Wildflower Seed and Plant Growers Association

Sunshine Mimosa

Mimosa strigillosa Torr. & A. Gray

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Introduction

Mimosa strigillosa is commonly known as Sunshine Mimosa, or as 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]

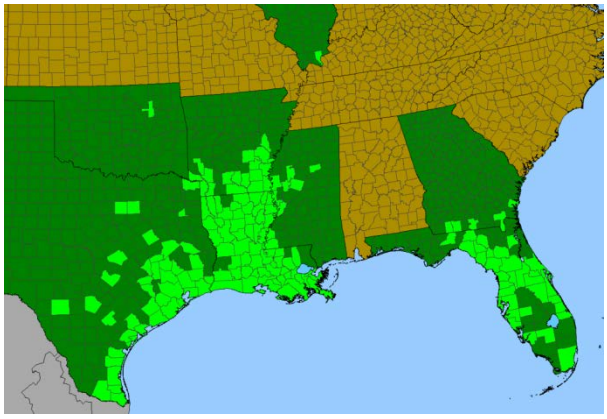

Figure 1. Distribution of Sunshine Mimosa (6). Reproduced with permission of BONAP.

In Florida, Sunshine Mimosa often occurs in disturbed areas with well-drained soils and is becoming more widespread along roadsides, especially in northern Florida.

A native groundcover very similar to Sunshine Mimosa is *Mimosa quadrivalvis* (Sensitive Brier) and 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 as 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.

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

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 in the winter.

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.

Figure 3. Sunshine Mimosa bipinnately compound leaf.

This groundcover will form a thick mat where there a lot of overlapping stems. Plant height varies from 3 to 6

inches depending on how much the stems overlap, flowering, and light level. All else being equal, plants growing under high pine shade will tend to be taller than plants in full sun.

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

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.

Bottlebrush-like flowers (Fig. 4), about an inch long, occur mainly in the spring. The showy purplish 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 seed have fully ripened, the pod shatters and the seed fall to the ground.

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

The olive brown to brown seed (Fig. 6), on average, are 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 seed per pound (15), slightly more than the 47,000 of Crockett (12). The hard seed coat imposes a physical dormancy. While the hard seed coat is impervious to water and helps to prolong shelf-life, seed must be scarified to ensure germination. For information about seed scarification, see **Germinating Seed** below.

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 soil types but soil must be well-drained.
- 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

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

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 germination. Scarification makes the seed coat permeable to water (and 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, like the amount in a seed packet, seed can be lightly rubbed with sand paper 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 (14) reported that scarifying Sunshine Mimosa seed for 10 sec in a mechanical scarifier was sufficient.

To determine if the seed coat has been scarified enough for germination, place a few of the scarified seed 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 inches 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 inches 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 that the soil stays slightly moist, until seedlings emerge. Then irrigate once per week with 0.5 inches water for 2 weeks; in sandy soils irrigate twice per week for 2 weeks.

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

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', which is 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

[3] Plant Probiotics – tomwacek@yahoo.com

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 used as a sticking agent, soda 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. And when checking roots for nodulation, keep in mind that since 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.

Pollinators

Honey bees are the only documented pollinator (8) of Sunshine Mimosa (Fig. 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).

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

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 & 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.

Landscape Use

Sunshine Mimosa is a good groundcover for residential and commercial landscapes (Fig. 9). Since 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, dense, 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.

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

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 out compete it. However, grasses and weeds can be mowed back without affecting Sunshine Mimosa.

Plantings can be established by seed, containerized

plants, or by root cuttings. Root cuttings are available that have N-fixing bacteria attached to the roots (see **Plant Material Sources**, page 10). 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 p. 9). For potted plants, spacing will depend on the size of the container, and how fast you want the 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 inches 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 Sunshine Mimosa is spreading as a result of mowing. Seed become attached to mowers and other roadside vegetation management vehicles and is deposited into new areas.

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 since it so low growing, it stays under the mower blades.

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

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 seed from mid-spring to fall; however, establishment probably will be best when seed are sown during the rainy season. And 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. Like roadsides, it would be a good groundcover to consider for steep slopes since it might help to control erosion.

Sunshine Mimosa has value for wildlife as well. 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.

Details about seed production start on page 6. Seed that has been dried and conditioned should be stored in a cool, dry environment.

Seed Production of Sunshine Mimosa

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

SPECIES DESCRIPTION: Warm season perennial legume; feather-like leaves composed of many leaflets; groundcover with overlapping stems that can form dense mat; purplish 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; honeybee 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 May 2013, is $5.00 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 postemergent control of grasses; however, read and follow all label directions regarding application to ornamental species not listed on the label. No herbicides are specifically labeled for use on Sunshine Mimosa *at* this time. Consider contacting the East Texas Plant Materials Center (Nacogdoches) for other weed management options.

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.

Seed Production of Sunshine Mimosa (continued)

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 results of soil test.
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 seed out 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. (Note: 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 Production of Sunshine Mimosa (continued)

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 the allotted time of the germination test. 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 or fungus, the seedling is deemed nonviable. Hence, a 'live' seed is not necessarily viable. At the conclusion of the germination test, all nongerminated, nondiseased 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 postgermination TZ test are classified as dormant; some labs refer to these seeds as 'hard.' Accurate TZ testing and interpretation of TZ test results requires considerable skill and experience.

Bulk Seed vs. Pure Live Seed A bag of seeds contains viable wildflower seeds, inert matter (nonviable seeds and pieces 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, since 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.

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

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

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Additional Literature

Florida Wildflower Foundation

Wildflower Literature

FlaWildflowers.org/Literature.php

Plant Material Sources

Seed, Root Cuttings, and Plants

Wildflower Seed & Plant Growers Association

www.FloridaWildflowers.com

(352) 988-8117

businessmanager@floridawildflowers.com

Plants

Florida Association of Native Nurseries

www.FloridaNativeNurseries.org

(321) 917-1960

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