

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
E. "KIKI" DE LA GARZA PLANT MATERIALS CENTER
KINGSVILLE, TEXAS

And

TEXAS A&M UNIVERSITY-KINGSVILLE
CAESAR KLEBERG WILDLIFE RESEARCH INSTITUTE
SOUTH TEXAS NATIVES
KINGSVILLE, TEXAS

NOTICE OF RELEASE OF HIDALGO GERMPLASM
MULTIFLOWER FALSE RHODES GRASS
SELECTED PLANT MATERIAL

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E."Kika" de la Garza Plant Materials Center and Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *South Texas Natives* announce the release of a selected plant material of multiflower false Rhodes grass (*Trichloris pluriflora* Fourn.) for the South Texas Ecoregion.

This plant will be referred to as Hidalgo Germplasm multiflower false Rhodes grass, and is released as a selected plant material class of certified seed (natural track). Hidalgo Germplasm was tested under the USDA NRCS accession numbers 9086184, 9088772, 9089128, 9091809, 9090315 and 9091844. Seed of the Hidalgo Germplasm multiflower false Rhodes grass release will be identified by USDA NRCS accession number 9093600.

This alternative release procedure is justified because there are no existing Texas commercial sources of tested and adapted multiflower false Rhodes grass. The potential for immediate use is high, especially for upland wildlife plantings and for range seeding mixes.

A. *Proposed Variety Name and Temporary Designation:*

HIDALGO GERMPLASM MULTIFLOWER FALSE RHODES GRASS

B. *Family, kind, genus and species:*

Family: Poaceae

Tribe: Chlorideae

Kind: multiflower false Rhodes grass

Genus and species: *Trichloris pluriflora* Fourn.

C. Origin and breeding history of the variety:

Collection Site Information: Accession 9086184 was collected by Forrest Smith on December 17, 2001 from native plants located along CR 461, five miles south of Alice in Jim Wells County, Texas at 27° 39' 056" N. latitude and 98° 06' 008" W. longitude (MLRA 83). Soil type of the collection site is an Opelika fine sandy loam (USDA NRCS 2009).

Accession 9088772 was collected by Forrest Smith and Cody Lawson on July 1, 2002 from native plants located at the Cerrito Prieto ranch in Webb County, Texas at 27° 55' 2.6" N. latitude and 99° 22' 15" W. longitude (MLRA 83). Soil type of the collection site is a Moglia clay loam (USDA NRCS 2009).

Accession 9089128 was collected by Paula Maywald and Alfonso Ortega on September 21, 2002 from native plants located at the McBride ranch in Medina County, Texas at 29° 11' 48" N. latitude and 98° 56' 59" W. longitude (MLRA 83). Soil type of the collection site is an Amphion clay loam (USDA NRCS 2009).

Accession 9091809 was collected by the *South Texas Natives* group on November 22, 2003 from native plants located at the Jones Alta Vista ranch in Jim Hogg County, Texas at 26° 58' 35.7" N. latitude and 98° 27' 44.6" W. longitude (MLRA 83). Soil type of the collection site is a Nueces sandy clay loam (USDA NRCS 2009).

Accession 9090315 was collected by Paula Maywald and Forrest Smith on November 16, 2002 from native plants located at the Sceligson ranch in Wilson County, Texas at 29° 11' 58" N. latitude and 97° 51' 55" W. longitude (MLRA 83). Soil type of the collection site is a Luling clay (USDA NRCS 2009).

Accession 9091844 was collected by the *South Texas Natives* group on December 9, 2003 from native plants located at the Tres Corrales ranch in Hidalgo County, Texas at 26° 31' 44.3" N. latitude and 97° 59' 41.1" W. longitude (MLRA 83). Soil type of the collection site is a Delfina fine sandy loam (USDA NRCS 2009).

Breeding history: Plants evaluated in all trials were grown from the original seed collection. First generation (G0) seed of each of the accessions was grown from the original seed collection. The G0 field was grown in isolation from other *Trichloris pluriflora* accessions, and from wild populations of the species. No intentional breeding, selection or genetic manipulation has been carried out on these accessions.

D. Objective description of the variety:

Description:

Multiflower false Rhodes grass, or fourflower trichloris as it is sometimes called, is a warm-season, native, perennial bunch grass. Mature foliage height ranges from 120 to 150 centimeters (4 to 5 feet) tall. It has a ligule that is prominently ciliate. The leaf blades are 5-10 millimeters

broad and up to 30 centimeters (12 inches) long. The inflorescence has 10-20 spicate primary unilateral branches to 20 centimeters long. They are mostly in one or two irregular verticels located at the culm apex. Spikelets are 5-6 mm in length and pale to tawny in color. There are four florets per spikelet. The glumes are sub equal and whitish. The second glumes extend into the awn which is about 2 mm long. The lower lemma is 3-awned. The middle awn is 8-12 mm long, while the lateral awns are 3.5-4.5 mm long. Chromosome number is $2n=60$ (Gould, 1975). The plants produce seed from July through September. Multiflower false Rhodes grass has an average of 2,146,000 seeds per pound.

Potential Uses: Hidalgo Germplasm multiflower false Rhodes grass is recommended for upland wildlife and in range plantings.

E. Evidence

Method of Breeding and Selection:

Initial Evaluation

As part of an effort to collect, evaluate, and release germplasms of a variety of plants native to South Texas, personnel from E."Kika" de la Garza Plant Materials Center and South Texas Natives (STN) obtained seed of multiflower false Rhodes grass from 43 field locations in South Texas.

Initial evaluations began in 2001 at the USDA/NRCS E. "Kika" de la Garza Plant Materials Center (PMC), Kingsville, Texas. Fourteen accessions of multiflower false Rhodes grass were transplanted for field evaluation on the clay soils of the PMC in April, 2001. Initial evaluation plots were not replicated but consisted of 50 plants of each accession. By March of 2005, 32 accessions, representing a wide distribution of the species across south Texas, had been planted at the evaluation plot at the PMC. Thirty-eight accessions were also planted at Rancho Blanco, Webb County by STN. Seeds were collected in June and November of 2005 at the PMC and germination tested in September 2007 (Tables 1 & 2). Accessions 9091844 and 9089128 revealed the best overall seed production and germination. Accession 9091844 had a 61 gram harvest and germination percentages of 44 and 38. Accession 9089128 had a 102 gram harvest and germination percentages of 42 and 28.

