



GRASS, WEED AND WILDFLOWER GUIDE

Quick Reference: Grasses, Weeds and Wildflowers
Found throughout Texas

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Alkali Sacaton

Sporobolus airoides (Torr.) Torr.

Native, warm-season perennial growing 16–60" tall.

- Seed heads are up to 15" long, moderately open with many seed tipped branches forming a pyramid shape.
- Leaves are flat and then margins roll inward after emergence. Base of many stems appear bleached and shiny.
- Mid successional species found on a variety of soils including saline sites.
- Valuable as a restoration species for disturbed saline and alkaline sites.
- Blooms April–September.
- Alkali Sacaton is a desirable, native species
- Blades are long and slender and are hairy at the throat.
- 1,758,000 seeds per pound.



Tiny seeds of Alkali Sacaton are born singly at the end of the seedhead branches

Photos courtesy Texas Native Seed Program



Alkali Sacaton is very tolerant of salt affected soils



Annual Ryegrass

Lolium multiflorum L.

Introduced, cool-season, annual bunchgrass

- Primarily used for soil stabilization on revegetation projects.
- Grows to 3' tall, but typically shorter
- Flowers from May–June
- TxDOT does not use annual ryegrass in seeding on the state's right of way.



Annual Ryegrass is no longer used in seeding the ROW

Photos courtesy of Amanda Fowler, TxDOT Maintenance Field Support Section.



Annual Ryegrass seed heads



Arizona Cottontop

Digitaria californica (Benth.) Henr.

Native, warm-season perennial that grows 15–40" tall.

- Seed head is composed of 4–11 alternating branches 2–5" long. Seeds are characterized by long silky white hairs, like cotton.
- Leaves are bluish-green, lower portion soft and velvet like. Base of plants are knotty, purplish, and freely branching.
- Mid-late successional species found on a variety of soils, especially during abnormally wet periods.
- Readily and quickly establishes by seed.
- Blooms July–November.
- 614,000 seeds per pound.



Arizona Cottontop is also California Cotton Top

Photos courtesy of Texas Native Seed Program



The cottony seeds give this plant its name



Bahiagrass

Bahiagrass Paspalum notatum Flugge

Introduced, warm-season perennial growing 12–40" tall.

- Seed head is a single stem with two (sometimes 3–4) seed branches at the end forming a V. Leaves are short, waxy, and folded.
- Plants have stolons and rhizomes, forming large colonies that can displace native species.
- Mid successional species found on a variety of soils.
- Blooms June–November.
- Native to Mexico, Central and South America.
- Leaves are short, waxy, and folded.



Bahiagrass has good salinity toxicity

Photos courtesy of Texas Native Seed Program



Bahiagrass is sometime the dominant species in East TX ROW's despite being an introduced species



Bermuda Grass

Cynodon dactylon (L.) Pers.

Introduced, warm-season perennial that grows 4–12" tall.

- Seed head is composed of 3–7 branches of purple seed clusters in one whorl at end of stem.
- Hairs found at base of leaf blade.
- This sod grass has stolons and rhizomes that form large colonies with a dark bluish-green color.
- Desired as a forage plant, lawn grass, and for erosion control, but can be invasive and compete aggressively with native plants.
- Located throughout Texas, it is the most controlled plant by edge of pavement applications
- Spreads by seeds and rhizomes.
- Grows on any moderately well-drained soil, whether acid or alkaline, for both clay and sandy soils.
- 2,000,000 seeds per pound.



Bermudagrass is probably the most common introduced grass in Texas

Photo courtesy of Texas Native Seeds Program



Bermudagrass mostly spreads by its rhizomes and stolons



Big Bluestem

Andropogon gerardii Vitman

Native, warm-season perennial bunchgrass that forms large colonies by rhizomes and can grow 35–60" tall.

- Lower leaves are covered with hairs and leaf margins are rough.
- Seed heads are a panicle of 2–6 dark branches which can be purplish or sometimes yellowish.
- Reproduces mainly by rhizomes in areas with relatively low disturbance.
- Late successional species, excellent livestock forage but is difficult or slow to establish by seeding.
- Blooms August–November.
- 165,000 seeds per pound.



A common name of Big Bluestem is Turkey Foot for its seedhead

Photos courtesy of Texas Native Seed Program



Big Bluestem is considered one of the major grasses of the tallgrass prairie



Blue Grama

Bouteloua gracilis (Kunth in H.B.K.)
Lag. ex Griffiths

Native, warm-season perennial that grows 5–36" tall.

- Seed head is a single stem with 2–3 branches of 40+ spikelets on each that extend beyond the end of the branch.
- Purple to bluish.
- Dried branches curl upwards. Rhizomes create mat like colonies in well drained alkaline soils.
- Mid-late successional species that readily establishes from seed.
- Blooms July–November.
- The mature seedhead resembles the human eyebrow.
- Widely adapted to different soil types and is extremely drought tolerant.
- 825,000 seeds per pound.



Blue Grama is a good plant for both wildlife and livestock

Photos courtesy Texas Native Seed Program



One of the major plants of the short grass prairies



Buffalograss

Buchloe dactyloides (Nutt.) Engelm.

Native, warm-season perennial that grows 3–12" tall.

- The male and female plants grow in separate colonies.
- Seeds are bur like and found beneath the leaves, male pollen comb-like structures are found on stems above the leaves.
- Leaves are uniformly short, becoming curly and golden brown when dormant.
- Stolons form dense sod-like colonies that are found on a variety of well-drained soils.
- Mid-late successional grass that can be slow or difficult to establish from seed.
- Blooms April–November.
- Buffalograss is a native, desirable species
- Wide climate adaptation, tolerates severe drought and normal rainfall conditions.
- 56,000 seeds per pound.



Buffalograss is a major plant in the short grass prairie

Photos courtesy Texas Native Seed Program



The male flower of Buffalograss is easy to see, the female is at the base and harder to find



Buffelgrass (Link.)

Cenchrus ciliaris

Introduced, warm-season perennial bunchgrass growing up to 4' tall.

- Easily established and vigorous growing.
- Spreads by short rhizomes and reproduces by seeds.
- Slender, leafy stems.
- Grows from knotted crown.
- Seed head is 1–4" long in a cluster of slender, purplish, bristle-covered seed.
- 400,000 seeds per pound



Buffelgrass grass stand with purplish, bristle-covered seed

Photos courtesy of Herbarium, Texas A & M Research and Extension Center, Uvalde, Texas



Buffelgrass hairy auricle



Bushy Bluestem

Andropogon glomeratus

Native, warm-season perennial which grow 2–5' in height

- Seedheads have large bushy spikelets which give the plant its name
- Leaves are simple, alternate and grow linearly from the base reaching upright
- Valuable as a wetland species or for stabilization in wetter areas.
- Mid successional species found primarily in wet clayey soils
- Blooms August–November



Bushy bluestem is most easily identified by its inflorescence during the winter dormancy

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Bushy bluestem is a key species for wildlife



Canada Wildrye

Elymus canadensis L.

Native, cool-season perennial that grows 35–60" tall.

- Seed head is a drooping spike 4–8" long, closely resembles wheat or barley with shorter, curved awns.
- Leaves are broad and dark green and clasp the stem.
- Found in riparian areas, under large trees, and in moist ditches.
- Important early spring forage plant.
- Mid-late successional species found on a variety of soil types and excellent for cool season and early spring restoration plantings.
- Blooms March–June.
- 87,560 seeds per pound.



Canada Wildrye is a cool season grass mostly observed in fall and spring

Photos courtesy of Texas Native Seeds Program



Canada Wildrye usually requires higher moisture levels in the soil



Dallisgrass

Paspalum dilatatum Poir.

Introduced, warm-season, perennial grass that grows from 1–4' tall.

- Leaves blades are flat and generally ½" wide
- Flowers from April to November
- 3–6 seed spikes per stem
- Late in the season the plant becomes reddish at the base
- Rapid seed growth and heavy seed production have resulted in this plant overtaking neglected areas
- 281,000 seeds per pound



Dallisgrass seed head.

Photo courtesy of
Stephenville.TAMU.edu



Dallisgrass red base

Photo courtesy of Chris
Gardiner, Tropical Forages



Eastern Gamagrass

Tripsacum dactyloides (L.) L.

Native, warm-season perennial growing 36–72" tall.

- Seed head is composed of 1–3 branches that can grow up to 12" long with male parts placed above female parts on each branch.
- Species closely related to corn. Leaves are 1" wide and have rough often sharp margins.
- Plants have deep rhizomes and the bases of stems are purple.
- This large bunchgrass is excellent forage but easily over grazed.
- Late successional species found on a variety of soils in bottomlands, ditches, riparian corridors, and protected areas.
- Reproduces often through seedheads
- Blooms April–November.
- 281,000 seeds per pound



Eastern gamagrass mostly reproduces by seedhead

Photos courtesy of Texas Native Seed Program



Eastern gamagrass is widespread in the eastern portion of the state and grows very tall



Foxtail Millet

Setaria italic (L.) P. Beauv

Introduced, warm-season, annual bunchgrass growing 24–60" tall.

- Used for temporary erosion control
- Slender, erect stems that branch somewhat at the crown
- Seeds are in a dense, cylindrical, bristly seed head
- Can be grown in almost any area that has warm weather during the growing season and sufficient rainfall.
- 200,000 seeds per acre



Bristly seed head of
Foxtail Millet

Photos courtesy of Mike Haddock, Kansas Wildflowers and Grasses



Foxtail Millet can provide a quick ground cover to hold and stabilize soil temporarily



Galleta Grass

Hilaria jamesii (Torr.) Benth.

Native, warm-season perennial that grows 12–26" tall.

- Seed head is a single spike with fuzzy seed clusters, similar to curly mesquite but larger.
- Leaves are wiry and curved when dry and typically blue green tinted.
- Plants are strongly rhizomatous and can form large colonies.
- Mid-late successional species that is very rhizomatous and found in arid soils.
- Good restoration species that quickly establishes from seed.
- Blooms June–September.
- Spikelets have long hairs at the base.
- Grows on dry rocky ledges, slopes, hills and flats around the state.
- 159,000 seeds per pound



Galleta grass has historically been used for basketry and other items

Photos courtesy of Texas Native Seed Program



Galleta grass is an important grass in drier areas



Goosegrass

Eleusine indica (L.) Gaertn.

Introduced, warm-season, annual bunchgrass that grows from 4 to 30" tall.

- Leaves blades are flat or folded up to 12" long and 1/3" wide
- Flowers from June–September
- Grows from the basal rosette of stems
- Tends to be a weedy grass in turf areas similar to crabgrass



Goosegrass seed heads can easily be mistaken for Dallisgrass or Bahiagrass

Photos courtesy of Shawn Askew, Virginia Tech, Turf and Weed Science



Goosegrass is a common introduced grass which is a nuisance in many lawns



Green Sprangletop

Leptochloa dubia (Kunth in H.B.K.) Nees

Native, warm-season perennial that grows 12–38" tall.

- Seed head is composed of 2–16 seed branches that are up to 6" long, arranged in an open nodding "sprangle."
- Numerous small seed clusters found on each branch.
- Leaves and stems are flat, wiry, and slightly rough, commonly purple toward the base in young plants and dark green above.
- Provides good forage and cover.
- Early-mid successional, drought and cold tolerant species found on variety of well-drained soils.
- Readily establishes from seed.
- Blooms June–November.
- Serves as a nurse grass for other warm-season perennial seed species.
- Normally exists for 2 growing season.
- Very good drought drought tolerance.
- 538,000 seeds per pound



Green Sprangletop is the larval host for a few species of moths

Photos courtesy of Texas Native Seed Program



Green Sprangletop is great for restoration projects as it establishes quickly and easily.



Guineagrass

Urochloa maxima (Jacq.) R. Webster

Introduced, warm-season, perennial bunchgrass that grows over 6' tall.

- Originated from Africa
- Leaves blades are long, narrow, fine and soft.
- Guineagrass is considered a pest on the Right of Way and is not seeded in the TxDOT program
- Deep, dense, fibrous root system withstands drought conditions



Guineagrass seedhead

Photos courtesy of Gerald D. Carr, Oregon State University.



Mature Guineagrass seedhead



Hairy Grama

Bouteloua hirsuta Lag.

Native, warm-season perennial that grows 6–30" tall.

- Seed head is a single stem with 1–4 branches of 25–50 spikelets each.
- Branches extend beyond spikelets like a stinger.
- Leaves are flat or rolled with hairs rising from glandular dots on the margins.
- Mid-late successional species that forms dense tufts, occasionally with rhizomes and stolons.
- Found on a variety of soils.
- Easy to establish by seeding.
- Blooms June–November.
- 800,000 seeds per pound



Hairy grama establishes well for erosion control

Photos courtesy of Texas Native Seeds Program



Hairy grama a host plant for the Green Skipper moth



Halls Panicum

Panicum hallii Vasey

Native, warm-season perennial growing 12–24" tall.

- Seed head is open with branching structure with white-green seeds that turn shiny brown at maturity.
- Leaves are smooth, becoming curly and resembling wood-shavings when mature.
- Early successional species most common on calcareous soils, but also found on sands and clays.
- Species common in all successional stages, making it valuable in restoration efforts.
- Blooms April–November.



Hall's Panicum prefers dry, arid soils

Photos courtesy of Texas Native Seeds Program



Hall's Panicum can be recognized by its dried, curling leaves



Hooded Windmill Grass

Chloris cucullata Bisch.

Native, warm-season perennial that grows 12–18" tall.

- Seed head is composed of 10–25 purplish branches of seed clusters arranged in a single tight whorl within ¼" on main stem.
- Seedheads turn straw-yellow or black when ripe.
- Leaves are bluish green and form tufted bunches that may have stolons.
- Early successional species that is easily established from seed and valued for restoration purposes.
- Found on a variety of soil types.
- Blooms August–September
- Seedheads look like a windmill
- Bunchgrass



Hooded Windmillgrass sometimes flowers multiple times per year

Photos courtesy of Texas Native Seeds Program



Hooded Windmillgrass is widely distributed around Texas



Indian Rice Grass

Stipa hymenoides Roem. & Schult.

Native, cool-season perennial growing 8–30" tall.

- Seed head is an open many branching structure with fuzzy seeds at the end of each hair like branch.
- Leaves are slender and tightly rolled. Species does not tolerate poorly drained soils.
- Early-mid successional species found on upland sandy soils.
- Blooms May–July
- Very drought hard, cold hardy and intolerant of overwatering.
- 164,500 seeds per pound



Photo courtesy of Roger Banner, Utah State University Extension 2007 TxDOT Grass Guide, Indian Ricegrass seed head



Indian Rice Grass is highly palatable to domesticated animals and wildlife

Photo courtesy of Texas Native Seeds Program



King Ranch Bluestem

Bothriochloa ischaemum (L.) Keng

Introduced, warm-season perennial that grows 18–48"

- Culms branch above the base with hair on top side of leaves. Seed heads are loosely fan-shaped with twisted awns.
- Can form dense turf if mowed often.
- Poor value other than for erosion control, aggressively invades disturbed soil throughout the state, often limiting native plant species diversity.
- King Ranch Bluestem is not a desirable plant in the ROW, but is not often specifically controlled.
- Blooms primarily July–November.
- Leaf blades are ½" to 9" long
- Also called Plains Bluestem.



Photos courtesy of Tasker H. (Buddy) Hudson Jr., TxDOT Maintenance Field Support Section



Kleberg Bluestem

Dichanthium annulatum (Forssk.) Stapf

Introduced, warm-season perennial that grows 8–40" tall.

- Seed head is composed of 2–9 branches of seed clusters that are 1–3" long.
- Stem nodes covered with white hairs.
- Introduced as a forage grass, reproduces through stolons and seed.
- Early successional invasive species found in disturbed areas.
- Aggressively competes with most native plants and commonly forms persistent monocultures.
- Blooms throughout the year.
- Bunchgrass
- Also called Diaz Bluestem, Angleton Bluestem, Hindi Grass, and Ringed Dichanthium.
- TxDOT does not seed on the state's right of ways.



Kleberg Bluestem is not planted by TxDOT

Photos courtesy of Texas Native Seeds Program



Kleberg Bluestem is an invasive which originated in Africa



Kleingrass

Panicum coloratum L.

Introduced, warm-season, tufted perennial bungrass

- Origin African introduced as pasture grass
- Fine stemmed, leafy, with stems arising from knotty base
- Grows to 3–4' in height
- Flowers from May to September
- No longer seeded in the ROW due to large size and non-native status
- 490,000 seeds per pound



Kleingrass is often used a forage pasture grass in agriculture

Photo courtesy of Herbarium, Texas A&M Research and Extension Center, Uvalde, Texas



Kleingrass is commonly found in South and Central Texas.

