, DuPage, Kankakee, LaSalle, & Ogle counties.

Culture:

Description: Native perennial grass; roots minimum depth; culms; leaves; sheaths ;heads; spikes; N. key features: “Tufted; sheaths & culms pubescent with long & sort hairs; autumnal form spreading, much branched.” (Ilpin)

Comments: status: Endangered in Illinois. phenology: Blooms C3.

Associates:

VHFS:

Dichanthelium commutatum (Schultes) Gould PANIC GRASS,

Habitat: distribution/range:

Culture:

Description: Native perennial grass;

Comments: status: phenology: Blooms 6-10. C3.

Associates:

VHFS: [*Panicum commutatum* Schult]

Dichanthelium depauperatum (Muhlenberg) Gould STARVED PANIC GRASS, upl

Habitat: Dry prairies, sand prairie, & limestone prairies.

Culture: Fresh seed or fall plant.

Description: culms 0.5-.75';

Comments: Blooms 5,6,7,8, remontan 7-11. C3. Calcareous, non competitive

“Uncommon in dry places. High prairie south of Harrison & the gravel hills bordering Rock River.”
(ewf55)

VHFS: [*Panicum depauperatum* Muhl]

Dichanthelium dichotomum (Linnaeus) Gould FORKED PANIC GRASS,

Habitat: distribution/range:

Culture:

Description:

Comments: status: phenology: Blooms 5-10. C3.

“In flat and marshy situations ...” (Short 1845).

Associates:

VHFS:

Panicum implicatum Scribn WOOLLY PANIC-GRASS, (*implicatus -a -um* entangled, woven in.)

Habitat: Sandy, dry, & sterile pastures & meadows. distribution/range:

Culture: Broadcast fresh seed in new plantings, dormant seed or cold moist stratify. 426,316 (gnh11) seeds per pound. Monitor for hydrophily.

bottom line: Initial seed test datum indicates dormant seeding is strongly required. Broadcast frost & early spring seeding, drill late spring. Germ 12%. Dorm 85%. Test 25 days.**

Description: Native, low growing, tufted, perennial panic-grass, with soft, hairy blades & sheaths; roots minimum depth; culms; leaves rolled in the bud-shoot; sheaths not compressed, not keeled, densely papillose-pilose with erect hairs 1 to 2 mm long, split to base, loose; margins not as broadly hyaline as in *P capillare*; auricles absent; collar broad, distinct, pubescent, yellowish or light green; ligule a fringe of long (3.0-5.0 mm) & short (0.5-1.0 mm) hairs; blade 3.0-7.0 mm wide, 3.0-5.0 cm long, flat, cordate at base & tapering to the pointed tip, long, firm, erect or ascending, pilose on the upper surface with erect, whitish hairs 2.0-4.0 mm long, densely appressed-pubescent on the lower surface, green, not ridged, not keeled; midrib not conspicuous; margins often involute towards the apex, scabrous. The basal leaves forming the winter rosette are 4.0-5.0 mm wide, 1.0-2.0 cm long, lanceolate-ovate, acuminate, coriaceous, green in the autumn, becoming brown & persisting in the following summer, glabrous on the surfaces but long-ciliate on the margins, finely ridged; heads; spikes; N. key features: “This grass is distinguished from *P capillare* by its

longer ligule & long-hairy upper surface of blade, & by its smaller but coarser foliage. Other spp of *Panicum* (*P tennesseense* Ashe, *P boreale* Nash & *P huachucae* Ashe) of similar growth habits are often found in pastures & meadows. The first two may be distinguished from *P implicatum* by their relatively glabrous blades & the latter by its short appressed pubescence.” (Nowosad et al 1936)

Comments: status: phenology: Blooms In northern Illinois, harvest seeds late June. Seed source Whiteside Co.

“Most common in moist sandy places in Coon Creek Bottom (*P lanuginosum* Ell. var *fasciculatum* (Torr) Fern)” (ewf55 as *P huachucae* Ashe).

“Common in sandy & in dry places & in open woods” (*P lanuginosum* Ell var *implicatum* (Scribn) Fern) (ewf55 as *P implicatum* Scribn.).

“In open woods east of Roscoe, in Rock Cut Forest preserve & in the sand west of Shirland” (ewf55 as *P tennesseense* Ashe).

Associates:

VHFS: “The taxonomy of this sp is the stuff of which bad dreams are made.” (sw94) [*P Lindheimeri* Nash, var *implicatum* (Scribn) Fern, *P lanuginosum* Ell, var *implicatum* (Scribn) Fern]



Panicum implicatum

1st photo by Jock Ingels

Dichanthelium jooi (Vasey) Mohlenbrock *IL PANIC GRASS,

Habitat: distribution/range: Johnson & Union cos. Illinois is at the northern limit of its range.

Culture:

Description: Perennial grass; N. key features: “Culms decumbent, tufted, glabrous; internodes purplish; pubescent spikelets; autumnal form not reported in Illinois.” (Ilpin)

Comments: status: Endangered in Illinois. phenology: Blooms C3.

Associates:

VHFS: [*Panicum jooi* Vasey] “May be part of *Dichanthelium commutatum* (Schult) Gould” (Ilpin)

Dichanthelium latifolium (Linnaeus) Gould & Clark BROAD-LEAVED WITCH GRASS,

Habitat: “Common in woods.” (ewf55) distribution/range:

Culture:

Description:

Comments: status: phenology: Blooms 6-10. C3.

“In flat and marshy situations ...” as *Panicum latifolium* L. (Short 1845).

Associates:

VHFS: [*Dichanthelium latifolium* (L) Harvill, *Panicum latifolium* L]



Dichanthelium latifolium

Dichanthelium laxiflorum (Lamarck) Gould

Habitat: distribution/range:

Culture:

Description: Native perennial grass;

Comments: status: phenology: Blooms 5-9. C3.

Associates:

VHFS: [*Panicum xalapense* HBK, *P laxiflorum* Lam]

Dichanthelium leibergii (Vasey) Freckmann PRAIRIE PANIC GRASS, aka LEIBERG'S PANIC GRASS (*leibergii* honoring John Bernhard Leiberg, (1853-1913), Swiss born botanical explorer, forester, bryologist, & author of several books, including Contributions to the Flora of Idaho & Minnesota.) facu+

Habitat: Mesic & dry prairies & mesic prairie savannas.

Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ②Sow at +2 to +4°C (34-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn). Sow immediately, successional restoration. Cold moist stratify 60 days worked well on Lake Co seed 2011 crop. 204,800 (aes10) seeds per pound.

"*Panicum leibergii* Mesic prairie. Blooms June? Pistils MAROON. Harvest July? 8"; SEEDLING TRANSPLANT. Seeds should be sown while fresh for germination next spring. Blooms late 1st year. A handsome cool-season grass." (rs ma)

Description: Native perennial grass; culms 1.5-2.0'; N. key features:

Comments: status: phenology: Blooms 5,6,7, & 8,9,10. C3. In northern Illinois, collect seeds in late June-early July. Collect seeds in se Wisconsin in September - October (Heon et al 1999). Cool season bunch grass. Attractive, "misty" inflorescence, dwarf plantings, xeriscaping. Persists in *Bromus inermis* sods! Seed source Whiteside Co.

"Prairies in the southwest part of the county & east of Winnebago." (ewf55)

Associates:

VHFS: [*Panicum leibergii* (Vasey) Scribn]

Dichanthelium linearifolium (Scribner) Gould SLENDER-LEAVED PANIC GRASS,

Habitat: distribution/range:

Culture:

Description: Native perennial grass;

Comments: status: phenology: Blooms 5-9. C3.

Associates:

VHFS: [*Panicum linearifolium* Scribn] Variety *wernerii* (Scribn) Mohlenbr.

Dichanthelium malacophyllum (Nash) Gould PANIC GRASS, aka SOFT-LEAF ROSETTE GRASS,

Habitat: distribution/range: Jackson, Johnson, Perry, Pope, Union, & Williamson counties in southern Illinois.

Culture:

Description: N 2n = 18.

Comments: status: phenology: Blooms 6-10. C3.

Associates:

VHFS: [*Panicum malacophyllum* Nash] “occasionally intergrades, & perhaps hybridizes, with *D oligosanthes* & *D acuminatum*.”

Dichanthelium mattamuskeetense (Ashe) Mohlenbrock PANIC GRASS,

Habitat: distribution/range: Massac Co, far west of its normal range.

Culture:

Description: key features: “Sparsely tufted; bearded nodes; usually velvety-pubescent leaves & spikelets; autumnal form sparingly branched.” (Ilpin)

Comments: status: phenology: Blooms C3.

Associates:

VHFS: [*Panicum mattamuskeetense* Ashe]

Dichanthelium meridionale (Ashe) Freckmann MAT PANIC GRASS, aka MATTING WITCH GRASS,

Habitat: distribution/range:

Culture:

Description:

Comments: status: phenology: Blooms 5-9. C3.

“Dry prairie roadside west of Rockford & open woods in Rock Cut Forest Preserve.” (ewf55)

“A micrometer is needed to measure the very short puberulence (0.1 mm) that distinguish this taxon, *D leucothrix*, & *D wrightianum* from other members of the *D acuminatum* group.” (Weakley 2007)

Associates:

VHFS: [*Panicum meridionale* Ashe]

Dichanthelium microcarpon (Muhlenburg) Mohlenbrock SMALL FRUITED PANIC GRASS,

Habitat: distribution/range:

Culture:

Description:

Comments: status: phenology: Blooms 5-10. C3.

Associates:

VHFS: [*Panicum microcarpon* Muhl]

Dichanthelium nitidum (Lamarck) Mohlenbrock PANIC GRASS,

Habitat: distribution/range: Jackson Co, at the northern limit of its range.

Culture:

Description: Native perennial grass; key features: “Cespitose; nodes with reflexed hairs; autumnal form with reduced few-flowered panicles.” (Ilpin)

Comments: status: phenology: Blooms vernal 5-6, autumnal 7-10. C3.

Associates:

VHFS: May be part of *Dichanthelium dichotomum* (L) Gould. [*Panicum nitidum* Lam.]

Dichanthelium oligosanthes (JA Schultes) Gould *NY HELLER'S ROSETTE GRASS, aka FEW-FLOWERED PANIC GRASS,

Habitat: distribution/range:

Culture:

Description: Native perennial grass;

Comments: status: Endangered in New York. phenology: Blooms 6-10. C3.

Associates:

VHFS: [*Panicum oligosanthes* JA Schultes]

Dichanthelium oligosanthes (Schultes) Gould FEW FLOWERED WITCH GRASS,

“Much less common than *P scribnerianum* but found in similar places. Lovesee woods northeast of Roscoe & a high prairie roadside 5 miles northwest of Rockford.” (ewf55)

CORRECT TO D SCRIB,

***Dichanthelium oligosanthes* (Schultes) Gould scribnerianum** (Nash) Gould *NY, PA SCRIBNER'S PANICUM, aka SCRIBNER'S ROSETTE GRASS, SCRIBNER'S WITCH GRASS, VELVET PANIC GRASS, [facu]

Habitat: Mesic, dry, & sand prairies.

