Wildflower Seed and Plant Growers Association

Sunshine mimosa (*Mimosa strigillosa*)

Torr. & A. Gray

Introduction

Mimosa strigillosa is commonly known as Sunshine mimosa, or Powderpuff, because of the shape of its showy flowers.

This native groundcover occurs in two disjunct populations (Fig. 1 [6]). The southeastern population occurs mainly in peninsular Florida, north to extreme southern Georgia and west to the central Florida panhandle. The western population occurs mainly from western Mississippi to southeastern Texas, as well southern Arkansas.[1] In Florida, Sunshine mimosa often occurs in disturbed areas with well-drained soils and is becoming more widespread along roadsides, especially in northern Florida.

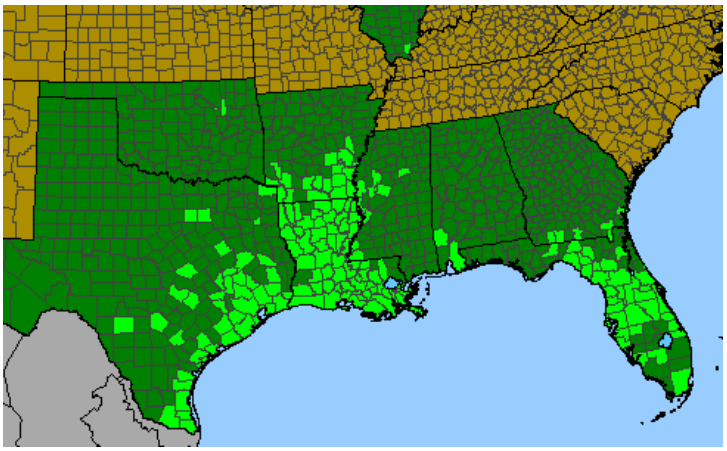

Figure 1. Distribution of Sunshine mimosa (6). Reproduced with permission of BONAP.

A native groundcover very similar to Sunshine mimosa is *Mimosa quadrivalvis* (Sensitive brier). It is the only other *Mimosa* species native to Florida. Sensitive brier has short spines along its stems, which makes it easy to distinguish from Sunshine Mimosa, which lacks spines. Two varieties of Sensitive brier occur in Florida – *Mimosa quadrivalvis* var. *angustata* (Sensitive brier) and *Mimosa quadrivalvis* var. *floridana* (Florida sensitive brier). Sensitive brier is the most widespread of the three native *Mimosa* species. It occurs in many counties throughout Florida in habitats ranging from disturbed sites to upland to mesic flatwoods. Florida sensitive brier occurs only in peninsular Florida and is found in disturbed areas as well as mesic flatwoods. All three taxa typically occur in full sun to high pine shade.

Description

Sunshine mimosa is a low-growing, perennial legume (Fig. 2). While it is perennial, subfreezing temperatures will kill the top growth. Shoots that do not die in winter might become somewhat yellowish.

Figure 2. Sunshine mimosa is a sustainable groundcover in urban settings.

It has bipinnately compound leaves (Fig. 3) comprised of tiny leaflets that usually fold up when touched and in hot, dry weather to reduce transpirational water loss. This groundcover will form a thick mat of overlapping stems. Plant height varies from 3 to 6 inches, depending on overlapping stems, flowering, and light level. All else being equal, plants growing under high pine shade tend to be taller than plants in full sun.

Figure 3. Sunshine mimosa bipinnately compound leaf.

[1]There are reports of M. strigillosa in one county each in Illinois and Oklahoma (5)

Stems often form roots at nodes. Roots can penetrate deep into the soil – one of the likely reasons that Sunshine mimosa is drought tolerant once established. Like other plants in the legume or bean family (Fabaceae), the roots can become nodulated with bacteria that convert atmospheric nitrogen into ammonia – a form of nitrogen that plants can utilize – by the process of nitrogen fixation. Essentially, this allows Sunshine mimosa and other legumes to make their own nitrogen fertilizer. For more information about nodulation, see **Inoculating Plants** on page 3.

Figure 4. Powderpuff is a common name for *M. strigillosa* because of the shape of its flowers.

Bottlebrush-like flowers (Fig. 4), about an inch long, occur mainly in the spring. The showy pink flowers give way to small flattened pods (Fig. 5) that ripen about 4 to 5 weeks after flowering. The hairy pods typically are three-segmented, with each segment usually containing a seed. When seeds fully ripen, the pod shatters and the seeds fall to the ground.

