



TEXAS ROADSIDE WILDFLOWERS

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KEY WORDS

roadside seeding, *Amblyolepis*, *Castilleja*,
Coreopsis, *Gaillardia*, *Glandularia*,
Lupinus, *Oenothera*, *Phlox*, *Verbena*

NOMENCLATURE

USDA NRCS (2004)

Texas bluebonnets (*Lupinus texensis*) blooming along Willow Loop Road in Gillespie County, Texas, enhance recreational experiences.

Photo by Tara Luna

Texas is an immense area that is diverse in botanical richness. Encompassing 692 408 km² (267 339 mi²), dense pine and hardwood forests in the eastern portion of the state slowly give way to blackland prairies and savannah-like oak-grasslands, and southward to semitropical forests of jungle-like swamps, sandy lands, and densely wooded uplands that are home to many state endemics. The arid, southern Great Plains in the northwest drop southward to the semi-tropical lower Rio Grande Valley and the far west region of the Big Bend country is part of the northern reach of the Chihuahuan Desert, considered the most biologically rich desert of North America. In the middle of the state, limestone and granite

outcroppings define the Edwards Plateau of the Hill Country, famous for the vast displays of Texas bluebonnets, Indian paintbrush, buttercups and evening primroses, and Drummond phlox.

From early March to the end of October, Texas is literally covered with wildflowers that produce landscapes of brilliant colors. Long undulating waves of constantly changing colors border roadsides, adjacent pastures, grasslands, and forests as one species after another comes into bloom. In many areas, Texas bluebonnet displays stretch as far as the eye can see, creating the illusion of an ocean of deep blue. In late spring and summer, a variegated robe of reds, yellows, and pinks quilt the landscape.

These vast wildflower displays encourage thousands of residents and tourists to drive and bicycle Texas roadways to enjoy the beauty.

HISTORY

In 1932, the Texas Department of Transportation (TxDOT) hired its first landscape architect to maintain, preserve, and encourage wildflowers and other native plants along rights-of-way. Native species that were colonizers in areas after road construction were noted, and development of a management plan to encourage, perpetuate, and protect native wildflower stands was formulated. By 1934, directives were issued to delay all mowing, unless essential for safety, until spring and early summer wildflower seasons were over. This practice has expanded into a full-scale vegetation management system. A combination of selective mowing and herbicide application, wildflower preservation and seeding, and an active public awareness program drives the highway beautification program. The Highway Beautification Act, championed by Lady Bird Johnson during the 1970s, resulted in increased public awareness and added fuel to the existing TxDOT program.

TxDOT strives for a balance in maintenance and management of Texas highways. Maintenance techniques used to encourage wildflower growth include safety, or strip, mowing that allows wildflowers to bloom and native grasses to emerge. Directives to mow around blooming wildflower areas are included in mowing contracts. Mowing does not begin until the mass of spring wildflowers has finished blooming and seeds have matured. During mowing operations, late-blooming species are protected and preserved by leaving them in non-mow areas. Furthermore, it is especially desirable to conserve any rare or uncommon type by leaving these species undisturbed or by restricted management. Fall mowing is used after the first

frost to open the canopy, allowing germination of annual species the following spring. Mowing dates also coincide with flowering and seed maturation phenology of perennial species so that they are also allowed to produce seeds.

For statewide use, TxDOT purchases and sows approximately 18 144 to 27 216 kg (40 000 to 60 000 lbs) of wildflower seeds (annuals, biennials, and perennials) per year in native and non-native plantings in new construction areas, annual replacement sites, and in locations where they are lacking. In the past, wildflower areas were cut with a sickle mower after the peak blooming season and before seeds dispersed. The “flower hay” was raked up and spread where TxDOT wanted to establish or enhance wildflower populations. Another old method for wildflower cultivation involved carefully blading a thin layer of topsoil containing wildflower seeds and spreading the soil in a new location that was either barren of vegetation or where there was a thin population of grasses. Today’s preferred methods of wildflower propagation involve purchasing seeds from commercial growers and salvaging topsoil in construction sites where wildflowers and desirable grasses are present.

The peak wildflower blooming season draws tourists from across the nation to see the color unfold each spring. The main state highways, secondary highways, and farm-to-market roads have vast displays—providing motorists and bicyclists with many options for wildflower viewing. Our public awareness efforts include “Wildflowers of Texas” brochures, a wildflower manual, and wildflower presentations to interested groups. A wildflower hotline, starting in March of every year, advises the public on the best wildflower viewing areas.

