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# Evaluation of Plants for Stabilizing Shorelines of Catfish Production Ponds



*'Halifax' Maidencane*



*'Flageo' Marshhay Cordgrass*

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# EVALUATION OF PLANTS FOR STABILIZING SHORELINES OF CATFISH PRODUCTION PONDS

BY

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## ABSTRACT

The performance of 'Flageo' marshhay cordgrass, (*Spartina patens*), 'Halifax' maidencane, (*Panicum hemitomon*), and marshhay cordgrass accession – P1-415141, (*Spartina patens*), was evaluated for adaptation and potential for stabilizing shorelines of catfish production ponds in Alabama and Georgia. These field plantings were evaluated over a period of four years. The marshhay cordgrass plantings performed extremely well when planted about one foot in elevation above normal pool elevation. The long slender rhizomes provide a good cover along the front slope of the dam to the water edge. During the drawdown period or fluctuating water level the strong rhizomes of Flageo and Halifax spread into this unprotected area and provide protection from soil erosion. Observations have been made in Greensboro, Alabama and Dalton, Georgia where marshhay cordgrass can tolerate long periods of inundation after the pond water level returns to the normal pool elevation. Halifax maidencane (*Panicum hemitomon*) was evaluated after planting about one foot below normal pool evaluation along the dam areas susceptible to erosion from wave action. It also has extensively creeping rhizomes that

produce numerous sterile shoots and is adapted to growth along the water edge of catfish ponds. Halifax will grow into water until the depth is about 18.0 inches.

The 'Flageo' marshhay cordgrass variety and accession P1-415141, (*Spartina patens*), and 'Halifax maidenhair' (*Panicum hemitomon*) are good companion plants to use to control erosion caused by wave action on catfish dams.



**Halifax Maidencane in Macon, Georgia**

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## **INTRODUCTION**

Catfish farming is big business in the Blackbelt of Alabama. In this area, there are about 24,000 acres of catfish production ponds and impoundments. The shoreline, berms or levees, and the dams of many of the catfish production impoundments are eroding because of inadequate vegetation. The wave action and fluctuating water level increases the complexity of establishing and maintaining vegetation along the water edge. Water quality is degraded, water storage capacity is lost, and aesthetics is lowered.

### **Needs**

- a. Plant species which can be easily established with vegetative material.
- b. Plant species that will not affect catfish harvesting operations.
- c. Plants which will retain themselves to a strip where the waterline exists.
- d. Must possess a strong root system necessary to tolerate the erosive force of wave action.
- e. Must be able to endure both wet and dry soil conditions.
- f. Tolerate prolonged flooding.
- g. Plants that can tolerate fluctuation in the water level.
- h. Plant must be low-growing so as not to screen the view of the water.
- i. Tolerate high levels of nutrients.
- j. Plant must be adapted to prairie soils.

### **Study Areas**

A series of field plantings were initiated in 1987 in Alabama and Georgia to determine the adaptation and performance of Halifax maidencane (*Panicum hemitomon*), Flageo marshhay cordgrass (*Spartina patens*), and marshhay cordgrass experimental accession P1-415141 for shoreline stabilization.

The Study sites selected for the evaluation included five locations plant materials in Alabama and Georgia.

### **ALABAMA**

- Greensboro, Alabama (Hale County) Blackbelt Area
  - State Cattle Ranch (Halifax maidencane only)
  - John Broussard
  - Randy Hollingsworth

## **GEORGIA**

- Macon, Georgia (Bibb/Monroe Counties) Coastal Plain
  - Ogburn Lake (Halifax Maidencane only)
- Moultrie, Georgia
  - Country Club Lake

## **Materials and Methods**

The plant materials for this evaluation came from two plant materials centers, Americus, Georgia and Coffeerville, Mississippi. The Flageo, Halifax and accession P1-415141 was planted with vegetative materials.

FLAGEO Marshhay cordgrass (*Spartina patens*)

'Flageo' marshhay cordgrass is a new plant for stabilizing coastal areas and was cooperatively released in 1990 by the USDA, Natural Resources Conservation Service (NRCS) plant materials centers in Americus, Georgia and Brooksville, Florida and Fort Valley State University School of Agriculture located in Fort Valley, Georgia.

