ORAL PRESENTATION

Development of Seeding Technologies of Smooth Cordgrass for Tidal Marsh and Shoreline Restoration

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Introduction

Smooth cordgrass (*Spartina alterniflora*) is a native, warm-season wetland grass that grows in the intertidal zone of saline and brackish marshes throughout the Northeast, Mid-Atlantic, Southeast, and Gulf Coasts. It is typically planted as vegetative plugs for shoreline and tidal marsh restoration. However, this can be very costly for large projects. If reliable seeding techniques could be developed for certain types of sites, establishing smooth cordgrass by direct seeding would be more cost effective. This species has been successfully seeded on large, level mudflats in the Gulf Coast region where tidal elevations are low. However, in the Mid-Atlantic and Northeast states where tidal fluctuations are moderate to high, little is known about what soil and environmental site conditions are conducive to direct seeding smooth cordgrass for stabilization and restoration of shorelines and marshes.

Methods

In cooperation with the Army Corps of Engineers- New York District and the National Park Service- Gateway National Recreation Area, NY, the Cape May Plant Materials Center of the USDA-NRCS is working to develop cost effective strategies of establishing Spartina alterniflora as a component of the Army Corps- Jamaica Bay Islands Marsh Restoration Project. A seeding study was initiated on May 22, 2007 with Spartina alterniflora seed collected within the Park Service boundaries the previous fall (September 2006).

The seed was cleaned and stored over the winter of 2007-2008 and direct seeded into the dredged sand using a Planter Jr. single row push planter. Four replicated plots (25 ft. by 40 ft.) were seeded in both low and high energy sites for a total of ¼ acre. To ensure continuous flow of seed from the hopper to the opened furrow, the Spartina seed was mixed with non-clump forming (cheap) cat litter at a ratio of 50:50 by volume. The treatments were (1.) control with no seed applied and (2.) replicated plots seeded at 1.5"-2"depths in rows parallel to the shoreline. Rows are on 1.5 foot centers. This resulted in

17 parallel rows per seeded treatment. The low energy plots were at the highest elevation of daily inundation with a 70 foot wide vegetated buffer of vegetatively planted smooth cordgrass in front of the seeding. Conversely, the high energy site was lower in elevation (about mid-tide) and had only a 20 foot wide planted buffer of smooth cordgrass below it.

Plant density counts were taken in August 2007 and July 2008 and were statistically analyzed.

Results

Observations: As of August 21, 2007, the low energy treatments had good germination and establishment. Some individual plants were 9" tall. The high energy plots were less successful as only a few plants on one edge were existing. An initial evaluation was done in September 2007. Table 1 is a summary of stem counts near the end of the first growing season.

Table 1. Stem Density Counts - September 19, 2007

Treatment	Average # Stems/foot				**Average**
	Rep 1	Rep. 2	Rep. 3	Rep. 4	
Low Energy	6.33	3.25	1.67	1.67	**3.23**
Low Energy (control)	0	0	0	0	**0**
High Energy	0.25	1	4.5	4.75	**2.62**
High Energy (control)	0	0	0	0	**0**

Table 2. Stem Density Counts – July 31, 2008

Treatment	Average # Stems/foot				**Average**
	Rep 1	Rep. 2	Rep. 3	Rep. 4	
Low Energy					
Low Energy (control)					
High Energy					
High Energy (control)					

Literature Cited

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