Culture: ①No pre-treatment necessary other than cold, dry stratification (pr09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn). Fresh seed, no treatment; dormant seed, or cold moist stratify.

seed counts & rates: 144,000 (pm), 129,418 (gna03), 148,148 (gna04) seeds per pound; 288,000 (shirley), 390,000 seeds per pound.

bottom line: Limited seed test data indicate dormant seeding is strongly required. Germ 9.3, 9.5. na, sd 2.2, r6.0-12 (6.0)%. Dorm 66.5, 70.5, na, sd 21.6, r33-92 (59)%. Test 37, 37, na r35-39 days.**

Description: Native perennial grass; roots minimum depth; culms 0.5-1.5'; leaf blades short & rather broad, distributed along the culm; sheaths; heads; spikes panicle as long as broad, but not densely flowered spikelets blunt; N. key features:

Comments: status: 🍏 📖 Endangered in New York & Pennsylvania as *Panicum scoparium* S Wats ex Nash, non Lam. phenology: Blooms 5,6,7, remontant 7-10. C3. In northern Illinois, collect seeds in July. Collect seeds in se Wisconsin in August - September (he99). Landscaping. Seed source Whiteside Co. "Common on the gravelly upland prairies south & east of Rockford & in the Sugar River sand area. (*P oligosanthes* Schultes var *scribnerianum* (Nash) Fern)" (ewf55)

Associates:

VHFS: [*Dichanthelium oligosanthes* (JA Schultes) Gould var *helleri* (Nash) Mohlenbr, *Panicum helleri* Nash, *P macrocarpon* Le Conte ex Torr, *P oligosanthes* Schult var *helleri* (Nash) Fern, *P oligosanthes* Schult var *scribnerianum* (Nash) Fern, *P scoparium* S Wats ex Nash, non Lam, *P scribnerianum* Nash]. The USDA places variety *helleri* (Nash) Fern, known from Jackson & Randolph counties in synonymy with variety *scribnerianum*.



Dichanthelium oligosanthes (Schultes) Gould *scribnerianum* (Nash) Gould

Dichanthelium perlongum (Nash) Freckmann LONG-STALKED PANIC GRASS,

Habitat: “In sandy places in Rockton & Shirland Townships, also on the gravel hills east of Ill. Rt. No. 173.”

(ewf55) distribution/range:

Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ②Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

Description: Native perennial grass;

Comments: status: phenology: Blooms 5-9. C3. Collect seeds in se Wisconsin in August - September (he99).

Associates:

VHFS: [*Panicum perlongum* Nash]

Dichanthelium polyanthes (Schultes) Mohlenbrock PANIC GRASS,

Habitat: distribution/range:

Culture:

Description: N 2n = 18

Comments: status: phenology: Blooms 6-10. C3.

Associates:

VHFS: [*Panicum polyanthes* Schult] This is included in *Dichanthelium linearifolium* (Scribn ex Nash) Gould by some.

Panicum praecocius Hitchcock & Chase LONG HAIRED PANIC GRASS

①Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn).

“Dry prairies in Burritt Township & gravel hills bordering Rock River.” (ewf55 as *Panicum praecocius* Hitchc & Chase)

Panicum psuedo-pubescens Nash.

“So called by Hitchcock & Chase. Common in Sugar River sand area. (*P villosissimum* var *pseudo-pubescens* (Nash) Fern) (*P euchlamydeum* Shinners)” (ewf55)

Dichanthelium ravenelii (Scribner & Merrill) Gould *IL RAVENEL'S PANIC GRASS,

Habitat: Dry sandy woodlands. distribution/range: Known from Hardin, Pope, & Union counties, at the northwest margin of the sp range.

Culture:

Description: key features: “Tufted; culms erect, rather stout, pubescent; blades pubescent below; autumnal form spreading to ascending, much branched, reduced leaves & panicles.” (Ilpin)

Comments: status: Endangered in Illinois. phenology: Blooms vernal 5-7; autumnal 6-8. C3.

Associates:

VHFS: [*Panicum ravenelii* Scribn & Merr]

Dichanthelium scoparium (Lamarck) Gould *IN VELVET PANICUM, aka BROOM PANIC-GRASS,

Habitat: Adapted to coarse & medium textured soils. Anaerobic tolerance none. CaCO₃ tolerance high.

Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 4.5-7.5. distribution/range: Johnson, Pope, & Williamson counties, Illinois.

Culture: Growth rate rapid. Seedling vigor medium. Vegetative spread rate none. Spreads slowly from seed. 380,000 (usda) seeds per pound.

Description:

Comments: status: Endangered in Indiana. phenology: Blooms 6-10. C3.

Associates: Provides food for large mammals & upland birds.

VHFS: [*Panicum scoparium* Lam.]

Dichanthelium sphaerocarpon (Ell) Gould ROUNDSEED PANICUM

Habitat: Dry & mesic prairies. distribution/range:

Culture:

Description: 0.75-2.0’;

Comments: status: phenology: Blooms 6-10 (5-6). C3.

Associates:

VHFS: [*Panicum sphaerocarpon* Ell]

Dichanthelium villosissimum (Nash) Freckmann *MA, OH HAIRY PANIC GRASS, aka WHITEHAIR ROSETTE GRASS, WHITE-HAIRED WITCH GRASS, (*villosissimus -a -um* most villous, Latin superlative adjective, from Latin for with hairs, villous, soft-hairy, softly hairy, from *villōsus -a -um*, shaggy, hairy, rough, from *villus*.)

Habitat: distribution/range:

Culture:

Description:

Comments: status: Special concern in Massachusetts. Presumed extirpated in Ohio. phenology: Blooms 5-9. C3.

“Not recognized in Jones’ Flora & doubtfully different from *P pseudo-pubescens*. Common in Sugar River sand area.” (ewf55)

Associates:

VHFS: [*Dichanthelium acuminatum* (Sw) Gould & CA Clark var *villosum* (Gray) Gould & CA Clark, *D lanuginosum* (Ell) Gould var *villosissimum* (Nash) Gould, *D ovale* (Ell) Gould & CA Clark ssp *pseudopubescens* (Nash) Freckm & Lelong, *D villosissimum* (Nash) Freckm var *pseudopubescens* (Nash) Mohlenbr, *Panicum acuminatum* Sw var *villosissimum* (Nash) CF Reed, *P acuminatum* Sw var *villosum* (Gray) Beetle, *P nitidum* Lam var *villosum* Gray, *P ovale* Ell var *pseudopubescens* (Nash) Lelong, *P ovale* Ell, var *villosum* (Gray) Lelong, *P pseudopubescens* Nash, *P villosissimum* Nash, *P villosissimum* Nash var *pseudopubescens* (Nash) Fern]

Dichanthelium villosissimum (Nash) Freckmann var **praecocius** (AS Hitchcock & Chase) Freckmann *OH WHITEHAIR ROSETTE GRASS, (*villosissimus, villosissimum* most villous, from Latin for with hairs, villous, soft-hairy, softly hairy, from *villōsus -a -um*, shaggy, hairy, rough, from *villus*;

Habitat: distribution/range:

merge with D praecocius

Culture:

Description:

Comments: status: Endangered in Ohio. phenology: Blooms 5-9. C3.

Associates:

VHFS: [*Dichanthelium praecocius* (AS Hitchc & Chase) Mohlenbrock, *P lanuginosum* Ell var *praecocius* (AS Hitchc & Chase) McNeill & Dore, *P praecocius* AS Hitchc & Chase]

Dichanthelium wilcoxianum (Vasey) Freckmann *IN, WI FALL ROSETTE GRASS, aka BLOOD WITCHGRASS, WILCOX’S PANICGRASS, (*wilcoxianum -a -um* honoring General Timothy E Wilcox, U.S. Army; avid student of plants, c. 1900)

Habitat: distribution/range: Carroll, Lee, Pope, Scott, Whiteside, & Winnebago counties.

Culture:

Description: Native perennial grass; N 2n = 18. key features:

Comments: status: Rare in Indiana. Special concern in Wisconsin. phenology: Blooms 6-9. C3.

Found only on the gravel hill prairies that border Rock River, the prairie north of Forest Hills Country Club, & the one west of Rockton.” (ewf55)

Associates:

VHFS: [*Dichanthelium oligosanthos* (JA Schultes) Gould var *wilcoxianum* (Vasey) Gould & CA Clark, *Panicum wilcoxianum* Vasey, *P wilcoxianum* Vasey var *breitungii* Boivin]

Dichanthelium yadkinense (Ashe) Mohlenbrock *IL SPOTTED-SHEATH WITCH GRASS,

Habitat: distribution/range:

Culture:

Description: key features: “Tufted from a knotted crown; glandular spots on the sheaths autumnal form having blades only slightly smaller than vernal ones.” (Ilpin)

Comments: status: Endangered in Illinois. phenology: Blooms 6-7. C3.

Associates:

VHFS: [*Panicum yadkinense* Ashe] Some authorities include this grass in *Dichanthelium dichotomum* (L) Gould var *dichotomum*, which under various synonyms is listed in seven states.

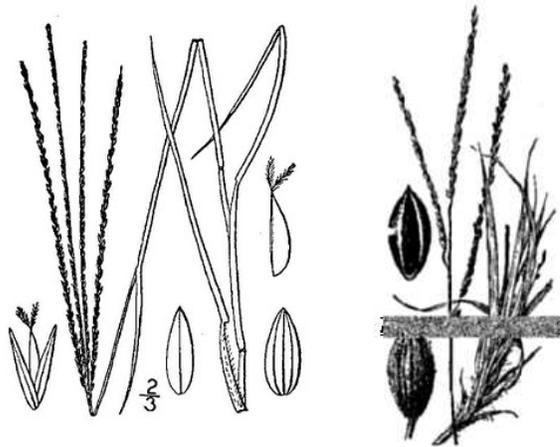
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DIGITARIA Haller **CRAB GRASS** New Latin, from Latin *digitus* finger, a reference to the inflorescence, & New Latin *-aria*. A genus of about 200 spp of grasses found in tropical & warm temperate regions & having one-flowered spikelets in one-sided digitately arranged racemes. This genus includes cereal crops, forages, turf grasses, & weeds. $x = 9$. [*Digitaria* Heist]

Digitaria filiformis (Linnaeus) Koeler *MI, NY, OH **SLENDER FINGER GRASS**, aka **SLENDER CRABGRASS**, **SMOOTH CRABGRASS**, (*filiformis -is -e* New Latin, thread-like, shaped like threads.)

Comments: Probably extirpated in Michigan. Threatened in New York. Presumed extirpated in Ohio.

