



# PURPLETOP TRIDENS

## *Tridens flavus* (L.) Hitchc.

Plant Symbol = TRFL2

**Common Names:** grease grass, purpletop tridens, redtop, and redtop tridens (North Carolina State Extension, 2021)

**Scientific Names:** *Tridens flavus* var. *flavus*

### Description

**General:** Purpletop tridens is a native, perennial bunchgrass with culms 2 to 6 feet tall arising from a rhizomatous crown (Fig. 1). Leaves are 0.12 to 0.5 inches wide, 10 to 28 inches long, and taper to a point (Gould, 2008; Leithead et al., 2008). Leaf surfaces are smooth or sparsely covered in stiff hairs (Gould, 1975). Purpletop tridens can be identified by its ligule of stiff hairs on both sides of the leaf sheath at the collar (Phillips Petroleum, 1956). The pyramid shaped inflorescence is open, drooping, 6 to 14 inches or more long with spreading lower branches 4 to 10 inches long (Gould, 2008; Hatch and Pluhar, 1995) (Fig.2). The inflorescence, which is purplish green in bloom stage to early maturity, is often covered in an oily substance, giving it the origin of the common name “grease grass” (Phillips Petroleum, 1956; Hatch and Pluhar, 1995). Blooming begins in August and ends in November (Gould, 2008). Seeds are whitish yellow, small, and about 0.06 to 0.09 inches long (Miller and Miller, 2005).

**Distribution:** The *Tridens* genus contains 14 species in the US down to Argentina (Diggs et al., 2006). Purpletop tridens occurs from New Hampshire to Florida, westward to the eastern half of Texas, then north to Nebraska and Wisconsin (Hitchcock and Chase, 1950; Diggs et al., 2006; Williams, 1997) in USDA Plant Hardiness Zones 4a to 9a (NC State Extension, 2021). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

**Habitat:** Purpletop tridens is found in a variety of habitats including old fields, prairies, open woods, woodland openings, powerline and railroad rights-of-ways, and roadsides (Loflin and Loflin, 2012; Illinois Wildflowers, 2021). Williams (1997) observed purpletop tridens growing along a roadside with other species including big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), thin paspalum (*Paspalum setaceum*), purple lovegrass (*Eragrostis spectabilis*), spotted beebalm (*Monarda punctata*), fewleaf sunflower (*Helianthus occidentalis*), and toothed spurge (*Euphorbia dentata*) in a Wisconsin study.

### Adaptation

Purpletop is adapted to sites receiving full sun to partial shade (NC State Extension, 2021). It tolerates dry to moist sandy, sandy loam, loam, clay loam, or clay soils in areas receiving 30 or more inches of rainfall (Leithead et al., 2008; Illinois Wildflowers, 2021; Ladybird Johnson Wildflower Center, 2021).



Figure 1. Purpletop tridens with inflorescence. Photo credit: Tyler Wayland, Texas Native Seeds.



Figure 2. Purpletop tridens inflorescence. Photo credit: Tyler Wayland, Texas Native Seeds.

## Uses

*Livestock* – Purpletop tridens has fair forage value and is grazed early in the season then again after frost (Hatch and Pluhar, 1995; Linex, 2014). Boggess and Baker (1983) suggest purpletop tridens has potential to reduce seasonal forage variations when grown with cool season grasses and legumes.

*Wildlife and Pollinators* – Purpletop tridens has fair value to wildlife. Wild turkey and northern bobwhite quail consume seeds in fall (Miller and Miller, 2005), and it provides denning, nesting materials, and cover throughout the year (Loflin and Loflin, 2012; NC State Extension, 2021). Purpletop tridens supports several pollinator species. It is a larval host for the crossline skipper (*Polites origenes*), little glassywing (*Pompeius verna*), and broad-winged skipper (*Poanes viator*) (Ladybird Johnson Wildflower Center, 2021). Common wood nymph (*Cercyonis pegala*) butterfly caterpillars eat the foliage, and mature individuals consume rotting fruit and flower nectar (Illinois Wildflowers, 2021; NC State Extension, 2021).

*Other*- Purpletop tridens can be used as native ornamental grass and is attractive with its reddish-purple inflorescence when planted en masse. It is salt tolerant and found along roadsides (NC State Extension, 2021).

## Ethnobotany

No references have been found regarding use by Native Americans.

## Status

*Threatened or Endangered*: Purpletop is not threatened or endangered (US Fish and Wildlife Service, 2021).

*Wetland Indicator*: Purpletop tridens is a facultative upland (FACU) plant in Atlantic and Gulf Coastal Plain and Eastern Mountains and Piedmont, but an upland plant in the Western Mountains, Valleys, and Coast, Arid West, Great Plains, Midwest, and Northcentral/Northeast regions of the US (U.S. Army Corps of Engineers, 2018).

*Weedy or Invasive*: This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Web site (<http://plants.usda.gov/>) and your state's Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

## Planting Guidelines

Site preparation is critical for establishment of native species and is done well in advance of planting. Use herbicides, mowing, and tillage to control undesirable vegetation. Limit tillage as it destroys soil structure and releases a wide array of annual weeds that compete with the planting. Allow rain or irrigation to germinate weed seeds and apply a broad-spectrum herbicide to eliminate weed seedlings prior to planting. Seed drills are the preferred planting implement as they control seeding depth, seed spacing, and ensure excellent seed-to-soil contact. A drill equipped with a chaffy/fluffy seed box is recommended when planting purpletop seed (Pfaff et al., 2002). When planting with a conventional seed drill, plant into a firm seedbed to prevent loose soil from falling back into the planter's press wheel tracks and burying the seed too deeply after the first rain event. Complete fall dormant plantings from September 1 to November 1 and spring plantings from December 1 to June 1 (USDA NRCS, 2018). Purpletop has approximately 454,000 seeds/lb (hulled) to 465,000 seeds/lb (Pfaff et al., 2002; USDA, 1948). Plant seed ½ to ¼ inch deep using a seeding rate of 3 PLS lb/acre or about 30 seed/ft<sup>2</sup> for monoculture plantings. Adjust the seeding rate of purpletop tridens to the desired percent in the mixture.