Table 1. Grams harvested in June of 2005 from the initial evaluation plot of multiflower false Rhodes grass accessions and percent germination results tested in September of 2007.

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9043300	Frio	6/20/2005	69.0	8.7	32.0	38.7
9043207	La Salle	6/20/2005	31.0	1.3	14.0	25.3
9090594	Maverick	6/20/2005	35.0	15.3	42.0	46.7
9090579	La Salle	6/20/2005	29.0	8.0	32.7	36.7
9089091	Dimmit	6/20/2005	10.0	2.0	17.3	19.3
9086182	Zavala	6/20/2005	36.0	2.7	35.3	38.0
9090413	Medina	6/20/2005	22.0	21.3	65.3	70.7
9088560	Dimmit	6/20/2005	27.0	9.3	49.3	54.7
9089128	Medina	6/20/2005	102.0	18.7	42.0	42.0
9090315	Wilson	6/20/2005	9.0	8.7	37.3	47.3
9045811	Karnes	6/20/2005	46.0	18.7	50.7	54.7
9090655	Live Oak	6/20/2005	10.0	1.3	8.0	10.0
9090721	Wilson	6/20/2005	missing	-	-	-
9045782	Starr	6/20/2005	46.0	2.7	28.0	32.0
9064432	Starr	6/20/2005	41.0	0.7	24.0	27.3
9052756	Duval	6/20/2005	34.0	0.0	25.3	30.7
9091809	Jim Hogg	6/20/2005	31.0	8.7	50.0	57.3
9090548	Duval	6/20/2005	64.0	6.7	34.7	43.3
9093192	Webb	6/20/2005	14.0	14.0	54.7	61.3
9088772	Webb	6/20/2005	26.0	23.3	38.0	38.0
9038717	Jim Wells	6/20/2005	32.0	0.7	10.7	16.0
9086181	Jim Wells	6/20/2005	22.0	6.0	32.0	40.0
9086184	Jim Wells	6/20/2005	15.0	6.0	28.7	31.3
9086185	Jim Wells	6/20/2005	25.0	6.7	44.0	59.3
9086186	Jim Wells	6/20/2005	24.0	10.0	32.7	39.3
8252	Willacy	6/20/2005	34.0	9.3	41.3	44.7
9043279	Cameron	6/20/2005	32.0	1.3	43.3	51.3
9091844	Hidalgo	6/20/2005	61.0	4.0	36.7	44.7
9090364	Willacy	6/20/2005	17.0	32.0	62.0	65.3
9091884	Brooks	6/20/2005	19.0	3.3	40.0	49.3
9090281	Hidalgo	6/20/2005	14.0	20.0	70.0	72.0
9091883	Kenedy	6/20/2005	11.0	13.3	57.3	64.0

***12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

**Accessions chosen for release are in bold print.

Table 2. Seed harvested in November of 2005 from the initial evaluation plot of multiflower false Rhodes grass accessions and percent germination results from testing in September of 2007.

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9089091	Dimmit	11/9/05	sample	-	16.0	22.0
9086182	Zavala	11/9/05	sample	-	10.7	16.7
9043300	Frio	11/9/05	sample	-	16.7	29.3
9043207	La Salle	11/9/05	sample	-	26.7	40.0
9090594	Maverick	11/9/05	sample	8.7	14.0	17.3
9090579	La Salle	11/9/05	sample	2.0	6.7	10.0
9090413	Medina	11/9/05	sample	6.7	12.7	15.3
9088560	Dimmit	11/9/05	sample	11.3	20.0	23.3
9089128	Medina	11/9/05	sample	21.3	27.3	28.0
9045811	Karnes	11/9/05	sample	-	14.0	22.0
9090655	Live Oak	11/9/05	sample	-	32.7	36.7
9090721	Wilson	11/9/05	sample	-	25.3	26.7
9090315	Wilson	11/9/05	sample	15.3	18.7	28.0
9045782	Starr	11/9/05	sample	0.0	24.0	26.0
9064432	Starr	11/9/05	sample	0.0	19.3	26.0
9052756	Duval	11/9/05	sample	-	22.0	28.0
9091809	Jim Hogg	11/9/05	sample	12.7	24.0	30.0
9090548	Duval	11/9/05	sample	29.3	48.0	55.3
9093192	Webb	11/9/05	sample	9.3	16.0	20.0
9088772	Webb	11/9/05	sample	5.3	14.0	20.7
9038717	Jim Wells	11/9/05	sample	0.0	22.7	29.3
9086181	Jim Wells	11/9/05	sample	-	15.3	19.3
9086184	Jim Wells	11/9/05	sample	-	14.7	22.7
9086185	Jim Wells	11/9/05	sample	9.3	33.3	45.3
9086186	Jim Wells	11/9/05	sample	6.7	9.3	13.3
8252	Willacy	11/9/05	sample	0.0	20.0	23.3
9043279	Cameron	11/9/05	sample	-	22.7	38.7
9091844	Hidalgo	11/9/05	sample	-	32.0	38.7
9090364	Willacy	11/9/05	sample	12.0	28.0	35.3
9091884	Brooks	11/9/05	sample	11.3	12.7	21.3
9090281	Hidalgo	11/9/05	sample	34.7	38.7	45.3
9091883	Kenedy	11/9/05	sample	22.0	32.0	38.0

***12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

The initial field evaluation plot at the PMC was evaluated in April of 2006 (Table 3). Evaluations were based on percent of plants that survived, the amount of regrowth after dormancy, vigor based on leaf color as well as height and width of plant and the abundance of

leaves, density of leaves per height of plant, resistance to diseases and insects, and tolerance to cold, heat and drought, uniformity in timing and height of plant vegetation and inflorescence development, and the developmental stage of the plants. In August of 2006, an additional two accessions were added to the evaluation plot at the PMC bringing the total number of accessions to thirty-four. South Texas Natives (STN) also added accessions to their field locations bringing their totals to 43 at Texas AgriLife Experiment Station (TAES) Uvalde and 42 at Rio Farms.

Table 3. Field performance of multiflower false Rhodes grass from the initial field evaluation plot transplanted in March 2005 and evaluated in April 2006.