VHFS: [*Digitaria laevigulumis* Fern, *D leucocoma* (Nash) Urb, *Panicum filiforme* L, *Syntherisma filiformis* (L) Nash]



Digitaria filiformis

Digitaria ischaemum (Schreber) Muhlenburg **SMALL CRAB-GRASS**, aka **SMOOTH CRAB-GRASS**, (*ischaemus -a -um* Modern Latin from an ancient Greek name, from Greek ἰσχαίμος, *iskhaemos*, styptic, blood-restraining, staunching or stopping blood, from ἴσχειν, *iskhein*, to hold, & αἷμα, *aima*, blood, from supposed styptic properties.)

Habitat: A weed in lawns, pastures, meadows, & waste places. “Common in cultivated fields & in waste places.” (ewf55) distribution/range: Weedy Eurasian sp now throughout much of the world.

Culture: ?

Description: Low, branching, ascending or nearly prostrate, introduced, annual grass; roots; culms; leaves rolled in the bud-shoot; sheaths compressed, glabrous or the basal ones sometimes sparsely hairy, pale green, tinted pink or purple, split, with margins hyaline & overlapping; auricles absent; collar broad, distinct, with a few flexuous hairs at the margin, pale, often divided; ligule membranous, 2.0-3.0 mm long, obtuse to truncate, slightly undulate, thickened & often tinted at the edges; blade 2.0-6.0 mm wide, 2.0-10 mm long, flat, cordate at base, sharp-pointed, not ridged, dull green or tinged with purple, sparsely hairy with twisted hairs at base on upper surface; margins glabrous or sparsely ciliate, smooth or scabrous; heads; spikes; $N 2n = 36$. key features: *D ischaemum* is distinguished from *D sanguinalis* by its smaller size & glabrous & usually purplish sheaths.

Comments: status: ♣ phenology: Blooms

Associates:

VHFS: [*Digitaria humifusa* Pers, *Panicum glabrum* Gaud, *Syntherisma Ischaemum* (Schreb) Nash]



Digitaria ischaemum

Digitaria sanguinalis (Linnaeus) Scopoli LARGE CRAB-GRASS, aka FINGER GRASS, HAIRY CRABGRASS, NORTHERN CRABGRASS, (*sanguinalis* -is -e from Latin *sanguis*, *sanguinis* m., blood, family, & -alis -is -e, adjectival suffix signifying pertaining to, relating to, of, in connection with, or belonging to.)

Habitat: “Common in yards gardens, &c” (ewf55) distribution/range: Weedy Eurasian sp now throughout much of the world.

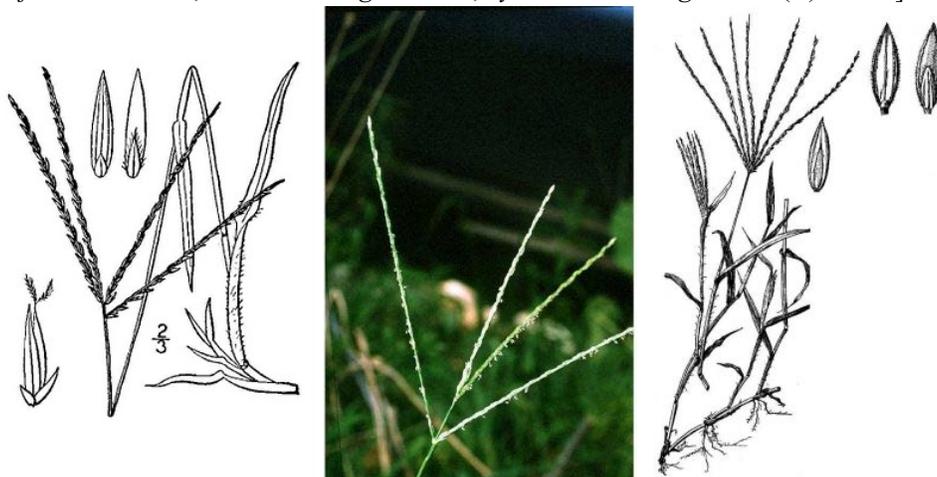
Culture: ?

Description: Low-growing spreading hairy, pale green annual introduced grass; roots; culms bent, often rooting at the nodes; leaves rolled in the bud-shoot; sheaths compressed, pilose, green but sometimes purplish-veined, split with margins hyaline; auricles absent; collar broad, distinct, sparsely hairy, divided by midrib; ligule membranous, 0.5-2.0 mm long, acute, undulate or toothed, often reddish; blade 4.0-0 mm wide, 5.0-15 cm long, flat, soft, drooping, often puckered, sharp-pointed, green, not ridged, pilose on both surfaces with a few longer hairs at base on upper surface; midrib prominent on lower surface; margins scabrous; heads; spikes; $N 2n = 36, 28, 34, 54$. key features: *D sanguinalis* is a stouter-growing grass than *D ischaemum*, is pubescent on the sheaths & blades & generally lacks the purple coloring.

Comments: status: ♣ phenology: Blooms

Associates:

VHFS: [*Digitaria fimbriata* Link, *Panicum sanguinale* L, *Syntherisma sanguinalis* (L) Dulac]



Digitaria sanguinalis

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

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DIPLACHNE Palisot de Beauvois 1812 (maintained in w12)

DISTICHLIS Rafinesque 1819 **SALT GRASS, ALKALIGRASS** *Distichlis* Distich'lis (dis-TIK-lis) from Latin *distichus* from Greek *distichos*, meaning two ranked, or with two rows, referring to the distichous leaf arrangement. A small genus of American grasses found along seashores & in alkaline regions, having

creeping rhizomes, distichous leaves, & several-flowered spikes in small panicles. There are 6 to 10 (ca. 5) spp primarily from warmer North America, but found in North, Central, & South America & Australia.

Distichlis spicata (Linnaeus) Greene INLAND SALTGRASS, aka SALT GRASS, SPIKEGRASS, (*strictus* -a -um strict, upright, erect, tight, from Latin *strictus*, drawn tight, bound up.)

Habitat: Wet, saline, & alkaline soils. Survives in coastal areas periodically flooded by seawater. Fine to moderately fine textured soils best. Basic to neutral soils. distribution/range: In the Midwest adventive from the West. Known from 42 of the lower 48 states, the exceptions are Arkansas, Indiana, Kentucky, Tennessee, Vermont, & West Virginia.

Culture: 519,000 (usda), 520,000 to 603,800 (wns01) seeds per pound. In solid stands, plant 10 lb pls per acre in summer (gran).

Description: Warm-season, perennial native (western USA) grass, short to medium tall (1-12", or 1.1 feet), strongly rhizomatous, sod-forming, monoecious (?).

Comments: C4. Useful in unusually saline sites. Seed source Western commercial sources.

Associates: Moderate palatability.

ethnobotany: SALTGRASS is a respiratory allergenic plant that is offered by Miles Pharmaceutical & used by Florida physicians to treat respiratory allergies (USDA plant guide)

VHFS: Formerly *Distichlis stricta* (Torr) Rydb. Weakly calls this *D spicata* (L) Greene. Two salt grasses have been described as varieties, subsp, or spp. Variety *spicata* ranges from the Atlantic coast from Nova Scotia & Prince Edward Island south to tropical America, & on the Pacific Coast. Variety *stricta* (Torrey) Scribner, adventive in Illinois, is known from saline sites in western North America.



Distichlis spicata

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ECHINOCHLOA Palisot de Beauvois **BARN-YARD GRASS, JUNGLE-RICE** *Echinochloa* (e-keen-O-klo-a) New Latin, from Greek *echin-*, *echinos*, a hedgehog, & Greek *chloa*, *chloe* grass, young verdure, from *chloos* light green color, from the prickly awns, related to Greek *chloros*, greenish yellow. 40-50 spp of the tropics & warm-temperate regions, 13 spp in northern North America. Used as nurse crop in wetland restoration & as wildlife food. Attracts upland gamebirds & songbirds, & waterfowl. Our spp are light-sensitive, early successional annuals. X = 9. The weedy introduced *E crus-galli* closely resembles the native *E muricata*. In the past, they have been treated as the same sp. *Oplismenus* Beauv.

Echinochloa crusgalli (Linnaeus) Palisot de Beauvois BARNYARD GRASS, aka BARN GRASS, BLACK MILLET, BILLION DOLLAR GRASS, *ÉCHINOCHLOA PIED-DE-COQ*, JAP MILLET, LARGE BARNYARD GRASS, (*crusgalli* (kroos-GA-lee) a cock's spurs or cockerel's spur.) facw

Habitat: Seasonally inundated, wet meadows, common in agricultural & early successional wetlands. Open meadows, cultivated fields, & in waste areas around buildings. "A common barnyard grass." (ewf55)

Culture: No treatment, light. One source has plant in late July or early August, but annuals should not be sown in the late growing season.

seed counts & rates: 114,286 (gni), 118,553 (gn03), 119,191 (gnh02), 119,522 (gna04), 135,482 (gna06), 155,000? (Anon 81), 504,000 seeds per pound. Best used as a nurse crop at one (1) pound per acre in spring or

dormant seeded. Anon 1981 recommends 20-25 lbs per acre. Granite says 25-40 lb pls per acre alone in spring or summer.

cultivation: Tolerates most soils textures. Best in neutral soils.

bottom line: Seed needs no treatment, dormant seed or spring plant. Seed is photodormant, surface sow or very shallow cover. Essentially nondormant. Germ 88.3, 94, 95, sd 13, r49-98 (49)%. Dorm 1.3, 0.0, 0.0, sd 3.3, r0.0-13 (13)%. Test 17, 16, na, r6-32 days. (#18).**

Description: Coarse annual with broad leaves; culms 1.5-3.5'; leaves rolled in the bud-shoot; sheaths compressed, keeled, glabrous, smooth, pale green, split; auricles absent; collar conspicuous, broad, glabrous, light yellowish green; ligule absent; blade 8-15 mm wide, 10-30 cm long, glabrous, pale or yellowish green, keeled, not ridged; margins smooth or scabrous; $N 2n = 54$. key features:

Comments: Blooms 6,7,8,9. C4. Seed source farmed wetlands, Green River Lowland, & commercial sources, central Illinois.

“In flat and marshy situations ... the universally diffused.” *Echinochloa crus-galli* (L.) Beauv. as *Panicum crus-galli* L. (Short 1845).

Associates: Waterfowl, marshbirds, shorebirds, upland gamebirds, & songbirds eat seeds. Aquatic furbearers (esp. muskrats) eat foliage & plants.