Broadcast seeding is an alternative planting method when site conditions are not conducive for seed drills. If possible, follow the same instructions to control undesirable vegetation as listed above. Lightly drag the area with a harrow or other implement prior to planting. Broadcast the seed over the area then lightly drag the planted area to cover the seed or use a culti-packer to incorporate seed into the soil. Increase seeding rates 25% when broadcast seeding to compensate for lack of control of planting depth and seed-to-soil contact. Mix seed with a carrier agent such as sand or cat litter to facilitate seed flow and even distribution over the planting area.

## Management

Purpletop tridens is fire tolerant (USDA, NRCS, 2021). Mowing is an effective mechanical control method. Selective herbicides can be used to control weeds in purpletop. Consult your local agricultural extension specialist and always read and follow label and safety instructions for each management method. Purpletop tridens will increase on favorable sites where other forage grasses are overgrazed but decrease if grazed continually closer than 4 to 6 inches (Phillips Petroleum Company, 1956).

## Pests and Potential Problems

Purpletop tridens is susceptible to sorghum midge (*Contarinia sorghicola*) larvae that eat the seeds. A purpletop tridens borer (*Eurytomocharis triodiae*) bores into stems damaging stems and seedheads. Aphid species such as rusty plum aphid (*Hysteroneura setariae*) and orchard grass aphid (*Hyalopteroides humilis*) feed on the foliage and decrease plant productivity (Illinois Wildflowers, 2021). Purpletop tridens can be considered a weed in hayfields and pastures (University of Missouri, 2021) depending upon land manager's objectives.

## Environmental Concerns

Purpletop tridens is a native plant within its range of occurrence and has no known negative effects on the environment.

## Control

Control purpletop tridens using mechanical means, such as mowing, or a broad-spectrum herbicide. Contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Control measures appear in this document only to provide specific information. USDA NRCS does not guarantee the control methods named, and other methods may be equally effective.

## Seeds and Plant Production

Establish commercial seed production fields with transplants or direct seeding. Transplanting seedlings in the spring is the preferred method of establishing seed production fields as it creates a uniform, evenly spaced, complete stand, and allows the use of pre-emergent herbicides to reduce weed competition. Prepare the seedbed as previously discussed in the *Planting Guidelines*.

For direct seeding, drill seeds  $\frac{1}{2}$  to  $\frac{1}{4}$  inch deep using a seeding rate of 40 seeds/linear foot (USDA NRCS Brooksville Plant Materials Center, 1997). Space rows to allow for weed control and seed harvesting equipment. Supply moisture to seedlings to encourage plant establishment and development. Do not fertilize seed production fields during the first year. Fertilization the first growing season increases weed competition. Control weed pressure in seed production fields by cultivating between rows, utilizing spot applications of broad spectrum and selective herbicides, hoeing, or hand rogueing. Use pre-emergent herbicides to control undesirable weeds. Apply fertilizer after production stands are established. Purpletop tridens fertilized with 10-10-10 at 100 lb/acre rate increased foliage, seedhead production, and seed yield compared to unfertilized plants (USDA NRCS Brooksville Plant Materials Center, 1997). Seed increase fields may take a couple of years to reach full production (Grabowski, 2001).

Harvest seed in fall when it is in hard dough to mature stage (Pfaff et al., 2002) (Fig. 3). Direct combining is the preferred harvest method (Pfaff et al., 2002). Prepare the combine for harvesting by setting the concave to one and a half times the thickness of the seed. Then adjust cylinder speed until only unthreshed seed that is immature or partly filled is discharged from the back of the combine. Set forward speed to prevent overloading the combine header intake as too much material prevents efficient threshing. Adjust combine air setting or fan speed to prevent blowing good seed out of the back of the combine (Harmond et al., 1961).

Scalp harvested material to remove stems and inert matter then dry by spreading on a hard surface such as a barn floor with fans blowing air over the seed or in a bin with forced air but no heat. Use a seed cleaner with air adjustments and separation screens to remove chaff and unfilled seed. Clean seed using a top screen of 9.5/64 round hole and bottom screens of 8/64 and 7/64 round hole to remove fines and small trash (Barbour, 2007). Combine harvest and cleaner settings may vary annually depending upon seed size and weight. Seed yields of 400 lb/acre are possible from row planted production fields (Grabowski, 2001). Store harvested seed in a controlled environment of 50°F or less and 50% or less relative humidity to improve seed longevity (Apfelbaum et al., 2005). Grabowski (2001) reports seed storage duration of 1 to 3 years.

## Cultivars, Improved, and Selected Materials (and area of origin)

Select cultivars based on the local climate, resistance to local pests, and intended use. Consult with your local land grant university, local extension or local USDA NRCS office for recommendations on adapted cultivars for use in your area.



Figure 3. Purpletop tridens seeds. Photo credit: Melinda Brakie, USDA NRCS East Texas Plant Materials Center.

Union Germplasm purpletop was released in 2005 by the USDA NRCS Jimmy Carter Plant Materials Center and US Forest Service. It is used for erosion control, wildlife habitat improvement, and native plant restoration. This release is adapted to the southeastern US, particularly South Carolina (USDA NRCS Jimmy Carter Plant Materials Center, 2012).

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### **Citation**

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