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Turfgrass Evaluations of Curly Mesquitegrass

I. Overall Progress

Research efforts during 1989 have concentrated on the turfgrass performance of curly mesquitegrass. Plants were selected for turf characteristics based on nursery evaluations, and performance under selection pressure during the evaluation of cultural practices. At least 22 sources of plant material were selected for use as the foundation for turfgrass releases of curly mesquitegrass.

II. Nursery Evaluations

Nursery swards were rated for percent spread, winter kill, weed infestation, early spring flowering, growing height, leaf length, leaf width, and color in 1989.

By the end of 1988, a majority (65/90) of the nursery accessions had filled at least 75% of their 1.5 m^2 plot while 5 accessions failed to fill more than 25% of their plot. Some degree of winter kill was observed in 44.4% (40/90) of the nursery swards. Most swards had 5 or less winter weeds. Twenty four percent of the nursery swards displayed early flowering (50% or more flowering shoots) in mid-April. Thirty four percent of the swards displayed low growing height while 26.9% of the swards had short leaf length. Thirty five and 23.5% of the nursery swards had an acceptable or better than acceptable color rating and fine leaf width, respectively.

Based on these ratings six nursery accessions were selected and vegetatively propagated for use as the progenitors of turf-type curly mesquitegrasses. These six accessions have been planted into an experiment with four replications to further evaluate responses to cutting heights.

III. Cultural Practices

During 1988, five nursery selections were identified as having turfgrass qualities. In March 1989 these selections were recollected from the exact native stands and propagules were transplanted into an experiment to evaluate responses to the cultural practices of mowing (5 cm, 10 cm, and no cut) and nitrogen fertilization (0, 1, and 2 lb N 1000 ft^{-2}). Percent ground cover and color ratings were conducted in July and August.

No differences existed among accessions with respect to color. All plots that were cut displayed acceptable color (a rating of 6.0) at both ratings. The no cut treatment had poor color ratings for both rating dates as this treatment accumulated dead plant tissue and flowering stalks. Nitrogen had no influence on color for either rating date. Increasing nitrogen increased percent ground cover for both rating dates. Significant differences were observed among accessions in percent ground cover for both ratings. The **average** ground cover for the five accessions ranged from 33 to 13 percent for the July rating, and from 72 to 49 percent in August. Increasing cutting height also increased the percent ground cover. Fewer stolons were removed from the 10 cm height of cut than from the 5 cm cutting height. The no cut treatment had the highest average percent ground cover (70.5%) for the August rating.

While under the selection pressure of mowing, stolon counts were performed on 100 propagules. The number of stolons per plant ranged from 10 to 94 and averaged 35 ± 16. No correlation existed between high nitrogen and stolon number indicating that stolon production has a significant genetic component. Fourteen selections were identified as having 40 or more stolons, and are being vegetatively increased for use as the progenitors of turf-type curly mesquitegrasses.

IV. Seed Related Investigations

The effects of seeding rates (1 gm and 2 gm per m^2) and planting dates (June 1, July 1, and August 1) on seedling establishment were assessed in 1989. Seeding rates were based on an average seed index (SI) value of 50 mg per 100 seeds (from 1987 data), and equate to 0.2 and 0.4 lbs per 1000 ft^2. The most recent SI analysis has shown that the population SI is slightly higher (65 mg 100 $seeds^{-1}$) than previous estimates.

The June planting date produced a significantly lower average number of seedlings per m^2 than did the July or August plantings. The higher seeding rate established a significantly greater number of seedlings per m^2 than the lower seeding rate irrespective of planting date. Curly mesquitegrass seedlings were recognizable 11 days after planting for each planting time and seeding rate. Seeds did not display staggered emergence into the following months. After six weeks it was difficult to identify original seedlings because of prolific stolon production. Although the June planting date produced a lower average number of seedlings, plots seeded in June had the highest percent ground cover by October 1989 due to a longer growing season allowing for more vegetative spread.

Controlled environment experiments conducted in 1988 demonstrated and confirmed the promotional effects of Gibberellic Acid (GA) at 500 ppm on germination of curly mesquitegrass seeds. The control treatments of these experiments were used to identify seed sources that displayed consistently high germination. The average germinations of seeds in the control treatments of these experiments after 96 hr were 15, 30, and 34%. Recent experiments were conducted to determine the concentration of GA (0, 250, 500, 750, and 1000 ppm) that maximizes germination of curly mesquitegrass seeds. These experiments lead to the conclusion that GA at 250 ppm was as effective as any other concentration in enhancing germination compared to the control. Additionally, the average germination of curly mesquitegrass seeds after 96 hr in the control treatments of these recent experiments was 80%.