

'Rocker' Tanglehead (*Heteropogon contortus* [L.] Beauv. ex Roem. and J.A. Schultes): An Improved Cultivar for Conservation

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Abstract—'Rocker' tanglehead (*Heteropogon contortus* [L.] Beauv. ex Roem. and J.A. Schultes) is a perennial, warm-season bunchgrass. It is recommended for use in critical area stabilization and rangeland revegetation as well as erosion control along roadways, construction sites and other disturbed areas within the desert Southwest. Its main use is intended for rill and gully erosion control where extra moisture is available. Rocker (9043377, P.I. 562143) was released on September 28, 1992 by the Soil Conservation Service (SCS) in cooperation with the U.S.D.A. Agricultural Research Service and the University of Arizona Agricultural Experiment Station. It was selected over other strains for its better overall vigor, ability to initiate spring growth, and capacity to produce an abundance of green herbage. Rocker also exhibits a later flowering date than the other strains it was evaluated with. Rocker is a "source identified" release, meaning that this material originated from a natural stand of known location and elevation. This release has not been subject to any genetic manipulation.

Rocker tanglehead (*Heteropogon contortus* [L.] Beauv. ex Roem. and J.A. Schultes) is a native, perennial bunchgrass; *Culms* tufted, 100 to 120 cm tall, usually branching well above the base; *Sheaths* compressed-keeled, glabrous with a few short hairs at the junction with the blade; *Ligule* short, truncate, fringed with short, stiff hairs; *Blades* mostly 5 to 8 mm wide, flat or folded, scabrous, 20 to 30, occasionally 36 cm long, usually ciliate on the margins with a few long, papillose-hispid hairs; *Racemes* 3 to 7 cm long, produced on slender lateral culm branches as well as terminating the main culm; *Rachis* joints readily disarticulating at maturity; *Glumes of staminate spikelet* about 7 mm long, bright green, several-nerved, hirsute; *Fertile spikelet* about 1 cm long from the base of the long, stiffly-hispid callus to the glume apex, the first glume dark brown, coriaceous, hispid, enclosing the second glume; *Awn of fertile lemma* stout, twisted, twice geniculate, pubescent below with spreading hairs mostly 0.5 to 1 mm long, readily deciduous at maturity, usually falling entangled with the awns of other spikelets (Taxonomic description for Rocker provided by Dr. John R. Reeder [ret.] at the University of Arizona Herbarium,

Tucson). (Greek, *heteros*, different, and *pogon*, beard, referring to the awnless male and awned female spikelets [Munz and Keck 1973].)

Heteropogon contortus is an obligate apomict (Emery and Brown 1957). Normal chromosome numbers for this species are $2n=60$ (Gould 1975). Tanglehead is a C4 plant and virtually all growth occurs after the onset of summer rains (in Arizona: late July to early August), unless warm spring temperatures coincide with adequate soil moisture (Novelly 1986).

Rocker tanglehead was comparatively evaluated with 26 accessions of *Heteropogon contortus* in the 1986 *Heteropogon contortus* Initial Evaluation Planting (IEP). In 1990, Rocker was one of four tanglehead accessions selected for best overall performance.

In 1991 all four accessions were transplanted into a spaced plant, mass selection block for evaluation and final selection. Rocker was the superior performer in this planting. It has shown vigorous growth, is a larger, more robust plant, and flowers at a later time. Throughout the whole evaluation process, Rocker tanglehead has consistently flowered 2 to 3 weeks later than all other accessions. Beginning in late September, it continues to flower and produce seed through early November.

Observations in the mass selection block have shown that Rocker averages a size of 120 cm by 120 cm versus an average size of all other plants of 70 cm by 90 cm.

Rocker tanglehead exhibited a greater tolerance to drought conditions than the other accessions within the IEP block. Following the summer of 1991, in which the Tucson Plant Materials Center received well below-average precipitation, Rocker produced an abundance of green herbage despite very low summer precipitation. All other accessions tended to remain mostly dormant throughout the rest of the summer.