Rio Grande Plains Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Development Stage
9043207	La Salle	100	25	5	5	5	5	a few flowers
9089091	Dimmit	96	25	5	4	5	5	many flowers
9086182	Zavala	100	25	5	5	5	5	vegetative
9090594	Maverick	100	25	5	3	5	5	a few flowers
9090579	La Salle	100	25	5	3	5	5	a few flowers
9090413	Medina	100	25	3	3	5	5	vegetative
9088560	Dimmit	100	25	5	4	5	5	a few flowers
9089128	Medina*	100	25	4	4	5	5	a few flowers
9045811	Karnes	100	25	5	5	5	5	vegetative
9090655	Live Oak	100	25	5	5	5	5	a few flowers
9090721	Wilson	100	25	5	4	5	5	vegetative
9090315	Wilson	100	25	5	4	5	5	many flowers
9045782	Starr	100	25	5	5	5	5	a few flowers
9064432	Starr	98	25	5	5	5	5	a few flowers
9052756	Duval	94	25	5	5	5	5	a few flowers
9091809	Jim Hogg	100	25	5	4	5	5	many flowers
9088772	Webb	100	25	5	3	5	5	many flowers
9090548	Duval	100	25	5	4	5	5	many flowers
9093192	Webb	100	25	5	4	5	5	many flowers
9038717	Jim Wells	100	25	5	5	5	5	a few flowers
8252	Willacy	100	25	5	4	5	5	a few flowers
9091844	Hidalgo	100	25	5	5	5	5	many flowers
9086181	Jim Wells	98	25	5	5	5	5	a few flowers
9086184	Jim Wells	98	25	5	5	5	5	vegetative
9086185	Jim Wells	100	25	5	5	5	5	a few flowers
9043279	Cameron	96	25	5	5	5	5	a few flowers
9090364	Willacy	100	25	5	5	5	5	many flowers
9091884	Brooks	100	25	5	4	5	5	many flowers
9090281	Hidalgo	100	25	5	4	5	5	many flowers
9091883	Kenedy	100	25	5	5	5	5	many flowers

* Ocular estimate (1 = Best/10=Worst)

By 2007, accession 9089128 had begun to show its preeminence for both vigor and forage production as well as for seed production and germination characteristics. However, we wanted to release a composite mix of this species that would be environmentally adapted across its range of habitat. So we began to look at how the accessions clustered into 5 regions. Region 1 was the northwest counties of Uvalde, Medina, Maverick, Zavala, Frio, Dimmit and LaSalle. Region 2 was the counties of Live Oak, Wilson and Karnes. Region 3 was the counties of Webb and Zapata. Region 4 was the counties of Duval, Jim Hogg, Brooks and Starr. Region 5 was the counties of Jim Wells, Kleberg, Kenedy, Hidalgo, Willacy and Cameron.

Accession 9089128 continued to perform superior throughout the field evaluations in 2007 and 2008 (Table 4 and Table 7). It also continued to have excellent seed production and seed germination characteristics (Table 5, Table 6 and Table 8). South Texas Natives also evaluated 7 accessions from Region 1 at three south Texas locations, Rancho Blanco in Webb county, Rio Farms in Willacy county and Texas AgriLife Research Station in Uvalde county (Table 9). Accession 9089128 was the best performing accession over all three locations. It had the best vigor, forage production and seed production of any of the accessions evaluated. Based on its excellent performance over a 4 year period, accession 9089128 was selected to represent region 1 of the Rio Grande Plain Ecoregion.

Table 4. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in 2007.

Region 1 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9043300	Frio	100	100	4.5	5.0	5.0	5.0	4.5
9043207	La Salle	100	100	5.0	4.5	5.0	5.0	4.5
9089091	Dimmit	94	100	4.0	4.0	5.0	5.0	4.5
9086182	Zavala	100	100	5.0	5.0	5.0	5.0	5.0
9090594	Maverick	100	100	5.0	5.0	5.0	5.0	4.5
9090579	La Salle	100	100	5.0	4.5	5.0	5.0	4.5
9090413	Medina	100	100	4.0	4.5	5.0	5.0	4.5
9088560	Dimmit	100	100	5.0	4.0	5.0	5.0	5.0
9089128	Medina	100	100	3.5	3.5	5.0	5.0	3.5

* Ocular estimate (1 = Best/10=Worst)

Table 5. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in May of 2007 and germination tested in September of 2009.

Region 1 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9043300	Frio	5/24/07	sample	46.0	51.3	54.7
9043207	La Salle	5/24/07	sample	40.0	60.7	65.3
9086182	Zavala	5/24/07	sample	44.7	56.0	57.3
9090594	Maverick	5/24/07	sample	50.7	55.3	60.0
9090579	La Salle	5/24/07	sample	44.0	60.0	63.3
9089091	Dimmit	5/24/07	sample	50.7	66.7	70.0
9090413	Medina	5/24/07	sample	27.3	44.0	48.0
9088560	Dimmit	5/24/07	sample	48.0	66.0	70.7
9089128	Medina	5/24/07	sample	53.3	75.3	77.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 6. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2007 and germination tested in September of 2009.

Region 1 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9043300	Frio	9/27/07	sample	7.3	12.0	25.3
9043207	La Salle	9/27/07	sample	14.7	28.7	34.0
9089091	Dimmit	9/27/07	sample	9.3	13.3	18.7
9086182	Zavala	9/27/07	sample	5.3	11.3	25.3
9090594	Maverick	9/27/07	sample	16.7	24.0	28.0
9090579	La Salle	9/27/07	sample	3.3	10.0	14.7
9090413	Medina	9/27/07	sample	11.3	15.3	28.7
9088560	Dimmit	9/27/07	sample	13.3	18.7	39.3
9089128	Medina	9/27/07	sample	15.3	22.7	35.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 7. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in April 2008.

Region 1 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9043300	Frio	100	100	4.0	4.0	5.0	5.0	5.0
9043207	La Salle	100	100	5.0	5.0	5.0	5.0	5.0
9089091	Dimmit	94	100	5.0	4.0	5.0	5.0	5.0
9086182	Zavala	100	100	5.0	5.0	5.0	5.0	6.0
9090594	Maverick	100	100	5.0	5.0	5.0	5.0	5.0
9090579	La Salle	100	100	5.0	4.0	5.0	5.0	5.0
9090413	Medina	100	100	4.0	4.0	5.0	5.0	3.0
9088560	Dimmit	100	100	6.0	5.0	5.0	5.0	5.0
9089128	Medina	100	100	3.0	3.0	5.0	5.0	3.0

* Ocular estimate (1 = Best)

Table 8. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2008 and germination tested in February 2010.