Figure 5. Sunshine mimosa pods contain up to 3 seed.

The olive-brown to brown seeds (Fig. 6) average about 5–6 mm long and 2–3 mm wide, about the same size as the seed of the Crockett selection of Sunshine mimosa (12). There are 50,000 to 60,000 seeds per pound (15), slightly more than the 47,000 of Crockett (12). The hard seed coat imposes a physical dormancy. While the seed coat is impervious to water and helps to prolong shelf-life, seeds must be scarified to ensure germination. For information about seed scarification, see **Germinating Seed** below.

Figure 6. The olive brown to brown seed of Sunshine mimosa are 5–6 mm long and 2–3 mm wide.

Growing Conditions

Sunshine mimosa grows best under the following conditions:

- Light: Full sun to high pine shade
- Soil type: Adapted to a wide variety of well-drained soil types
- Soil pH: 6.2-7.1, but will tolerate a pH as low as 4.7 (9). A pH below 5.5 is detrimental to nitrogen-fixing (N-fixing) bacteria (13).
- Soil moisture: Slightly dry to slightly moist; drought tolerant when well-established
- Fertilization: Supplemental fertilization will stimulate flowering since flowers originate on new growth; however, nitrogen will inhibit colonization of the roots by N-fixing bacteria. If fertilizing, use a low rate of controlled-release fertilizer that will last throughout the summer. Fertilizers should contain no or low amounts of phosphorus (P) unless results of a soil test show that P is deficient. Potash applied in mid-winter to early spring may help to increase seed production and quality (15); base the application rate of potash on a soil test.

Germinating Seed

The optimum soil pH for germination and emergence of seedlings is 5.5 to 6.6 (9). The seed coat of Sunshine mimosa is impervious to water so it must be scarified to ensure

[2] Scarified seed should be stored in cool, dry conditions (temp. < 50F; relative humidity < 50%).

germination. Scarification makes the seed coat permeable to water (without damaging the embryo when done properly).[2] There are several methods to scarify seed, but the most effective is mechanical scarification (10, 14).

For a small amount of seed, such as the amount in a seed packet, seed can be lightly rubbed with sandpaper or an emery board, or on a rough concrete surface. Or nick the seed coat with fingernail clippers.

For larger amounts of seed, consider using a rock tumbler or a commercial-grade seed scarifier.

Regardless of the method, do not over-scarify the seed, as this will damage the embryo. Walker reported that scarifying Sunshine mimosa seed for 10 seconds in a mechanical scarifier was sufficient (14).

To determine if the seed coat has been scarified enough for germination, place a few seeds in a shallow dish of water. Sufficiently scarified seed will swell and soften within an hour or two; swollen seed must be sown immediately. If most seed do not swell, repeat the scarification process in 5–10 second intervals and retest after each interval.

Sow scarified seed about 0.25 inch deep. In loose soil, slightly compact the soil prior to planting to help ensure that seed does not get too deep. While seed below 0.5 inch deep may germinate, seedlings might not have enough stored energy to reach the soil surface.

Irrigate seeded areas every 2 to 3 days with about a third of an inch of water, or as needed so the soil stays slightly moist, until seedlings emerge. Then irrigate once per week with 0.5 inch of water for 2 weeks; in sandy soils irrigate twice per week for 2 weeks.

Inoculating Plants

Bacteria in the genus *Rhizobium*, and other genera as well, colonize roots of legumes in what is termed a symbiotic relationship, that is, a relationship that benefits both organisms.The bacteria produce ammonia which the plant can use, and the plants produce organic compounds that support the bacteria.

Nitrogen-fixing bacteria infect root hairs, the fine white roots at the tips of the root system. Infected roots form nodules in which the bacteria reside (Fig. 7). Nodules most often are seen up to the time of flowering. After that, nodules usually start to deteriorate as the plant's resources are directed to flowering and seed production, not the roots.

Figure 7. Nodules on the roots of Sunshine mimosa contain bacteria that convert atmospheric nitrogen into ammonia, a form of nitrogen that the plant can utilize. Photo: Terry Zinn.

Inoculating legumes requires the proper species and strain of bacteria. In the case of Sunshine mimosa, that inoculant is 'Rhizobium Inoculant for Mimosa', available from Plant Probiotics[3]. Store inoculants in the refrigerator until ready to use. The Sunshine mimosa inoculant has a shelf life of 12 months if stored in a sealed bag in a refrigerator (13).