The ability of Rocker tanglehead to initiate earlier spring growth than the other accessions will allow this selection to have a greater ability/advantage to compete for water and nutrients. In addition, the ability of this accession to stay green and initiate growth under extended drought-like conditions makes Rocker tanglehead a desirable conservation plant.

Rocker was primarily selected for use in controlling rill and gully erosion because it produces dense stands of seedlings in areas where extra moisture is available. Its low palatability permits it to mature and produce seed where more palatable species may be too closely grazed to do so (Ward and Martin 1972).

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According to Ward and Martin (1972), the value of tanglehead as an erosion control plant has been demonstrated on the Santa Rita Experimental Range, south of Tucson, Arizona. Before treatment (chaining), gullies and rills on the study area were raw and actively eroding. After chaining, dense stands of tanglehead filled most of the gullies and rills and erosion was greatly reduced.

Novelly (1986) states that the seed of *Heteropogon contortus* exhibits a dual inhibitory system to germination (Tothill 1977). Naked caryopses less than 4 months old exhibit dormancy akin to epicotyl dormancy, readily overcome by gibberelic acid, and also partly reduced by repeated wetting and drying. Dormancy declines with age with maximum germination occurring at 12 months of age. Seed remains viable for up to four years if adequately stored. Maximum germination was recorded at constant 30 °C (Tothill 1977), with little increase at 35 °C. Constant 25 °C reduced germination as did alternating temperatures if one temperature was below 30 °C.

Emery and Brown (1958) have stated that *Heteropogon contortus* consists of a relatively uniform series of populations with an extensive native range throughout most of the tropical and subtropical grassland regions of the world. The distribution of *Heteropogon contortus* is reported from every major land mass between 35° N latitude and 35° S latitude; it is endemic in the New World, and in the Old World from South Africa to Australia, and on numerous islands of the Pacific Ocean.

Rocker is best adapted to elevations ranging from 1,067 to 1,676 m with 305 to 406 mm of annual precipitation, and sandy loam surface soils with clay loam subsurface soils.

Other plants found growing in association with Rocker include: cane bluestem (*Bothriochloa barbinodes* [Lag.] Herter), sideoats grama (*Bouteloua curtipendula* [Michx.] Torr.), curly mesquite (*Hilaria belangeri* [Steud.] Nash), galleta grass (*Hilaria jamesii* [Torr.] Benth.), fairy duster (*Calliandra eriophylla* Benth.), ocotillo (*Fouquieria splendens* Engelm.) and mesquite (*Prosopis juliflora* [Swartz]).

Rocker tanglehead seed can be drilled at a depth of 13 mm into a well prepared seedbed or broadcast seeded over a disturbed seedbed. Good seed-soil contact is required for optimum germination and establishment. The recommended seeding rate is 4 to 6 pure live seed (pls) pounds per acre for drill-seeding, and 8 to 12 pls pounds per acre for broadcast seeding. Plantings should be conducted after the onset of summer rains. Spring plantings could be conducted if spring rains appear to be above

average in frequency, but they are not recommended. Plantings should be managed to prevent young seedlings from being grazed to insure establishment (normally 1 to 2 years of rest).

It is recommended that Rocker be utilized as part of a seeding mixture, comprising roughly 20 to 30% of the total mix. However, the percent composition can vary depending on the seeding objective. When seeding on sites subject to erosion, mulching is recommended to conserve soil moisture, prevent surface compaction or crusting, reduce surface runoff and erosion, control weeds, and help establish plant cover. If Rocker is to be drill-seeded, the material needs to be de-awned to prevent blockage in the drill tubes. If the seed cannot be de-awned, broadcasting or hydroseeding is required.

Foundation seed of Rocker for certified seed increase is available from the USDA-SCS Tucson Plant Materials Center, 3241 N. Romero Rd., Tucson, AZ 85705. Seed propagation of Rocker is restricted to two generations of increase from breeder seed and one of each from foundation and certified. Breeder and foundation seed will be maintained by the USDA-SCS Tucson Plant Materials Center.

For more information on availability and use of Rocker tanglehead, contact your local SCS office. All programs of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status or handicap.

References

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