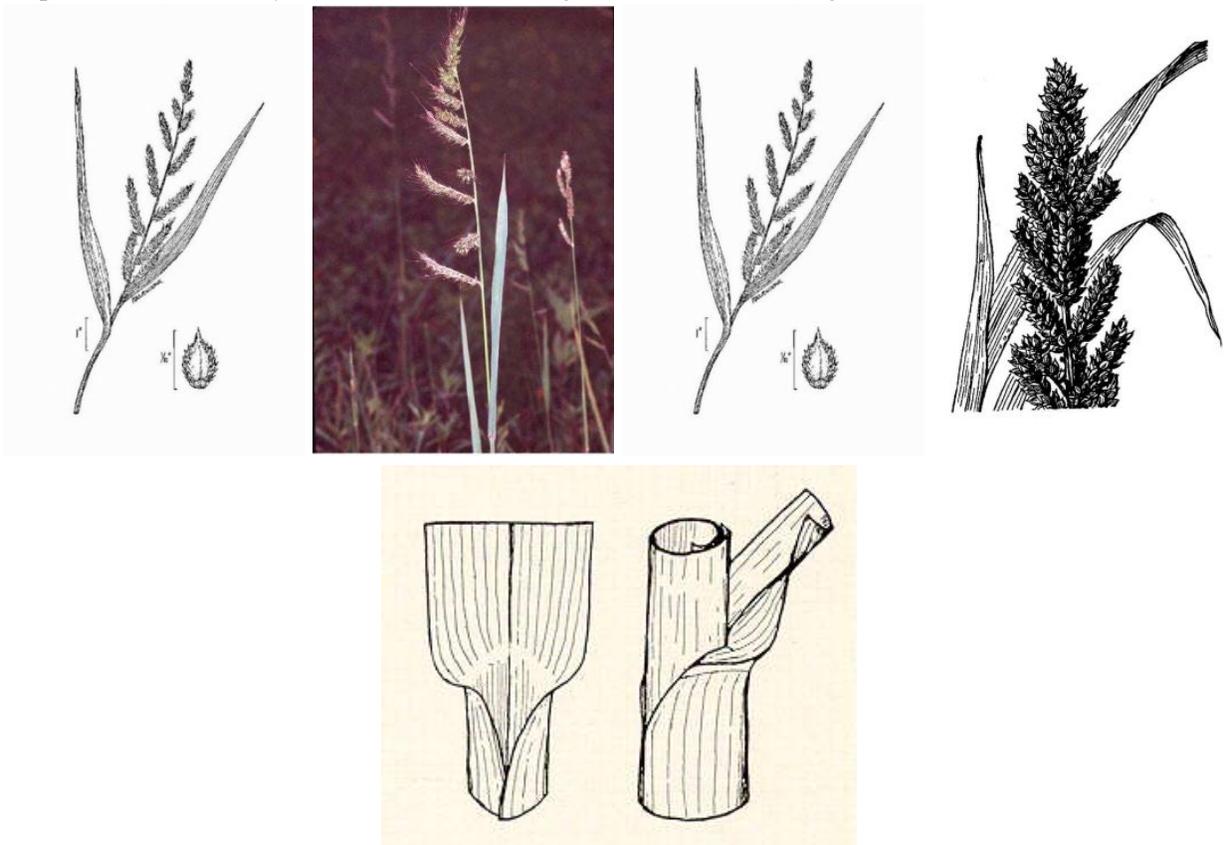
VHFS: [*Echinochloa crus-galli*, *Panicum crusgalli* L] In northern Illinois usage, this is a diverse sp complex that includes many other taxa often treated as spp.

Var **frumentacea** (Link) WP Wight JAP MILLET, (*frumentaceus -a -um* rich in flour, grain yielding, grain-like, pertaining to grain, as in *spiritus frumenti*.)

Habitat: Best in wetland soils, but will grow in well-drained soils, pH 4.7 to 7.4.

Culture: Sow in spring or summer. Ernst says plant 20-30 lbs per acre as a crop, or 10 lb per acre as a companion crop. We recommend no more than 1 lb per acre, & we support those rightly prefer to eliminate this entirely from restoration seedings. Prairie Moon also recommends 1 pound per acre as a nurse crop. 225,000 (gran) seeds per pound.

Description: Warm season, cold tolerant, coarse, tall, annual bunchgrass, 1-5', with 4-8" seed head. Will grow in any soil, but adapted to wet, swampy sites. Excellent food & cover for wildlife. Favored by waterfowl, & can be flooded in the fall for waterfowl. Good for erosion control. Used as nurse crop or companion crop for establishing wetland perennials, but easily overdone. If a little is good, more is better, right?



Echinochloa crus-galli 4) variety *frumentacea*

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Echinochloa crus-galli (foreground, *E walteri* background)

Line drawing of collar area from Nowosad et al 1936, courtesy <http://www.caf.wvu.edu/~forage/library/index.htm>

Echinochloa muricata (Palisot de Beauvois) Fernald BARNYARD GRASS, aka AMERICAN BARNYARD GRASS, COCKSPUR GRASS, ROUGH BARNYARD GRASS, (*muricatus* –a -um muricate, roughened by means of sharp hard points, full of rough, short, sharp points, from Latin *muricatus* pointed like a purple fish.)

Habitat: Disturbed floodplains & agricultural wetlands. distribution/range:

Culture:

Description: Bunch grass; culms to 5'; N 2n = 36. key features:

Comments: status: phenology: Blooms July to August. Native annual grass. Cover crop for disturbed wetlands. Nurse crop for wetland plantings. Self-sowing to an extent, but like most annuals needs a disturbance cycle, such as cultivation.

Associates: Provides food & cover for songbirds, gamebirds, & waterfowl.

VHFS: Two named varieties, var *muricata* & *microstachya* Wiegand, their ranges vary with the authority.



Echinochloa muricata

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Echinochloa walteri (Pursh) A Heller WALTER'S MILLET, aka COAST BARNYARD GRASS, SALT-MARSH COCKSPUR GRASS, WATER-MILLET, (*walteri* for Thomas *Walter*, 1740-1789.) obl

Habitat: Seasonally inundated wetlands. "Banks of rivers & ponds, ditches, marshes & wet shores, locally common in the marshes at the western end of Lake Erie" (rvw11).

Culture: No treatment, light.

seed counts & rates: 413,000 (usda), 508,521 (gnh11) seeds per pound.

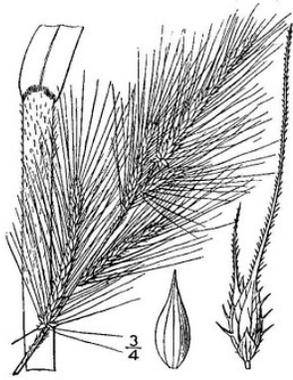
availability: Commercially available but limited. Buy early & buy often.

bottom line: Initial test datum indicates field-sown seed is significantly benefited by dormant seeding or cold moist stratification for greenhouse production. Germ 61%. Dorm 25%. Test 34 days.**

Description: Erect annual, native grass; culms 1.5-3.5', N 2n = 36.

Comments: status: phenology: Blooms 8,9. In northern Illinois, harvest seed in late September into October. C4.

VHFS: [*Echinochloa walteri* (Pursh) A Heller var *laevigata* (Wieg) SR Hill, *Panicum walteri* Pursh]



Echinochloa walteri

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Echinochloa walteri (background, *E crus-galli* foreground)

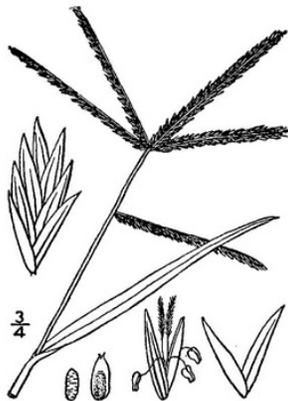
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ELEUSINE Gaertner **YARD GRASS, GOOSE GRASS** *Eleusine* New Latin, from Greek *Eleusinē*, a name for Demeter, the goddess of grain (Ceres, goddess of Harvests), from the Attic town *Eleusis*, where *Ceres* was worshipped; ἐλευσίον, *eleusition*, belonging to Eleusis.

Eleusine indica (Linnaeus) Gaertner **GOOSE GRASS, aka CROWFOOT GRASS, INDIAN GOOSE GRASS, YARD GRASS**, (*indicus -a -um* of Indian origin, the subcontinent, of or from or referring to India; often used as a general reference to the Far East)

“ A common dooryard grass.” (ewf55) ♀

VHFS: [*Cynosurus indicus* L]



Eleusine indica

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ELYMUS Linnaeus 1753 **COUCH GRASS, LIME GRASS, LYME GRASS, WILD RYE, RYE GRASS** *Elymus* (E-li-mus) New Latin, from an ancient Greek name *Elumos*, or *elymos*, millet (Italian millet, *Setaria italica*, also known as *melinê*; *knêmê melinê*, in plural a millet field), a type of grain, meaning millet, or a case, a quiver, referring to the λέμμα, lemma, & palea which are tightly rolled about the seed. (the base root is ελυμ-, the *upsilon* translating variously as *elym-* or *elum-*.) One author cites Greek ελύω, *elyo*, to envelop; referring to the spike in the sheath; similar to Greek ελυμος, *elymos*, meaning a case, a quiver, millet; also ελυμα, *elyma*, the share-beam of a plow. The Elymians, Greek Ἐλυμοί, *Elymoi*, Latin *Elymi*, were an ancient tribe that lived in western Sicily (they used Greek (or Phoenician?) alphabet, but their language is undeciphered), & were said to be a millet-growing people. The Trojans who fled from Troy to Sicily settled in that part of Sicily called themselves *Elymi*, after *Elymus*. *Elymus* (Greek Ἐλυμος, *Elumos*, *Elymos*; *Elymnus* in Strabo), was the natural son (or bastard son) of Anchises & brother of Eryx, one of the fleeing Trojans. With the aid of Aeneas, they built the towns of Aegesta & Elymé (Elima). *Elumos* is also a term for a type of *aulos*, a Greek 'two-piped' reed wind instrument, possibly originating from Phrygian *phrugiaulos*. It is often mistranslated as flute. (*Gramineae*)

A genus of tall tufted perennial grasses, about 150 spp, semi-cosmopolitan in temperate regions, comprising the lyme grasses, having closely flowered terminal flower spikes, & being sometimes used as fodder & to bind loose sandy soil. 16 spp & hybrid, 19 taxa, are listed from Illinois (m14). $X=7$. *Elytrigia* Desv is sometimes treated as a section in *Elymus* (w12). Formerly in part *Terellia* Lunell 1915.

Widely used in restoration & reclamation work. No treatment is usually necessary. Moist cold stratify or fall plant may help some seed lots light, cool soils. Cool season grasses. "No pretreatment necessary. May be moist cold treated. Light to very light cover, very good germination. Benefits from light shade immediately after transplanting." (mfd93) Wind pollinated. Attracts small mammals & songbirds. Easy from seed.

<http://wisplants.uwsp.edu/scripts/detail.asp?SpCode=ELYTRASTRA>.



Mixed *Elymus* species, fencerow, Sodtown Slough, Thomas, Illinois

Elymus arenarius Linnaeus LYME GRASS, aka SAND RYEGRASS, (*arenarius* (a-ray-NAH-ree-us) sand loving, growing in sandy places, relating to sand, of sand or sandy places, from Latin *arena*, sand; slime, mud, & *-arius*, connected to or possessed by.) FACU

Habitat: Native to Eurasia, found on the sandy shores of Lake Michigan.