Plants are inoculated at the time of seeding. Tom Wacek (Plant Probiotics) suggests mixing the seed with a small amount of 10% sugar water as a sticking agent (13). The goal is to make the seed surface tacky enough so that the inoculum sticks to the seed surface; however, too much sugar water will make the seed too wet and difficult to plant. While soda has been widely

[3] Plant Probiotics – tomwacek@yahoo.com

used as a sticking agent, it can be very acidic; low pH inhibits bacterial growth.

Be aware of soil conditions that are detrimental to *Rhizobium* bacteria (13): high temperature; organic matter < 1%; pH < 5.5; and low moisture. When checking roots for nodulation, keep in mind that because the nodules are attached to the fine roots, digging up roots needs to be done very carefully so that the fine roots do not break off.

Pests and Diseases

Little sulphur butterfly (*Pyrisitia lisa* [formerly *Eurema lisa*]) caterpillars will feed on the foliage (1). These larvae can be desirable (or not) depending on your point of view. No diseases have been observed.

Figure 8. Honey bees are an important pollinator of Sunshine mimosa.

Pollinators

Honey bees are the only documented pollinator of Sunshine mimosa (Fig. 8) (8). Based on anecdotal observations in Florida (15), they seem to be the main pollinator, although"bottle bees" also have been observed (15). In Texas, Crockett mimosa "...attracts a wide array of pollinating and foraging insect [sic] in late spring" (12).

Plant (Germplasm) Sources

The disjunct nature of Sunshine mimosa populations (see **Introduction**, page 1) could affect performance of plants derived from western populations that are used in Florida. This situation is similar to that of *Aristida stricta* (Wiregrass), a native grass of the southeastern U.S. that is comprised of disjunct northern and southern populations (7). Based on results of a population genetics study across the range of *A. stricta* as well as previous work, Sharma et al. (11) concluded that there was "...sufficient differentiation among populations of this species to warrant... use of local seed and plant sources for conservation projects."

Additionally, end users should strongly consider purchasing conditioned seed to ensure the best seed quality available. For example, seed sold by the Florida Wildflower Seed and Plant Growers Association is subjected to a cleaning (i.e., conditioning) procedure that substantially reduces the percentage of nonviable seed. Unconditioned seed lots could have a relatively high percentage of nonviable seed.

Figure 9. Sunshine mimosa is a sustainable alternative to turf. Photo: SCCF Native Plant Nursery.

Landscape Use

Sunshine mimosa is a good groundcover for residential and commercial landscapes (Fig. 9). Because it can spread rapidly, it is best used where maintenance is not needed to contain it. As few as four or five 1-gal pots planted in a landscape can cover 200 to 300 sq ft in less than a full growing season. Its rapid spread, mat-like habit, and deep root system also make it a good species for steep slopes that are difficult to mow, or on slopes to help control erosion.

Despite its rapidly spreading nature, Sunshine mimosa is not overly competitive and can be interplanted with turf. Grasses will grow through it and aggressive weeds can outcompete it. However, grasses and weeds can be mowed back without affecting Sunshine mimosa.

Plantings can be established by seed, containerized plants, or root cuttings. Cuttings that have N-fixing bacteria attached to the roots are available (see **Plant Material Sources**, page 9). If seeding, use 2.5 to 3 oz of scarified, pure live seed (PLS) per 1000 sq ft. (Scarification – see **Germinating Seed**, pages 2–3; pure live seed – see page 8). For potted plants, spacing will depend on the size of the container, and how fast you want plants to fill in.

Root cuttings and containerized plants need to be irrigated every few days for 3 to 4 weeks until plants are established. Apply about 0.5 inch of water per irrigation event. See **Germinating Seed** (pages 2–3) about irrigating seeded sites.

Roadsides

Sunshine mimosa is becoming more common along roadsides, especially in northern peninsular Florida. Apparently it is spreading as a result of mowing. Seeds become attached to mowers and other roadside vegetation management vehicles and are deposited into new areas.

Figure 10. Sunshine mimosa performs well on roadside right-of-ways, as seen here along I-75.

This drought-tolerant, low-growing wildflower is adaptable to a variety of situations and requires no special management practices to sustain it. Sunshine mimosa can co-exist with roadside turf (Fig. 10) as well as thrive in the harsh conditions adjacent to the shoulder. And because it so low growing, it stays under mower blades.

