UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TUCSON PLANT MATERIALS CENTER
TUCSON, ARIZONA

AND

THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA

NOTICE OF RELEASE OF A SELECTION OF SPIKE DROPSEED SELECTED CLASS OF GERMPLASM

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), and the University of Arizona announce the release of a selected class of spike dropseed (*Sporobolus contractus* A.S. Hitchc.) for the southwestern United States.

As a selected release, this germplasm will be referred to as Cochise Germplasm spike dropseed to document general collection location. It has been assigned the NRCS accession number 9064068. Cochise Germplasm is released as a selected class of certified seed.

This alternative release procedure is justified by the lack of existing commercial sources of spike dropseed. The biological qualities of spike dropseed make it a good choice for preliminary vegetation in areas dominated by exotic grasses. Propagation material of this species is needed for ecosystem restoration and enhancement. The potential for immediate use is high. At present, there are no commercial releases of spike dropseed.

Species:	*Sporobolus contractus*
Common Name:	spike dropseed
Plant Symbol:	SPCO4
Accession Numbers:	9064068

Collection Site Information

Cochise Germplasm is a composite of 44 accessions collected from native spike dropseed stands in Arizona, southern Utah, and Nevada (Table 1). Plant materials were collected from areas within the Tucson Plant Materials Center (TPMC) service area to develop a population of spike dropseed with a broad genetic base and adapted to a wide area within its natural range.

Description

Spike dropseed is a native, cespitose, perennial warm-season bunchgrass. Culms range from 40-120 cm tall and 2-4 mm in diameter at the base. Culms may occur in small

Table 1. Accession number and origin of collections for Cochise Germplasm spike dropseed.

Accession Number	Collection Location
1. 9029241	T20S, R25E, Sec 13 Cochise County, AZ
2. 9015265	T14S, R24E, Sec 15 Cochise County, AZ
3. 9022775	Utah
4. 9003960	T18S, R15E Santa Rita Ex. Range
5. 9003959	T13N, R22E Navajo County, AZ
6. 9003958	T8S, R30E Greenlee County, AZ
7. 9003953	T15, R6E Yavapai County, AZ
8. 9015266	T18N, R21E Gila County, AZ
9. 9047372	T28N, R62E, Sec 14 Clark County, NV
10. 9047373	T2N, R45E, Sec 15 Nye County, NV
11. 9047374	Pima County, AZ
12. 9047424	T21S, R7E Sec 10 Pima County, AZ
13. 9047423	T19S, R8E Pima County, AZ
14. 9047452	T17S, R8E, Sec 10 Pima County, AZ
15. 9053631	T5N, R60E, Sec 12 Nye County, NV
16. 9053632	T12N, R60E, Sec 18 Nye County, NV
17. 9063633	T20N, R11E, Sec 17 Coconino County, AZ
18. 9053634	T14S, R25E, Sec 10 Cochise County, AZ
19. 9053635	Cochise County, AZ
20. 9053636	T8S, R30E, Sec 18 Greenlee County, AZ
21. 9053637	T7S, R23E, Sec 18 Graham County, AZ
22. 9053638	Cochise County, AZ

Accession Number	Collection Location
23. 9053639	Cochise County, AZ
24. 9053640	T9, R17E, Sec 36 Cochise County, AZ
25. 9053641	T19S, R15E, Sec 9 Eddy County, NM
26. 9053642	Cochise County, AZ
27. 9055802	T14S, R6E, Sec 27 Pima County, AZ
28. 9055820	T16S, R8E, Sec 32 Pima County, AZ
29. 9055821	Cochise County, AZ
30. 9055822	Cochise County, AZ
31. 9055823	Pima County, AZ
32. 9055824	Cochise County, AZ
33. 9055826	T11S, R20E, Sec 5 Cochise County, AZ
34. 9055827	T14S, R25E, Sec 10 Cochise County, AZ
35. 9055831	Pima County, AZ
36. 9055834	T4S, R64E, Sec 10 Lincoln County, NV
37. 9055835	T4S, R64E, Sec 10 Lincoln County, NV
38. 9055838	T1S, R16E, Sec 11 Gila County, AZ
39. 9055847	T8S, R31E, Sec. 13 Greenlee County, AZ
40. 9055848	T7S, R23E, Sec 18 Graham County, AZ
41. 9055849	T8S, R32E, Sec 5 Greenlee County, AZ
42. 9055851	T18S, R1W, Sec 31 Pima County, AZ
43. 9055855	T3S, R11W, Sec 6 Cochise County, AZ
44. 9055856	T14S, R25E, Sec 9 Cochise County, AZ

clusters to large clumps. The sheath is rounded and glabrous on the back, usually with tufts of long hairs on either side of the collar and often ciliate pilose on the margins. The ligule has a dense fringe of short or relatively long hairs. The blades are flat or involute, tapering to a slender tip, glabrous and 10-30 cm long. The panicle is dense, contracted, spikelike or moderately lobed, typically 1 cm or less thick and 15-20 cm long. The basal portion and sometimes the entire panicle remain enclosed in the sheath. Spikelets are light brownish or lead colored and 2-2.8 mm long. The glumes are thin, membranous and unequal. The first glume is usually half as long as the second; the second equals the length of the lemma or is slightly shorter. The caryopsis is approximately 1 mm in length, broad and flattened.