Region 1 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9043300	Frio	9/29/08	sample	6.7	11.3	24.0
9043207	La Salle	9/29/08	sample	0.7	6.7	11.3
9089091	Dimmit	9/29/08	sample	3.3	8.0	18.0
9086182	Zavala	9/29/08	sample	2.7	16.0	26.0
9090594	Maverick	9/29/08	sample	16.0	19.3	24.0
9090579	La Salle	9/29/08	sample	n/a	12.7	16.7
9090413	Medina	9/29/08	sample	n/a	27.3	30.7
9088560	Dimmit	9/29/08	sample	1.3	4.0	8.7
9089128	Medina	9/29/08	sample	11.3	21.3	27.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 9. Mean summary of evaluations across three South Texas locations in 2007 by South Texas Natives (STN) of Region 1 multiflower false Rhodes grass.

Accession	9090594	9090579	9090413	9089128	9089091	9088560	9089182
County	Maverick	La Salle	Medina	Medina	Dimmit	Dimmit	Medina
Soil type	Loam	Clay loam	Sandy clay	Clay	Sandy loam	Loam	Clay
Uvalde Survival	75	60	100		100	100	8
Rio Farms Survival	100	100	91	100	100	100	
Rancho Blanco Svl.	100	90	100	90	100	100	9
2005 Rio Farms Vigor	2.5	3	3.5	2	1.8	2.8	
2005 Uvalde Vigor	2.2	4.2	3		2.5	2.5	
2006 Uvalde Vigor	8	8	7.5		8.5	8.5	1.5
2005 Rancho B. Vigor	2.75	2.25	2.5	2	3	3	
2006 Rancho B. Vigor	3	3	4	3.5	3	4.5	4
2005 RioFmSeed Prd.	2.2	3	4.1	2.1	1.7	2	
2005 UvaldeSeedPrd.	2.5	4	3.2		3	2.5	
2006 UvaldeSeedPrd.	5.5	5	5.5		5	5	2.5
2005 Ran.Bl.SeedPrd.	2.75	3	3.5	2.75	3.5	4.5	
2006 Ran.Bl.SeedPrd.	3.5	3	3.5	2.5	2.5	2.5	4.5
2005 RioFarmsForPrd	2.7	3.1	3.2	2	2	3	
2005 Uvalde For.Prd	2.5	4.2	3		2.5	2.75	
2006 Uvalde For.Prd	8	7.5	7.5		7.5	8	3
2005 Ran.Bl.ForPrd	3.5	2.75	3.25	2.5	4	4.25	
2006 Ran.Bl.For.Prd	3	3	4	3.5	3	5	4
2005 Rio Farms Germ	6	14.6	10.6	14.6	12.6	14.6	
2006 Rio Farms Germ	18.6	7.33	24.6	9.3	22.67	16	
2006 RanchoBl. Germ	13.3	12	12.6	16	21.3	14	
2007 RanchoBl. Germ	41.3	40.6	63.3	40.6	48	41.3	35.33
2007 Uvalde Germ	20	26.6	37.3		21.3	38.6	49.33
2005RioFarmsMeanEv	2.31	2.77	3.16	1.93	1.79	2.39	
2005 UvaldeMeanEval	2.19	3.41	2.60		2.27	2.36	
2006 UvaldeMeanEval	5.50	5.36	5.29		5.50	5.57	1.71
2005 Ran.Bl.MeanEval	2.57	2.39	2.43	1.93	2.96	3.32	
2006 Ran.Bl.MeanEval	2.79	2.71	3.36	2.86	2.71	3.71	3.43
Mean Eval X Location	3.07	3.33	3.37	2.24	3.05	3.47	
Mean Germ X Location	19.84	20.23	29.68	20.13	25.17	24.90	

From region 2, there were only 4 accessions evaluated. There was not a lot of difference between these accessions (Tables 10 thru 14). Although accession 9045811 had slightly better field performance, accession 9090315 had consistently higher seed germination percentages. South Texas Natives evaluated 3 of the 4 accessions from Region 2 at three south Texas locations, Rancho Blanco in Webb county, Rio Farms in Willacy county and Texas AgriLife Research Station in Uvalde county (Table 15). Since the selected accession would represent the northeast section of the Rio Grande Plain Ecoregion, we put a higher weight on the scores that came from the Uvalde Research Station. Accession 9090315 was the best performing accession at the Uvalde location. It had a higher survival rate and better plant vigor. It also had better seed production and higher seed germination rates than any of the other accessions evaluated at the

Uvalde site. Furthermore, it was one of the very few accessions that had its origin from a clay soil. Thus, based on its excellent performance over a 4 year period, accession 9090315 was selected to represent region 2 of the Rio Grande Plain Ecoregion.

Table 10. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in 2007.

Region 2 Ecotype - Block E (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9045811	Karnes	96	100	4.0	4.0	5.0	5.0	5.0
9090315	Wilson	100	100	5.0	4.5	5.0	5.0	5.0
9090655	Live Oak	100	100	5.0	4.5	5.0	5.0	4.5
9090721	Wilson	100	100	5.0	4.5	5.0	5.0	4.5

* Ocular estimate (1 = Best)

Table 11. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in May 2007 and germination tested in September of 2009.

Region 2 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9090655	Live Oak	5/24/07	sample	60.0	70.0	76.0
9090721	Wilson	5/24/07	sample	50.0	72.0	74.0
9045811	Karnes	5/24/07	sample	39.3	56.7	62.0
9090315	Wilson	5/24/07	sample	42.7	66.7	71.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 12. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2007 and germination tested in September of 2009.

Region 2 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9045811	Karnes	9/27/07	sample	7.3	20.7	30.0
9090315	Wilson	9/27/07	sample	20.7	30.0	48.7
9090655	Live Oak	9/27/07	sample	14.0	28.0	51.3
9090721	Wilson	9/27/07	sample	16.7	36.0	40.7

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 13. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in 2008.

Region 2 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9045811	Karnes	96	100	4.0	4.0	5.0	5.0	5.0
9090315	Wilson	100	100	5.0	5.0	5.0	5.0	5.0
9090655	Live Oak	100	100	5.0	4.0	5.0	5.0	4.0
9090721	Wilson	100	100	5.0	4.0	5.0	5.0	5.0

* Ocular estimate (1 = Best)

Table 14. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2008 and germination tested in February 2010.