Because it can form a thick mat and is deep rooted, Sunshine mimosa would be a good groundcover for steep slopes that are difficult to mow; it may even help to control erosion. It can also be used in island plantings instead of turf, thereby reducing maintenance as well as improving aesthetics (Fig. 2).

New roadside plantings are best established with scarified, inoculated seed sown with a drill. Seed can be sown from mid-spring to fall; however, establishment probably will be best when seed are sown during the rainy season. Be aware that fall-seeded sites may not produce many flowers the following spring. If planting a monoculture, sow 7 to 8 lb PLS per acre. If planting with other native wildflowers or grasses, use a lower seeding rate. However, be aware that wildflowers and grasses might limit and/or obscure Sunshine mimosa flowers or cause it to be leggy or only a sparse groundcover.

Conservation Use

Sunshine mimosa should be useful in conservation projects because of its drought tolerance and ability to form a thick, deeply rooted groundcover. As on roadsides, it would be a good groundcover to consider for steep slopes since it might help to control erosion.

Sunshine mimosa also has value for wildlife. Deer will graze the foliage (5), and it apparently attracts "...a variety foraging insects in late spring... that create excellent bugging areas for wild turkey poults and other large bird species" (12).

Plantings are best established by seed. Use a seed drill to sow scarified, inoculated seed at 7 to 8 lb PLS per acre during the rainy season as noted above; lower the seeding rate when mixing with other species.

Seed Production

The outlook for seed is bright as Sunshine mimosa is a showy, low maintenance, drought-tolerant groundcover that can be used in a variety of situations.

Seed that has been dried and conditioned should be stored in a cool, dry environment. (See details about seed production on page 6.)

Seed Production of Sunshine mimosa

These seed production guidelines were developed in consultation with Terry Zinn, Wildflowers of Florida, Inc., Alachua, Fla. The format is consistent with that used by the USDA Plant Materials Center, Brooksville, Fla.

SPECIES DESCRIPTION: Warm season perennial legume; feather-like leaves composed of many leaflets; groundcover with overlapping stems that can form dense mat; pink bottlebrush-like flowers; seed are contained in a pod. Naturally occurs in disturbed areas with well-drained soils, and is becoming more widespread along roadsides; drought tolerant when established. Seed may be source of food for game and non-game birds; foliage may be grazed on by cattle; honey bee is only documented insect pollinator; larval plant for little sulphur butterfly; being a legume, it provides a sustainable source of nitrogen to native systems.

AVERAGE SEED/LB (KG): 50,000 to 60,000/lb (22,680 to 22,216/kg)

SEEDING RATE-DRILLED: (Pure live seed): 7–8 lb/ac. Scarify seed to ensure germination

INOCULANT: 'Rhizobium Inoculant for Mimosa' purchased from Plant Probiotics (tomwacek@yahoo.com). An 8 oz package will treat 50 to 60 lb of seed. The price of an 8 oz package, as of August 2020, is $60.00 plus shipping.

NOTE: The inoculant 'Strophostyles spec 1' from Nitragin (now owned by Novozymes) has been used to inoculate roots of Sunshine mimosa; however, it is not known whether it is still available.

SEEDING DEPTH: 1/4"

ROW SPACING: At least 2 ft; however, given the rapidity with which it spreads, consider not delineating into rows.

PLANTING DATE: Late spring to early summer. This will allow time for plants to become well established for seed production the following year.

WEED CONTROL:

Prior to establishment: Use herbicides and/or cultivation for 1 to 2 years to obtain a clean weed-free seedbed. Controlling weeds before planting will greatly reduce the amount of weed control needed after establishment.

Established stand: Hand weed as needed. Graminicides with open-ended labels may be used for post-emergent control of grasses; however, follow all label directions regarding application to ornamental species not listed on the label. Plateau® (Imazapic) is labeled for use on Sunshine mimosa. Consider contacting the East Texas Plant Materials Center (Nacogdoches) for other weed management options. *Note: The mention of an herbicide chemical by brand name does not constitute an endorsement by the Florida Wildflower Cooperative. The Cooperative recommends that if such a product is used, it be applied strictly according to label instructions and that personal protection safety equipment be employed as recommended by the product manufacturer's label. Products meant for commercial use only should be applied by a licensed applicator.*

INSECT/PATHOGEN CONTROL: While no serious pests have been observed under cultivation, little sulphur butterfly larvae may cause some foliar damage.