Photo courtesy of Texas Native Seeds Program



Lehmann Lovegrass

Eragrostis lehmanniana Nees

Introduced, warm-season perennial that grows 16–32" tall.

- Seed heads are 5–7" long and 1–3" wide forming an open oblong shape with grey-green seed clusters.
- Lower portion of stems run parallel with the ground, often rooting at nodes.
- Leaves are short and roll inward.
- Early successional, weedy species that thrives on sandy soils, often out competing natives.
- Blooms July–October.
- Smaller and less cold-hardy than Weeping Lovegrass
- 4,245,000 seeds per pound



Lehman Lovegrass can be invasive

Photos courtesy Texas Native Seed Program



Lehmans Lovegrass establishes on disturbed soil quickly



Little Barley

Hordeum pusillum Nutt.

Native, cool-season annual that grows up to 14" tall.

- Seed head is a flattened spike of bright green, rough seed clusters that have short awns, similar to related cereal grain crops
- Leaves are up to 5" long and smooth. Quickly turns straw-colored at maturity
- Early successional species found in disturbed areas on a variety of soils
- Blooms March–June
- Prefers full sun and dry conditions



Little barley gets its name from its resemblance to domesticated barley.

Photos courtesy of Texas Native Seeds Program



Little barley is a great option for cool season native establishment



Little Bluestem

Schizachyrium scoparium (Michx.) Nash

Native, warm-season, perennial bunchgrass that grows 2–4' tall

- Tolerant to wide range of sandy to clay soils with adequate soil moisture
- Has moderate drought tolerance
- Populations with decrease with heavy mowing or grazing
- Flowers from August to December
- 260,000 seeds per pound



Little Bluestem seed heads turn a rust color with maturity

Photos courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Little Bluestem is a desirable native grass



Multiflower False Rhodes Grass

Trichloris Pluriflora Fourn.

Native, warm-season perennial growing up to 40" tall.

- Seed head is composed of 5–20 whorled branches that can be 1–5" long and emerge from a single area at the end of the stem
- Turn light brown at maturity.
- The upper side of leaves have hairs towards the base.
- Provides good forage for livestock and cover for birds.
- Mid-late successional species found on a variety of soils but is most common on clay and clay loam soils.
- Blooms May–September.
- 1,428,000 seeds per pound.



False Rhodes Grass prefers deep alluvial soils

Photos courtesy of Texas Native Seed Program



False Rhodes Grass is known for its showy inflorescence



Orchardgrass

Dactylis glomerata L.

Introduced, cool-season, perennial tall growing irregularly sodding bunchgrass

- Dense root system without rhizomes or stolons
- Spreads by tillering
- Flowers in May
- Introduced from Europe
- Shade tolerant, but also grows in full sun
- 654,000 seeds per pound



Orchardgrass seed heads

Photos courtesy of David Hannaway, Oregon State University, Forage Information System



Orchardgrass was introduced from Eurasia and Africa

Courtesy of Anna Gardner, Iowa State University



Pink Pappusgrass

Pappophorum bicolor Fourn.

Native, warm-season perennial growing 12–32" tall.

- Seed head is a spike 5–8" long that has a pink or purplish color turning straw-colored at maturity
- Seed structure resembles a tiny pineapple
- Leaves, 4–8" long, dark green with shiny appearance, may have sandpaper like texture on upper surface with hairs at the base of blade
- Mid successional species found on a variety of soils
- Good seed quality and vigorous seedlings, making it an excellent restoration species
- Blooms April–November



Pink Pappusgrass is found on sandy or gravelly soils

Photos courtesy of Texas Native Seeds Program



Seed heads of this bunchgrass are tinged with pink or purple



Plains Bristlegrass

Setaria macrostachya Kunth

Native, warm-season perennial growing up to 43" tall.

- Seed heads are up to 10" long spikes of densely held round seeds that have one small bristle below each seed
- Leaves are flat, bright green, and slightly rough
- Provides good forage for cattle and seed is eaten by many species of birds and quail
- Mid-late successional species found on a variety of soils and in disturbed areas
- Seed is made several times a year, but germination rates are medium to poor
- Blooms May–November
- Does not usually occur in large dense stands and short lived
- Usually associated with mesquite, gravelly washes and disturbed sandy areas.
- 305,000 seeds per pound



Plains bristlegrass has only one hair bristle below each seed

Photos courtesy of Texas Native Seeds Program



Plains bristlegrass may flower more than one time per year



Purple Prairie Threawn

Aristida purpurea Nutt.

Native, warm-season perennial that grows 15–30" tall.

- Seed heads are nodding, purplish, and seeds have 3 long awns.
- Leaves are mostly basal with hairs found along sheath margins.
- Early successional species that is poor forage but good for wildlife cover
- Easily colonizes degraded dry soils
- Blooms April–May and July–September



Purple prairie threawn establishes well on newly disturbed soil

Photos courtesy of Texas Native Seeds Program



The seed of purple prairie threawn is incredibly tiny, but comes attached to the awns, hence the name.



Rhodesgrass

Chloris gayana Kunth

Introduced, warm-season, perennial that grows 1.5–6' tall

- Stems are fine and leafy
- Leave blades are smooth and 6–20" long and 1/3" wide.
- Can tolerate a variety of soils and pH ranges, but grows best with average annual rainfall of 24–40"
- Provides excellent erosion control and weed suppression
- Rhodesgrass is not planted on TxDOT ROW's



Rhodesgrass

Photos courtesy of Kev Shaw, Tropical Forages, The International Center for Tropical Agriculture, The Commonwealth Scientific and Industrial Research Organization, and DPI & F.



Rhodesgrass seed heads



Sand Bluestem

Andropogon hallii Hack

Native, warm-season, perennial bunchgrass growing 3-8' tall

- Spreads by seed and rhizome
- Plants are tall with fine stems
- Forms dense colonies 15–20 feet across
- Grows best on sandy soil types
- Flowers August to October
- 113,000 seeds per pound



Photo courtesy of James Bowns, Utah State University Extension, shows Sand Bluestem plant



Photo courtesy of Randy Rosiere, Range Types of North America, Tarleton State University and show Sand Bluestem seed heads



Sand Dropseed

Sporobolus cryptandrus (Torr.) A. Gray

Native, warm-season perennial growing 24–45" tall.

- Seed head is a 6–14" long narrowly branching structure that is often partially enclosed in a leaf
- All leaves have a visible ring of hairs at the base of each, upper leaves are borne at a right angle to the stem, or nearly so
- Early successional species found on a variety of soils especially sand and is easily established through range seedings and on disturbed sites
- Blooms May–November
- Bunchgrass that spreads from seed and the old bunches increase in size by tillering.
- The hard seed ordinarily does not germinate unless scarified or treated with acid to make the seed coat permeable.
- 5,300,000 seeds per pound



Sand Dropseed is most identifiable by the “flag leaf” perpendicular to the stem

Photos courtesy of Texas Native Seeds Program



Sand Dropseed can also be identified by dense hairs at the collar



Sand Lovegrass

Eragrostis trichodes (Nutt.) Alph. Wood

Native, warm-season, perennial, bunchgrass growing 2–5' tall.

- Reproduces by seed
- Mature bunches increase in size by tillering and rooting at the nodes of base stems
- Dense, deep root systems
- Grows best on sandy soil
- Decreases rapidly when mowed or grazed closer than 5"
- 1,300,000 seeds per pound



Delicate seed heads of Sand Lovegrass

Photos courtesy of Mike Haddock, Kansas Wildflowers and Grasses



Bunch of Sand Lovegrass



Shortspike Windmill Grass

Chloris x subdolichostachya Mull.

Native, warm-season perennial that grows 12–28 inches.

- Seed head is composed of 5–11 branches of seed clusters arranged in several whorls spaced within 1 inch on main stem.
- Stolons can form large mats, leaves are short and have flat bases.
- This species is a hybrid of hooded windmill and tumble windmill grass and displays characteristics of each.
- Early successional species that competes well with non-native species and readily establishes from seed.
- Blooms May–October.
- 3,000,000 seeds per pound



The inflorescence whorl

Photos courtesy of Texas Native Seeds Program



Shortspike Windmillgrass



Showy Chloris

Chloris virgate Sw.

Native, warm-season, annual grass that grows 10–40" tall.

- Usually found in right of ways in disturbed areas.
- Typically along the edge of pavement and under guardrails.
- Found in clay soils
- Flowers from May through November

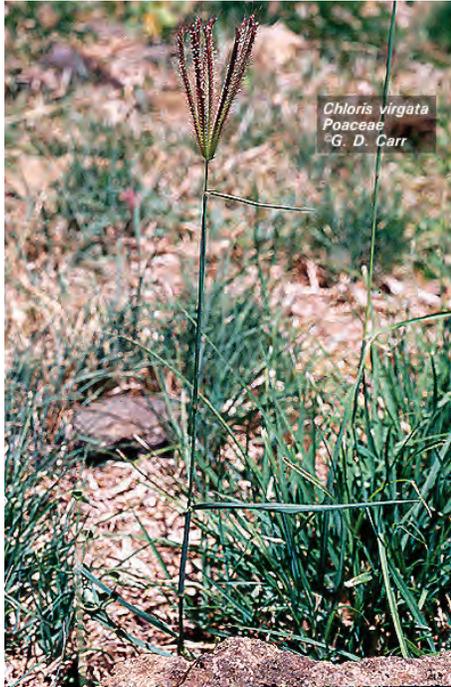


Photo courtesy of Gerald D. Carr, Oregon State University shows the Showy Chloris' seed head



Showy Chloris along the edge of pavement and under guardrail.

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section.



Sideoats Grama

Bouteloua curtipendula (Michx.) Torr.

Native, warm-season perennial that grows 18–40" tall.

- Seed head is characterized by a single main stem with 30–80 branches hanging from one side, each with 2–8 spikelets each
- Margins of leaf blades have hairs arising from glandular dots
Rhizomes may or may not be present depending on variety
- Desirable mid or late successional species for livestock and wildlife
- State Grass of Texas
- Easy to establish by seeding
- Blooms June–November
- Small oatlike seeds hang down uniformly on one side of the seedstem as indicated by the name.
- This species will decrease if mowed or grazed closer than 2–3" during the growing season.
- 191,000 seeds per pound



Sideoats grama is the state grass of Texas

Photos courtesy of Texas Native Seeds Program



Sideoats grama gets its name from the seed being held perpendicular to the stem



Silver Bluestem

Bothriochloa laguroides (Gould) Allred

Native, warm-season perennial that grows 18–40" tall.

- Identified by fluffy silver seed heads with many branches that have a strong odor when crushed
- Stems grow slightly prostrate away from base then make a characteristic dog leg upward
- Stem nodes are smooth and white
- Readily establishes from seeding, and competes well with many introduced grasses
- Produces seed several times a year
- Blooms May–November
- Bunchgrass
- Also reproduces from tillers.
- Prefers dry soil and full sunlight.



Silver Bluestem establishes well in arid, dry soils

Photos courtesy of Texas Native Seeds Program



Silver Bluestem is adapted to many types of habitats



Slender Grama

Bouteloua repens (Kunth in H.B.K.) Scribn. & Merr.

Native, warm-season perennial that grows 8–20" tall.

- Seed head is a single stem with 4–9 branches of 3–15 light tan-cream colored seed clusters on each branch.
- Leaves roll inward and may have hairs along the margin.
- Early successional species found on many different soil types.
- Aggressively colonizes disturbed soils and is one of easiest native grasses to establish by seeding.
- Can be found on sand, sandy, loam, clay and clay loam soils.
- Blooms March–October.
- 116,300 seeds per pound



Single stem with cream colored seed clusters of Slender Grama

Photos courtesy of Texas Native Seeds Program



Slendar Grama grass



Switchgrass

Panicum virgatum L.

Native, warm-season perennial growing 36–75" tall.

- Seed head is a many branched and pyramid shaped, having purplish seed clusters at the end of each branch
- Leaves have dense hairs at the base of the blade, color can be silver blue to a bright green
- Late successional species that forms large dense clumps. Reproduces by seed and rhizomes, and is good forage
- Found in moist areas and well managed prairies on a variety of soils
- Blooms September–November
- 389,000 seeds per pound.
- Leaf blades are 4–24" long and up to a ½" wide.
- Roots can reach up to 10–11 feet deep.



Switchgrass is one of the major plants of the tallgrass prairie

Photos courtesy of Texas Native Seeds Program



Due to its tall growth pattern and ability to form monocultures, switchgrass is often controlled in the ROW for safety reasons.



Tall Fescue

Lolium arundinaceum (Schreb.) Dumort.,
nom. cons.

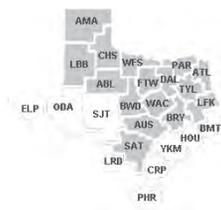
Introduced, cool-season perennial grass which grows 3' to 4' in height

- Dark green basal leaves are broad and branch off of erect tiller stems
- Produces short rhizomes and has a bunch-type growth habit
- Seed head is compact panicle, 3–4" in length
- Prone to infection by endophytic fungus which causes disease in grazing animals
- Fibrous root system can penetrate the soil 5 feet deep, making good use of sub-soil moisture.
- 227,000 seeds per pound



Tall fescue has widely replaced native grasses in many areas of the US and does not provide adequate food for wildlife

Photo courtesy of Mike Haddock, Kansas Wildflowers and Grasses



Endophyte affected fescue can have a negative impact on any animal which consumes it

Photo courtesy of David Hannaway, Oregon State University, Forage Information System

Texas Grama

Bouteloua rigidseta (Steud.) A. S. Hitchc.

Native, warm-season perennial that grows 6–20" tall.

- Seed head is a single stem with 2–7 branches of wedge-shaped seed clusters that contain 2–5 seeds each
- Leaves are short, very narrow, and tufted at the base of the plant
- Early successional species found throughout Texas that establishes quickly on disturbed sites
- Blooms April–November



Texas Grama establishes well on disturbed soils

Photos courtesy of Texas Native Seeds Program



The seedhead of Texas Grama is bell shaped



Tumble Windmill Grass

Chloris verticillata Nutt.

Native, warm-season, perennial that grows 6–20" tall.

- Leaf blades are ¼–4" long and 0.2" wide.
- Grows in heavy, sandy or gravelly soils distributed along the roadsides
- Blooms have two or more windmill like branches.
- Flowers May through September



Tumble Windmillgrass
seed head

Photo courtesy of Shawn Askew, Virginia Tech, Turfgrass Weed Science



Windmill effect of the
inflorescence

Photo courtesy of Mike Haddock, Kansas Wildflowers and Grasses



Vasey Grass

Paspalum urvillei Steud.

Introduced, warm-season perennial grass which grows to 7' in height

- Leaf blades can be up to 15" long and ½" in width
- Flowers May–November
- Prefers wet moist soil, but can propagate in well drained soils
- Vasey Grass is not seeded on the state's right of ways due to its large size and growing habit.



Vasey Grass is an invasive grass which can grow up to 7 feet tall

Photos courtesy of Randy Rosiere, Range Types of North America, Tarleton State University



Vasey grass originates from Africa and prefers moist soils



Weeping Lovegrass

Eragrostis curvula (Schrad.) Nees

Introduced, warm-season, perennial bunchgrass that grows from 2-4' tall

- Has narrow, drooping leaf blades that are rough on the bottom and top sides.
- Inflorescence is loose and contains many seeds
- Prefers sand soils
- Good at soil erosion stabilization
- 1,500,000 seeds per pound



Photos courtesy of Randy Rosiere, Range Types of North America, Tarleton State University



Western Wheatgrass

Agropyron smithii (Rydb.) Á. Löve

Native, cool-season, perennial that grows 1-3' tall

- Sod-forming grass that reproduces from rhizomes and seed
- Grows in clumps
- Starts growing in early fall, staying green during winter, with maximum growth in the spring
- Stems are bluish-colored, therefore its often called bluestem wheatgrass
- Spread slowly
- Tolerant of mild droughts and has strong cold tolerance
- Thrives on low areas of heavy soils where runoff accumulates
- Flowers June–Mid-summer
- 110,000 seeds per pound



Photos courtesy of Mike Haddock, Kansas Wildflowers and Grasses



Wheat (Red, Winter)

Triticum aestivum L.

Introduced, cool-season, annual, bunchgrass growing 2.5–3' tall.

- Reproduces from seed each year
- Used as temporary erosion control
- Flowers from March to May
- 11,000 seeds per pound



Photo courtesy of Twain Butler, Forages of Texas, Texas Cooperative Extension Service shows wheat inflorescence in a field.



Yellow Indiangrass

Sorghastrum nutans (L.) Nash

Native, warm-season perennial bunchgrass growing 20–90" tall.