Region 2 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9045811	Karnes	9/29/08	sample	5.3	12.7	26.0
9090315	Wilson	9/29/08	sample	n/a	29.3	38.0
9090655	Live Oak	9/29/08	sample	6.0	12.0	29.3
9090721	Wilson	9/29/08	sample	8.7	22.0	36.0

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 15. Mean summary of evaluations across three South Texas locations in 2007 by South Texas Natives (STN) of Region 2 multiflower false Rhodes grass.

Accession	9090721	9090655	9090315
County	Wilson	Live Oak	Wilson
Soil Type	Sandy loam	Clay loam	Clay
Uvalde Survival	90	4.5	100
Rio Farms Survival	98	98	88
Rancho Blanco Svl.	100	90	7
2005 Rio Farms Vigor	3	2.4	3.8
2005 Uvalde Vigor	2.5	4.5	2.2
2006 Uvalde Vigor	7.5	7	7
2005 Rancho B. Vigor	2.5	3.5	3
2006 Rancho B. Vigor	3	5	4
2005 RioFmSeed Prd.	3.4	2.7	4.2
2005 UvaldeSeedPrd.	2.8	5.5	2.5
2006 UvaldeSeedPrd.	5	5	5
2005 Ran.Bl.SeedPrd.	3.5	5	3
2006 Ran.Bl.SeedPrd.	3	4.5	3
2005 RioFarmsForPrd	3.1	2.5	4
2005 Uvalde For.Prd	3.2	5	5
2006 Uvalde For.Prd	7	7	7
2005 Ran.Bl.ForPrd	3.5	4	3
2006 Ran.Bl.For.Prd	3	5.5	4
2005 Rio Farms Germ	14	16.6	17.3
2006 Rio Farms Germ	25.3	25.3	33.3
2006 RanchoBl. Germ	28	28.6	22.6
2007 RanchoBl. Germ	35.3	62.6	60.6
2007 Uvalde Germ	34	30	37.3
2005 RioFarmsMeanEv	2.96	2.34	3.51
2005 UvaldeMeanEval	2.43	4.11	2.56
2006 UvaldeMeanEval	5.14	5.14	5.00
2005 Ran.Bl.MeanEval	2.79	3.32	2.57
2006 Ran.Bl.MeanEval	2.71	4.21	3.36
Mean Eval X Location	3.21	3.83	3.40
Mean Germ X Location	27.32	32.62	34.22

From region 3, there were only two accessions evaluated at the PMC, accession 9093192 and accession 9088772. There was not a lot of difference between these two accessions (Tables 16 thru 20). South Texas Natives evaluated these 2 accessions along with 4 other accessions at its three field locations in south Texas (Table 21). There was no real difference between the two accessions in plant vigor or seed production at the closest evaluation location which was Rancho Blanco in Webb County. Accession 9088772 did have better forage production at Rancho Blanco then accession 9093192. However, the reason we chose accession 9088772 to represent region 3 of the Rio Grande Plain Ecoregion was because it was not only a good performer at Rancho Blanco but it also had the most consistent performance of all 6 accessions across all 3 field locations.

Table 16. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in 2007.

Region 3 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9088772	Webb	100	100	4.5	4.5	5.0	5.0	4.5
9093192	Webb	100	100	4.5	4.5	5.0	5.0	4.5

* Ocular estimate (1 = Best)

Table 17. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in May of 2007 and germination tested in September of 2009.

Region 3 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9088772	Webb	5/24/07	sample	53.3	63.3	64.0
9093192	Webb	5/24/07	sample	66.0	72.7	75.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 18. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2007 and germination tested in September of 2009.

Region 3 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9088772	Webb	9/27/07	sample	6.0	11.3	27.3
9093192	Webb	9/27/07	sample	10.0	19.3	32.0

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F).

Table 19. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in April 2008.

Region 3 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9088772	Webb	100	100	5.0	4.0	5.0	5.0	4.0
9093192	Webb	100	100	5.0	5.0	5.0	5.0	5.0

* Ocular estimate (1 = Best)

Table 20. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2008 and germination tested in February 2010.

Region 3 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9088772	Webb	9/29/08	sample	n/a	25.3	35.3
9093192	Webb	9/29/08	sample	n/a	38.0	46.0

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F).

Table 21. Mean summary of evaluations across three South Texas locations in 2007 by South Texas Natives (STN) of Region 3 multiflower false Rhodes grass.

Accession	9093192	9088772	9091865	9089060	9088779	9088778
County	Webb	Webb	Zapata	Webb	Webb	Webb
Soil type	Sandy Loam	Clay Loam	Clay Loam	Sandy Loam	Sandy Loam	Sandy Loam
Uvalde Survival		90				
Rio Farms Survival	100	98				
Rancho Blanco Svl.	70	65				
2005 Rio Farms Vigor	2.7	3.2				
2005 Uvalde Vigor		2				
2006 Uvalde Vigor		3.5	3	2.5	3	2.5
2005 Rancho B. Vigor	3.5	3.5				
2006 Rancho B. Vigor	3.5	3.5	5.5	5	4.5	3.5
2005 RioFmSeed Prd.	3.5	2.5				
2005 UvaldeSeedPrd.		1.75				
2006 UvaldeSeedPrd.		4.5	3.5	4	2.5	3
2005 Ran.Bl.SeedPrd.	5	5.25				
2006 Ran.Bl.SeedPrd.	2.5	2.5	5	5	4	5.5
2005 RioFarmsForPrd	2.8	3.1				
2005 Uvalde For.Prd		2				
2006 Uvalde For.Prd		5	3.5	4	3	3.5
2005 Ran.Bl.ForPrd	4.5	4				
2006 Ran.Bl.For.Prd	3.5	3	6	5	4.5	3.5
2005 Rio Farms Germ	17.3	21.3				
2006 Rio Farms Germ	31.3	17.3				
2006 RanchoBl. Germ	18	19.3				
2007 RanchoBl. Germ	56.6	38	60.67	47.33	26.67	36
2007 Uvalde Germ		44.7	88	34	52.67	32
2005RioFarmsMeanEv	2.76	2.69				
2005 UvaldeMeanEval		1.75				
2006 UvaldeMeanEval		3.00	2.36	2.57	2.07	2.21
2005 Ran.Bl.MeanEval	3.29	3.32				
2006 Ran.Bl.MeanEval	2.93	2.79	4.64	4.29	3.57	3.29
Mean Eval X Location	2.99	2.71				
Mean Germ X Location	30.80	23.98				

From region 4, five accessions were evaluated at the PMC (Tables 22 thru 26). Accessions 9091809 and 9090548 showed the most consistent field performance and seed germination of the accessions evaluated there. South Texas Natives evaluated 3 accessions from Region 4 but both 9091809 and 9090548 were included in their evaluations at the three south Texas locations, (Table 27). Accession 9091809 demonstrated excellent performance at the Rancho Blanco and Rio Farms locations. It had better survival, plant vigor, and seed production than any of the other accessions evaluated at both those locations. It also had higher mean germination percentages across all 3 locations. Furthermore, it was the only accessions that had its origin from a sandy clay loam soil. Thus, based on its excellent performance over a 4 year period, accession 9091809 was selected to represent region 4 of the Rio Grande Plain Ecoregion.

