

# Evaluation of Curly Mesquite and Spruce top Grama for Turfgrass Development



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## Objectives:

1. Assess germplasm variation for turf-type growth habits for the native bunch grass, Spruce top grama, and the native sod grass, Curly mesquitegrass.
2. Identify superior germplasm for improved population development.

The use of Native grasses as ground covers and turf grasses is dependent on several factors which include tolerance to mowing, resistance to pests, environmental stress tolerance (heat, cold, drought), herbicide tolerance, and ease of commercial propagation.

In the desert southwest, bermudagrass is the most stress tolerant and widely adapted warm season turfgrass species. The turfgrass industry has historically developed turf-type germplasm which requires medium to high maintenance levels, based on intended use and recuperative potential. Many "turf" sites often have less physical demands, such as the maintenance of a long term grass ground cover, which provides adequate density to avoid prolonged weed control.

In the desert southwest few native grasses are available as true perennials which can tolerate mowing pressure and maintain a turf-type growth habit. There are two grasses under evaluation for such use, a bunch grass (*Bouteloua chondroides*) and a stoloniferous grass (*Hilaria belangeri*).

## Spruce top grama (*Bouteloua chondroides*)

Spruce top grama is a bunch grass, which is found at elevations of 2800 feet in rangelands that receive six inches of rain from May to August. Plants from the Santa Rita range were collected from a natural localized population 35 miles southeast of Tucson Arizona. Individual plants were replicated vegetatively, and placed in a space-plant nursery, and mowed 2–3 times weekly at 3.0 inches with a rotary mower. These plants were flood irrigated once every 4–6 weeks and received minimal fertilization. About 15% of the clones

**Figure 1. Sprucetop grama planted in August 2012 at University of Arizona. Individual plants are cut at 3.0 inches and flood irrigated once every six weeks.**



had acceptable turfgrass quality after two years of mowing.

A second test was devised to investigate the tolerance of Spruce top grama when there is interplant competition. Here, open pollinated seed was used to sow small plots in 12 x 24 inch trays. Plots were seeded at two seeding rates, at 5.5 or 11.0 seeds per square inch. Kentucky 31 tall fescue was sown at the same seeding density, as a utility grass comparison. Spruce top grama developed and maintained an acceptable turf from seed, with turfgrass quality equal to or better

than that of K-31 tall fescue. More open pollinated seed was collected in September 2012 and will be used for nursery seed production in 2013, and for large scale plot mowing trials.

### **Curly Mesquite (*Hilaria belangeri*)**

In the summer of 2011, 135 clones of *Hilaria belangeri* were collected from a 15 year old 5 acre field located at an elevation of 1100 ft outside of Phoenix Arizona. This is way below the elevation were Native stands of curly mesquite grass are found. Plants collected would have natural selection for heat tolerance, which is a highly desirable trait for use in low elevation desert markets. In early 2012, individual clones were propagated in the greenhouse as vegetative copies. A replicated field trial was established on September 3rd at the Tucson Plant Materials Center. Each clone appears three times in the field. All plants will be mowed after plants exhibit full green up in the spring of 2013 and produce a “first succession” of pegged stolons. Data taken in 2012 includes (1) seed head counts of replicated plants in the field, (2) seed head counts of replicated plants in the greenhouse, (3) seed head counts of individual

germplasm genetic stock plants, (4) resistance to sod webworm, (5) plant density and (6) tactile canopy assessment. This data will be used to determine if (1) phenotypic correlations exist for vegetative and reproductive performance assessments between clones. This “initial” data will also be compared to turfgrass quality of mowed field clones, starting in the summer of 2013.

#### **Summary Points**

- Spruce top grama showed that 15% of its randomly selected field population has a desirable turf type habit and tolerates mowing stress.
- Initial studies show that this species can tolerate “neighbors” as a seeded turf.
- Curly mesquite clones have been established in replicated space plant nursery, which will be mowed in 2013 and 2014.
- Curly mesquite clones have demonstrated significant variation for seed head production, response to sod webworm infestation, inherent plant density, and unmowed canopy heights.