- Seed heads are 7–12" long, golden yellow, and plume-like.
- Seed clusters have 0.5" long bent twisted awns
- Leaves can grow up to 3' long and have a blue-green to bright green color
- Plants form large dense colonies with rhizomes and provide good forage for cattle and cover for wildlife
- Late successional species found in a variety of locations including disturbed areas, on moist sand and clay soils
- Fairly drought and cold tolerant
- Blooms September–November
- Indiangrass is not seeded on the state's right of way because of its large growing habit.
- 120,000 seeds per pound.



Yellow Indian Grass is one of the major tallgrass prairie species

Photos courtesy of Texas Native Seeds Program



Yellow Indian Grass can form pure stands in lowland areas



African Rue

Peganum harmala L.

African Rue is an invasive perennial forb native to Africa, the Middle East and India. It grows to a height of 2' and spreads up to 4' in diameter

- Extremely drought resistant and invasive in disturbed soils of dry regions
- Flowers are white with five petals which bloom in April to September
- Leaves are simple with pinnate or parallel venation
- African rue is toxic to animals due to poisonous alkaloids



African Rue is one of the most common weeds in West Texas

Photos courtesy of Amanda Fowler, TxDOT Maintenance Field Support Section



African Rue is a difficult to control invasive species

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Barnyard Grass

Echinochloa muricata (P. Beauv.) Fernald

Introduced, warm-season, annual grass that grows 1–5' tall.

- Leaf blades are 4–20" long and ¼–¾" wide
- Stem bases are reddish brown to dark purple
- Grows in wet and dry regions, but prefers moist areas
- Flowers from July to September
- Blooms April–August



Barnyard grass plants

Photos courtesy of Mike Haddock, Kansas Wildflowers and Grasses



Barnyard Grass seed head



Bastard Cabbage

Rapistrum Crantz

Invasive, cool-season annual native to Europe, with many branches, which grows from 1-5' in height.

- Flowers are small, yellow, and clustered at the tips of the branches
- Leaves are deep green and lobed with large masses of leaves at the basal portion of the plant
- Bastard cabbage is early successional and can form a monoculture if not managed correctly
- Grows during the fall and winter and blooms in early spring
- Also goes by Turnip Weed



Bastard Cabbage is a common roadside weed most visible in the early spring

Photo courtesy of Amanda Fowler, TxDOT Maintenance Field Support Section



Bastard Cabbage is actually edible, but don't pick it on the side of the road

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section

Broom Snakeweed

Gutierrezia sarothrae (Pursh) Britt. & Rusby

Native, warm-season perennial in the Sunflower family which grows 15–30" in height

- Leaves are small, simple with pinnate or parallel venation
- Flowers are small, yellow which grow at the terminal end of the branch, blooming from September to November
- Annual broomweed grows in many habitats from native ranges to disturbed sites, usually on heavy clay soils



Broomweed is common along the side of the road in disturbed sites

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Broomweed thrives where many other plants struggle to establish

Photo courtesy of Thomas Muller, Lady Bird Johnson Wildflower Center



Common Cattail

Typha latifolia Michx.

Native, warm-season perennial which grows to a height of 4–8'

- Cylindrical flowers of yellow, green or brown color. Female flowers have long hairs.
- Stems are tall, erect and unbranched
- Cattails prefer moist soil and will survive in areas without standing water, but where the soil is always damp.
- Cattails spread by rhizomes and can be easily spread by mowing
- 14,000,000 seeds per pound



Cattails are a common plant found along wet areas in roadsides and riparian sites

Courtesy of Stephanie Brundage, Lady Bird Johnson Wildflower Center



Cattails are controlled when they grow too tall for safe travel along roadsides.

Courtesy of Norman Flagg, Lady Bird Johnson Wildflower Center



Chinese Tallow Tree

Sapium sebiferum (L.) Roxb

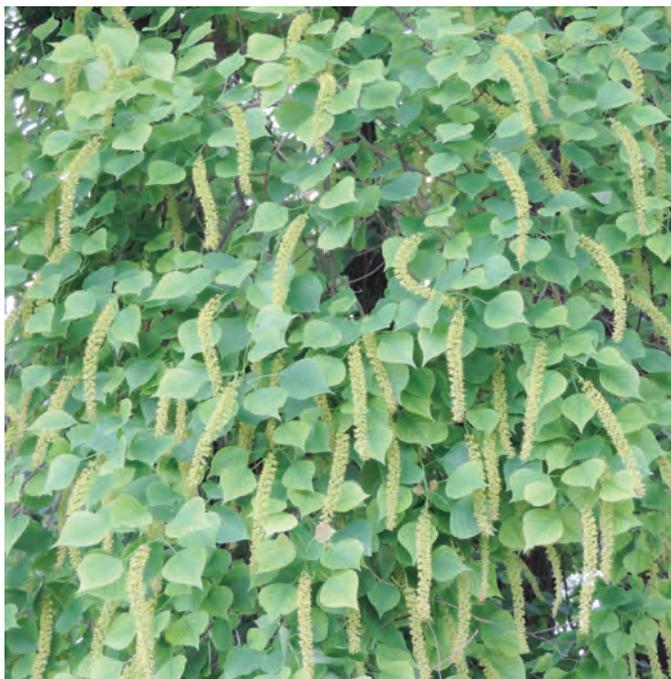
Introduced, warm-season perennial which grows to 30' in height

- Flowers have no petals and grow as 2–6" drooping spikes
- Fruit has three cells, which fall at maturity
- 6,300 seeds per pounds



The invasive Chinese tallow is commonly found in riparian areas competing with native vegetation

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Chinese tallow is a popular ornamental tree which was become invasive in many areas of Texas



Common Sunflower

Helianthus annuus L.

Native, warm-season annual with potential to grow well over 6' tall.

- Many elliptic yellow rays surround a large central disk in common sunflowers. Central disk may range in color from dark maroon to yellow. Flower heads may grow up to 5" across.
- Leaves and stems are green and covered in a multitude of coarse hair. Leaves are roughly lanceolate in shape and may grow up to 5" long.
- Sunflowers typically grow solitarily but have a large potential to spread and take over an area.
- Seeds are elongated and may be dark brown or black in color when separated from the plant.
- Early-mid successional species.
- Blooms July–October
- 47,000 seeds per pound



While a good pollinator and native, common sunflower often grows too tall for safety

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Common sunflower is one of our easiest plants to identify



Crabgrass

Digitaria texana Hitchc.

Native, cool-season perennial not growing more than 1' tall.

- Leaves are long and grow alternately along branching stems resembling the legs of a crab. Stems typically lay flat on the ground and individual blades may raise slightly upward.
- Grows solitarily
- Seeds are extremely small
- Early-mid successional
- Blooms September–January
- 800,000 seeds per pound



Crabgrass is a hated weed amongst lawn keepers and roadside vegetation managers alike

Photos courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Curly Dock

Rumex crispus L.

Introduced warm-season perennial broadleaf weed which grows to one meter in height.

- Flower are small and greenish in color and form dense clusters on elongated stems
- Leaves are simple with pinnate or parallel venation and have not notches or indentations along the edges
- Plant is an early successional plant and will easily establish in disturbed sites
- Dock plants contain oxalates and can be poisonous if ingested in large enough quantities
- 200,000 seeds per pound



Curly Dock can usually be identified by the seed head still visible months after the plant is dormant

Photos courtesy of Tasker (Buddy) H. Hudson, Jr., TxDOT Maintenance Field Support Section



Curly Dock is native to Europe and Western Asia



Curlycup Gumweed

Grindelia squarrosa (Pursh) Dun.

Native, warm-season perennial which grows from 8 to 35" in height

- Flowers in July to August
- Leaves are hairless, shiny and heavily toothed along the margins.
- Flowers are yellow and very sticky below the disk flowers
- Member of the sunflower family, this plant is very adapted to waste areas and disturbed sites
- 400,000 seeds per pound



Curlycup gumweed grows too tall on the roadside and often needs to be controlled

Photos courtesy of Mike Haddock, Kansas Wildflowers And Grasses



It is common for curlycup gumweed to dominate in certain circumstances



Giant Cane

Arundo Donax L.

Introduce, warm-season perennial growing to 20' tall

- Leaves are flat and grow to roughly 1.5' long and 2" wide, color varies as green and white stripes run the length of the blade, leaves arranged alternately
- Grows clumped, spreading from large rhizomes, rhizomes easily clog dams/spillways
- Spread from rhizomes
- Mid-late successional species



When mowed giant cane tends to multiply rapidly

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Giant Cane grows rapidly, this cane is over 12 feet tall and was cut back 2 months prior



Giant Ragweed

Ambrosia trifida L.

Native, warm-season annual which can grow up to 10' in height in optimal conditions.

- Leaves are palmately compound, with three large lobes with long petioles
- Flowers are either male or female and can exceed 6" in length
- This early successional species can be invasive and form monocultures which shade out desirable species
- Giant Ragweed has been linked to hay fever in the fall
- Giant Ragweed is one of the most important plants to control in the vegetation management system
- 55,000 seeds per pound



Giant Ragweed is often found forming large stands and shading out competition

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Giant Ragweed is controlled in Texas due to its quick growth and height.

Photo courtesy of Amanda Fowler, TxDOT Maintenance Field Support Section



Horseweed

Conyza canadensis (L.) Cronquist

Native, winter or warm-season annual growing to 1'- 5' tall

- Flower heads are very small with white or purplish streaks.
- The leaves are alternate, oblong to lance-shaped measuring 2 to 10 cm long.
- Tiny, puff-ball-like seed heads
- Early succession
- Bloom Dates: July–November
- 700,000 seeds per pound



When horseweed grows too tall in the roadside sometimes it needs to be managed

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Horseweed is another member of the Aster family



Huisache

Vachellia farnesiana (L.) Wight & Arn.

Native, warm-season perennial growing to a height of 15–25'

- The flowers are produced on a fragrant, yellow, fluffy ball with many clusters of yellow stamens.
- The leaflets are gray-green and twice-compounded with eight to 16 divisions, each having 10 to 20 pairs of small, sensitive leaflets.
- Early succession
- Bloom dates: January–April
- 4,980 seeds per pound



Huisache tends to grow over the road and needs to be controlled.

Photo courtesy of Keith Fox, TxDOT Maintenance Field Support Section



Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Johnson Grass

Sorghum halepense (L.) Pers.

Native, warm-season perennial growing to 3'-10' tall

- The flower head is large, open, well branched and has an overall pyramid outline. Initially it is green or greenish violet. At maturity, it becomes a dark reddish or purplish brown.
- The leaf has a prominent whitish midvein, which snaps readily when folded over.
- Oval to egg-shaped, dark reddish-brown to black seed.
- Early succession species
- Bloom dates: May–October
- 16,000 seeds per pound



Johnsongrass is one of the most controlled weed in the vegetation management program

Photos courtesy of Travis Jez, TxDOT Maintenance Field Support Section



Johnsongrass is a common invasive species found throughout Texas



Honey Mesquite

Prosopis glandulosa Torr.

Native, warm-season perennial growing up to 30' tall

- The flower is mainly pink and white
- Small pinnately-compound leaves, leaves close during night; fine texture.
- Early succession status
- Bloom dates: April–July
- 18,000 seeds per pound



Mesquite has been used for centuries for flour and wood by native people.

Photo courtesy of Keith Fox, TxDOT Maintenance Field Support Section



Mesquite can be best controlled when young, such as with this plant.

Photo courtesy of Jacob Eickstead TxDOT, Maintenance Field Support Section



Morning Glory

Ipomoea cordatotriloba Dennst.

Introduced, warm-season annual that reach a height of 10' tall

- Morning glory typically produces typical funnel-shaped blossoms in white, red, blue, purple and yellow.
- Leaves are heart-shaped, 4–5 inches long
- Seeds are sized between 1/8" and 1/4" long. The mature Morning glory seeds are dark-brown to matte-black and wedge shaped.
- Early successional stages in some rangeland plant communities.
- Bloom dates: Early summer to the first frost
- 4,000 seeds per pound



While often grown ornamentally, Morning Glory can become invasive

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Morning glory vine is known to take over sidewalks and roadside structures



Musk Thistle

Carduus nutans L.

Introduced, cool-season biennial which grows to 6' in height

- 1.5–6' disk-shaped terminal flowers are 4–9 cm (1.5"–3.5") wide, solitary, involucre and corollas are purple, outer bracts squarrose with spines.
- The dark green leaves are coarsely lobed, elliptic to lanceolate, with a smooth waxy surface, and a yellowish to white spine at the tip.
- Each plant may produce thousands of yellowish-brown or straw-colored seeds with attached plumose bristles.
- Early successional species that establishes well in open
- Bloom dates: May–June
- 10,000–20,000 seeds per plant



Musk thistle is grows much taller than the Texas Thistle

Photos courtesy of Texas Invasives



Musk thistle can be seed shading out native grasses.



Pigweed

Amaranthus sp.

Native, warm-season perennial growing 1–6' tall

- The flowers are small, green and crowded into coarse, bristly spikes at the top of the plant. Smaller spikes are located in the leaf axils below.
- The leaves are alternate on the stem, long-stalked, and range from dull green to shiny or reddish green. The leaf blade is oval to diamond-shaped, but is usually broader at the base. The margins of the leaves are smooth.
- Early successional
- Bloom dates: July–October
- 600,000 seed per lbs



Pigweed is a common agricultural and roadside pest

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Pigweed is one of our hardest weeds to control.



Prickly Lettuce

Lactuca serriola L.

Introduced, warm-season perennial which grows to a height of 2-7' tall

- Panicles of pale yellow flowerheads are produced from the central stem and upper side stems
- The upper leaf surface is hairless, but there are prickles along the edge, and the midrib on the lower leaf surface is lined with sharp prickles. 6 to 12" long, coarse, and variable in size and shape.
- The single-seeded fruits are oblong, about 1/10" long, brownish, and end with a slender beak that is nearly as long as the fruit.
- Early to mid-successional
- Blooms mid-summer to fall
- 1,008,800 seeds per pound



Prickly lettuce is commonly found in roadside ditches

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Like many invaders, Prickly Lettuce shades out desirable species



Prickly Pear

Opuntia sp.

Native, warm-season perennial succulent growing 5' tall

- Most prickly pear cactus have yellow, red or purple flowers, even among the same species.
- The pads are modified branches or stems that serve several functions – water storage, photosynthesis and flower production.
- Generally replaced by other species in advanced stages of succession
- Early spring through the summer
- 145,000 seeds per pound



Prickly pear has many varieties and is adapted for many environments

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Prickly pear can often be spread by mowing



Russian Thistle

Salsola tragus L.

Introduced, warm-season perennial growing 8"- 36"

- Inconspicuous flowers grow in junction where leaves meet stem above spine-tipped modified leaves. Flowers lack true petals, but petal-like sepals are small, translucent, greenish-white, with pink to deep red veins, sometimes white.
- Leaves of seedlings soft, fleshy, green, and needle-like. As the plant matures, leaves become short, scale-like, and tipped with stiff spine.
- Seeds: Germinate with little water. Viability is short.
- Successional Status: primary and secondary succession
- Bloom dates: July–October
- 270,000 seeds per pound



Russian Thistle

Photo courtesy of Cade Harris

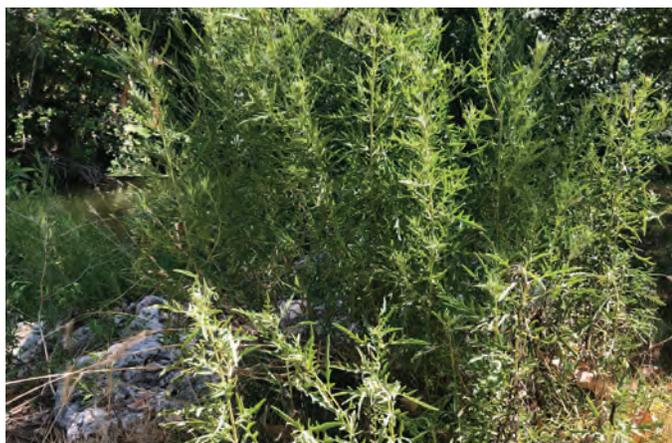


Western Ragweed

Ambrosia psilostachya DC.

Native, warm-season perennial, reach heights of 12" to 72"

- Abundant, slender spike-like racemes, 1 to 6" long, at the tip of the central stem and side branches.
- Leaves are thick, oval-lance shaped in outline, up to 5" long and 2" wide but deeply divided into narrow lobes that are typically further lobed. Leaves are hairy, more densely on the underside and can give the leaves a gray-green cast.
- Early successional species
- Bloom dates: Mid-August–September
- 55,000 seeds per pound



Western Ragweed is commonly found along roadside and agricultural field edges

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Western Ragweed is responsible for many allergies in the spring and summer



Willow Baccharis

Baccharis salicina Torr. & A. Gray

Native, warm-season perennial growing 3'–6'

- Flowers are tan/ white with a fuzzy texture.
- The leaves taper at the base and are fairly pointed at the tip.
- Early Successional
- Blooms July–October
- 159,400 seeds per pound



Willow Baccharis is also called Roosevelt weed for being planted to stabilize soils in the dust bowl.