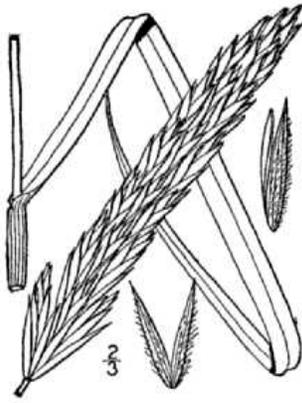
Culture: Seed germinates well in greenhouse with dry stratification (gni). Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn). 55,172 seeds per pound,

Description: Appearing similar to & often associated with *Ammophila*, but with glaucous leaves. *Ammophila* differs from *Leymus* by having only one floret per spikelet.

Elymus mollis is listed by Short (1845), and is typically a synonym of *E arenarius*. "Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies" (Short 1845). Short did not travel north of Peoria, and J&F offer no synonym, so the reference is interesting but unsure. (Check FNA hard copy)

Comments: status: ♣

VHFS: [*Leymus arenarius* (L) Hochst]



Elymus arenarius

Elymus canadensis Linnaeus CANADA WILD RYE, aka CANADIAN WILD RYE, *ÉLYME DU CANADA*, GREAT PLAINS WILD RYE, LYME GRASS, NODDING WILD RYE, PRAIRIE WILD RYE, (*canadensis* -is -e (kan-a-DEN-sis) of or from Canada or the north-east USA, of Canadian origin.) Facultative (-)

Habitat: Unstable member of most native communities, hill, sand, dry & mesic prairies, bottomlands, roadsides & edges of woods, thickets, & open fields. Dry or moist soil, usually in full sun. Dry prairies. Mesic sp. Adapted to moist or periodically moist well-drained soils. Natural meadows, along streambanks, & in damp open woods (now36).

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (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 +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination (tchn). Establishes easily from seed for quick cover. Good seedling vigor; easy in well-drained soils. Some say germination best if drilled 1.0-1.5” deep (us97), but light cover works well.

seed counts & rates: 64,000 (gni), 67,200 (pn02, aes10), 68,128 (jfn04), 75,200 (ew12), 76,512 (shirley), 83,200 (pm02), 86,160 (aosa), 110,570 (gnak04), 114,185 (gnak03), 114,000 (ecs), 115,000 (stocks, gran, wns01), 119,836 (gnhk02), 121,814 (gnas05), 122,109 (gnh07), 124,274 (lhn), 135,000 (kaste02), 155,000 (anon81) seeds per pound. Anon 1981 recommends 10-15 lb/acre in monocultures!!! Broadcast 1 lb pls per 2,000 ft. sq or drill 10-12 pls lbs per acre in monocultures!!!! (stocks). Granite seed recommends 7 lb pls per acre in monocultures. USDA (1997) recommends 0.2 to 2.0 pls lbs per acre in mixes. We recommend 0.5 to 1.0 pls lbs per acre, rarely 2 pls lbs per acre in mixes seeded into *in situ* soils with other native spp. We may seed heavier in rebuilt urban soils, erosion control mixes, or when there is little or no post-planting maintenance. A full stand will develop in 2-3 years, then rapidly gives way to warm season grasses. This is a short-lived, successional sp, & expensive in quantity. Why seed at 5-8# when it will be gone in a few years anyway? Its only money.

availability: Availability was a historical issue, but it has become increasingly more available each year (with the possible exception of the 2012 drought).

cultivation: Space plants 1.5-2.0'. Mesic to dry soils, full sun to partial shade. Prefers moist sites in areas of low precipitation, but will also grow in sandy soils. Best in coarse to moderately coarse soils. Prefers moderately well to poorly drained soils. Clay soil tolerant. Minimal flooding tolerance. Partial to full sun, shade tolerant. Moderate to high drought tolerance. Nutrient load tolerance low. Moderate salt tolerance, siltation tolerance low. Wide pH range, neutral to basic soils.

Good pioneer sp. Good seedling vigor & good early spring growth, some shade tolerance.

bottom line: Seed spring or dormant. One lot in ten may require dormant seeding. Dormant lots appear more frequent since 2007. Germ 78.9, 86.5, 90, sd 20.1, r12-98 (86)%. Dorm 11.7, 2.5, .0, sd 19.5, r0.0-85 (85)%. Test 26, 21, 32, r19-40 days. (#43).**

greenhouse & garden: Easy from seed, most lots require no treatment. Rare lots require moist cold stratification for 30-60 days @ 35°F or dormant seeding in an unheated coldframe. Have prop stock germ tested (not TZ) before planting untreated seed in greenhouse for insurance. The cost of a germ test is chump change compared to a lost crop.

Description: Tall, erect, cool-season, dark green or glaucous short-lived, perennial bunchgrass; some say this forms a loose sod, 16" minimum root depth; culms 2.0-6.0'; leaf blades flat with a rough upper surface & fine toothed margins, leaves rolled in the bud-shoot, green almost all year long; sheaths not compressed, not keeled, green or glaucous, sometimes pinkish at base, glabrous, smooth, split with edges overlapping, the innermost margin broadly hyaline, the outermost ciliate with hairs to 1.5 mm long; auricles present, narrow, 1.0 to 2.5 mm long, claw-like, clasping; collar distinct, broad, continuous, glabrous, yellowish green, often oblique; ligule coarse-membranous, greenish, 0.5 to 1.5 mm long, truncate, finely notched & short-ciliate; blade 8.0-20 mm wide, 10-30 cm long, dark green, sometimes glaucous, flat, tapering, sharp-pointed, dull, prominently ridged & slightly scabrous on the upper surface, almost smooth on the under surface, the midrib forming a keel toward the base; margins scabrous heads; spikes; 6-8" long; $N 2n = 28$, rarely 42. key features: ① "*Elymus canadensis* generally has broader & smoother blades & longer ligule than *E virginicus*. Both spp have broader & coarser blades than *Agropyron cristatum*." (now36)

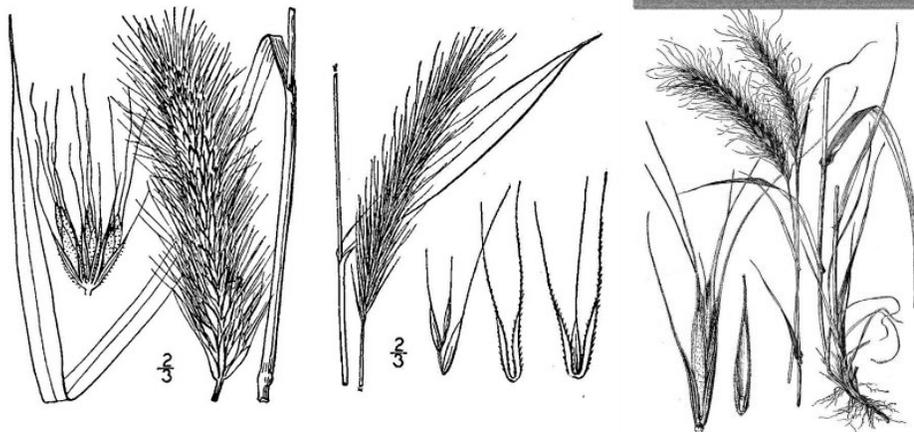
Comments: status: phenology: Blooms June to September. In northern Illinois, collect seeds in late August through October. Collect seeds in se Wisconsin in September - October (he99). Landscaping, primarily used as a successional native nurse crop, which soon gives way to climax grasses. An ornamental grass with attractive dried seed heads, nodding, wheat-like spikes, 6-8" long, persisting into winter. Useful for erosion control, the fibrous root system helps stabilize plantings, establishes early native cover. Easily established in disturbed areas. Useful in upper shoreline zone, streambanks, upland slope buffers, & vegetated swales. Seed source nursery production from genetic source Rock River Hills, Lee Co &/or Green River Lowland, Henry Co, & Squaw Grove Twp, DeKalb Co.

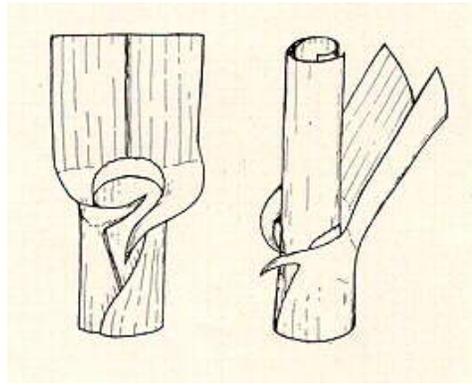
Elymus canadensis var *glaucifolius*: "Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies" (Short 1845).

"A common wild rye growing along roads, fencerows, edges of woods, &c. Spike usually exserted & nodding. Hybridizes with BOTTLEBRUSH GRASS." (ewf55)

Associates: Larval host. Provides habitat for small mammals, food & cover for wildlife. Good palatability but poor tolerance to grazing. Walnut tolerant. In 2011, observed *Popillia japonica*, JAP BEETLES on several plants, but saw no damage.

VHFS: [*E robustus* Scribn & JG Smith var *vestitus* Wieg, *E wiegandii* Fern] **Discuss Illinois varieties.**





Elymus canadensis

Line drawing of collar area from Nowosad et al 1936, courtesy <http://www.caf.wvu.edu/~forage/library/index.htm> 1st Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

Elymus hystrix Linnaeus [formerly *Hystrix patula* Moench] *ME BOTTLEBRUSH GRASS, aka EASTERN BOTTLEBRUSH GRASS, GLUMELESS WILD RYE, *Oságéen;Dah*, Iroquois, no translation, (*patulus -a -um* spreading from Latin *patulus*, adjective, wide open, gaping, wide-spreading.) BOTTLEBRUSH is a reference to the resemblance of the inflorescence to a brush used to clean the inside of bottles. upl

Habitat: Mesic savannas & deciduous woods, woodland openings & borders, adjacent to woodland paths, meadows near woods, & rocky glades. Forests. "Frequently seen but seldom abundant. It grows in thickets & at the edge of woods." (ewf55) distribution/range: Manitoba east to Nova Scotia, south to Georgia, west to Oklahoma, & north to North Dakota.