FERTILIZATION:

During establishment: Apply phosphorus, potassium and micronutrients according to soil test recommendations.

Established stand: Apply phosphorus, potassium and micronutrients according to soil test recommendations. Check potassium levels in winter; apply potash in mid-winter to early spring based on soil test results. DO NOT APPLY NITROGEN, as it will inhibit colonization of roots by N-fixing bacteria.

IRRIGATION:

During establishment: Good soil moisture is required during establishment.

Established stand: Can tolerate dry conditions once established, but good soil moisture is necessary for production of viable seed. If necessary, stands can be irrigated between pollination and the final stages of seed ripening to promote seed production.

HARVEST:

Harvest dates: Mid-June and July

Collection window: Pods mature about 4–5 weeks after flowering. Harvest when flower stems turns brown; seed coat may be slightly green and slightly soft. Pods will shatter while still on flower stem if not harvested when noted. Spread out seed to dry.

Manual: Harvest by hand, or use hedge trimmer

Direct combine: Cutter head height must be set at 2 to 3 inches above soil surface. (A combine set up to harvest beans or peas should work well.) The East Texas Plant Materials Center recommends the following, which should be used as a guide when harvesting Florida selections or ecotypes (1): "When combine harvesting seed, set the concave distance to approximately ¼ inch at its narrowest point, and use a moderately low fan speed. Due to the height of the combine header, a slow pace must be used to avoid scraping the ground. ...Large amounts of green material in the combine hopper can create a heat and damage the seed quickly in the summer. It is also has a tendency to pack the auger tubes in the combine and is very difficult to clear."

Stage: When flower stem turns brown

Lodging: N/A

Shattering: High

PRECLEANING TREATMENT/STORAGE: Spread harvested pods in drying area for at least 1 week

For combine-harvested material, "scalp as much green material as possible from the seed" (1) before spreading out seed to dry

PROCESSING:

Dehulling: Hammermill for seed remaining in the pods

Scalping: Air screen cleaner; screen openings on final screen should be oval; fan speed can be set high since seed is relatively heavy

Final Cleaning: SeedTech Air Density Separator (increases percentage of filled seed)

SEED YIELD: 40 to 80 lb/ac. In Texas, stands of the Crockett selection have yielded up to 150 lb/ac. Yield may be highly dependent on the presence of honey bees, which seems to be the main pollinator based on anecdotal observations in the Florida production field.

EXPECTED PRODUCTIVE STAND LIFE: Stands should persist for many years. In Florida, one seed plot has been in production for 10 years.

Viable vs. Nonviable Seed / 'Bulk Seed' vs. 'Pure Live Seed'

Source: Norcini, J.G., A.L. Frances, and C.R. Adams. 2009. Establishment of Lanceleaf tickseed (*Coreopsis lanceolata*) in roadside right-of-ways. Florida Cooperative Extension Service Publication. ENH 1103

Viable vs. Nonviable Seeds

For seed producers and end users, seeds are classified as either viable or nonviable. A seed is deemed viable only if it is capable of germinating and producing normal plants under field conditions. To determine the percentage of viable seeds within a seed lot, a seed technologist conducts two tests. First, a germination test is conducted to determine the percentage of seeds that develop into normal seedlings within an allotted time. A normal seedling possesses all of the structures necessary for the seedling to develop normally. If any of the essential structures are lacking or underdeveloped, or if the seedling is obviously infested with a bacteria of fungus, the seedling is deemed nonviable. Hence, a "live" seed is not necessarily viable. At the conclusion of the germination test, all nongerminated, nondiseasesd seeds are subjected to a viability test, which typically is a tetrazolium (TZ) test. Tetrazolium is a colorless chemical that stains living tissue pink to red. Seeds subjected to the TZ test are deemed viable if the structures essential for germination and normal seedling development are stained pink to red. Seeds that test positive in a post-germination TZ test are classified as dormant; some labs refer to these seeds as 'hard.' Accurate TZ testing and interpretation of TZ test results require considerable skill and experience.