Photos courtesy of Tasker (Buddy) H. Hudson, Jr., TxDOT Maintenance Field Support Section



Willow Baccharis often inhabits disturbed areas where it can grow to heights unsafe for the traveling public.



Antelope-Horn Milkweed

Asclepias asperula (Decne.) Woodson

Native, warm-season perennial growing 8–24" tall.

- Flowers are a pale yellow-greenish with purple streaks and are clustered at the end of each stem forming a semi-globe.
- Leaves are 1" wide lance shaped to linear, fold slightly at the mid vein, and are opposite in arrangement.
- Plants form large clumps.
- Seed is found in large horn like pods and attached to a puff of white silky hairs.
- Mid-late successional species found on rocky or sandy prairies and road side ditches.
- Blooms May–October.
- 64,000 seeds per pound



Antelope horn milkweed is an essential host plant for Monarch and Queen Butterflies

Photos courtesy of Texas Native Seeds Program



Milkweed is also an essential plant for a range of pollinating insects and their predators.

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Ashy Dogweed

Thymophylla tephroleuca (S.F. Blake)
Strother

Native, warm-season, perennial growing to 30 cm tall.

- Flowers are bright yellow with 12 to 13 ray florets and are no more than 3cm across.
- Leaves are slender and thread-like and grow to 15 mm long. Leaves are typically a muted shade of green.
- Plants are shrub-like and tend to grow solitarily.
- Mid-successional species
- Blooms March–August
- Ashy Dogweed is a state and federally protected endangered species



Ashy Dogweed is a member of the Aster family

Photo courtesy of Norman Flaigg, Lady Bird Johnson Wildflower Center



Ashy Dogweed is a perennial plant

Photo courtesy of Wynn Anderson, Lady Bird Johnson Wildflower Center

Awnless Bush Sunflower

Simsia calva (Engelm. & A. Gray)

Native, warm-season perennial sub-shrub growing 1.5–3' tall.

- Flowers are 1–1.5" in diameter and have yellow petals and centers.
- Plant forms a tight, many branching bush.
- Leaves have arrowhead shape with rough margins.
- Blooms throughout the year making it an excellent pollinator plant.
- Mid-late successional species found on well drained soils such as sandy loams, gravelly soils, and clay loams.
- Blooms May–November.
- 331,000 seeds per pound



This flower prefers well-drained limestone and caliche soils

Photos courtesy of Texas Native Seeds Program



Awnless bush sunflower is a great pollinating species for butterflies and bees



Bailey's Ballmoss

Tillandsia baileyi Rose ex Small

Native, warm-season perennial growing larger than most species of ballmoss.

- Flowers are small and pink.
- Leaves are covered in tiny hairs that die shortly after formation. This leaves pores which allows nutrient uptake through humidity.
- Plants may often grow in dense clumps essentially “taking over” large portions of host trees.
- Late successional species
- Blooms March–May
- Bailey's ball moss is a rare plant, protected by TxDOT



The Bromeliaceae family includes such plants such as pineapples. Also known as an “air plant”

Photo courtesy of
Jacob Eickstead, TxDOT
Maintenance Field Support
Section

Black-eyed Susan

Rudbeckia hirta L.

Native, warm-season forb that is mostly an annual, but occasionally in favorable conditions can be biennial. Grows to 1–2' tall

- Flowers are 2–3" brightly colored yellow with 10–12 petals per flower and brown central cone.
- Leaves are scattered, oval and covered with bristly hairs.
- Seed nutlet is charcoal gray once mature and is easily propagated
- early successional species found on a wide range of soils, but prefers well-drained areas.
- Blooms April–October
- 1,710,000 seeds per pound



Black-eyed Susan refers to many species of plants and is commonly just referred to as Rudbeckias

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Rudbeckias are the larval host for Bordered Patch and Gorgone Checkerspot butterflies

Photo courtesy of Texas Native Seed Program



Blue Mistflower

Chromolaena coelestinum (L.) DC.

Native, warm-season rhizomatous perennial which grows from 1–3' tall.

- Flowers are small and clustered on the top of the plant. Color bright blue or violet and about ¼ inch in length.
- Plants can form large clumps and become dominant in right circumstances
- Seed is tiny, black and elongated with white hairs attached at the end
- Found on most soil types, but prefers heavy textured clayey soils with high organic matter. Commonly found on roadsides and along fencelines.
- Blooms July–November
- 5,600,000 seeds per pound



Blue Mistflower is very attractive to pollinators

Photo courtesy of R.W. Smith, Lady Bird Johnson Wildflower Center



Close up of the leaves of Blue Mistflower

Photo courtesy of James Holmes, Lady Bird Johnson Wildflower Center



Bluebell Gentian

Eustoma grandiflorum L.

Native, warm-season annual or perennial growing 18–24” tall.

- Flowers are 6 petaled and light pink in color. Transition to a purplish red in the center with yellow stamens and pistils.
- Leaves are a muted green color and arranged opposite. Leaves grow along the single stem of each flower.
- Plants tend to grow clustered together.
- Blooms Jun–Oct
- 0.25 lbs/acre planting rate



Eustoma is Greek, meaning open mouth



Bluebell Gentian has a large range and is adapted to many habitats

Photos courtesy of Carolyn Fannon, Lady Bird Johnson Wildflower Center



Butterfly Milkweed

Asclepias tuberosa L.

Native, warm-season perennial which grows to 1 to 2' tall

- Flowers are Bright orange arranged in flat-topped clusters borne at the end of the stems
- Multi-stemmed plant with long, pointed, and smooth leaves arranged alternate
- Seed are formed in long narrow pods attached with white puffy hairs
- Mid-late successional species found in sunny areas and prefers well-drained soils.
- Blooms May–September
- 87,000 seeds per pound



Butterfly milkweed is an essential plant for monarch caterpillars

Photos courtesy of Texas Native Grasses Program



Butterfly Milkweed also grows by Pleurisy Root



Chihuahua Flax

Linum vernale Woot

Native, warm-season annual which grows primarily in the Chihuahua desert.

- Flowers are yellow-orange, bowl shaped with a maroon center
- Leaves are alternated, slender 1/3 to 1" long.
- This very slender, erect plant is common in the Chihuahuan Desert and can be found on rocky, limestone soils



A close up of the Chihuahua Flax flower

Photos Courtesy of Patrick Alexander, USDA-NRCS Plants Database



During rainy years in the desert Chihuahua Flax thrives and is abundant



Chocolate Flower

Berlandiera lyrata Benth.

Native, warm-season perennial which grows 1-2' in height and has a chocolate aroma.

- Flowers have yellow rays, commonly with 8 petals surrounding a maroon disk. Flowers open in the morning and drop during the heat of the day.
- Leafy plant with short branches and leaves 3-5" long.
- Blooms April–November
- Grows in dry, rocky, limestone soils of Texas.
- This plant gets its name from the chocolate odor from its flower and has been used for food seasoning in the past.



Chocolate flower gets its name for smelling like chocolate

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



The Chocolate flower opens in the morning and is often drooping by the afternoon.

Photo courtesy of Bruce Leander, Lady Bird Johnson Wildflower Center



Clammyweed

Polanisia dodecandra (L.) DC.

Native, warm-season annual forb that can grow up to 3" tall.

- Flowers are rose pink with long dark pink stamen.
- The large seed is found in long slender capsules that dry and split.
- Leaves are in groups of three and plant has a very strong unpleasant odor when touched.
- Excellent pollinator and insect plant.
- The large seed is eaten by many birds including upland game species.
- Early successional species found on loose soils, especially in disturbed areas.
- Blooms March–October.
- 104,000 seeds per pound



Clammyweed is known for its smell, but not always positively known

Photos courtesy of Texas Native Seeds Program



Despite the smell, Clammyweed may be one of our greatest pollinators



Compass Plant

Silphium laciniatum L.

Introduced, warm-season perennial growing 3–6' tall

- Bright yellow flowers scattered along the top half of the stout, radiate around the stem.
- Deep cut hairy leaves reaching 2" in length, leaves typically orient themselves north and south
- May grow clumped or individually
- Seed located centrally in the flower, similar to common sunflower species
- Mid-successional species commonly found in prairies
- Blooms July–September
- 10,560 seeds per pound



Compass Plant is a member of the sunflower family, Asteraceae

Photos courtesy of R.W. Smith, Lady Bird Johnson Wildflower Center



Compass Plant gets its name from the way its leaves tend to orient North-South



Crimson Clover

Trifolium incarnatum L.

Introduced, cold-season, transitional species growing 1-2' tall

- Flowers appear as “pointed” buds and are crimson in color 1" to 2.5" long and appear at end of stems
- Leaves are trifoliate and appear heart or egg shaped. 0.5" to 1" long, no v-shaped leaf marks
- Plants often grow close together and form “mats”
- Yellow seeds are singly borne in small pods within the flower
- Mid-successional species
- Blooms March–April
- 160,000 seeds per pound



Crimson Clover is commonly found along roadsides as an introduced legume

Photo courtesy of Maxpixel.net



Crimson Clover works well for erosion control

Photo courtesy of Wikipedia/Crimson_clover



Davis' Green Pitaya

Echinocereus davisii

Native, perennial, succulent growing to 3.5 cm tall

- Flowers are small and a tawny to greenish yellow color
- Spines are rounded, light green and may have a faded red spot near the end. Spines may be dense enough to hide the stem completely. Has relatively few ridges compared to other similar cacti species
- Plants typically grow solitarily
- State and Federally protected endangered species
- Mid-successional species



Davis' green pitaya is one of the smallest *Echinocereus* cacti.

Photo courtesy of Jackie Poole, Texas Parks and Wildlife Department



This cactus lives on flint-like rock (novaculite).

Photo courtesy of Wynn Anderson, Lady Bird Johnson Wildflower Center

Devils Bouquet

Nyctaginia capitata Choisy

Native, warm-season perennial growing 1–3' tall

- Flowers are red and many small flowers clump around the end of each stem, clump resembles bouquet, flowers close during day and open during evening
- Leaves are wavy with sticky hairs
- Plants may grow solitarily or in clumps
- Seeds found in center of individual flowers with stamen protruding outward
- Mid-successional species found along roadsides and in fields, prefers dry sandy-loamy soils and sun to part shade
- Blooms April–November



Devil's Bouquet is a member of the Four O'clock Family of Plants

Photo courtesy of Joseph Marcus, Lady Bird Johnson Wildflower Center



The flower will open in the evening and close as the day warms.

Photo courtesy of Terrell Alan, Lady Bird Johnson Wildflower Center



Downy Paintbrush

Castilleja sessiliflora Pursh

Native, warm-season perennial which grows 6–10" in height

- Flowers are large, but inconspicuous yellow or pinkish. Color comes from the surrounding bracts which are tinged with pink or red.
- Leaved area long and slim greenish along the base.
- Early successional species which establishes well from seed, but not from transplant
- Member of the figwort family, the plant is semiparasitic on nearby plants
- Prefers dry and rocky soils
- 3,200,000 seeds per pound



Common in West Texas, this plant is a great pollinator for the desert portions of Texas

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Like other paintbrushes, this plant is semiparasitic



Drummond Phlox

Phlox drummondii Hook.

Native, warm-season annual which grows from 6–12" in height.

- Flowers can be pink, red, white, or lavender. Blooms are 1" and trumpet shaped.
- Leaves are soft, hairy and sticky.
- Seeds are small, with 234,000/pound
- Prefers acidic, sandy soils.
- This showy Texas flower is one of the most commercial available flowers due to Thomas Drummond sending seeds from Texas in 1835, resulting in the flowers immense popularity in Europe.
- 234,000 seeds per pound
- Blooms February–June



Drummond Phlox is actually grown around the world as a commercial flower

Photos courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Drummond Phlox is commonly found in most areas of Texas



Engelmann Daisy

Engelmannia perstenia (Raf.) Goodman & C.A. Lawson

Native, cool-season perennial forb growing up to 3' tall.

- Flowers are numerous, bright yellow, and measure 1–2" in diameter.
- Leaves are all basal, up to 8" long, dissected or “cut” in appearance, and very palatable for cattle and deer.
- Plant remains green throughout the winter. Mid successional species found on a variety of soils.
- Deep tap root makes it drought tolerant.
- Blooms February–November.
- 120,000 seeds per pound



Engelmann Daisy is one of our most prolific yellow flowers

Photo courtesy of Texas Native Seeds Program



Engelmann Daisy can often be found on our roadsides after the bluebonnets have set seed

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Eryngo

Eryngium leavenworthii Torr. & A. Gray

Native, warm-season annual which grows to 20–40" in height

- Flowers are minute, purple, and accompanied by small spiny bracts, also purple.
- Leaves are simple, ovate, thorny and tough in texture
- Eryngo is an important pollinator species and is an interesting native flower for ornamental and wildlife purposes.
- Eryngo prefers calcareous soils, and can be found in nearly all regions of Texas
- 303,900 seeds per pound
- Blooms July –September



Eryngo maintains its color for a long time, making it popular for floral arrangements

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



While commonly thought of as a thistle, Eryngo is member of the carrot family

Photo courtesy of Sam Glinsky, TxDOT Maintenance Field Supports Section



Feather Dalea

Dalea formosa Torr.

Native, warm-season leguminous shrub which can grow to 6' in height

- Flowers are bright purple to pinkish-purple with yellow banner petal. Silvery, fuzzy spike like clusters accompany the flowers
- Leaves are small, pinnately compound leaves
- Seeds are shaggy-haired seed pods, 1 to 2 seeds per pod
- Feather dalea is an excellent example of the many woody dalea species which inhabit the range lands and ROW of Texas. It is a legume, adding nitrogen to the soil by root nodules.
- Blooms April–August



Feather Dalea is a common roadside plant of West Texas

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Feather Dalea is a great pollinator for the Western portion of the state



Fox-Glove

Penstemon cobaea Nutt.

Native, warm-season perennial growing to 2' tall.

- Flowers are light pink and shaped like a tube that flares outward at the end, can resemble a “glove”, grows to 2” long.
- Leaves are very small, less than an inch in length and may be pointed, resembling an arrow head.
- Plants may grow solitarily or clustered.
- Blooms May–June
- 260,480 seeds per pound.



Foxglove also goes by the name Prairie Beardtongue

Photo courtesy of Sandy Smith, Lady Bird Johnson Wildflower Center



This plant is a strong attractor for moths

Photo courtesy of Johnny Johnson, Lady Bird Johnson Wildflower Center



Frogfruit

Phyla nodiflora (L.) Greene

Native, warm-season perennial, and evergreen in warm years, which grow 3–6" in height.

- Leaves are green with reddish or purplish tinge during cold temperatures
- Flowers are small, white, and clustered along the flower head
- Excellent pollinator species which also provides groundcover in full sun and partial shade
- Adapted for a wide range of soils and tolerates droughts and flooding.



Despite its small size, Frogfruit is a good plant for pollinators

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Frogfruit is a member of the verbena family of flowers.

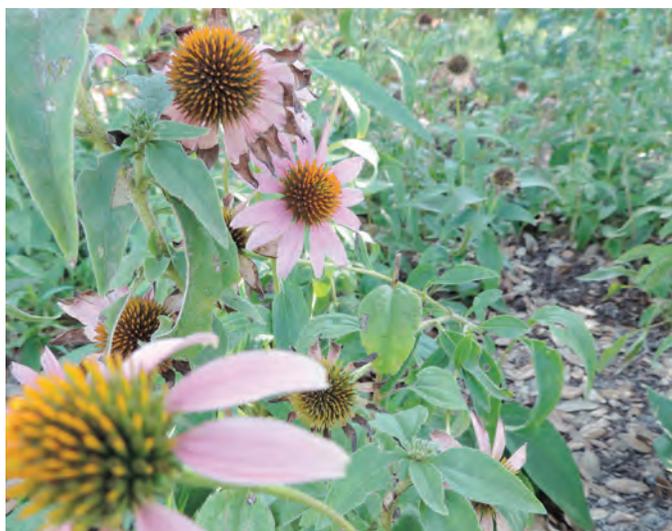


Giant Purple Coneflower

Echinacea purpurea (L.) Moench

Native, warm-season perennial which grows to 2–5' in size

- Leaves are rough, scattered and become small toward the top of the stem
- Flowers are single, large atop the stem with domed purplish-brown center and drooping lavender rays
- This attractive plant is a common site amongst pollinator gardens and roadsides
- Blooms May–July
- 117,000 seeds per pound



Purple coneflower is another great pollinator

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



This attractive plant is popular amongst native plant gardeners

Photo courtesy of Ray Mathews, Lady Bird Johnson Wildflower Center



Green Thread

Thelesperma filifolium (Hook.) A. Gray

Native, year-round annual or perennial growing 1-3' in height

- Flowers are eight rayed and a solid yellow color. A single flower rests atop each stem.
- Leaves are thin and thread-like, may look almost absent in some cases.
- Plants tend to grow clustered or clumped.
- Early-mid successional species.
- Blooms April–October
- 6lbs/acre



Greenthread gets its name from its delicate stalk.