Table 22. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in 2007.

Region 4 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9045782	Starr	92	100	5.0	5.0	5.0	5.0	5.0
9064432	Starr	98	100	5.0	5.0	5.0	5.0	5.0
9052756	Duval	94	100	5.0	5.0	5.0	5.0	5.0
9091809	Jim Hogg	100	100	5.0	5.0	5.0	5.0	4.5
9090548	Duval	100	100	4.0	3.5	5.0	5.0	3.5

* Ocular estimate (1 = Best)

Table 23. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in May of 2007 and germination tested in September of 2009.

Region 4 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9045782	Starr	5/24/07	sample	48.7	66.7	71.3
9064432	Starr	5/24/07	sample	48.0	59.3	66.7
9052756	Duval	5/24/07	sample	46.7	61.3	64.0
9091809	Jim Hogg	5/24/07	sample	54.7	70.7	74.0
9090548	Duval	5/24/07	sample	56.0	68.0	77.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 24. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2007 and germination tested in September of 2009.

Region 4 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9045782	Starr	9/27/07	sample	22.7	40.0	51.3
9064432	Starr	9/27/07	sample	33.3	42.7	52.0
9052756	Duval	9/27/07	sample	16.7	38.7	47.3
9091809	Jim Hogg	9/27/07	sample	15.3	28.7	43.3
9090548	Duval	9/27/07	sample	8.7	14.7	41.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 25. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in April 2008.

Region 4 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9045782	Starr	92	100	5.0	5.0	5.0	5.0	5.0
9064432	Starr	98	100	5.0	5.0	5.0	5.0	5.0
9052756	Duval	94	100	5.0	6.0	5.0	5.0	5.0
9091809	Jim Hogg	100	100	5.0	5.0	5.0	5.0	5.0
9090548	Duval	100	100	5.0	3.0	5.0	5.0	3.0

* Ocular estimate (1 = Best)

Table 26. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2008 and germination tested in February 2010.

Region 4 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9045782	Starr	9/29/08	sample	12.0	36.7	57.3
9064432	Starr	9/29/08	sample	6.7	23.3	46.7
9052756	Duval	9/29/08	sample	11.3	28.7	40.0
9091809	Jim Hogg	9/29/08	sample	8.7	19.3	26.7
9090548	Duval	9/29/08	sample	4.7	8.0	16.7

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 27. Mean summary of evaluations across three South Texas locations in 2007 by South Texas Natives (STN) of Region 4 multiflower false Rhodes grass.

Accession	9091884	9091809	9090548
County	Brooks	Jim Hogg	Duval
Soil type	Sand	Sandy clay loam	Clay loam
Uvalde Survival	90	40	3.5
Rio Farms Survival	94	100	
Rancho Blanco Svl.	90	100	10
2005 Rio Farms Vigor	2.8	2.7	
2005 Uvalde Vigor	2.5	3.25	
2006 Uvalde Vigor	7.5	7	1.5
2005 Rancho B. Vigor	3	2.75	
2006 Rancho B. Vigor	3.3	2.5	4
2005 RioFmSeed Prd.		2.7	
2005 UvaldeSeedPrd.	2.5	3.25	
2006 UvaldeSeedPrd.	5	5	2
2005 Ran.Bl.SeedPrd.	4.75	3.25	
2006 Ran.Bl.SeedPrd.	3	2.5	4.5
2005 RioFarmsForPrd	2.8	2.8	
2005 Uvalde For.Prd	2.5	3	
2006 Uvalde For.Prd	7	7.5	2
2005 Ran.Bl.ForPrd	4	3.5	
2006 Ran.Bl.For.Prd	3.3	2.5	4
2005 Rio Farms Germ	10.6	12	
2006 Rio Farms Germ	19.3	52.6	
2006 RanchoBl. Germ		30	
2007 RanchoBl. Germ	66.6	50.6	47.33
2007 Uvalde Germ	36	44.6	57.33
2005RioFarmsMeanEv	2.64	2.44	
2005 UvaldeMeanEval	2.07	2.68	
2006 UvaldeMeanEval	5.21	5.14	1.43
2005 Ran.Bl.MeanEval	3.11	2.68	
2006 Ran.Bl.MeanEval	2.93	2.29	3.21
Mean Eval X Location	3.19	3.05	
Mean Germ X Location	33.13	37.96	

From region 5, accessions 9091883 and 9091844 had better field performance than any of the other accessions evaluated at the PMC (Tables 28 thru 32). South Texas Natives evaluated 7 accessions from Region 5 at their three south Texas field locations, Rancho Blanco in Webb county, Rio Farms in Willacy county and Texas AgriLife Research Station in Uvalde county (Table 33). Since the selected accession would represent the southeast section of the Rio Grande Plain Ecoregion, we put a higher weight on the scores that came from the Rio Farms Research Station. Accession 9091844 was the best performing accession at the Rio Farms location, as well as at the other two field locations. It had better plant vigor and forage production. It also had better seed production and higher seed germination rates than any of the other accessions evaluated at the Rio Farms site. Thus, based on its excellent performance over a 4 year period, accession 9091844 was selected to represent region 5 of the Rio Grande Plain Ecoregion based on performance and seed germination data. Accession 9086184 had moderate performance in the PMC evaluations (and was not evaluated by STN), however the accession was included in the Hidalgo Germplasm release because of evidence of genotypic differentiation from the other selections. This was done in an effort to maximize the genetic diversity of the release and maximize adaptation potential of the release to the variety of sites in which it will be planted in the region.

Table 28. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in 2007.