Flageo is a perennial, warm season grass with erect stems, mostly less than 40 inches tall. It spread by long slender rhizomes. Leaves are less than 1/8 inch wide and are sometimes flat, but usually roll inward from the edges with the upper surface inside. It produces seed but the germination is usually less than 10%.

Until recently, Flageo was mostly used for coastal erosion control on back dune areas. Inland uses include stabilizing waterways, gullies, roadbanks, minespoil and saline oil seep areas. It is also used for nutrient reclamation for filter and municipalities are applied. Flageo can be planted vegetatively with hand dibbles or with a tree planter for larger sites.

HALIFAX Maidencane (*Panicum hemitomom*)

Halifax maidencane was released by the Jamie L. Whitten Plant Materials Center located in Coffeerville, Mississippi.

Halifax is a native warm season perennial grass that is adapted to growth in shallow ponds and other wet areas of the southeastern states. It has extensively creeping rhizomes that produce numerous sterile shoots with many overlapping leaves that grow up to 30 inches. The occasional seed stem is about three feet tall, producing little or no seed. The leaf blades are about six to twelve inches long and ¼ to ½ inches wide. They are somewhat stiff and grow in an almost vertical position. On a catfish pond shoreline it will grow down into the water for about 18 inches and up the bank for about 2 – 3 feet.

This grass occurs from New Jersey south to Florida and west through Tennessee to Texas. Maidencane can be established in field plantings by planting rhizomes (sprigs).

### **Site Preparation:**

None required. In older farm ponds it is recommended that the water level be lowered about one (1) foot in elevation to plant the Halifax at or below the normal pool elevation. In new ponds, flag an area about one (1) foot below normal pool to locate the suitable Halifax planting location. Plant when adequate moisture is available.

### **Time of Planting:**

Both the Flageo and Halifax can be planted in early spring. The planting window is from February through June.

### **Flageo Marshhay Cordgrass Planting Recommendations**

#### **Spacing**

Place vegetative material (plants) 12 to 24 inches apart about one foot above normal pool elevation. (Zone A) See planting diagram enclosed.

#### **Depth**

Plant 4 to 8 inches, or deeper, in moist soil. Use a hand dibble to plant the vegetative material.

#### **Fertilization**

For establishment, broadcast one to two pounds of 13-13-13 fertilizer or its equivalent per 100 feet of planted row.

#### **Maintenance**

All planting should be protected from grazing by cattle.

### **Halifax Maidencane Planting Recommendations**

#### **Spacing**

Plant springs in a small furrow or trench that is 3-4 inches deep. Plant rhizomes that are six (6) inches long, plant one spring per foot of row in rows that are two (2) feet apart. Start planting along the edge of the normal pool elevation with the first row and plant the succeeding rows lower in elevation down to about one (1) foot below normal pool elevation.

It may be necessary to lower the water level about one foot in elevation prior to planting Halifax maidencane to get good coverage of the maidencane in this critical establishment area. (Zone B) In new ponds, plant Halifax maidencane before the water level reaches the normal pool elevation.

### **Depth**

Plant rhizomes or sprigs 3-4 inches deep and cover with about ½ to 2 inches of soil material.

### **Fertilization**

Usually fertilizer is not required in catfish production ponds because the nutrient content of the water is adequate for fertilization. In new farm ponds, broadcast one to two pounds of 13-13-13 fertilizer or its equivalent per 100 feet of planted row.

### **Maintenance**

All plantings must be protected from grazing by cattle. Do not plant Halifax maidencane where grass carp have been stocked to control vegetation. Burn maidencane in late winter to remove dead material and to improve vigor during growth the following year.

### **Results and Discussion**

The plantings at the Alabama Cattle Company were completely destroyed caused by overgrazing by cattle. Halifax is very palatable to livestock and can be destroyed by grazing.

The Flageo marshhay cordgrass and the marshhay cordgrass accession P1-415141 became very well established along the slope of the dam the first growing season. Growth habitats were observed not only up the slope but slender rhizomes were noticed growing down to and into the water about 18-24 inches. The 2<sup>nd</sup> and 3<sup>rd</sup> growing seasons provided the plants the opportunity to become very well established. During this period, the normal pool elevation has dropped in some locations (Georgia) because of summer drought. The Flageo rhizomes were continuing to spread even more into the area that was once flooded. Then when flooded, Flageo maintained a strong dense stand longer than anticipated below the water line, even for a complete growing season.