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Green Milkweed

Asclepias viridis Walter

Native, warm-season perennial growing 1–2' tall.

- Flowers are pale green and are clustered in a globe-like head.
- Similar to antelope-horns, leaves are broader, 1–3" wide and are alternate in arrangement.
- Seed is found in horn like pod attached to a puff of white silky hairs.
- Mid-late successional species found on a variety of soils, prairies, ditches, and disturbed areas.
- Blooms April–September.
- 57,600 seeds/pound



Green Milkweed is an important host plant for Monarch butterflies

Photo courtesy of Sandy Smith, Lady Bird Johnson Wildflower Center



Green Milkweed has broader leaves and more green flowers than Antelope Horns Milkweed

Photo courtesy of Alan Cressler, Lady Bird Johnson Wildflower Center



Gregg's Mistflower

Conoclinium greggii (A. Gray) Small

Native, warm-season perennial which grows up to 2' tall.

- Flowers are small, purplish-blue clustered together to form puffy 2" flower heads
- Leaves are pinnately dissected and separated in to deeply divided three lobes
- Gregg's Mistflower is commonly found along creeks and streams and often attracts butterflies in the fall
- Blooms March–November



Blue Mistflower is an excellent attractor for butterflies such as this queen butterfly

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Blue Mistflower is commonly found in ditches and along stream banks



Illinois Bundleflower

Desmanthus illinoensis (Michx.) MacM. ex Robins & Fern.

Native, warm-season perennial legume growing 1.5–3' tall.

- Flowers are white and form a tight ball like cluster.
- Seeds are found in many slender pods that are 3–4 times as long as broad and form dense rattle like bundles.
- Leaves are up to 3.5" long and have 5–18 segment pairs of leaflets.
- Provides good forage for livestock, wildlife, and seed is consumed by birds.
- Mid-late successional species found on a wide range of soils and easily established from seed.
- Blooms May–September.
- 67,200 seeds/pound



Illinois Bundleflower is commonly planted in Texas ROW's

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Illinois Bundleflower is a legume which fixes Nitrogen in the soil



Gaillardia (Indian Blanket)

Gaillardia pulchella Foug.

Native, warm-season perennial growing 1–2' tall.

- Flower heads are dark red or yellow in the center surrounded by 6–10 rays which are either white or yellow (all depends on variety and area).
- Leaves are 2–4" long and grow alternate. They are thick and covered in soft hair. Leaves become smaller, higher up the plant.
- May grow solitarily or bunched
- Seeds are burr-like and have small hair-like fibers for transport.
- Mid-successional species.
- Blooms April–October
- 153,000 seeds per pound



Indian Blanket is one of the most prolific flowers in Texas

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Indian blanket is a great pollinator and establishes well when planted by seed

Photo courtesy of Bruce Leander, Lady Bird Johnson Wildflower Center



Ironweed

Vernonia baldwinii Torr.

Native, warm-season which grows 3-10' in height

- Flowers are purple with 15 to 25 being arranged at the end of each stem, each flower has 5 thin petals arranged around the center of the flower
- Leaves are 3–4 inches long and lance shaped
- Names refers to the toughness of the main stem
- Blooms August through October
- 368,000 seeds per pound



Ironweed is an excellent plant for fall blooms. Historically Ironweed was used to treat stomach ailments

Photos courtesy of Amanda Fowler, TxDOT Maintenance Field Support Section



Johnston's Frankenia

Frankenia johnstonii Correll

Native, warm-season perennial which flowers year round, growing to 30cm tall

- Flowers are white and petals are generally spoon shaped. They are cupped by cylindrical, narrow, leaf-like structures.
- Leaves are roughly 1cm long and may be covered in a mealy whitish powder
- Plants tend to grow solitarily
- Fruit is brown, egg shaped and contains 1 seed
- Mid-successional species
- Blooms year round and changes color to reddish during fall months
- State and Federally protected threatened species



Johnston's Frankenia grows in saline, chalky, clayey and sandy hillsides in South Texas.

Photo courtesy of Dana Price, Texas Parks and Wildlife

Lance-Leaf Coreopsis

Coreopsis lanceolata L.

Native, warm-season species growing 1–2.5' tall

- Flower heads are yellow and roughly 1.5" in diameter, disk flowers protruding from the center are above the distinctly different 4 lobed ray flowers
- Leaves are green and between 3–4", have an opposite arrangement or potentially alternate towards the top of the stem, some leaves have deep cuts resembling leaflets
- Tend to grow clumped together
- Small seeds appear darker yellow to reddish in the center of the flower
- Early-mid successional species preferring dry soils and tolerating a large variety of light conditions
- Blooms April–June
- 221,000 seeds per pound



Lanceleaf coreopsis is common on roadsides and old fields

Photo courtesy of Carolyn Fannon, Lady Bird Johnson Wildflower Center



This plant is adaptable to a wide range of habitats

Photo courtesy of Stephanie Brundage, Lady Bird Johnson Wildflower Center



Lemonmint or Purple Horsemint

Monarda citriodora Cerv.ex Lag.

Native, warm-season annual growing 12" to 24" tall.

- Flowers are lavender to pink in color, whorled and subtended by whitish or lavender bracts.
- Leaves are lance like, line the stem with pairs of leaves serrated along the edges.
- Plants have several stems originating from the base.
- Early successional species found on sandy or rocky soils dry soils.
- Blooms May–July
- 819,000 seeds per pound



Also goes by the name
Beebalm

Photo courtesy of
Jacob Eickstead, TxDOT
Maintenance Field Support
Section



Lemonmint is important to
all pollinators, especially
native pollinators.

Photo courtesy of Travis Jez,
TxDOT Maintenance Field
Support Section



Lloyd's Fishhook Cactus

Echinomastus mariposensis Hester

Native, warm-season perennial cactus which grows less than one foot in height

- Flowers are white, pink, yellow, and green; occasionally with midstripes in the flower
- Native to South Texas and Coahuila, Mexico
- Also known as Mariposa Cactus
- Blooms February–March
- State and Federally protected endangered species



Lloyd's Fishhook Cactus gets its name from the way its spines grow.

Photo courtesy of Wynn Anderson, Lady Bird Johnson Wildflower Center

Locoweed

Astragalus mollissimus

Native, warm-season species growing 12–18" tall

- Flowers are pink to purple and grow in clusters along the top 2–4" of upward turned stems
- Leaves are pale green to grayish, pinnate and are 6–10" long, 20–30 leaflets are arranged opposite along the center of the leaf
- These plants tend to grow solitarily
- Small black seeds can be found at the center of individual flowers
- Mid-successional species
- Blooms March–May
- 192,000 seeds/pound



Locoweed is a common flowering plant in West Texas

Photos courtesy of JPaul Cox, Lady Bird Johnson Wildflower Center



Locoweed is actually a legume

Photos courtesy of Stephanie Brundage, Lady Bird Johnson Wildflower Center



Maximillian Sunflower

Helianthus maximiliani Schrad.

Native, warm-season perennial forb growing 5–7' tall.

- Flowers are yellow with yellow center, 2–3" in diameter, emerging from leaf axils along a central stalk.
- Leaves are up to 12" long, lance like in shape, slightly folding upward from mid-vein.
- Palatable for cattle and seed is consumed by upland game birds.
- Mid-successional species found on a variety of soils in open prairies, road sides, and disturbed areas.
- One of the most abundant sunflowers.
- Blooms September–October.
- 182,000 seeds per pound



Maximillian Sunflower is often growing in non-mow areas of the ROW

Photos courtesy of Travis Jez, TxDOT Maintenance Field Support Section



This sunflower is incredible showy and very popular with people and pollinators.



Mealy Blue Sage

Salvinia farinacea Benth.

Native, warm-season perennial growing 2–3' tall

- Flowers are blue to lavender in color and have exactly 5 lobes and 2 lips. They grow 2/3" to 3/4" long with 2 stamens and 1 pistil.
- Long narrow leaves grow in clusters surrounding the flower stems. Leaves may or may not have teeth.
- Typically grow clustered together.
- Dark brown to dark green seeds may be found near the base of the stamens.
- Mid-successional species
- Blooms April–October
- 368,000 seeds per pound



Mealy Blue Sage is a popular plant amongst pollinators

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Mealy Blue Sage is commonly found in native flower gardens



Mountain Pink

Centaurium beyrichii (Torr. & A. Gray ex Torr.) B.L. Rob.

Native, warm-season native growing to about 1' tall

- Bright pink to purple flowers grow clustered at the ends of stems, flowers typically have 5 petals surrounding a white/yellow center
- Leaves are green to lime green, they extend directly out from stems and may grow to be 3" long. May resemble spines in some plants
- Plants tend to grow individually but close to other individuals
- Mid-successional species
- Blooms May–July



Mountain Pink is a great flower for our hard to grow soils.

Photo courtesy of Travis Jez, TxDOT Maintenance Field Support Section



Mountain Pink is great for rock gardens

Photo courtesy of Texas Native Seeds Program



Narrow Leaf Blazing Star

Liatris punctata Hook.

Native, late-warm season perennial growing 1-2' tall

- Flowers are pink or purple and form in erect clusters along the top portion of the stem
- Many small and narrow leaves surround the stem and intermingle with the flowers
- Plants typically form large clumps but can grow solitarily
- Seeds form on the heads of individual flower stalks
- Mid succesional species prefers sandy dry soil and full sun, typically found on loess hills or prairies
- Blooms August–October
- 112,000 seeds per pound



Dotted blazing star is one of our showiest flowers

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Also called gayfeather, this plant has historically been used medicinally.

Photo courtesy of Keith Fox, TxDOT Maintenance Field Support Section



Navasota Ladies' Tresses

Spiranthes parksii Correll

Native, warm-season annual which grows to less than 1 foot in height.

- A native orchid found primarily in oak savannas
- Basal leaves surround a single stalk like structure. During flowering the basal leaves are absent.
- The flowers spiral around the stalk and are creamy white in color
- Produces numerous seeds, but are incredible small, like all orchids
- Orchids have a very strong symbiotic relationship with soil fungi
- State and Federally protected endangered species



Ladies' thrive in poor soils, often eroded

Photo courtesy of Jan Horbaczewski



Navasota Ladies' Tresses look very similar to other ladies' tresses and can be hard to tell apart.

Photo courtesy of Jackie Poole, Texas Parks and Wildlife

Neches River Rose Mallow

Hibiscus dasycalyx S.F. Blake & Shiller

Native, warm-season perennial which grow up to 8 feet tall

- Grows along river banks, with hairless leaves which are triangular shaped, 5–12 cm long and very narrow
- Two sets of hairy leaf-like appendages are located below the flower
- Flowers are creamy white with a deep red base and petals are 5–7 cm long
- A small fruit, 1–2 cm long, forms after germination
- Blooms June to August
- Found in woodlands in open marshy habitats
- State and federally protected threatened species



The creamy white flower of the Neches Rose-mallow is found in the heat of the summer

Photos courtesy of Jackie Poole, Texas Parks and Wildlife



This flower is very similar to the soldier mallow flower

Nellie's Cory Cactus

Escobaria minima (Baird) D.R. Hunt

Native, warm-season perennial succulent which grows to 4 cm in height

- Spines are stout, peg-like, and numerous along the cone-shaped stem
- Flowers are bright pink to fuchsia colored, with a forked, green stigma
- Forms green fruit after flowering with egg-shaped seeds which are brown or black
- Grows in chert or flint-like rock (novaculite) in the Chihuahuan Desert
- State and Federally protected endangered species



The spines of this cacti are tightly clustered against the stem.

Photo courtesy of Dale and Marian Zimmerman, Texas Parks and Wildlife

Orange Zexmenia

Wedelia texana (A.Gray) B.L. Turner

Native, warm-season perennial sub-shrub growing 1.5–3' tall.

- Flowers are about 1" in diameter and have a yellow-orange color.
- Plants have many solitary stems with lance shaped leaves, all of which are covered in short stiff hairs.
- Plant is consumed by wildlife, livestock, and is an important insect/pollinator species.
- Mid-late successional species found on a variety of soils.
- Blooms March–December.



Also known as Texas
Creeping Ox-Eye

Photos courtesy of Texas
Native Seeds Program



Orange Zexmenia is a
great flowering plant for
drier climates



Partridge Pea

Chamaecrista fasciculata (Michx.) Greene

Native, warm-season annual legume that grows 1–3' tall.

- Flowers are showy yellow and grown along the main stem.
- Seeds are found in straight narrow pods that split and twist on maturity expelling the seed.
- Leaves consist of 10–16 pairs of soft leaflets.
- Seed is eaten by many species of birds including quail.
- Early-Late successional species found on a wide range of soils and responds positively to disturbance and fire.
- Blooms May–November.
- 43,200 seeds per pound



Partridge Pea is a legume common in roadside plantings

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Partridge pea ticks all the boxes, pretty, legume, low growing, and native.

Photo courtesy of Texas Native Seeds Program



Pecos Sunflower (Puzzle Sunflower)

Helianthus paradoxus Heiser

Native, warm-season annual which grows to a height of 3–6 feet in height

- Leaves are opposite on the lower portions and alternate on the higher portions of the stem. Leaves are 7–15 cm long and have smooth edges.
- Flowers are 3–5 heads per branch and have 12–20 yellow petals in a 5–7 cm floret. The center is deep red to purplish
- The seeds are small, 3–4 mm long and lack hairs
- Grows in desert saline soils which are permanently wet called cienegas
- Pecos Sunflower is a State and Federally threatened species



Pecos sunflower thrives in wet, saline soils

Photos courtesy of Jackie Poole, Texas Parks and Wildlife Department



Pecos sunflower is only found in Texas and New Mexico

Pink Evening Primrose

Oenothera speciosa Nutt.

Native, cold-warm season perennial transitional species 1-2' tall

- Flowers range from dark pink to white and appear at the top of stems along upper leaf axils, as small as 1" diameter, individual flowers last only a single day
- Leaves are typically slender and pinnate, can be lance shaped depending on region. Green to pale green
- Tend to grow close together, nearly forming mats with intertwined leaves
- Seeds are small and black, occur in center of individual flowers
- Mid-successional species
- Blooms February–June
- 864,000 seeds per pound



Pink Evening Primrose can be found in nearly all regions of Texas

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Pink Evening Primrose is probably one of the most common, but important flowers in Texas.

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Plains Coreopsis

Coreopsis tinctoria Nutt.

Native, warm-season annual growing 1-2' tall

- Small yellow flowers turn maroon towards center and appear at the end of stems, petals are notch tipped
- Leaves are pinnately compound with many branches extending in all directions
- Tend to grow bunched together
- Seeds are dark red to black and many are produced and held in the center of flowers
- Early-mid successional species
- Blooms April–June
- 1,400,000 seeds per pound



Plains coreopsis is cultivated extensively

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Plains coreopsis has historically been brewed as a tea



Prairie Acacia

Acacia angustissima (Mill.) O. Ktze.

Native, warm-season perennial legume that rarely grows 2–4' in height.

- Flowers are small, white to creamy white, and form ball-like clusters.
- Seed is found in a brown flat pod 1–3" long.
- Leaves are fern like, divided into 3-12 pairs of segments which are then divided into 6-20 tiny leaflets.
- Plants have woody rhizomes and are thorn-less.
- Species is utilized by livestock, wildlife, and in restoration plantings.
- Mid-late successional species found on a variety of well drained soils, can tolerate acidic and alkaline soils, and the strong rhizomes make it very drought tolerant.
- Blooms May–November.
- 220,000 seeds per pound



The flower of Prairie Acacia is not showy as some flowers, but still loved by bees

Photos courtesy of Texas Native Seeds Program



Prairie acacia is another native legume species common in many areas of Texas



Prairie Coneflower/ Mexican Hat

Ratibida columnifera (Nutt.) Wooton & Standl.

Native, warm-season annual or perennial growing 1–3' tall

- Flower petals are typically yellow near the base and tip with a thick red stripe between. The central disk is long and extends “out” of the flower and is brown/green in color, single flowers appear at the end of stems
- Leaves are feathery and deeply cleft, typically bright green
- Tend to grow clustered together
- Seeds are small and black, surround central disk
- Mid-successional species
- Blooms May–October
- 1,230,200 seeds per pound



Foliage has a strong odor that repels deer.