Region 5 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9038717	Jim Wells	100	100	5.0	5.0	5.0	5.0	5.0
9086181	Jim Wells	98	100	5.0	5.0	5.0	5.0	4.5
9086184	Jim Wells	96	100	5.0	4.5	5.0	5.0	5.0
9086185	Jim Wells	100	100	5.5	5.5	5.0	5.0	5.5
9086186	Jim Wells	100	100	5.0	5.0	5.0	5.0	5.0
9086211	Kleberg	-	100	4.0	3.5	5.0	5.0	4.0
9086212	Kleberg	-	100	5.0	3.5	5.0	5.0	4.0
8252	Willacy	66	100	5.5	4.5	5.0	5.0	4.5
9043279	Cameron	96	100	4.5	4.5	5.0	5.0	4.5
9091844	Hidalgo	98	100	5.0	5.0	5.0	5.0	5.0
9090364	Willacy	100	100	4.5	5.0	5.0	5.0	4.5
9091884	Brooks	100	100	5.0	5.0	5.0	5.0	5.0
9090281	Hidalgo	100	100	5.0	5.0	5.0	5.0	5.0
9091883	Kenedy	100	100	3.5	3.5	5.0	5.0	3.0

* Ocular estimate (1 = Best)

Table 29. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in May of 2007 and germination tested in September of 2009.

Region 5 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9038717	Jim Wells	5/24/07	sample	49.3	61.3	62.0
9086181	Jim Wells	5/24/07	sample	44.0	58.0	68.0
9086184	Jim Wells	5/24/07	sample	49.3	56.7	57.3
9086185	Jim Wells	5/24/07	sample	56.0	77.3	80.7
9086186	Jim Wells	5/24/07	sample	53.3	64.0	67.3
9086211	Kleberg	5/24/07	sample	63.3	76.0	80.0
9086212	Kleberg	5/24/07	sample	54.0	73.3	74.7
8252	Willacy	5/24/07	sample	52.0	64.0	68.0
9043279	Cameron	5/24/07	sample	37.3	50.7	61.3
9091844	Hidalgo	5/24/07	sample	55.3	85.3	86.0
9090364	Willacy	5/24/07	sample	54.7	60.0	66.0
9091884	Brooks	5/24/07	sample	40.0	63.3	72.7
9090281	Hidalgo	5/24/07	sample	48.0	62.0	68.0
9091883	Kenedy	5/24/07	sample	27.3	80.0	87.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 30. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2007 and germination tested in September of 2009.

Region 5 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9038717	Jim Wells	9/27/07	sample	19.3	24.0	32.7
9086181	Jim Wells	9/27/07	sample	2.7	8.0	12.0
9086184	Jim Wells	9/27/07	sample	16.0	29.3	38.0
9086185	Jim Wells	9/27/07	sample	11.3	31.3	57.3
9086186	Jim Wells	9/27/07	sample	12.0	28.0	33.3
9086211	Kleberg	9/27/07	sample	16.7	31.3	42.0
9086212	Kleberg	9/27/07	sample	18.7	32.7	48.0
8252	Willacy	9/27/07	sample	26.0	38.0	48.0
9043279	Cameron	9/27/07	sample	5.3	14.0	38.0
9091844	Hidalgo	9/27/07	sample	28.7	46.0	58.7
9090364	Willacy	9/27/07	sample	8.7	25.3	40.0
9091884	Brooks	9/27/07	sample	9.3	20.7	34.7
9090281	Hidalgo	9/27/07	sample	14.0	33.3	46.0
9091883	Kenedy	9/27/07	sample	13.3	28.7	60.0

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 31. Field performance of multiflower false Rhodes grass from the initial field evaluation plot evaluated in April 2008.

Region 5 Ecotype - PMC (clay soil)

Accession Number	Origin (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production
9038717	Jim Wells	100	100	5.0	5.0	5.0	5.0	5.0
9086181	Jim Wells	98	100	5.0	6.0	5.0	5.0	5.0
9086184	Jim Wells	96	100	6.0	5.0	5.0	5.0	6.0
9086185	Jim Wells	100	100	6.0	6.0	5.0	5.0	6.0
9086186	Jim Wells	100	100	5.0	5.0	5.0	5.0	5.0
9086211	Kleberg	100	100	5.0	5.0	5.0	5.0	5.0
9086212	Kleberg	100	100	5.0	4.0	5.0	5.0	4.0
8252	Willacy	66	100	6.0	5.0	5.0	5.0	5.0
9043279	Cameron	96	100	4.0	4.0	5.0	5.0	5.0
9091844	Hidalgo	98	100	5.0	5.0	5.0	5.0	5.0
9090364	Willacy	100	100	4.0	5.0	5.0	5.0	3.0
9091884	Brooks	100	100	5.0	5.0	5.0	5.0	5.0
9090281	Hidalgo	100	100	5.0	5.0	5.0	5.0	5.0
9091883	Kenedy	100	100	4.0	4.0	5.0	5.0	3.0

*Ocular estimate (1 = Best)

Table 32. Seed harvested and percent germination of multiflower false Rhodes grass accessions from the initial evaluation plot harvested in September of 2008 and germination tested in February 2010.

Region 5 Ecotype

Accession Number	Origin (County)	Date Harvested	Grams Harvested	3 Days %	7 Days %	28 Days %
9038717	Jim Wells	9/29/08	sample	8.7	20.7	40.0
9086181	Jim Wells	9/29/08	sample	5.3	14.0	21.3
9086184	Jim Wells	9/29/08	sample	12.0	24.7	30.7
9086185	Jim Wells	9/29/08	sample	6.7	18.0	28.0
9086186	Jim Wells	9/29/08	sample	7.3	19.3	26.0
9086211	Kleberg	9/29/08	sample	3.3	8.0	16.7
9086212	Kleberg	9/29/08	sample	22.7	30.0	39.3
8252	Willacy	9/29/08	sample	19.3	28.7	42.7
9043279	Cameron	9/29/08	sample	1.3	7.3	30.7
9091844	Hidalgo	9/29/08	sample	12.7	42.0	51.3
9090364	Willacy	9/29/08	sample	n/a	33.3	62.7
9091884	Brooks	9/29/08	sample	n/a	26.0	42.7
9090281	Hidalgo	9/29/08	sample	n/a	20.7	30.7
9091883	Kenedy	9/29/08	sample	0.7	10.7	19.3

* 3 reps of 50 seeds each at 12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F)

Table 33. Mean summary of evaluations across three South Texas locations in 2007 by South Texas Natives (STN) of Region 5 multiflower false Rhodes grass.

