

'Raider Azure' Mealy Blue Sage (*Salvia farinacea* var. *farinacea* Benth.)

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Abstract. Native wildflowers provide a rich germplasm resource for continued plant improvement. Over the past 10 years, native accessions of *Salvia farinacea* var. *farinacea* Benth. have been collected and introduced into an ornamental breeding program. Texas Tech University announces the release of a new mealy blue sage cultivar named 'Raider Azure'. 'Raider Azure' is intended for use as a drought-tolerant native ornamental for demanding landscapes. It has been trialed for use as a perennial bedding plant where it has displayed attractive violet–blue flowers and a vigorous growth habit, which is common in this species. The extended bloom period for mealy blue sage suggests the cultivar 'Raider Azure' is well suited for full sun bedding displays in a variety of locations.

Mealy blue sage (*Salvia farinacea* var. *farinacea* Benth) is an attractive wildflower native to a wide range in the southern United States, including Texas, New Mexico, and Oklahoma (Correll and Johnston, 1970; Diggs et al., 1999). Mealy blue sage, a member of the Lamiaceae family, is native to areas characterized by rocky outcroppings, limestone prairies, floodplains, and hillsides.

This herbaceous perennial is valued for its violet–blue flower spikes and informal growth habit (Arnold, 2002). Bloom period for this native is dependable from late spring to frost. The spiciform inflorescence is borne on a naked peduncle and is composed of multiflowered clusters (Correll and Johnston, 1970). The name mealy blue sage is derived from the white tomentose covering of the calyx, which may have a violet–blue tinge. The foliage of the var. *farinacea* is ovate–lanceolate with slender petioles, whereas the ecotype with truncate or subcordate bases has attained the varietal status of var. *latifolia* Shimmers. The attractive flowers are pollinated by a wide variety of medium to large bee species (Neff, 2003).

Mealy blue sage is an herbaceous perennial in U.S. Department of Agriculture Zones 7 through 10 and may be used as an attractive annual color plant in cooler climates (Arnold, 2002). This plant is primarily used in native and low-maintenance landscapes under demanding environments. Although propagation by seed is common (Nokes, 1986), asexual propagation may be accomplished easily

from softwood or semihardwood cutting. Very little seed dormancy is exhibited, so no pretreatment is required for successful germination. Mealy blue sage reaches marketable 3.8-L container size in ≈20 weeks (Knowles, et al., 1993). Tipton (1992) determined mealy blue sage to have the highest germination percent between 25 and 28 °C with germination reaching in excess of 96%. Allelopathy, however, has been observed in several species of *Salvia*. Baskin and Baskin (1998) reported bare zones 1 to 2 m from the crowns of *Salvia* spp. As a result of the presence of volatile compounds released by these shrubs, the germination of other herbaceous species is inhibited. Volatiles found in *Salvia* spp. included the terpenes camphor, α-pinene, β-pinene, cineole, camphene, and dipetene (Muller and Muller, 1964).

Origin

Accessions of Mealy blue sage were identified and collected during the springs of 1996 and 1997 from the Edwards Plateau, Rolling High Plains, and High Plains vegetational regions of Texas (Correll and Johnston, 1970). Four of the best accessions were selected for their erect growth habit, dark floral color, and uniformity. Both years' seed were collected, cleaned, and stored in a cool dry environment. During 1998, each accession of mealy blue sage seed was sown in Metro-mix 200 (Sun Gro Horticulture Canada, Ltd, Vancouver, Canada) peat-lite media in 10 cm × 15 cm disposable aluminum pans. Seed were germinated in a greenhouse with temperatures ranging from 21 to 26 °C. After seedlings achieved the four-leaf stage, they were transplanted into 52-count plug trays and grown 3 additional weeks in the greenhouse. The plug

trays were acclimatized for 3 weeks in a shady location outdoors before transplanting them into field plots during late April at the Texas Tech University experimental farm in Lubbock, TX. The soil at the experimental farm is characterized as an Amarillo fine sandy loam soil (fine-loamy, mixed, superactive, thermic Aridic Paleustalfs). Plant growth measurements (plant height and width, flower spike characteristics, floret characteristics, and an overall visual rating) were taken monthly. To determine the accession with the most uniform flowering and highest overall appearance rating, during peak bloom, each accession was screened using these measures. Two accessions identified as being the most floriferous and with the most vibrant flower color were advanced to the 1999 trial. In 1999, the trial was repeated and the top-performing accession was identified using the same criteria as the previous year. Again, the seed was collected, cleaned, and stored in a cool, dry location. For the 2000 trial, an additional commercial accession No. 3302 was secured from Wild Seed Farms, Fredericksburg, TX, and was used as a comparison with the 1999 top accession. Based on the 2000 trial, the 'Raider Azure' accession was shown to be superior in vigor, habit, and overall appearance.