Culture: ①No treatment, easy from seed. "No pretreatment necessary. May moist cold treat. Light to very light cover. Very good germination" (mfd93). ②No pre-treatment necessary other than cold, dry stratification (pm09). One month cold stratification in a refrigerator or cold garage; seed can be cold stored for three years (Schultz et al 2001). No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③"No pre-treatment needed. Sow seeds just below soil surface at 70°F & water. Slow to germinate." (ew12) ④Sow at 20°C (68°F), germination slow (tchn).

seed counts & rates: 59,259 (gn), 62,500 (gn), 74,426 (gnhae02), 75,000 (ecs), 75,200 (pn02, jfn04), 78,908 (gna07), 80,000 (aes10), 83,302 (gnh02), 91,431 (gnaag05), 103,008 (agr), 121,600 (pm, ew12) seeds per pound.

availability: Commercially available but limited, with demand exceeding supply. Sp is short-lived in production beds, hence availability is feast or famine. Expect seasonal shortages.

asexual propagation: Division is possible.

culture: Space plants 1.0-1.5'. Mesic soils, partial shade to full shade. Tolerates dry soil, drought, dense shade, & air pollution. Clay soil tolerant. Drought tolerant. Under optimum conditions, will naturalize. Individual plants may be short lived.

bottom line: Dormancy mechanisms are variable. Spring seeding works most years, with most lots <10% dormant, but 1/3 of all lots are >50% dormant. Flipflop species. Germ 61.1, 77.5, 93, sd 31.7, r8.5-99 (90.5)%. Dorm 28.5, 8.8, 0.0, sd 32.7, r0.0-87.5 (87.5)%. Test 28, 25, 23, r17-44 days. (#29)**

Description: Cool season, bunching native grass; roots fibrous; culms 1.5-3.0', spread 1-1.5'; leaves with wavy edges, held normal to the stalk, green almost all year long; sheaths; heads up to 4" long; spikes; N 2n = 28. key features:

Comments: status: Threatened in Maine. phenology: Blooms 6,7,8. In northern Illinois, collect seeds in late June- early October. Collect seeds in se Wisconsin in September - October (he99). Ornamental bottle-brush-like seed heads. Immature heads are useful as a 'cut-flower'. Ornamental, used in shady landscaping, plant in masses for visual effect, best when back lite. Sp is also specified for soil stabilization, but it is not a star player, it is a real erosion-control puss-arm; negative bang for the big bucks. A soil stabilizing Caspar Milquetoast. Seed source nursery production plots from genetic sources Tomahawk Creek, Dimmick Twp, LaSalle Co. See also *Phragmites*.

Associates: Provides food & cover for birds & other wildlife. Larval host for *Enodia anthedon* NORTHERN PEARLY EYE. Deer resistant. Walnut tolerant. No serious insect or disease problems.

VHFS: [*Asperella hystrix* (L) Humb, *Hystrix hystrix* (L) Millsp, *H patula* Moench]

J Schultz, P Beyer, & J Williams, 2001, Propagation protocol for production of container *Hystrix patula* Moench plants; USDA FS - Hiawatha National Forest, Marquette, Michigan. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 19 February 2012). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



Hystrix patula





Elymus hystrix, & hybrid in production plot

Elymus lanceolatus (Scribner & JG Smith) Gould ssp ***lanceolatus*** Formerly *Agropyron riparium* Scribner & JG Smith. [STREAMBANK WHEATGRASS, aka THICKSPIKE WHEATGRASS, (*riparius* -a -um of river banks, from Latin *riparius*, frequenting banks of streams or rivers, riverside.)

Habitat: Definitely not native but occasionally specked in Illinois jobs. distribution/range: Common in the northern Great Plains & Intermountain regions. Occasionally specified in Chicago metro erosion control.

Culture: Growth rate moderate. Seedling vigor high to excellent. Vegetative spread rate rapid.

seed counts & rates: 142,000 (rain), 153,000 (usda), 156,000 (gran) seeds per pound. Several commercial varieties are available, with seed counts ranging from 66,000 to 153,000 seeds per pound. Plant in fall or spring, 6-8 lbs per acre in fall (rain). 6-8 pls lbs (20-25 pls seeds per sq ft) in early spring on heavy to medium textured soils & in late fall on medium to light textured soils (usda). For turf, plant 2 pls lbs per 1,000 ft sq. For reclamation, plant 15 pls lbs per acre (pots).

cultivation: Neutral to basic. Low acidity tolerance. Medium salinity tolerance. Adapted to coarse to fine textured soils. Anaerobic tolerance medium. CaCO₃ tolerance medium. Drought tolerance high. Fertility requirement medium. Salinity tolerance low or medium or high. Shade intolerant. pH 6.6-8.4. Characteristics may vary with the cultivar.

Description: Cool-season, more drought-tolerant, than its name would lead you to believe, strongly rhizomatous, sod-former, spreading strongly underground, short to medium tall, to 1.0-3.0', perennial sod-former, with thin leaves making a soft texture. Forms an extensive rhizome system.

Comments: Makes fine textured lawn if mowed, responds to irrigation. Excellent erosion control.

This sp has been specified in erosion control projects in northern Illinois. Its use should be limited in Illinois, until its aggressive potential is known. According to the USDA plant guide (<http://plants.usda.gov>), this plant "grows near sea level" in the Great Lakes region, which by my calculation puts it near the deepest parts of Lake Michigan (*this placement of this plant at "sea level" is the direct consequence of the Cold War era replacement of Geography with Social Studies in grade schools & high schools*). The synonymous? *Elytrigia dasystachya* (Hook) A&D Löve subsp *psammophila* (JM Gillett & Senn) Dewey, GREAT LAKES WHEATGRASS grows on the shores of Lake Michigan in Wisconsin & Michigan (threatened in Wisconsin).

Associates: Good wildlife value, medium to desirable forage value for cattle, sheep, horses, & elk. This grass is also eaten by deer & antelope in the spring.

VHFS: Similar to ssp *dasystachyum* [*A dasystachyum*] but from slightly wetter sites, & is more productive in heavier soils. *Agropyron dasystachyum* (Hook) Scribn & JG Sm, *A dasystachyum* (Hook) Scribn & JG Sm var *riparium* (Scribn & JG Sm) Bowden, *A dasystachyum* (Hook) Scribn & JG Sm var *riparum* (Scribn & JG SM) Bowden [orthographic error], *A elmeri* Scribn, *A lanceolatum* Scribn & JG Sm, *A riparium* Scribn & JG SM, *A riparum* Scribn & JG Sm [orthographic error], *Elymus lanceolatus* (Scribn & JG Sm) Gould var *riparius* (Scribn & JG Sm) Dorn, *E subvillosus* (Hook) Gould, *Elytrigia dasystachya* (Hook) A&D Löve, *E ripara* (Scribn & JG Sm) Beetle [orthographic error], *E riparia* (Scribn & JG Sm) Beetle.

Kim Anderson, 1993, Two pioneer dune grasses: *Calamovilfa longifolia* & *Agropyron dasystachyum*. Biological Station, University of Michigan (UMBS)



Agropyron riparium

Elymus repens (Linnaeus) Gould Forever known *Agropyron repens* (L) Palisot de Beauvois #AK, AZ, CA, CO, HI, IA, KS, OR, UT, WY QUACKGRASS, aka *CHIENDENT*, *CHIENDENT RAMPANT*, COMMON COUCH, COUCHGRASS, COUCH GRASS, CREEPING QUACKGRASS, DOG GRASS, QUITCH, QUITCH GRASS, QUICK GRASS, SCUTCH, SCUTCH GRASS, TWITCH, TWITCH GRASS, WITCHGRASS, (*repens* creeping, creeping & rooting, from Latin, *repens*, participle of *repo*, *reperere*, *repsi*, *reptus*, crawl or creep, referring to the creeping & often rooting stems.)

Habitat: Weed of fields, roadsides, & railways. In the se USA, roadsides, disturbed areas, pastures; uncommon, probably introduced from Europe (sometimes considered to be partially native along the coast).” (w12). **distribution/range:** Form *repens*, with lemmas awnless, native to Europe & Asia; adventive in fields & waste ground; common in northern $\frac{3}{4}$, rare in southern $\frac{1}{4}$ of Illinois [*Agropyron repens* (L) Palisot de Beauvois, *Elytrigia repens* (L) Nevski] Form *aristatum*, with lemmas with an awn up to 10 mm long, native of Europe & Asia, is rarely adventive in waste ground, only found in Cook Co. [*Agropyron repens* (Linnaeus) Palisot de Beauvois f *aristatum* (Schum) Holmb]

Culture: Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid. Moderate seed spread rate. 110,000 (usda) seeds per pound.

cultivation: Adapted to coarse, medium & fine textured soils. Anaerobic tolerance low. CaCO₃ tolerance low. Drought tolerance low. Fertility requirement medium. High fire tolerance. Salinity tolerance none. Shade intolerant. pH 5.2-7.8.

Description: Rhizomatous introduced perennial grass; roots long, running rootstocks, with numerous shoots forming a loose but tough sod, 14” minimum depth; culms; leaves rolled in the bud-shoot; sheaths not compressed, not keeled, pubescent with soft, short, erect or retrorse hairs especially on lower leaves, rarely glabrous, green, split, with hyaline margins overlapping; auricles present, 1 to 3 mm long, slender, terete, clawlike, clasping; collar distinct, puberulent both inside & outside, whitish, yellowish or sometimes purplish tinged, broad, v-shaped, divided by midrib, oblique; ligule membranous, 0.5 to 1.0 mm long, obtuse, finely tooth-fringed, ciliate or entire; blade 3.0-10 mm wide, 8.0-20 cm long, flat, slightly keeled at base, sharp-pointed, green sometimes slightly glaucous; upper surface generally sparsely pilose-pubescent, slightly ridged but midrib not conspicuous; margins & upper surface harsh-scabrous; heads; spikes; N 2n = 22, 42. **key features:** ① “This grass is extremely variable in the degree of hairiness of the blades & sheaths. The hairs are more noticeable on the young leaves in the spring than on those formed later in the season. *Agropyron repens* may be distinguished from *A cristatum* by its puberulent collar & less conspicuously ridged blade.” (now36) ② “Like *Agropyron smithii*, but has pubescent sheaths & flat broader leaf blades. Forma *aristatum* with awns to 10 mm long versus *A smithii*; leaves are deep green or blue-green, flexible, soft, flat leaves.” (Ilpin)

Comments: **status:** ● Noxious weed in Alaska, Arizona, California, Colorado, Hawaii, Iowa, Kansas, Utah, & Wyoming. “B” designated weed in Oregon. This sp is considered weedy & invasive in parts of its range (Assorted authors. 200_. State noxious weed lists for 46 states, Haragan 1991, Uva et al 1997, Stubbendieck et al 1994, SWSS 1998, Hoffman & Kearns 1997, Whitson et al 1996.). The creeping rhizomes are difficult to eradicate.

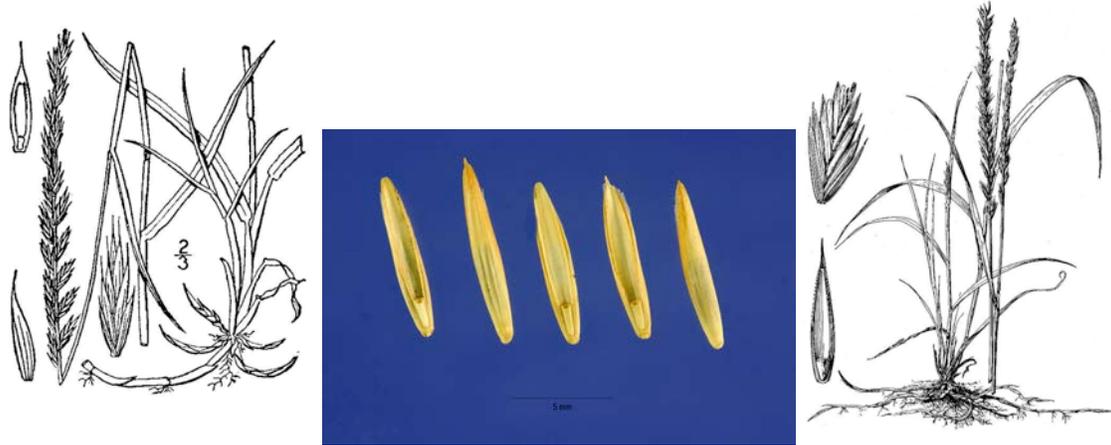
phenology: Blooms June-July. C3.