Courtesy Richardson Charmaine, Lady Bird Johnson Wildflower Center



Tea from leaves and stalks used for stomach ache and pain in side

Courtesy Marian Reid, Lady Bird Johnson Wildflower Center



Prairie Verbena

Glandularia bipinnatifida (Nutt.) Nutt.

Native warm season perennial growing to less than 1 foot tall.

- Petals have 5 lobes which may appear split into two sections. Bright purple flowers cluster at the top of stems.
- Leaves densely line the stem of the plant and resemble spines.
- Plants may grow clustered or solitarily.
- Mid-successional species favoring prairies/ grasslands.
- Blooms March–October
- 450,000 seeds/pound



A member of the verbena family, which comprises over 3000 species

Photo courtesy of Travis Jez, TxDOT Maintenance Field Support Section



Prairie Verbena is widespread in Texas and adapted to many environments.

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Purple Passionflower

Passiflora incarnate L.

Native, warm season, perennial species reaching 12–36' long.

- Lavendar colored flowers are about 3" across, color may vary across varieties, petals/sepals form a circle of wavy hair like segments around central disk.
- Leaves are deciduous, they are typically dark green above and white below. Leaves have three lobes.
- Grows and spreads as a climbing vine, may be solitary or become intertwined with other individuals.
- Small dark purple to black seeds form on pistils in central disks of flowers.
- Blooms April–September
- 11,200 seeds per pound



Passionflower is a native vine loved by pollinators

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Passionflower has many varieties and can be found in many areas of Texas and the US



Purple Prairieclover

Dalea purpurea Vent. var. *purpurea*

Native, warm-season perennial legume that grows 8–35" tall.

- Flowers are 0.5–2" long, pinkish-purple spikes that bloom from the bottom up, leaving a portion of the cone bare.
- Leaves are small, narrow, and usually clustered in groups 3–5.
- Plant provides forage for wildlife and insects.
- Mid-late successional species found on a well drained soils in open areas.
- Blooms May–July.
- 293,000 seeds per pound



A common legume found on roadsides

Photos courtesy of Texas Native Seeds Program



Purple Prairie Clover is most identified by its cylindrical flower.



Rattlesnake Master

Eryngium yuccifolium Michx.

Native, warm-season perennial growing 3–6' tall.

- Flowers heads are “thistle-like” and are comprised of many green and white florets as well as pointed bracts all clustered together at ends of stems. Approximately 1" diameter.
- Leaves are blue green and resemble yucca, parallel veined.
- Plants may grow solitarily but typically grow bunched.
- Small whitish to light brown seeds resemble burs and are found a top seed heads.
- Mid-successional species
- Blooms May–August
- 120,000 seeds per pound



Rattlesnake master is a member of the carrot family

Photo courtesy of Sally and Andy Wasowski, Lady Bird Johnson Wildflower Center.



Their spiny leaves make them unpalatable to grazing livestock.

Courtesy Robert L. Stone, Lady Bird Johnson Wildflower Center.



Rough-stem Aster

Symphotrichum puniceum var. *scabricaule*

Native, warm-season perennial which grows to a height of up to 10 feet

- Leaves are toothed and attach directly to the stem
- Rough hairs are found throughout the plant
- Contains underground stems and some weak above ground stems
- Flowers area located at the branch tips, pale-lavender to blue in color with a yellow center
- Blooms September–November
- Rough-stem Aster is a rare plant protected by TxDOT



October is the peak flowering season for this plant

Photo Courtesy of Sam Kieschnick, iNaturalist (CC BY-NC), <https://www.inaturalist.org/taxa/243176-Symphotrichum-puniceum-scabricaule>

Roughstem Rosinweed

Silphium radula Nutt.

Native, warm season, perennial growing 5–6' tall.

- Flowers are 2–3" wide, bright yellow lanceolot shaped petals surrounding a greenish central disk growing atop a stem.
- Bright green leaves grow alternately along the stems, both stem and leaves have a rough sandpaper like texture hence the plant's name. Leaves rarely exceed 4".
- Plants often grow bunched or clustered but can grow solitarily.
- Mid-successional species
- Blooms June–August



Roughstem rosinweed is one of many yellow flowers found in the spring

Photo courtesy of Joseph A. Marcus, Lady Bird Johnson Wildflower Center.



The Aster family is one of the largest families of flowering plants.

Photo courtesy of W.D. and Dolphia Bransford, Lady Bird Johnson Wildflower Center.



Silverleaf Nightshade

Solanum elaeagnifolium Cav.

Native, warm-season perennial growing 1–3' tall.

- Flower petals form a star shape formed from 5 petals, typically blue, purple, white, or yellow in color with highly visible yellow stamens, typically 3/4" across.
- Leaves are 2–4" long with wavy edges, pale or mute green in color and form a triangular tip.
- Grows both solitary and in clumps.
- Brown seeds roughly 1mm across form in central disk.
- Early-mid successional species.
- Blooms April–October



Silverleaf nightshade is poisonous, but is still a good pollinator

Photos courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Silverleaf nightshade is one of the most common plants found on our ROW's



Silverleaf Sunflower/ Wooly Sunflower

Helianthus argophyllus Torr. & A. Gray

Native, warm-season annual which grows to a height of 4-7 feet

- Flowers are large, showy and yellow like the common sunflower
- Leaves are covered in a silky silver foliage which gives the plant its name
- Bottom leaves drop as the plant grows tall
- Blooms August through November
- Found along the coastal regions of Texas



Silverleaf sunflower is often controlled in the ROW due to its tall, vigorous growth

Photo courtesy of Peggy Romfh, Lady Bird Johnson Wildflower Center



Common in the Valley and Coastal areas of Texas

Photo courtesy of Travis Jez, Maintenance Field Support Section



Slender Rushpea

Hoffmannseggia tenella Tharp & L.O. Williams

Native, warm-season perennial which grows 8–20 cm in height

- Leaves are compact arising from two-three short main stems which grow opposite one another and 5–7 leaflet sprouts
- Flowers are yellow-pink to rose in color
- Member of the legume family of plants
- See pod contains 2–4 green-black seeds
- State and Federally protected as an endangered species



Photo courtesy of Jackie Poole, Texas Parks and Wildlife



Photo courtesy of Alice Hempel, Texas Parks and Wildlife

South Texas Ambrosia

Ambrosia cheiranthifolia A. Gray

Native, warm-season perennial which grows to 16 inches in height

- Non-woody perennial with erect stems and network of underground root-stems.
- Leaves on lower stem are opposite and arranged alternate on the upper stems
- Leaves are oval shaped, shallowly divided and unlobed with maturity
- Flower are inconspicuous, creamy-yellow male and female flowers clusters separated. Males are cup-shaped and females are globular and upright
- Blooms appear July through November
- Fruits hang below the male flowers and are bur-like
- State and Federal protected endangered species



South Texas Ambrosia can be recognized by its unique leaves

Photo courtesy of Jackie Poole, Texas Parks and Wildlife

Standing Cypress

Ipomopsis rubra (L.) Wherry

Native, warm-season biennial growing 3–6' tall.

- Flowers are red and tubular and flare outwards at the rim. Spots inside the flower may be orange or yellow. Flowers are arranged in a spike from the tip of the stem downward.
- Leaves are sparse and stem is unbranched. Leaves are small and almost absent in cases, tend to be light green.
- Plants tend to grow solitarily.
- Seeds are light brown and covered with silky hair-like strands.
- Mid successional species
- Blooms May–July
- 341,000 seeds per pound



Standing Cypress is biennial and won't bloom in the first year

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Standing Cypress is photosensitive and needs sunlight to germinate.



Swamp Milkweed

Asclepias incarnate L.

Native, warm-season perennial growing 2–4' tall.

- Large blossoms composed of very small rose-purple/pink flowers. Flowers cluster at tops of branching stems
- Leaves are lanceolate and opposite in arrangement, typically bright green and coarse, grow to 6" long.
- Typically grow clustered.
- Seeds are brown and less than half an inch in size.
- Early-mid successional species
- Blooms June–October
- 76,800 seeds per pound



Milkweeds are an important food source for the monarch caterpillar.

Photo courtesy of Stephanie Brundage, Lady Bird Johnson Wildflower Center.



Milkweeds are toxic only in large quantities.

Photo courtesy of Sally and Andy Wasowski, Lady Bird Johnson Wildflower Center.



Tahoka Daisy

Machaeranthera tanacetifolia (Kunth) Nees

Native, warm-season annual growing 6–12" tall.

- Flowers comprised of many slender bright purple petals or “rays.” Rays are typically lavender in color and surround a yellow central disk. Flowers may be described as “aster-like.”
- Leaves are sharply pointed and deep cut, can be described as fern-like.
- Typically grows in clumps or mounds.
- Seeds are small, elongated, and greenish brown in color.
- Early successional species
- Blooms May–October
- 496,000 seeds per pound



Tahoka Daisy is a great flowering plant for drier areas of the state

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Tahoka daisy prefers well drained and dry soil.



Tall Goldenrod

Solidago altissima L.

Native, warm-season annual plant growing 3–6'

- Small yellow flowers line the upper portion of branches, form a plume shaped inflorescence along end of stems.
- Yellow/green elliptic leaves arranged alternately along stem; roughly 2–3" in length
- Typically form dense areas of growth with many individual plants
- Small seed pods form hair like fibers from flower centers allowing transport by wind
- Mid-succesional species
- Blooms September–November



Tall goldenrod is a showy flower which is a great pollinator for the fall migration

Photo courtesy of Melody Lytle, Ladybird Johnson Wildflower Center



Tall goldenrod is one of the most important flowers for the late season

Photo courtesy of Norman Flaigg, Ladybird Johnson Wildflower Center



Texas Bluebells

Eustoma exaltatum (L.) Salisb. ex G. Don
ssp. russellianum (Hook.) Kartesz

Native, warm-season that may be annual, biennial, or perennial based on growing location (typically perennial). Grows to roughly 1.5' tall.

- Flowers can vary in color (blue, pink, purple, white, yellow.) They are bell shaped and occur at the end of stalks, have 5 petals. Stamens are a bright fluorescent yellow or lime green.
- Leaves are a pale or matte green, oblate, and may grow up to 3" long. Grow opposite.
- Tend to grow solitarily or in small clumps.
- Seeds are black and uncommonly small.
- Early-mid successional species, depends largely on location
- Blooms June–September



Because of their beauty Texas Bluebells are often over picked in the wild

Photo courtesy of Norman Flaigg, Lady Bird Johnson Wildflower Center



Texas Bluebells come in many varieties and colors from blue to lavender

Photo courtesy of Sam Glinsky, TxDOT Maintenance Field Support Section



Texas Bluebonnet

Lupinus texensis Hook.

Native, warm-season annual growing to roughly 1.5' tall.

- Stems are topped with clustered flowers, up to 50 may be found on a single stem. Tips of clusters are a vibrant white while majority of the flower is a deep, rich, blue. Flowers are “pea-like”.
- Leaves are light green, velvety and palmately compound. Typically comprised of 5 leaflets, leaves may grow to 4" in length.
- Plants grow solitarily but can nearly take over entire fields during bloom season.
- Seeds are very small and typically somewhere between army green and light brown.
- Early-mid successional species
- Blooms March–May
- 13,500 seeds per pound
- Bluebonnets are a legume



The blue and white contrast guides the pollinator to the flower, once its pollinated the flower goes away.

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Lupinus texensis is one of six *Lupinus* species that together are all designated as the state flower of Texas

Photo courtesy of Travis Jez, TxDOT Maintenance Field Support Section



Texas Golden Gladecress

Leavenworthia aurea Torr. var. *texana*
(Mahler) Rollins

Native, cool-season annual which grows from 4–8 inches in height

- Basal rosette of leaves with leaf blades 3.5–5 cm in length. Leaves are toothed and shallowly lobed
- Flowers are bright yellow, 7–9 mm long and 2–3 mm wide
- Fruit is pod-like, held erect and contains 5–11 circular seeds
- Prefers chalky soils in ironstone and glauconitic glades
- State and Federally protected endangered species



Texas Golden Gladecress is unique and not easily confused with other species

Photo courtesy of Bill Carr,
Ladybird Johnson Wildflower
Center

Texas Indian Paintbrush

Castilleja indivisa Engelm.

Native, warm-season annual, biennial, or perennial species
growing 6–16"

- Bracts form “paintbrush like” spikes turning from green to red towards the tip of the flower, flower petals themselves are inconspicuous and green
- Leaves are linear and arranged alternately up the stem; 1–2"
- Tends to grow in clumps
- Early successional species tolerates most soil types, prefers full sun and dry soil
- Blooms March–May
- 5,100,000 seeds per pound



Indian Paintbrush is actually semi-parasitic

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Indian Paintbrush is often seen amongst its more commonly recognized neighbors.



Texas Milkweed

Asclepias texana A. Heller

Native, warm-season perennial growing 6–18" tall.

- Flowers are white and form an umbel-like cluster, very showy.
- Leaves are a broad lance shape.
- Seed is found in horn like pods and attached to a puff of white silky hairs.
- Mid-late successional species found in shady rocky areas.
- Blooms May–August.



Texas milkweed is commonly found on roadsides and along woodland edges

Photo courtesy of Mary Henderson and Mary Hall, Lady Bird Johnson Wildflower Center



Texas milkweed is another milkweed important to monarch habitat

Photo courtesy of Ray Mathews, Lady Bird Johnson Wildflower Center



Texas Poppymallow

Callirhoe scabriuscula B.L. Rob.

Native, warm-season annual which grows to 3 feet in height

- Leaves are simple, alternate and lobed and all green parts of the plant are covered in dense, star-like hairs
- Lower leaves form a rosette, and leaves on the stem are smaller with 3–5 deep, blunt lobes
- Flower are attractive, reddish in color with five pointed lobes
- Blooms May to June
- Fruit is 8–12 mm in diameter and when dry, releases black, kidney shaped seeds
- State and Federally protected endangered species



Texas Poppy-mallow prefers deep sandy soils

Photos courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



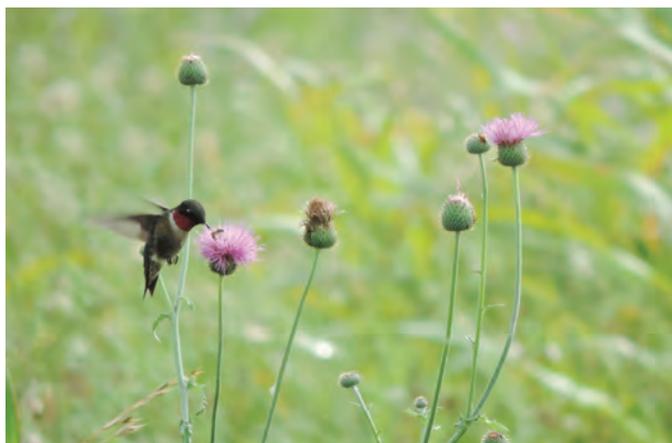
Most visible while in bloom, but hard to find in droughts

Texas Thistle

Cirsium texanum Buckley

Native, warm-season biennial growing 2–5' tall.

- One flower head sits atop each stem, contains no ray flowers but many disk flowers which are rose-lavendar in color. Flowers are roughly ball shaped.
- Leaves are alternate and grow 4–9" long on unbranched stems. Leaves are green on the top and white on the bottom. They have a wooly texture on the bottom. Leaf shape is irregular.
- Grows solitarily but may grow in clusters.
- Seeds are extremely tiny and attached to many hair-like fibers which promote transportation via wind.
- Early-mid successional species
- Blooms April–August



Texas Thistle is a popular plant for pollinators

Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Texas Thistle is a native, pollinator friendly plant

Photo courtesy of Tasker H. (Buddy) Hudson, Jr., TxDOT Maintenance Field Support Section



Texas Trailing Phlox

Phlox nivalis ssp. *Texensis*

Native, warm-season perennial which grows to 1 foot in height

- Spreads horizontally, then vertically
- Leaves are on the woody stems year-round
- Leaves are needle-like, but teardrop shaped on flowering stems
- Flowers cluster in groups of three to six with flower petals united in a tubular shape
- Flowers are variable, with pink to bluish, purple to white colorations
- Blooms March–May
- State and Federally protected endangered species



Trailing phlox prefers the longleaf pine regions. Prefers sandy soils overlaying clay soil in fire-maintained sites

Photos courtesy of James Garland Holmes, Lady Bird Johnson Wildflower Center

Texas Wild-Rice

Zizania texana Hitchc.