The plant trial was then moved to the Texas A & M Research and Extension Center in Dallas during 2001 where the soil is characterized as an Austin silty clay (fine-silty, carbonatic, thermic Udorthentic Haplustolls). This soil provided less drainage than previous trials and also had a greater shrink swell potential. 'Raider Azure' and the commercial comparison were seeded in the greenhouse and again transplanted in the field following the protocol listed previously. Once again, in a dissimilar environment, 'Raider Azure' was determined to have better vigor and overall appearance throughout the season. During 2002, 'Raider Azure' was transplanted into the field in Dallas, TX, where it was allowed to open-pollinate for the 2002 growing season where there were no other native populations present. Approximately 1% of the plants were rouged for a silver cast to the foliage and less erect growth habit. Recurrent phenotypic selection was used to screen this material again in 2003 (Cycle 3), 2004 (Cycle 4), and 2005 (Cycle 5). Seed from ≈1000 plants grown in 2005 from the Cycle 5 material were bulked and increased in the field during 2006. This material is now being released as *Salvia farinacea* 'Raider Azure', the third addition to the Raider Wildflower Collection.

Description

'Raider Azure' mealy blue sage has a mature plant height of 68 to 72 cm with a spread of 95 to 110 cm. This erect perennial produces spikes of dark purple flower (violet–blue group N89B) with a lighter purple throat (violet–blue group 93B) (Royal Horticultural Society, 2001). The spike inflorescence is

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composed of 150 to 180 florets each contained in a light gray tomentose bract tinged with dark purple (green group 128D). 'Raider Azure' blooms from late spring to frost and retains a moderate herbal fragrance throughout the season. When flowers senesce, spikes remain until removed. 'Raider Azure' may be cut back to half of its height after flowering and it will quickly rebloom on a compact plant. 'Raider Azure' leaves are lanceolate with a dark green color (yellow-green group 91B) and have a 1.0 to 1.5-cm width and 7 to 8-cm length. The seed is dark brown (brown group 200A) with an average 1000-seed weight of 0.5 mg.

Performance

During the 2003 through 2004 growing seasons in Dallas, TX, plants randomly selected from Cycles 3 and 4 populations were compared with the commercially available common seed source of mealy blue sage using a randomized complete block design. Each of the four blocks contained 15 plants transplanted into unamended field soil. Supplemental irrigation was provided as necessary during the growing season. An analysis of variance was run using SPSS 15.0 (SPSS, 2007), and it was determined that 'Raider Azure' developed more stems per plant as well as longer and wider corolla than the commercial variety (Table 1). This increase in stem number created a more dense appearance in 'Raider Azure'. In addition, larger florets (Table 1) allow for a greater visual impact by the dark purple flower spikes (Fig. 1).

'Raider Azure' is recommended for use in native landscapes and low-maintenance plantings. Plants may be propagated by tip cutting or through seed. Seed propagates easily but should be held in cool, dry storage. Surface and internal soil drainage is critical to prevent overwatering, especially during winter months. In areas with heavy soils, raised beds are recommended. Once established in the landscape, deep, infrequent watering is the most efficient way to maintain 'Raider Azure'. 'Raider Azure' blooms throughout the growing season with minimal care. Shearing to remove spent flower spikes will increase flowering and provide a more compact habit.

Table 1. Comparison of a commercially available common *Salvia farinacea* and *Salvia farinacea* Raider Azure in field trials in Dallas, TX.

Germplasm source	No. stems per plant	Floret length (mm)	Floret width (mm)
2003			
Wild Seed Farms	5.33 (0.741) ^z	10.3 (0.314)	10.44 (0.440)
Raider Azure	9.47 (1.573)	12.5 (0.215)	12.40 (0.286)
Significance	*	***	***
2004			
Wild Seed Farms	11.65 (0.563) ^z	15.38 (0.450)	8.72 (0.388)
Raider Azure	15.40 (1.35)	18.72 (0.284)	10.47 (0.448)
Significance	*	***	***

^zMeans represent separate measurements of 15 plants of each germplasm source. Numbers within the parentheses are the SE of the mean.

t* test significant, $P \leq 0.05$; *t* test significant, $P \leq 0.01$; ****t* test significant, $P \leq 0.001$.



Fig. 1. Example of field grown TTU-V53 ('Raider Azure') mealy blue sage.

Availability

For availability of both experimental and commercial seed, contact the corre-

sponding author, Texas Tech University, Department of Plant and Soil Science, Lubbock, TX 79409-2122; phone 806-742-2837.

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