“Our common quackgrass has very short awns. The long awned variety appears more often in highway shoulder & railroad bank plantings.” (ewf55)

Associates: Larval host of *Thymelicus lineola* EUROPEAN SKIPPER (SKIPPERLING). Allelopathic (usda properties).

VHFS: Mohlenbrock (2014) calls this *Elytrigia repens* (Linnaeus) Desv ex Nevski.

[*Agropyron repens* (L) P Beauv, *A repens* (L) P Beauv var *repens*, *A repens* (L) P Beauv var *repens f aristatum* (Schumach) Holmb, *A repens* (L) P Beauv var *repens f pilosum* (Scribn) Fern, *A repens* (L) P Beauv var *repens f trichorrhachis* Rohlena, *A repens* (L) P Beauv var *subulatum* (Schreb) Roem & Schult, *A repens* (L) P Beauv var *subulatum* (Schreb) Roem & Schult *f setiferum* Fern, *A repens* (L) P Beauv var *subulatum* (Schreb) Roem & Schult *f heberhachis* Fern, *A repens* (L) P Beauv var *subulatum* (Schreb) Roem & Schult *f subulatum*, *A repens* (L) P Beauv var *subulatum* (Schreb) Roem & Schult *f vaillantianum* (Wulfen & Schreb) Fern, *Elymus repens* (L) Gould, *Elytrigia repens* (L) Desv ex BD Jacks var *repens*, *E repens* (L) Desv ex BD Jacks var *vaillantiana* (Wulfen & Schreb) Prokudin, *E vaillantiana* (Wulfen & Schreb) Beetle, *Triticum repens* L, *T vaillantianum* Wulfen & Schreb]



Agropyron repens with *Poa arida*, highway median

Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image

Elymus riparius Weigand RIVERBANK WILD RYE, aka EASTERN RIVERBANK WILD RYE, *ÉLYME DES RIVAGES*, STREAMBANK WILD RYE, (*riparius -a -um* of river banks, from Latin *riparius*, frequenting banks of streams or rivers, riverside.) [fac-]

Habitat: Calcareous woodlands & wooded floodplains. Meadows, streambanks, & floodplains.

distribution/range:

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09).

seed counts & rates: 46,400 (pm), 64,000 (aes10), 69,565(gn), 73,067 (gnhe11), 75,578 (gna04), 88,496 (jfn04), 89,839 (gnhe13), 96,514 (gnae06), 125,000 (ecs) seeds per pound.

cultivation: Shade tolerant. Low drought tolerance. No salt tolerance. pH 4.5-7.1.

bottom line: Plant spring or dormant seed. Genesis seed test data indicate modest to slight dormancy rates, with nondormant lots common. Largely non-dormant. One lot 75% dormant. Germ 83.3, 90, 90, sd 19.1, r21-98.5 (77.5)%. Dorm 7.4, 0.0, 0.0, sd 18.3, r0.0-75 (75)%. Test 27, 27, na, r 16-36 days. (#16)**

Description: Roots 10" minimum depth; culms 3-5' tall; leaves green almost all year long; N 2n = 28. key features:

Comments: status: phenology: Blooms 7-8. Reclamation, conservation, & erosion control seedings. May be found associated with *Elymus virginicus*. Seed source Kane Co.

Associates: Provides food & cover for wildlife.

VHFS: [*Elymus canadensis* L var *riparius* (Wieg) B Boivin]



Elymus riparius

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database. - Not copyrighted image

Elymus trachycaulus (Link) Gould ex Shinners *MA, NJ, OH SLENDER WHEAT GRASS, aka DOG COUCH GRASS, ROUGH-STEMMED WHEATGRASS, BEARDED WHEATGRASS, WESTERN RYE-GRASS, (*trachycaulus -a -um* from Greek τραχύς, *trakhys*, rough, or *trakhelos*, neck, & Latin noun *caulis*, *caulis* m., from the Greek κάυλος, *kaulos*, the stem or stalk of a plant.) fac

Habitat: Mesic prairies, waste grounds, railroad tracks, degraded, calcareous prairies, occasional in sandy soils,. distribution/range: Native to northern & northeastern Illinois.

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③“Sow at +1 to +4°C (33-39°F) for 12 wks, move to 20°C (68°F) for germination” (tchn). Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Slow seed spread rate.

seed counts & rates: 110,400 (pm02), 119,379 (gnak03), 134,000 (cci), 134,978 (gna07), 146,451 (gnhk002), 150,000 (rain), 159,000 (gran, wns01), 167,837 (gna05), 171,030 (gna06) seeds per pound. Plant 6-8 lb/ac in fall (rain). No treatment, drill no deeper than 0.75" deep, 5 to 7 lbs (6-8 gran) pls per acre, but never plant alone, easily & quickly established. Plant in late fall or early spring. In Midwestern seed mixes, do not exceed 1-2 pls lbs per acre, or the permanent matrix will be stunted.

cultivation: 2,000-4,500'. Adapted to medium & fine textured soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance high. Fertility requirement medium. Salinity tolerance medium or high. Shade intolerant. pH 5.6-9.0

bottom line: This seed can be planted spring or dormant. 10% of lots significantly benefit from dormant seeding. Flipflop species, primarily non dormant, but occasional strong dormant lots 2012 & 2013.

Germ 85.6, 93.5, 95, sd 20.5, r22-98.5 (76.5)%. Dorm 7.1, 0.0, 0.0, sd 16.5, r0.0-65 (65)%. Test 23, 22, 28, r14-47 days. (#27)**

greenhouse & garden:

Description: Cool season, short-lived (3 to 5, rarely 5-10 years) perennial, native bunchgrass; roots very short rhizomes; culms moderately tall 13-24(40)"'; leaves rolled in the bud-shoot sheaths not compressed, glabrous, light green, split; margins hyaline; auricles rudimentary or absent; collar distinct, glabrous, pale green, continuous, often oblique; ligule membranous, 0.5 to 1.0 mm long, truncate, finely ciliate; blade 3 to 6 mm wide, 5 to 25 cm long, flat, narrow at base, tapering to a sharp point, medium green, glaucous, scabrous & distinctly ridged on upper surface, keeled on under side; margins scabrous; heads; spikes; $N 2n = 28$; key features: ① *Agropyron pauciflorum (trachycaulum)* is distinguished from *Agrostis tenuis* by its broader blades, rudimentary auricles & its tufted habit.

Comments: status: Endangered & extirpated in Maryland, endangered in New Jersey. Threatened in Ohio.

phenology: Blooms 7,8? (or 6) C3. Collect seeds in se Wisconsin in August (Heon et al 1999). Cool season, bunch grass, moderately drought tolerant. Calcareous soils, saline tolerant. Good for quick, native, perennial, non-aggressive cover. It is a good native nurse crop, persisting long enough for slower developing spp to establish. Very good erosion control. Good xeriscaping. Seed source Boone Co. Several commercial sources & varieties of subsp *trachycaulum* are available. Some characteristics may vary with the cultivar.

"Prairie east of Winnebago, apparently native." (ewf55, as *A pauciflorum* (Schw) Hitch.)

Associates: Endomycorrhizal. Good forage values. Good palatability to livestock & wildlife. Best wildlife values. Used for food & cover by upland game birds & small mammals. Beware of large grazing ungulates.

VHFS: Forever known as *Agropyron trachycaulum* (Link) Malte ex HF Lewis [or just (Link) Malte]

Our seed technologist insists this is an *Elymus*, but we northern Illinois restorationists are just a bit provincial. The subsp *trachycaulum* has 28 synonyms. The subsp *subsecundus* has 12 synonyms. [*A biflorum*, *A pauciflorum* (Schwein) Hitch, *A tenerum* Vasey, *A trachycaulum* (Link) Malte, *Elymus trachycaulum*, *E trachycaulum trachycaulum* (Link) Malte]



Elymus trachycaulum trachycaulum

Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image

Elymus trachycaulum (Link) Gould ex Shinnery subsp **subsecundus** (Link) A&D Löve *CT, NJ, OH
BEARDED WHEAT GRASS, aka SLENDER WHEAT GRASS,
Special concern in Connecticut. Endangered in New Jersey & Ohio.

Variety *unilaterale* (Vasey) Malte with spikelets several flowered, glumes acuminate or awn tipped, & flat blades. Known from Cook, Jo Daviess, Lake, McHenry, Tazewell, & Winnebago cos. Blooms 7-8. C3. Often included in subsp *subsecundus*.



Elymus trachycaulus subsecundus

Seed photo Jose Hernandez USDA-NRCS PLANTS Database. - Not copyrighted image

Elymus triticoides Buckley see ***Leymus triticoides*** (Buckley) Pilg.

Elymus villosus Muhlenberg ex Willdenow SILKY WILD RYE, aka DOWNY WILD RYE, HAIRY WILD RYE, (*villosus -a -um* Latin for with hairs, villous, soft-hairy, softly hairy, shaggy, from the adjective *villōsus -a -um*, shaggy, hairy, rough, from *villus, villi*, m, shaggy hair, tuft of hair, & *-osus -a -um*, adjectival suffix noting plenitude, abundance, fullness or notable, marked development, prone to.) *facu*

Habitat: Mesic & dry savannas & woods, occasional in seasonally wet habitats such as sandy floodplains. “forest sp...bear(s) little relation to grasslands or oak openings” (Cochrane & Iltis 2000). Ernst says “streambanks, moist woods, & marshes.” We have seen it on several, sandy-gravelly, well drained, but seasonally inundated floodplains on the middle Illinois River. Shade tolerant. Moderate drought tolerance.

distribution/range:

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99)

seed counts & rates: 55,172 (gn00), 85,282 (gnia04), 88,000 (pm, ecs), 102,022 (gnih02), 109,148 (gnia04), 115,536 (gnia05), 119,473 (gnih02), 122,636 (gnih07), 124,800 (jfn04), 156,414, 156,800 (aes10) seeds per pound.

bottom line: Seed spring or dormant, many lots are nondormant or less than 10% dormant seed. Our seed test data indicate dormant seeding or cold moist treatment is strongly needed in 2 out of 20 lots. Flipflop species? “Do you feel lucky? Well, do ya, punk?” Germ 80.6, 88.5, 94, sd 21.6, r8.0-98.5 (90.5)%. Dorm 11.3, 3.0, 0.0, sd 23.4, r0.0-88 (88)%. Test 26, 24, 24, r17-38 days. (#22)**

greenhouse & garden: Easy from seed, most lots require no treatment. Rare lots require moist cold stratification for 30-60 days @ 35°F or dormant seeding in an unheated coldframe. Have prop stock germ tested (not TZ) before planting untreated seed in greenhouse for insurance. The cost of a germ test is chump change compared to a lost crop.