The catfish producers in the Blackbelt area have adopted this planting concept because these plants will not interfere with their harvesting operations. The long, slender stems will allow the seines to move easily across the grass and it will fully recover after the harvesting operation is completed.

The Flageo marshhay cordgrass and Halifax maidencane are two good companion plants for stabilizing shorelines. The maidencane is well adapted to areas from the edge of waterline to about 18 inches of water depth.

The tall, erect stems and its extensive rhizome root system can reduce the energy of incoming waves thereby reducing the erosion of the shoreline, dams and levees. One of the best Halifax maidencane plantings was planted in a 23 acre catfish/ski lake combination near Macon, Georgia. This lake is used for catfish production and serves as an official water ski location in middle Georgia. The Halifax maidencane was planted along the entire waterline of the lake. It established quickly, and the slender rhizomes have spread out to a depth of about 18 inches. There is no erosion along the shoreline of this lake.

The landowner indicated to me that the overall water quality of her catfish lake has been greatly improved by Halifax maidencane.

The maidencane not only reduces erosion from wave action but it also serves as a filter for trapping sediment caused by runoff from heavy rains. She indicated also that this has helped to eliminate the off-flavor caused by muddy water.

### **Conclusions**

The use of Flageo marshhay cordgrass, experimental accession P1-415141 and Halifax maidencane for stabilizing shorelines of catfish production ponds has proven to be very successful. Based on the results of the field plantings, it is strongly recommended as a BMP for the intended purpose.

Flageo marshhay cordgrass and Halifax maidencane varieties are well adapted and recommended for planting in the Blackbelt prairie major land resource area (MLRA).

Flageo marshhay cordgrass and Halifax maidencane are both commercially available for establishment to control shoreline erosion that occurs in catfish production ponds and other farm ponds.

**TABLE 1 : PERCENT STAND FOR FLAGEO, HALIFAX AND MARSHHAY  
CORDGRASS ACCESSION P1-415141**

YEAR	Locations					Year Average	Variety Average
	A	B	C	D	E		
-----HALIFAX MAIDENCANE-----							
1987	70	70	75	--	--	72	
1988	(10)	80	95	90	--	85	
1989	*	85	85	100	70	85	
1990	*	90	90	100	75	88	
1991	*	90	90	100	80	90	
Location Average	70	83	85	98	75		82.1
-----FLAGEO Marshhay Cordgrass-----							
1987	--	70	65	--	--	68	
1988		75	75			75	
1989		85	80	80	--	82	
1990		90	85	80	--	85	
1991		90	85	85	--	87	
Average		82	78	83			81.0
-----Marshhay Cordgrass P1 – 415141-----							
1987	--	70	70	--	--	70	
1988		75	75		*	75	
1989		85	85		80	83	
1990		90	85		85	87	
1991		95	85		85	88	
Average		83	80		83		82.0

Locations: A -- State Cattle Ranch  
 B -- John Broussard  
 C -- Randy Hollingsworth  
 D -- Ogburn Lake  
 E -- Country Club Lake

- Not included in averages. -- No plantings established at that locations

Evaluation scale for vigor:

1 = Excellent  
 3 = Good  
 5 = Average  
 7 = Fair  
 9 = Barely Alive  
 10 = Dead

**TABLE 2 : VIGOR FOR Flageo, Halifax and Marshhay Cordgrass,  
Accession P1-145141**

YEAR	Locations					Year Average	Variety Average
	A	B	C	D	E		
-----HALIFAX MAIDENCANE-----							
1987	3	3	3	--	--	3	
1988	(10)	3	1	3	--	1.8	
1989	*	1	1	1	3	1.5	
1990		1	1	1	3	1.5	
1991		1	1	1	3	1.5	
	3	1.8	1.4	1.5	3		2.14
-----FLAGEO Marshhay Cordgrass-----							
1987	--	3	3	--		3	
1988	*	3	3	*		3	
1989		1	1		3	1.6	
1990		1	1		3	1.6	
1991		1	1		3	1.6	
	0	1.8	1.8	0	3.0		2.2
-----Marshhay Cordgrass P1 – 415141-----							
1987	--	3	3	--	--	3	
1988	*	3	3	*	--	3	
1989		1	3		3	2.3	
1990		1	1		1	1.0	
1991							

## **About the Author**

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