Native, warm-season perennial aquatic plant which grows in flowing water

- Clumping grass with roots underwater in riverbeds flowering parallel to the current
- Leaves are narrow and over 1–2 meters long
- Male flowers dangle off lower side branch and female flowers are on the upper branches
- Seed is 9–35 mm long and are cylindrical, black, brown, or greenish
- Flowers are very small, similar to many grass species
- State and Federally protected endangered species



Texas Wild-Rice is an endemic species which grows in Texas Rivers

Photos courtesy of Steven Schwartzman, Lady Bird Johnson Wildflower Center



Texas Wild-Rice greatly resembles domesticated rice plants

Tobusch Fishhook Cactus

Ancistrocactus tobuschii (W.T. Marshall) W.T. Marshall ex Backeb.

Native, warm-season perennial cactus which grows to less than six inches in size

- Spines are fishhook in shape and 2 ½ inches in length
- Flowers are 1–1 ½ inches in diameter and yellow in color and will persist for about 1 week
- Native to the Edwards Plateau and prefers gravelly soils with bare rock
- Fruit is torpedo shaped and pink in color when ripe
- State and Federally protected threatened species
- Blooms January – April



The spines will turn yellow to grey with age

Photo courtesy of Carle Fabre,
Lady Bird Johnson Wildflower
Center



Fruit of the plant are torpedo shaped

Photo courtesy of Bill Carr,
Lady Bird Johnson Wildflower
Center

Walker's Manioc

Manihot walkerae Croizat

Native, warm-season perennial spurge which grows 3–6 feet in height

- Leaves are alternate, lobed and leaf stalks attach to the middle of each leaf blade
- The fleshy roots store nutrients and waters, allowing the plant to start new roots each year
- Flowers are white, five-lobed and arise from the main stem
- The fruits are spherical, green, small, and white striped
- Fruits bear three seeds each
- State and Federally protected endangered species



The leaves vaguely resemble a fiddle

Photo courtesy of Jackie Poole, Texas Parks and Wildlife



The plant tends to depend on other plants for vertical support

Photo courtesy of Harry Cliffe, Lady Bird Johnson Wildflower Center

White Bladderpod

Lesquerella pallida (Torr. & A. Gray)
S. Watson

Native, cool-season annual which grows from 1–2 feet in height

- Leaves are teardrop shaped rosettes with irregular wavy edges. Grow to 4 inches in length, but decrease in size toward the top of the plant
- Flowers are white and yellow, clustered in groups of 4 along the stem
- Fruit is round to oval with 8–12 flat seeds at maturity
- State and Federally protected endangered species



White bladderpod is a member of the mustard family

Photos courtesy of James Garland Holmes, Lady Bird Johnson Wildflower Center



White bladderpod prefers alkaline, silty-sandy soils over ironstone

White Pricklypoppy

Argemone albiflora Hornem

Native, warm-season annual growing 3–6' tall

- Flowers grow atop many branching stems, resembling vines, flowers may be white or golden in certain varieties, surrounding a bright yellow center
- Leaves are alternate, deeply notched, and prickly—hence the name
- Tend to grow clumped together, may resemble a mass of vines
- Single dark red to black seed in the center of the yellow central disk
- Early- mid successional species
- Blooms March–July
- 176,000 seeds per pound



White Pricklypoppy

Photo courtesy of Travis Jez, TxDOT Maintenance Field Support Section



Photo courtesy of Jacob Eickstead, TxDOT Maintenance Field Support Section



Wholeleaf Rosinweed

Silphium integrifolium Michx.

Native, warm-season perennial which grows to a height of 2–6'.

- Blooms July–September
- Leaves are variable in shape, ranging from lanceolate to elliptic.
- Flowers are yellow, 2–3" in diameter and are subtended by bracts with yellow tips
- 19,200 seeds per pound



Wholeleaf rosinweed is known for being full of leaves

Photo courtesy of R. W. Smith, Lady Bird Johnson Wildflower Center



Wholeleaf rosinweed is another plant which is great for fall color

Photo courtesy of George H. Bruso, Lady Bird Johnson Wildflower Center



Winecup

Callirhoe involucrata (Torr. & A. Gray)

A. Gray

Native, warm season, perennial growing 8–20 inches tall.

- Flowers are 5 lobed and curved inward to resemble the shape of a wine cup. Flowers are purple to violet with a small white center.
- Leaves are arranged alternate and are multi-lobed. Resemble daisy leaves or clover in some instances.
- Plants grow clustered or solitarily.
- Early-mid successional species
- Blooms April–August
- 90,000 seeds per pound



Photos courtesy of
Jacob Eickstead, TxDOT
Maintenance Field Support
Section



Zapata Bladderpod

Physaria thamnophila Rollins & Shaw

Native, cool-season perennial which grows 2.5–4 feet in height

- Leaves are elongated oval rosettes 4–12 cm long with shallow tooth or smooth edges
- Flowers are clustered along the stem, but only rise from one side of the stem
- Flowers and fruit attached to the stalk and curve back toward the stem
- Flowers are yellow and teardrop-shaped
- Fruit is round to oval and bears eight flat seeds
- State and Federally protected endangered species



Zapata bladderpod is covered in microscopic hairs on all green parts of the plant

Photo courtesy of Jackie Poole, Texas Parks and Wildlife

Zizotes Milkweed

Asclepias oenotheroides Cham. & Schtdl.

Native, warm-season perennial growing between 1–3' tall.

- Flowers are very small, less than an inch in size. Five lobed, white stigmatic hood extends from the center of the 5 petaled flower. Petals are a light “waxy” green in color.
- Leaves are opposite and ovate, grow up to 4" long and are a bright green. Edged of leaves are wavy.
- Tends to grow solitarily; very, very low population density.
- Seeds are dark brown and flat, in nature are typically attached to hair-like fibers.
- Mid-successional species.
- Blooms March–September.



This species was sometimes used by Native Americans to make a poultice for skin rashes.



Also known as zizotes from “hierba de zizotes,” the Spanish common name for this plant.

Photo courtesy Charmaine Richardson Lady Bird Johnson Wildflower Center.



Item 164

Seeding for Erosion Control

1. DESCRIPTION

Provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed.

2. MATERIALS

2.1. Seed. Provide seed from the previous season’s crop meeting the requirements of the Texas Seed Law, including the testing and labeling for pure live seed (PLS = Purity × Germination). Furnish seed of the designated species, in labeled unopened bags or containers to the Engineer before planting. Use within 12 mo. from the date of the analysis. When Buffalograss is specified, use seed that is treated with KNO₃ (potassium nitrate) to overcome dormancy.

Use Tables 1–4 to determine the appropriate seed mix and rates as specified on the plans. If a plant species is not available by the producers, the other plant species in the recommended seed mixture will be increased proportionally by the PLS/acre of the missing plant species.

Table 1. Permanent Rural Seed Mix				
District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
1 (Paris) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.2	Bermudagrass	1.5
	Bermudagrass	1.8	Bahiagrass (Pensacola)	6.0
	Little Bluestem (Native)	1.7	Sand Lovegrass	0.6
	Illinois Bundleflower	1.0	Weeping Lovegrass (Ermelo)	0.8
			Partridge Pea	1.0
2 (Ft. Worth) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Englemann Daisy (Eldorado)	0.75
			Purple Prairie Clover	0.3

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)		
3 (Wichita Falls) Feb. 1–May 15	Green Sprangletop (Van Horn)	0.6	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Little Bluestem (OK Select)	0.8	Sand Dropseed (Borden County)	0.2
	Blue Grama (Hachita)	0.4	Partridge Pea (Comanche)	0.6
	Western Wheatgrass (Barton)	1.2	Little Bluestem (OK Select)	0.8
	Galleta Grass (Viva)	0.6	Englemann Daisy (Eldorado)	0.75
	Englemann Daisy (Eldorado)	0.75	Purple Prairie Clover (Cuero)	0.3
	Awnless Bushsunflower (Plateau)	0.2		
4 (Amarillo) Feb. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (Haskell)	3.6	Weeping Lovegrass (Ermelo)	0.8
	Blue Grama (Hachita)	1.2	Blue Grama (Hachita)	1.0
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
	Illinois Bundleflower	1.0	Sand Bluestem	1.8
		Purple Prairie Clover	0.5	
5 (Lubbock) Feb. 15–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Sideoats Grama (El Reno)	3.6	Weeping Lovegrass (Ermelo)	0.8
	Blue Grama (Hachita)v	1.2	Blue Grama (Hachita)	1.0
	Buffalograss (Texoka)	1.6	Sand Dropseed (Borden Co.)	0.3
	Illinois Bundleflower	1.0	Sand Bluestem	1.8
		Purple Prairie Clover	0.5	
6 (Odessa) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Blue Grama (Hachita)	0.4	Blue Grama (Hachita)	0.4
	Galleta Grass (Viva)	0.6	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Pink Pappusgrass (Maverick)	0.6	Sand Dropseed (Borden County)	0.2
	Alkali Sacaton (Saltalk)	0.2	Indian Ricegrass (Rim Rock)	1.6
	Plains Bristlegrass (Catarina Blend)	0.2	Sand Bluestem (Cottle County)	1.2
	False Rhodes Grass (Kinney)	0.1	Little Bluestem (Pastura)	0.8
	Whiplash Pappusgrass (Webb)	0.6	Purple Prairie Clover (Cuero)	0.3
	Arizona Cottontop (La Salle)	0.2		
7 (San Angelo) Feb. 1–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Sand Lovegrass (Mason)	0.2
	Little Bluestem (OK Select)	0.4	Sand Dropseed (Borden County)	0.2
	Blue Grama (Hachita)	0.4	Sand Bluestem (Cottle County)	1.2
	Western Wheatgrass (Barton)	1.2	Partridge Pea (Comanche)	0.6
	Galleta Grass (Viva)	0.6	Little Bluestem (OK Select)	0.8
	Englemann Daisy (Eldorado)	0.75	Englemann Daisy (Eldorado)	0.75
	Illinois Bundleflower (Sabine)	1.0	Purple Prairie Clover (Cuero)	0.3

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)
8 (Abilene) Feb. 1–May 15	Green Sprangletop (Van Horn) 1.0 Sideoats Grama (Haskell) 1.0 Texas Grama (Atascosa) 1.0 Hairy Grama (Chaparral) 0.4 Shortspike Windmillgrass (Welder) 0.2 Little Bluestem (OK Select) 0.4 Blue Grama (Hachita) 0.4 Western Wheatgrass (Barton) 1.2 Galleta Grass (Viva) 0.6 Engelmann Daisy (Eldorado) 0.75 Illinois Bumbleflower (Sabine) 1.0	Green Sprangletop (Van Horn) 1.0 Hooded Windmillgrass (Mariah) 0.2 Shortspike Windmillgrass (Welder) 0.2 Hairy Grama (Chaparral) 0.4 Sand Lovegrass (Mason) 0.2 Sand Dropseed (Borden County) 0.2 Sand Bluestem (Cottle County) 1.2 Partridge Pea (Comanche) 0.6 Little Bluestem (OK Select) 0.8 Engelmann Daisy (Eldorado) 0.75 Purple Prairie Clover (Cuero) 0.3
9 (Waco) Feb. 1–May 15	Green Sprangletop (Van Horn) 1.0 Sideoats Grama (Haskell) 1.0 Texas Grama (Atascosa) 1.0 Hairy Grama (Chaparral) 0.4 Shortspike Windmillgrass (Welder) 0.2 Little Bluestem (OK Select) 0.8 Purple Prairie Clover (Cuero) 0.6 Engelmann Daisy (Eldorado) 0.75 Illinois Bumbleflower 1.3 Awnless Bushsunflower (Plateau) 0.2	Green Sprangletop (Van Horn) 1.0 Hooded Windmillgrass (Mariah) 0.2 Shortspike Windmillgrass (Welder) 0.2 Hairy Grama (Chaparral) 0.4 Slender Grama (Dilley) 1.0 Sand Lovegrass (Mason) 0.2 Sand Dropseed (Borden County) 0.2 Partridge Pea (Comanche) 0.6 Little Bluestem (OK Select) 0.8 Engelmann Daisy (Eldorado) 0.75 Purple Prairie Clover 0.3
10 (Tyler) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 1.8 Bahia grass (Pensacola) 9.0 Sideoats Grama (Haskell) 2.7 Illinois Bumbleflower 1.0	Green Sprangletop 0.3 Bermudagrass 1.8 Bahia grass (Pensacola) 9.0 Weeping Lovegrass (Ermelo) 0.5 Sand Lovegrass 0.5 Lance-Leaf Coreopsis 1.0
11 (Lufkin) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 1.8 Bahia grass (Pensacola) 9.0 Sideoats Grama (Haskell) 2.7 Illinois Bumbleflower 1.0	Green Sprangletop 0.3 Bermudagrass 2.1 Bahia grass (Pensacola) 9.0 Sand Lovegrass 0.5 Lance-Leaf Coreopsis 1.0
12 (Houston) Jan. 15–May 15	Green Sprangletop 0.3 Bermudagrass 2.1 Sideoats Grama (Haskell) 3.2 Little Bluestem (Native) 1.4 Illinois Bumbleflower 1.0	Green Sprangletop 0.3 Bermudagrass 2.4 Bahia grass (Pensacola) 10.5 Weeping Lovegrass (Ermelo) 1.0 Lance-Leaf Coreopsis 1.0
13 (Yoakum) Jan. 15–May 15	Green Sprangletop (Van Horn) 1.0 Sideoats Grama (South Texas) 1.0 Texas Grama (Atascosa) 1.5 Slender Grama (Dilley) 1.0 Shortspike Windmillgrass (Welder) 0.3 Halls Panicum (Oso) 0.2 Plains Bristlegrass (Catarina Blend) 0.2 Canada Wildrye (Lavaca) 2.0 Illinois Bumbleflower (Sabine) 1.3 Purple Prairie Clover (Cuero) 0.6	Green Sprangletop (Van Horn) 1.0 Hooded Windmillgrass (Mariah) 0.4 Slender Grama (Dilley) 1.0 Hairy Grama (Chaparral) 0.8 Shortspike Windmillgrass (Welder) 0.2 Purple Prairie Clover (Cuero) 0.6 Partridge Pea (Comanche) 0.6 Engelmann Daisy (Eldorado) 1.0

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)		
14 (Austin) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower (Sabine)	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Engelmann Daisy (Eldorado)	0.75
		Purple Prairie Clover	0.3	
15 (San Antonio) Feb. 1–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Slender Grama (Dilley)	2.0
	Texas Grama (Atascosa)	1.0	Hairy Grama (Chaparral)	0.6
	Slender Grama (Dilley)	1.0	Shortspike Windmillgrass (Welder)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Pink Pappusgrass (Maverick)	0.6
	Pink Pappusgrass (Maverick)	0.6	Plains Bristlegrass (Catarina Blend)	0.2
	Halls Panicum (Oso)	0.2	Hooded Windmillgrass (Mariah)	0.3
	Plains Bristlegrass (Catarina Blend)	0.2	Multi-flowered False Rhodes Grass (Hidalgo)	0.1
	False Rhodes Grass (Kinney)	0.1	Arizona Cottontop (La Salle)	0.2
	Hooded Windmillgrass (Mariah)	0.2		
Arizona Cottontop (La Salle)	0.2			
16 (Corpus Christi) Jan. 1–May 1	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (South Texas)	1.0	Slender Grama (Dilley)	2.0
	Texas Grama (Atascosa)	1.0	Hairy Grama (Chaparral)	0.6
	Slender Grama (Dilley)	1.0	Shortspike Windmillgrass (Welder)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Pink Pappusgrass (Maverick)	0.6
	Pink Pappusgrass (Maverick)	0.6	Plains Bristlegrass (Catarina Blend)	0.2
	Halls Panicum (Oso)	0.2	Hooded Windmillgrass (Mariah)	0.3
	Plains Bristlegrass (Catarina Blend)	0.2	Multi-flowered False Rhodes Grass (Hidalgo)	0.1
	False Rhodes Grass (Kinney)	0.1	Arizona Cottontop (La Salle)	0.2
	Hooded Windmillgrass (Mariah)	0.2		
Arizona Cottontop (La Salle)	0.2			
17 (Bryan) Feb. 1–May 15	Green Sprangletop	0.3	Green Sprangletop	0.3
	Bermudagrass	1.5	Bermudagrass	1.5
	Sideoats Grama (Haskell)	3.6	Bahiagrass (Pensacola)	7.5
	Little Bluestem (Native)	1.7	Weeping Lovegrass (Ermelo)	0.6
	Illinois Bundleflower	1.0	Sand Lovegrass	0.6
			Lance-Leaf Coreopsis	1.0
18 (Dallas) Feb. 1–May 15	Green Sprangletop (Van Horn)	1.0	Green Sprangletop (Van Horn)	1.0
	Sideoats Grama (Haskell)	1.0	Hooded Windmillgrass (Mariah)	0.2
	Texas Grama (Atascosa)	1.0	Shortspike Windmillgrass (Welder)	0.2
	Hairy Grama (Chaparral)	0.4	Hairy Grama (Chaparral)	0.4
	Shortspike Windmillgrass (Welder)	0.2	Slender Grama (Dilley)	1.0
	Little Bluestem (OK Select)	0.8	Sand Lovegrass (Mason)	0.2
	Purple Prairie Clover (Cuero)	0.6	Sand Dropseed (Borden County)	0.2
	Engelmann Daisy (Eldorado)	0.75	Partridge Pea (Comanche)	0.6
	Illinois Bundleflower	1.3	Little Bluestem (OK Select)	0.8
	Awnless Bushsunflower (Plateau)	0.2	Engelmann Daisy (Eldorado)	0.75
		Purple Prairie Clover	0.3	