Description: Cool-season, native bunch grass; culms 3-5’; leaves blue green; N 2n = 28. **key features:**

Comments: **status:** **phenology:** Blooms 7-8. In northern Illinois, collect seeds in August - September. Collect seeds in se Wisconsin in September (he99). Attractive dried seed heads, useful in landscaping, shade plantings, & shady, mesic or gravelly rain gardens. Useful for erosion control on shady slopes. Said to perform well on low fertility sites. Seed source nursery production, genetic source LaSalle Co. “Awns long & spike long exerted. More slender than the other two spp (*E canadensis* & *E virginicus*). Found in woods & thickets. Common.” (ewf55)

Associates: Larval host. Provides food & cover for wildlife.

VHFS: Basionym *Elymus villosus* Muhl ex Willd. [*Elymus canadensis* var *villosus* (Muhl ex Willd) Shinnery, *E striatus* var *villosus* (Muhl ex Willd) A Gray, *E virginicus* subsp *villosus* (Muhl ex Willd) Á Löve, *Hordeum villosum* (Muhl ex Willd) Schenck, *Terrellia villosa* (Muhl ex Willd) Baum, (or as BR Baum)] **Discuss Illinois varieties.**



Elymus villosus

***Elymus virginicus* Linnaeus** VIRGINIA WILD RYE, aka LYME GRASS, TERELL GRASS, Facultative wet (-)

Habitat: Wet savannas & mesic to dry woodlands, tolerates moist to dry sites, sun to shade. Natural meadows, streambanks, thin open woods or open soil. distribution/range:

Culture: ① No pre-treatment necessary other than cold, dry stratification (pm09). ② No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (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)

seed counts & rates: 62,400 (pn02), 62,480 (agr), 67,200 (pm02), 68,800 (ew12), 70,000 (jfn04), 70,508 (gna04), 73,000 (ecs), 73,600 (aes10), 74,026 (gna05), 87,912 (gni), 96,000 (stock), 111,384 (gna03), 112,935 (gnih02), 117,252 (gnh06), 118,553? (gni03) seeds per pound. Broadcast 1 lb pls or drill 10-12 pls lbs per acre (stocks). When used as a nurse crop, plant 0.5 to 2.0 pls lbs per acre (gni). In mixes plant 0.06 to 1.0 pls lbs per acre (us97).

cultivation: Space plants 1.5-2.0'. Wet to dry soils, full sun to shade. Prefers moist soil, but it will grow in dry, sandy woods. Can tolerate inundation up to 6" for modest periods, also tolerant of dry soils. Tolerates clay soils. Partial to full sun, shade tolerant. Moderate drought tolerance. Nutrient load tolerance moderate. No salt tolerance. Siltation tolerance moderate. pH 5.0-7.4.

bottom line: Plant spring or dormant. About 25% of lots benefit from dormant seeding, having dormancy 20% or greater. Approaching flipflopness, with dorm increasing periodically since 2008 crop. Germ 80.2, 89, 94, sd 18.6, r30-98.5 (68.5)%. Dorm 12.2, 1.5, 0.0, sd 19.5, r0.0-65 (65)%. Test 29, 29, 24, r22-40 days. (#29)**

greenhouse & garden: Easy from seed, most lots require no treatment. Rare lots require moist cold stratification for 30-60 days @ 35°F or dormant seeding in an unheated coldframe. Have prop stock germ tested (not TZ) before planting untreated seed in greenhouse for insurance. The cost of a germ test is chump change compared to a lost crop. Usually successful by fall or spring seeding.

Description: Cool-season, tall, perennial, native bunch grass; roots loosely tufted, 12" minimum root depth; culms 1.5-3.5', some strains up to 6'; leaves rolled in the bud-shoot; sheaths not compressed, not keeled,

glabrous or rarely sparsely retrorse-hairy on the veins, smooth or sometimes slightly scabrous, green or the outer sheaths sometimes reddish at the base, split to the base, the edges overlapping, the margin of the outer one being scabrous, glabrous, or rarely sparsely ciliate, the margin of the inner hyaline, smooth & glabrous; auricles present, 0.5-1.5 mm long, sharp & clawlike, or rounded; collar broad, continuous glabrous, yellow-green, often oblique; ligule thick-membranous, greenish, about 0.5 mm long, truncate, undulate, ciliolate blade 4-12 mm wide, 10-30 cm long, flat, tapering to a sharp point; upper surface dull & sometimes slightly glaucous, distinctly nerved with small & close ridges; lower surface bright green with the distinct midrib forming a keel, scabrous on both surfaces, margins scabrous; heads beardless & upright through maturity; spikes; $N 2n = 28$. key features: “May be distinguished from *E canadensis* by having narrower blades, shorter ligule & more scabrous surfaces of blades. Both spp of *Elymus* have broader & coarser blades than *Agropyron cristatum*.” (now36)

Comments: status: phenology: Blooms 6,7. In northern Illinois, collect seeds in mid August through October. Collect seeds in se Wisconsin in August (he99). Attractive dried seed heads. Useful in landscaping, ornamental grass, specimen plantings, wetland restoration, moist soil stabilization, upper shoreline zones, streambank stabilization, shaded bank stabilization, upland slope buffers, vegetated swales, & rain gardens. Golden, wheatlike fall color. Sp can be planted alone, or in mixes in floodplains, pastures, or for wildlife habitat. Aggressive, if seeded too heavily. May be found associated with *Elymus riparius*. Seed source nursery production from genetic sources Bureau & eastern Whiteside counties & Cook Co It is highly variable & a very adaptable sp, from the shores of the Illinois River to the sand dunes of Green River.

“Among the most predominant of the *Gramineae*, on the rich, dry, and rolling prairies” (Short 1845).

“A more or less glaucous wild rye that flowers early & is common in moist places as ditches & roadsides. Awns usually short & base of spike often included.” (ewf55)

Associates: Larval host. Palatable & nutritious when grazed or hayed prior to heading.

VHFS: **Add varieties/spinoffs**. 27 subspecies, varieties & forms have been named. Basonym *Elymus virginicus* L. Formerly known as *Hordeum virginicum* (L) Schenck, *Leptothrix virginica* (L) Dumort, *Terrellia virginica* (L) Lunell, & *T virginica* (L) Nevski.

VIRGINIA WILD RYE is a self-pollinating, inbreeding sp. Genetic variation is not related to the distance between populations. Populations in widely separated regions may be more genetically similar than populations within a smaller region. (Huff 2006) Once again, we are not smart enough to define the “local ecotype”.





Elymus virginicus

Line drawing of collar area from Nowosad et al 1936, courtesy <http://www.caf.wvu.edu/~forage/library/index.htm>

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ELYTRIGIA Desvaux **Wheatgrass** *Elytrigia* Formerly *Agropyron*, placed as a section in *Elymus* by some. Maintained by Mohlenbrock (2014).

Elytrigia dasystachya (Hook) A Löve & D Löve WESTERN WHEATGRASS

Native to the w US; adventive along railroads: Cook, DuPage, & Will cos (m14).

[*Agropyron smithii* Rydberg var *molle* (Scribn & Smith) Jones, *A. dasystachyum* (Hook) Scribn, *Elymus lanceolatus* (Scribn & JG Sm) Gould]

Elytrigia dasystachya (Hook) A Löve & D Löve subsp ***psammophila*** (JM Gillett & Senn) Dewey [new name *Elymus lanceolatus* (Scribn & JG Sm) Gould subsp *psammophilus* (JM Gillett & Senn) A Löve]

*WI GREAT LAKES WHEATGRASS, aka SAND-DUNE WHEATGRASS, STREAMBANK WHEAT GRASS, THICKSPIKE, THICK-SPIKE WHEAT GRASS, (*dasys* for hairy, *stachys* for spike)

Plants from around the Great Lakes have been shown to be almost completely pollen sterile. Threatened in Wisconsin. A commercial variety, 'Sodar' wheatgrass is available. The original genetic material was from Grant Co, Oregon.

The USDA plant guide for this sp is also used for STREAMBANK WHEATGRASS & SNAKE RIVER WHEATGRASS (*E wawawaiensis*), & can be confusing.

VHFS: *Agropyron dasystachyum* (Hook) Scribn subsp *psammophilum* (JM Gillett & Senn) Dewey, *A dasystachyum* (Hook) Scribn var *psammophilum* (JM Gillett & Senn) EG Voss, *A psammophilum* JM Gillett & Senn, *Elymus lanceolatus* (Scribn & JG Sm) Gould subsp *psammophilus* (JM Gillett & Senn) A Löve, *Elytrigia dasystachya* (Hook) A&D Löve var *psammophila* (JM Gillett & Senn) Cronquist]



Seed photos Jose Hernandez USDA-NRCS PLANTS Database. - Not copyrighted images

Elytrigia elongata (Host) Nevski TALL WHEAT GRASS, July-Aug; Native to Europe; adventive in disturbed saline soils; Cook & DuPage cos; synonyms *Agropyron elongatum* (Host) Palisot de Beauvois, *Elytrigia pontica* (Podpěra) Holub, *Thinopyrum ponticum* (Podpěra) Barkworth & DR Dewey, *T ponticum* (Podpěra) ZW Lu & RC Wang] (per m14) “Waste areas near wool-combing mills, not known to be established or persistent; native of Europe and w. Asia” (w12).

Elytrigia repens (Linnaeus) Desv ex Nevski see ***Elymus repens*** (Linnaeus) Gould. QUACKGRASS is placed in *Elytrigia* by Mohlenbrock (2014).

Elytrigia smithii (Rydberg) Nevski, WESTERN WHEATGRASS, Native to the w US; adventive along railroads; occasional in the n ½ of the state, rare in the s ½; synonyms *Agropyron smithii* Rydberg and *Pascopyrum smithii* (Rydberg) A Löve.

GRASS IS IMMORTAL

GRASS is the forgiveness of nature --- her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannons, grow green again with grass, & the carnage is forgotten. Streets abandoned by traffic become grass grown like rural lanes, & are obliterated. Forests decay, harvests perish, flowers vanish, but grass is immortal ... Unobtrusive & patient, it has immortal vigor & aggression. Banished from the thoroughfares & the fields, it bides its time to return, & when vigilance is relaxed, or the dynasty has perished, it silently resumes the throne from which it has been expelled, but which it never abdicates. It bears no blazonry or bloom to charm the senses with the fragrance of splendor, but its homely hue is more enchanting than the Lily or the Rose. It yields no fruit in earth or air, & yet should its harvest fail for a single year, famine would depopulate the earth.

John J Ingalls
US Senator
Kansas -1873-1891

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End Grass Section One

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
 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.