Bulk seed vs. Pure live seed

A bag of seed contains viable wildflower seeds, inert matter (nonviable seeds and pices of leaves, stems, flowers) and possibly even some viable weed seeds. The total contents of the bag are referred to as bulk seed. The number of pounds of pure live seed(s) in a bag is a function of viability and purity and is based on weight. However, because the percentage of viable seeds is determined under lab conditions, it is unlikely that all viable seeds will germinate and develop into mature plants under field conditions.

$$\text{PLS (lb)} = \frac{\text{Total weight of seeds in bag (lb)} \times \%\ \text{purity} \times \%\ \text{viable seeds}}{10{,}000}$$

where the % viable seeds = % germination + % dormant (often called hard) seeds

For example, there are 81 lb PLS in a 100 lb bag of bulk seed that has 90% pure seed, with the pure seed being 90% viable (81 = [100 x 90 x 90]/10,000).

The bulk seed weight in the bag, % purity, % germination, and % dormant (or hard) seeds should always be on the seed label per Florida seed law specifications. The total percent viable seeds might also be listed on the label; if listed, simply use the total percent viable seeds in the equation above.

References

1. Biophilia Nature Center, Native Nursery & Bookstore. www.biophilia.net, accessed 15 May 2013.
2. Brakie, M. 2011. Plant guide for powderpuff (*Mimosa strigillosa*). USDA-Natural Resources Conservation Service, East Texas Plant Materials Center. Nacogdoches, TX 75964.
3. Chang, M., C.M. Crowley and A.A. Nuruddin. 1995. Responses of herbaceous mimosa (*Mimosa strigillosa*), a new reclamation species, to cyclic moisture stress. *Resources, Conservation and Recycling* 13(3-4):155-165.
4. Chang, M., A.A. Nuruddin, C.M. Crowley, and M.D. MacPeak. 1997. Evapotranspiration of herbaceous mimosa (*Mimosa strigillosa*), a new drought-resistant species in the southeastern United States. *Resources, Conservation and Recycling* 21(3):175-184.
5. Everitt, J. H.,.L. Drawe, and R.I. Lonard. 1999. Field guide to the broad-leaved herbaceous plants of South Texas: used by livestock and wildlife. Texas Tech University Press. Lubbock, Texas.
6. Kartesz, J.T. The Biota of North America Program (BONAP). 2013. Taxonomic Data Center. (http://www.bonap.net/tdc). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2013. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)]
7. Kesler, T.R., L.C. Anderson, and S.M. Hermann. 2003. A taxonomic reevaluation of *Aristida stricta* (Poaceae) using anatomy and morphology. Southeastern Naturalist 2:1-10.
8. Lieux, M.H. 1978. Minor honeybee plants of Louisiana indicated by pollen analysis. *Economic Botany* 32(4):418-432.
9. Nuruddin, A.A. and M. Chang. 1999. Responses of herbaceous mimosa (Mimosa strigillosa), a new reclamation species, to soil pH. *Resources, Conservation and Recycling* 27(4):287-298.
10. Pitman, W. 2009. Establishment and survival of native legumes on upland sites in Louisiana. *Native Plants Journal* 10(3):240-50.
11. Sharma, J., S. George, M. Pandey, J. Norcini, and H. Perez. 2011. Genetic differentiation in natural populations of a keystone bunchgrass (*Aristida astricta*) across its native range. *Genetica* 39(2):261-271.
12. USDA-Natural Resources Conservation Service. 2012. Release brochure for Crockett germplasm herbaceous mimosa (*Mimosa strigillosa*). East Texas Plant Materials Center, Nacogdoches, TX.
13. Wacek, Thomas. 2013. Response to request about information pertinent to nitrogen-fixing bacterial of *Mimosa strigillosa*. [email] Personal communication, 9 May 2013.
14. Walker, Kara.2006. Stratification and scarification techniques to improve the germination rates of herbaceous mimosa (*Mimosa strigillosa*). MS Thesis, Stephen F. Austin State University, Nacogdoches, Texas.
15. Zinn, Terry. 2013. Discussion about *Mimosa strigillosa*. [phone] Personal communication, 10 May 2013.

Additional Literature

Florida Wildflower Foundation
Wildflower Literature
FlaWildflowers.org/library

Plant Material Sources

Seed, Root Cuttings, and Plants
Wildflower Seed and Plant Growers Association
www.FloridaWildflowers.com
(352) 988-8117
businessmanager@floridawildflowers.com

Plants

Florida Association of Native Nurseries
www.FloridaNativeNurseries.org
(321) 917-1960
cammie@floridanativenurseries.org

Inoculant

Plant Probiotics
TomWacek@yahoo.com