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)
19 (Atlanta) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5 Illinois Bundleflower 1.0	Green Sprangletop 0.3 Bermudagrass 2.1 Bahagrass (Pensacola) 7.5 Sand Lovegrass 0.6 Lance-Leaf Coreopsis 1.0
20 (Beaumont) Jan. 15–May 15	Green Sprangletop 0.3 Bermudagrass 2.7 Sideoats Grama (Haskell) 4.1 Illinois Bundleflower 1.0	Green Sprangletop 0.3 Bermudagrass 2.1 Bahagrass (Pensacola) 7.5 Sand Lovegrass 0.6 Lance-Leaf Coreopsis 1.0
21 (Pharr) Jan. 15–May 15	Green Sprangletop (Van Horn) 1.0 Sideoats Grama (South Texas) 1.0 Texas Grama (Atascosa) 1.0 Slender Grama (Dilley) 1.0 Shortspike Windmillgrass (Welder) 0.2 Pink Pappusgrass (Maverick) 0.6 Halls Panicum (Oso) 0.2 Plains Bristlegrass (Catarina Blend) 0.2 False Rhodes Grass (Kinney) 0.1 Hooded Windmillgrass (Mariah) 0.2 Arizona Cottontop (La Salle) 0.2	Green Sprangletop (Van Horn) 1.0 Slender Grama (Dilley) 2.0 Hairy Grama (Chaparral) 0.6 Shortspike Windmillgrass (Welder) 0.4 Pink Pappusgrass (Maverick) 0.6 Plains Bristlegrass (Catarina Blend) 0.2 Hooded Windmillgrass (Mariah) 0.3 Multi-flowered False Rhoades Grass (Hidalgo) 0.1 Arizona Cottontop (La Salle) 0.2
22 (Laredo) Jan. 15–May 1	Green Sprangletop (Van Horn) 1.0 Sideoats Grama (South Texas) 1.0 Texas Grama (Atascosa) 1.0 Slender Grama (Dilley) 1.0 Shortspike Windmillgrass (Welder) 0.2 Pink Pappusgrass (Maverick) 0.6 Halls Panicum (Oso) 0.2 Plains Bristlegrass (Catarina Blend) 0.2 False Rhodes Grass (Kinney) 0.1 Hooded Windmillgrass (Mariah) 0.2 Arizona Cottontop (La Salle) 0.2	Green Sprangletop (Van Horn) 1.0 Slender Grama (Dilley) 2.0 Hairy Grama (Chaparral) 0.6 Shortspike Windmillgrass (Welder) 0.4 Pink Pappusgrass (Maverick) 0.6 Plains Bristlegrass (Catarina Blend) 0.2 Hooded Windmillgrass (Mariah) 0.3 Multi-flowered False Rhoades Grass (Hidalgo) 0.1 Arizona Cottontop (La Salle) 0.2
23 (Brownwood) Feb. 1–May 15	Green Sprangletop (Van Horn) 0.6 Sideoats Grama (Haskell) 1.0 Texas Grama (Atascosa) 1.0 Hairy Grama (Chaparral) 0.4 Shortspike Windmillgrass (Welder) 0.2 Little Bluestem (OK Select) 0.8 Blue Grama (Hachita) 0.4 Western Wheatgrass (Barton) 1.2 Galleta Grass (Viva) 0.6 Engelmann Daisy (Eldorado) 0.75 Awnless Bushsunflower (Plateau) 0.2	Green Sprangletop (Van Horn) 1.0 Hooded Windmillgrass (Mariah) 0.2 Shortspike Windmillgrass (Welder) 0.2 Hairy Grama (Chaparral) 0.4 Sand Lovegrass (Mason) 0.2 Sand Dropseed (Borden County) 0.2 Partridge Pea (Comanche) 0.6 Little Bluestem (OK Select) 0.8 Engelmann Daisy (Eldorado) 0.75 Purple Prairie Clover (Cuero) 0.3

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)
24 (El Paso) Feb. 1–May 15	Green Sprangletop (Van Horn) 1.0 Sideoats Grama (South Texas) 1.0 Blue Grama (Hachita) 0.4 Galleta Grass (Viva) 0.6 Shortspike Windmillgrass (Welder) 0.2 Pink Pappusgrass (Maverick) 0.6 Alkali Sacaton (Saltalk) 0.2 Plains Bristlegrass (Catarina Blend) 0.2 False Rhodes Grass (Kinney) 0.1 Whiplash Pappusgrass (Webb) 0.6 Arizona Cottontop (La Salle) 0.2	Green Sprangletop (Van Horn) 1.0 Hooded Windmillgrass (Mariah) 0.2 Blue Grama (Hachita) 0.4 Hairy Grama (Chaparral) 0.4 Sand Lovegrass (Mason) 0.2 Sand Dropseed (Borden County) 0.2 Indian Ricegrass (Rim Rock) 1.6 Sand Bluestem (Cottle County) 1.2 Little Bluestem (Pastura) 0.8 Purple Prairie Clover (Cuero) 0.3
25 (Childress) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 2.7 Blue Grama (Hachita) 0.9 Western Wheatgrass 2.1 Galleta 1.6 Illinois Bundleflower 1.0	Green Sprangletop 0.3 Weeping Lovegrass (Ermelo) 1.2 Sand Dropseed (Borden Co.) 0.5 Sand Lovegrass 0.8 Purple Prairie Clover 0.5

Table 2. Permanent Urban Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)
1 (Paris) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Bermudagrass 5.4
2 (Ft. Worth) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Bermudagrass 2.4 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Bermudagrass 2.1 Sand Dropseed (Borden Co.) 0.3
3 (Wichita Falls) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 4.5 Bermudagrass 1.8 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Bermudagrass 1.8 Sand Dropseed (Borden Co.) 0.4
4 (Amarillo) Feb. 15–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Blue Grama (Hachita) 1.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sideoats Grama (El Reno) 2.7 Blue Grama (Hachita) 0.9 Sand Dropseed (Borden Co.) 0.4 Buffalograss (Texoka) 1.6
5 (Lubbock) Feb. 15–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Blue Grama (Hachita) 1.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sideoats Grama (El Reno) 2.7 Blue Grama (Hachita) 0.9 Sand Dropseed (Borden Co.) 0.4 Buffalograss (Texoka) 1.6

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)
6 (Odessa) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (Haskell) 3.6 Blue Grama (Hachita) 1.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sideoats Grama (Haskell) 2.7 Sand Dropseed (Borden Co.) 0.4 Blue Grama (Hachita) 0.9 Buffalograss (Texoka) 1.6
7 (San Angelo) Feb. 1–May 1	Green Sprangletop 0.3 Sideoats Grama (Haskell) 7.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sideoats Grama (Haskell) 3.2 Sand Dropseed (Borden Co.) 0.3 Blue Grama (Hachita) 0.9 Buffalograss (Texoka) 1.6
8 (Abilene) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (Haskell) 3.6 Blue Grama (Hachita) 1.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sand Dropseed (Borden Co.) 0.3 Sideoats Grama (Haskell) 3.6 Blue Grama (Hachita) 0.8 Buffalograss (Texoka) 1.6
9 (Waco) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 1.8 Buffalograss (Texoka) 1.6 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Buffalograss (Texoka) 1.6 Bermudagrass 3.6 Sand Dropseed (Borden Co.) 0.4
10 (Tyler) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Bermudagrass 5.4
11 (Lufkin) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Bermudagrass 5.4
12 (Houston) Jan. 15–May 15	Green Sprangletop 0.3 Sideoats Grama (Haskell) 4.5 Bermudagrass 2.4	Green Sprangletop 0.3 Bermudagrass 5.4
13 (Yoakum) Jan. 15–May 15	Green Sprangletop 0.3 Sideoats Grama (South Texas) 4.5 Bermudagrass 2.4	Green Sprangletop 0.3 Bermudagrass 5.4
14 (Austin) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (South Texas) 3.6 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Bermudagrass 4.8 Buffalograss (Texoka) 1.6
15 (San Antonio) Feb. 1–May 1	Green Sprangletop 0.3 Sideoats Grama (South Texas) 3.6 Bermudagrass 2.4 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Bermudagrass 4.8 Buffalograss (Texoka) 1.6
16 (Corpus Christi) Jan. 1–May 1	Green Sprangletop 0.3 Sideoats Grama (South Texas) 3.6 Bermudagrass 2.4 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Bermudagrass 4.8 Buffalograss (Texoka) 1.6
17 (Bryan) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Bermudagrass 5.4

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)	Sandy Soils Species and Rates (lb. PLS/acre)
18 (Dallas) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Buffalograss (Texoka) 1.6 Bermudagrass 2.4	Green Sprangletop 0.3 Buffalograss (Texoka) 1.6 Bermudagrass 3.6 Sand Dropseed (Borden Co.) 0.4
19 (Atlanta) Feb. 1–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Bermudagrass 5.4
20 (Beaumont) Jan. 15–May 15	Green Sprangletop 0.3 Bermudagrass 2.4 Sideoats Grama (Haskell) 4.5	Green Sprangletop 0.3 Bermudagrass 5.4
21 (Pharr) Jan. 15–May 15	Green Sprangletop 0.3 Sideoats Grama (South Texas) 3.6 Buffalograss (Texoka) 1.6 Bermudagrass 2.4	Green Sprangletop 0.3 Buffalograss (Texoka) 1.6 Bermudagrass 3.6 Sand Dropseed (Borden Co.) 0.4
22 (Laredo) Jan. 15–May 1	Green Sprangletop 0.3 Sideoats Grama (South Texas) 4.5 Buffalograss (Texoka) 1.6 Bermudagrass 1.8	Green Sprangletop 0.3 Buffalograss (Texoka) 1.6 Bermudagrass 3.6 Sand Dropseed 0.4
23 (Brownwood) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (Haskell) 3.6 Bermudagrass 1.2 Blue Grama (Hachita) 0.9	Green Sprangletop 0.3 Buffalograss (Texoka) 1.6 Bermudagrass 3.6 Sand Dropseed (Borden Co.) 0.4
24 (El Paso) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (South Texas) 3.6 Blue Grama (Hachita) 1.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Buffalograss (Texoka) 1.6 Sand Dropseed (Borden Co.) 0.4 Blue Grama (Hachita) 1.8
25 (Childress) Feb. 1–May 15	Green Sprangletop 0.3 Sideoats Grama (El Reno) 3.6 Blue Grama (Hachita) 1.2 Buffalograss (Texoka) 1.6	Green Sprangletop 0.3 Sand Dropseed (Borden Co.) 0.4 Buffalograss (Texoka) 1.6 Bermudagrass 1.8

Table 3. Temporary Cool Season Seeding

Districts	Dates	Seed Mix and Rates (lb. PLS/acre)	
Paris (1), Amarillo (4), Lubbock (5), Dallas (18)	September 1– November 30	Tall Fescue Western Wheatgrass Wheat (Red, Winter)	4.5 5.6 34
Odessa (6), San Angelo (7), El Paso (24)	September 1– November 30	Western Wheatgrass Wheat (Red, Winter)	8.4 50
Waco (9), Tyler (10), Lufkin (11), Austin (14), San Antonio (15), Bryan (17), Atlanta (19)	September 1– November 30	Tall Fescue Oats Wheat	4.5 24 34
Houston (12), Yoakum (13), Corpus Christi (16), Beaumont (20), Pharr (21), Laredo (22)	September 1– November 30	Oats	72
Ft. Worth (2), Wichita Falls (3), Abilene (8), Brownwood (23), Childress (25)	September 1– November 30	Tall Fescue Western Wheatgrass Cereal Rye	4.5 5.6 34

Table 4. Temporary Warm Season Seeding

Districts	Dates	Seed Mix and Rates (lb. PLS/acre)	
All	May 1– August 31	Foxtail Millet	34

2.2. Fertilizer. Use fertilizer in conformance with Article 166.2., “Materials.”

2.3. Vegetative Watering. Use water that is clean and free of industrial wastes and other substances harmful to the growth of vegetation.

2.4. Mulch.

2.4.1. Straw or Hay Mulch. Use straw or hay mulch in conformance with Section 162.2.5., “Mulch.”

2.4.2. Cellulose Fiber Mulch. Use only cellulose fiber mulches that are on the Approved Products List, Erosion Control Approved Products. (<http://www.txdot.gov/business/resources/erosion-control.html>) Submit one full set of manufacturer’s literature for the selected material. Keep mulch dry until applied. Do not use molded or rotted material.

2.5. Tacking Methods. Use a tacking agent applied in accordance with the manufacturer’s recommendations or a crimping method on all straw or hay mulch operations. Use tacking agents as approved or as specified on the plans.

3. CONSTRUCTION

Cultivate the area to a depth of 4 in. before placing the seed unless otherwise directed. Use approved equipment to vertically track the seedbed as shown on the plans or as directed. Cultivate the seedbed to a depth of 4 in. or mow the area before placement of the permanent seed when performing permanent seeding after an established temporary seeding. Plant the seed specified and mulch, if required, after the area has been completed to lines and grades as shown on the plans.

3.1. Broadcast Seeding. Distribute the seed or seed mixture uniformly over the areas shown on the plans using hand or mechanical distribution or hydro-seeding on top of the soil unless otherwise directed. Apply the mixture to the area to be seeded within 30 min. of placement of components in the equipment when seed and water are to be distributed as a slurry during hydro-seeding. Roll the planted area with a light roller or other suitable equipment. Roll sloped areas along the contour of the slopes.

3.2. Straw or Hay Mulch Seeding. Plant seed according to Section 164.3.1., “Broadcast Seeding.” Apply straw or hay mulch uniformly over the seeded area immediately after planting the seed or seed mixture. Apply straw mulch at 2 to 2.5 tons per acre. Apply hay mulch at 1.5 to 2 tons per acre. Use a tacking method over the mulched area.

3.3. Cellulose Fiber Mulch Seeding. Plant seed in accordance with Section 164.3.1., “Broadcast Seeding.” Apply cellulose fiber mulch uniformly over the seeded area immediately after planting the seed or seed mixture at the following rates.

- Sandy soils with slopes of 3:1 or less—2,500 lb. per acre.
- Sandy soils with slopes greater than 3:1—3,000 lb. per acre.
- Clay soils with slopes of 3:1 or less—2,000 lb. per acre.
- Clay soils with slopes greater than 3:1—2,300 lb. per acre.

Cellulose fiber mulch rates are based on dry weight of mulch per acre. Mix cellulose fiber mulch and water to make a slurry and apply uniformly over the seeded area using suitable equipment.

3.4. Drill Seeding. Plant seed or seed mixture uniformly over the area shown on the plans at a depth of 1/4 to 1/3 in. using a pasture or rangeland type drill unless otherwise directed. Plant seed along the contour of the slopes.

3.5. Straw or Hay Mulching. Apply straw or hay mulch uniformly over the area as shown on the plans. Apply straw mulch at 2 to 2.5 tons per acre. Apply hay mulch at 1.5 to 2 tons per acre. Use a tacking method over the mulched area.

Apply fertilizer in conformance with Article 166.3., “Construction.” Seed and fertilizer may be distributed simultaneously during “Broadcast Seeding” operations, provided each component is applied at the specified rate. Apply half of the required fertilizer during the temporary seeding operation and the other half during the permanent seeding operation when temporary and permanent seeding are both specified for the same area.

Water the seeded areas at the rates and frequencies as shown on the plans or as directed.

4. MEASUREMENT

This Item will be measured by the square yard or by the acre.

5. PAYMENT

The work performed and the materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Broadcast Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Broadcast Seeding (Temp)" of warm or cool season specified, "Straw or Hay Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Straw or Hay Mulch Seeding (Temp)" of warm or cool season specified, "Cellulose Fiber Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Cellulose Fiber Mulch Seeding (Temp)" of warm or cool season specified, "Drill Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Drill Seeding (Temp)" of warm or cool season specified, and "Straw or Hay Mulching." This price is full compensation for furnishing materials, including water for hydro-seeding and hydro-mulching operations, mowing, labor, equipment, tools, supplies, and incidentals. Fertilizer will not be paid for directly but will be subsidiary to this Item. Water for irrigating the seeded area, when specified, will be paid for under Item 168, "Vegetative Watering."

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