

U.S. Department of Agriculture Work Unit Description AD-416 U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month/Day/Year) 07/13/2012	
1. Accession No.	Agency Identifiers		5. Work Unit/Project No.	6. Status
	2. NIFA	3. LA.B	LAB94157	A = New Project
7. Title Developing Plant Varieties and Technologies for Coastal Restoration				
8. Performing Organization 3780 - 2010 School of Plant, Environmental, and Soil Sciences Agricultural Experiment Sta, Louisiana State Univ			9. Cooperating Departments within State Performing Institution a. Biological & Agricultural Engineering b. Plant Pathology & Crop Physiol	
10. Multistate Project No.			11. Cooperating States	
12. Investigator Name(s) Last Name and Initials				
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14. Project Type Hatch	15. Contract/Grant/Agreement No.		16. Amount	17. FY
18. Award Date (Month/Day/Year)	19. Start Date (Month/Day/Year)		20. Termination Date (Month/Day/Year)	
	10/01/2012		09/30/2016	
Goals/Objectives/Expected Outputs				
<p>The goal of this project is to develop coastal plant varieties and production and establishment technologies that will advance coastal plant restoration technology in Louisiana. Specific objectives are: 1. Develop and release superior, genetically diverse vegetative and synthetic varieties of coastal wetland plants, including but not limited to smooth cordgrass and sea oats, to improve coastal wetlands restoration and management 2. Develop efficient plant production and establishment methods for coastal wetlands restoration and management 3. Expand the Coastal Plants Breeding program to include additional species that are important for coastal wetlands restoration and management</p>				
Methods				
<p>To develop and release coastal plant varieties a recurrent selection breeding program will be used. Initial plant material will be collected from natural populations. Breeding lines will be evaluated in LSU AgCenter laboratories, controlled greenhouses, container yards, shadehouses, field plots, and freshwater production ponds in Baton Rouge and in natural environments for a minimum of four trials. The first trial will be an unreplicated preliminary trial, which will be an augmented field design, and the remaining will be replicated randomized completed block designs. Superior breeding lines will be selected based upon data collected in field trials and will be released to the public, re-evaluated in the recurrent selection program, or both. To quickly provide superior, genetically different varieties of coastal plants initial releases will likely be vegetative. Released varieties and elite breeding lines will continually be incorporated into a synthetic breeding program to improve breeding populations and synthetic varieties. Selected lines will be intermated and the populations will be evaluated for potential release as synthetic varieties. Synthetic varieties will also be evaluated in a minimum of four trials as described above. To develop efficient plant production and establishment methods, best management practices will be investigated. Fertility requirements will be studied as well as timing and method and need of removing perennial plant material. Maximum age of production ponds and fields will also be determined, because most coastal plant producers would prefer unlimited life spans for production fields due to the labor requirements necessary to begin new production ponds. Best management practices that will be investigated for large-scale container production of smooth cordgrass and sea oats and include container size, plant size at establishment, watering requirements, fertilization requirements, plant cutting requirements, and frequency of re-potting to maximize plant yields. To determine seed germination and yield of sea oats in different environments, seed will be produced in artificial environments in Baton Rouge and beach environments at Holly Beach, LA. Differences in germination, yield, and pathogens will be determined and methods in increase yield and germination while decreasing pathogens of seed from artificial environments will be</p>				

investigated. Finally, two or three species will be collected throughout Louisiana to provide material to initiate breeding programs for additional species important for Louisiana's coastal restoration industry.


23. Non-Technical Summary

To reduce coastal erosion and create and maintain healthy wetlands, restoration projects are completed each year in Louisiana. Many restoration projects specify plant vegetation because this is a cost-effective and sustainable approach to rapidly increase the area of coastal wetlands, which protects residents and communities of coastal Louisiana and supports natural ecosystems. To maximize the benefits of expensive restoration projects in the northern Gulf of Mexico genetically different plants must be used in order to survive and reduce erosion. This requires the development and incorporation of many genetically different coastal plant varieties. In addition, economical and efficient methods to produce and establish coastal plants in natural environments are needed because very few technological advances have been made in the past 30 years. The LSU AgCenter is the only organization in the nation that has assembled a multi-disciplinary team of researchers to develop coastal plant varieties, production, and establishment technology based upon scientific research. The LSU AgCenter's Coastal Plants Program contributes to the advancement of efficient and economical coastal plant restoration techniques that enable natural, functioning ecosystems to develop at restored sites.

24. Keywords

Spartina alterniflora; Smooth cordgrass; Uniola paniculata; Sea oats; coastal restoration; plant breeding; plant ecosystem restoration; petroleum tolerance in plants; flood tolerance in plants;

**** The Original signed document is on file at this institution. ****

Signature	Title	Date
Dept:  Admin:	Associate Director	7/16/12