This species occurs naturally on dry, open, sandy or rocky slopes and washes. It is frequently found along roadsides at elevations from 760-1,981 meters. Flowering in native environments occurs from August to October, occasionally as early as June. In cultivation flowering may be controlled by availability of water. Spike dropseed is found from Colorado to southeastern California, Texas, and Sonora, Mexico.

Spike dropseed germination occurs within two ranges of alternating temperatures: 15.5 to 19 °C (8 hr) and 26.5 to 29.5 °C (16 hr), and at 26 to 32.5 °C (8 hr) and 15.5 to 19 °C (16 hr) (Sabo et al., 1979). Germination results at the first set of temperatures range from 3 to 5 days, with most germination occurring after 4 days. Germination in the second set of temperatures is slightly longer, ranging from 4 days to 7 days. Germination may be decreased when moisture stress levels are below 0 bars, but is not effected by the presence or absence of light (Sabo et al., 1979).

Spike dropseed has the potential to aid in the reclamation of rangelands dominated by exotic perennial grasses. This species was selected for germplasm development based upon biological characteristics that may allow it to compete with introduced exotic species such as Lehmann lovegrass that dominate some rangelands in southern Arizona.

Method of Selection

Cochise Germplasm was developed using the convergent-divergent plant improvement strategy. This strategy was developed to improve regional adaptation of germplasm (Lonnquist et al., 1979). It involves the collection of germplasm from the area of proposed use, followed by intercrossing and then dispersal to a set of target locations in the area. Finally, seed selected from the target locations was planted at the Tucson PMC to produce the Cochise germplasm of spike dropseed. The convergent-divergent process aims to develop germplasm that performs well in most sites within the proposed area of use.

Convergence Planting

The convergence planting in 1989 consisted of 44 accessions (Table 1). These accessions were planted at the Tucson PMC in a completely randomized block design with 4 replications. The accessions were allowed to intercross and seed was collected from individual plants in 1992. In 1993 equal amounts of seed from individual plants were combined and used to plant a seed production block at the Tucson PMC (nontarget environment). Seed from this production block was used to propagate individual plants for divergence plantings at 3 locations in southern Arizona.

Divergent Plantings

Three divergent sites (target environments) were established in southern Arizona. The sites were established in areas of differing ranges of annual precipitation: 1) the Dusty A7 Ranch site near Pomerene, Arizona, with the least precipitation (MLRA 41-3), 2) the BLM enclosure site near Bowie, Arizona, an area of intermediate precipitation (MLRA 41-2), and 3) the Y4 Ranch in Texas Canyon, Arizona, the site of highest precipitation (MLRA 41-3). These sites were also infested with stands of the exotic species, including Lehmann lovegrass (*Eragrostis lehmanniana*).

In August 1998, 196 spike dropseed plants were transplanted into 14 x 14 planting grids on each site (Dusty A7 ranch - August 14, 4Y ranch - August 17, and Bowie - August 18, 1998). Holes were dug with a gasoline-powered auger. Each hole was filled with approximately 2 quarts of water prior to transplanting. This was done to allow the plants to overcome transplant shock and become established on the sites. No additional supplemental water was provided.

The sites at Pomerene, Texas Canyon, and Bowie were evaluated on September 23, 1999. Seed were harvested randomly from surviving plants and brought back to the Tucson PMC. The seed were collected from individual plants, cleaned and stored. Equal amounts of cleaned seed from each plant were blended to form the Cochise Germplasm spike dropseed.

Ecological Considerations

Cochise Germplasm spike dropseed is a composite of naturally occurring germplasm and has undergone minimal purposeful selection. Cochise Germplasm does not differ significantly in rate of spread, seed production, or vigor from naturally occurring spike dropseed. Cochise Germplasm spike dropseed was "OK to release" when evaluated through the "Worksheet for Conducting and Environmental Evaluation of NRCS Plant Releases".

Anticipated Conservation Use

The potential uses of Cochise Germlasm spike dropseed include erosion control, wildlife food/cover, restoration of disturbed areas, rehabilitation of rangeland and for increasing plant diversity in arid rangeland communities.

Anticipated Area of Adaptation

Cochise Germplasm spike dropseed was developed for use in Southern Arizona. Spike dropseed is found naturally growing in dry open areas. It appears to prefer open sandy or rocky slopes and washes and is frequently along roadsides.

Availability of Plant Materials

Seed production will be maintained by the USDA-NRCS Tucson Plant Materials Center. Limited quantities of seed are available to seed producers for increase and to other interested parties as available.

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