There are approximately 445 146 ha (1 100 000 ac) of highway rights-of-way in Texas, and 323 742 ha (800 000 ac) are actively managed for wildflowers. Texas has 254 counties divided into 25 transportation districts. Seeding mixes vary according to district. Seeding rates vary

according to species composition, soil type, and percent slope, however, an average seeding rate of 140 PLS/m² (40 PLS/ft²) is used for most areas. Higher rates of seeding in the past resulted in decreased establishment of wildflowers.

Seeds are drill- and broadcast-seeded in October and November. The sowing method depends on soil type and planting depth requirement of each species per seed mix (Table 1). Broadcasting methods are usually a better option when seeding on slopes steeper than 3:1. TxDOT also strives to plant species that occur naturally for each district, as well as to seed a diversity of native wildflowers. Species in mixes include early spring and late summer flowering species. In most districts, a minimum of 8 to 10 wildflower species is included in seed mixes. In areas of new construction without vegetation TxDOT first seeds with native and adapted grasses to provide immediate cover and prevent soil erosion, and then seeds with wildflowers the following year. Many native wildflowers also have desirable maintenance attributes such as preventing soil erosion and increasing soil fertility. Because of conscientious management practices, the wildflower stands are now self-perpetuating. Limited annual seeding is done for all 25 districts.

One current project involves restoration of native vegetation in South Texas, an area that has a distinctly different climate yet is only 145 km (90 mi) south of Austin and extends to the Mexican border. This project involves collecting local ecotypes, bringing them into seed production by local commercial seed growers, and making the seed available to end users for reseeding projects.

SUMMARY

Highway beautification is alive and well in Texas. It has flourished and sustained itself for more than 60 y. The long established program of protecting and distributing native wildflowers has received

TABLE I

Seeding rates (pure live seeds [PLS]) and mixtures (for predominately clayey or sandy soils) for wildflower seeding in central Texas.

Species	Common name	Minimum PLS kg/ha (lb/ac)	Planting depth mm (in)	Soil suitability	
				Clayey	Sandy
<i>Amblyolepis setigera</i> DC. (Asteraceae)	Huisache daisy	1.12 (1.0)	3 (1/8)	yes	yes
<i>Castilleja indivisa</i> Engelm. (Scrophulariaceae)	Texas paintbrush	0.28 (0.25)	surface	yes	yes
<i>Coreopsis lanceolata</i> L. (Asteraceae)	Lance leaf coreopsis	2.24 (2.0)	1.5 (1/16)	yes	yes
<i>Coreopsis tinctoria</i> Nutt. (Asteraceae)	Plains coreopsis	0.56 (0.5)	1.5 (1/16)	yes	yes
<i>Gaillardia pulchella</i> Foug. (Asteraceae)	Indian blanket	3.36 (3.0)	3 (1/8)	yes	yes
<i>Glandularia bipinnatifida</i> (Nutt.) Nutt. var. <i>bipinnatifida</i> (synonym <i>Verbena</i> <i>bipinnatifida</i> Nutt. [Verbenaceae])	Plains verbena	0.28 (0.25)	1.5 (1/16)	yes	yes
<i>Lupinus texensis</i> Hook. (Fabaceae)	Texas bluebonnets	16.8 (15.0)	3 (1/8)	yes	no
<i>Oenothera speciosa</i> Nutt. (Onagraceae)	Showy primrose	1.12 (1.0)	surface	yes	yes
<i>Phlox drummondii</i> Hook. (Polemoniaceae)	Drummond phlox	4.48 (4.0)	3 (1/8)	no	yes

full public endorsement and every effort should continue to be made to further this work. Today, TxDOT not only plants and enhances wildflower areas, but more importantly, protects and maintains the investment made in past years. The state has discovered many benefits with roadside wildflowers, including a 25% reduction—about \$8 million per year—in maintenance costs as a result of less mowing. Other benefits include increased wildlife habitat and biodiversity, improved erosion control, enhanced aesthetics and tourism, increased planting success with hardy native plants, strengthened partnerships with natural resource agencies and volunteer groups, suppressed noxious weed invasions, and a demonstrated commitment to preserve and perpetuate the native flora.

HOTLINE AND INTERNET SITE

The Texas Department of Transportation's wildflower hotline (800.452.9292) and Internet site (<http://www.dot.state.tx.us/wflwr/main.htm>) provides user information on the best locations to find wildflowers along the Texas highway system. The hotline and Internet site are active from early March to early May.

REFERENCE

[USDA NRCS] USDA Natural Resources Conservation Service. 2004. The PLANTS database, version 3.5. URL: <http://plants.usda.gov> (accessed 22 Jun 2004). Baton Rouge (LA): National Plant Data Center

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