Accession	9091884	9091883	9091844	9090364	9090281	9090360	9090318
County	Brooks	Kenedy	Hidalgo	Willacy	Hidalgo	Hidalgo	Hidalgo
Soil type	Sand	Sandy loam	Sandy loam	Sandy loam	Sand	Sandy clay loam	Loam
Uvalde Survival	90			65	30	10	9.5
Rio Farms Survival	94	100	98	100	98		
Rancho Blanco Svl.	90	95	100	85	85	10	10
2005 Rio Farms Vigor	2.8	3.1	2.5	3.4	3		
2005 Uvalde Vigor	2.5			3	4		
2006 Uvalde Vigor	7.5			7	7.5	2	2.5
2005 Rancho B. Vigor	3	2.25	2.75	2.75	2.5		
2006 Rancho B. Vigor	3.3	3	2	3.5	4	2.5	3
2005 RioFmSeed Prd.		3.1	2.1	3.4	3.4		
2005 UvaldeSeedPrd.	2.5			3	3.75		
2006 UvaldeSeedPrd.	5			4	5	2.5	3
2005 Ran.Bl.SeedPrd.	4.75	2.5	3.75	3.75	4.25		
2006 Ran.Bl.SeedPrd.	3	3	3	3	4	3	3
2005 RioFarmsForPrd	2.8	3.2	2.7	3.7	3.4		
2005 Uvalde For.Prd	2.5			3	3.5		
2006 Uvalde For.Prd	7			6	7.5	3	3
2005 Ran.Bl.ForPrd	4	2	3.5	3.75	3		
2006 Ran.Bl.For.Prd	3.3	3	3	2.5	4	2.5	3
2005 Rio Farms Germ	10.6	11.3	11.3	8.6	6		
2006 Rio Farms Germ	19.3	26	40.6	22.6	34.6		
2006 RanchoBl. Germ		17.3	14	31.3			
2007 RanchoBl. Germ	66.6	34.6	64.6	48.6	46	32.67	50.67
2007 Uvalde Germ	36			40.6	36.6	62	40
2005RioFarmsMeanEv	2.64	2.76	2.23	3.04	2.90		
2005 UvaldeMeanEval	2.07			2.37	3.07		
2006 UvaldeMeanEval	5.21			4.43	5.29	2.00	2.07
2005 Ran.Bl.MeanEval	3.11	1.96	2.54	2.71	2.57		
2006 Ran.Bl.MeanEval	2.93	2.84	2.57	2.86	3.43	2.36	2.64
Mean Eval X Location	3.19	2.52	2.45	3.08	3.45		
Mean Germ X Location	33.13	22.30	32.63	30.34	30.80		

In 2007, we contacted the National Forest Genetic Electrophoresis Laboratory (NFGEL) in Placerville, California about conducting a genetic evaluation of multiflower false Rhodesgrass. We wanted to release a composite mix of this species that would be not only environmentally adapted across its range of habitat but genetically diverse as well. Therefore we submitted material to the lab in October of 2007. Three genetic analyses were used to address two questions pertinent to the transfer of seed from across the ecoregion:

- 1) Are we mixing accessions with different ploidy levels (which may lead to the generation of sterile hybrids)?
- 2) How diverse are the genetics of this species within the ecoregion and can we combine accessions?

No variation in ploidy content was observed in the seed collections. Of the 144 seeds assayed for relative ploidy level, all displayed equivalent DNA content with no evidence of genome duplication.

Isozyme and RAPD (DNA) analyses reveal low to moderate levels of genetic variation in 27 seed accessions of multiflower false Rhodesgrass. Analysis of six isozyme loci revealed low levels of variation. No variation was observed in 22 of the seed accessions, with all individuals examined having the same “common” genotype. This low level of functional (protein) variation results in low genetic distance between populations, with the maximum genetic distance estimated as 0.045 and indicates that low divergence has occurred between the seed collections (Nei 1987). However, the distribution of genetic variation among collections indicates the accessions are significantly differentiated ($\Phi_{ST} = 0.43$, $P = 0.001$), with one seed collection fixed for an alternate genotype (9086184). The isozyme data failed to resolve genetic differences between the majority of the collections.

Greater levels of variation and differentiation were resolved with RAPD analyses than with isozyme analyses, despite the fact that only two alleles are possible at a single RAPD locus and that the dominant nature of the markers means detection of heterozygotes are not possible. A greater number of multilocus genotypes were observed than in the isozyme data, indicating the seed collections are not uniform at the DNA level. Together, the patterns of genetic variation within and among seed accessions of multiflower false Rhodesgrass indicate the collections are significantly differentiated ($\Phi_{ST} = 0.53$, $P=0.001$ for RAPD data). The differentiation estimated for both the isozyme and RAPD data exceeds this level, indicating that gene flow is restricted among seed accessions. The significant differentiation may result from local adaptation of the gene pools (O'Neill and Aitken 2004). Although unsubstantiated it appears as if this species may be apomictic. Functional studies quantifying variation in fitness traits, such as common garden or reciprocal transplant experiments, would be necessary to determine if the genetic differentiation observed in these putatively neutral markers correspond to functional differences indicative of local adaptation.

Based on the isozyme and RAPD analyses, along with the adaptive characteristics indicated at the four field locations, we elected to initiate a seed increase at the PMC of six multiflower false Rhodes grass accessions which would consist of the top performing accessions and cover different soil types and the geographic range of the species. The accessions chosen for release

were: 9089128 (clay loam soil) Medina Co., 9090315 (clay) Wilson Co., 9088772 (clay loam) Webb Co., 9091809 (sandy clay loam) Jim Hogg Co., 9091844 (fine sandy loam) Brooks Co. and 9086184 (fine sandy loam) Jim Wells Co. Accessions 9089128 and 9091844 were chosen because they had the best field performances of all the accessions evaluated. Accessions 9088772, 9091844, 9091809 and 9090315 were chosen because all were the top performers for their region in south Texas. Furthermore, 9088772, 9091844, and 9090315 all displayed some isozyme variation compared to the other accessions, giving them some unique genetic characteristics to provide in the mix. And finally accession 9086184 was chosen not because it had the most exceptional field performance but because it had the most exceptional genetic characteristics. This accession was the only seed collection fixed for an alternate isozyme genotype. By adding it to the mix, we provide a variety of genetic material capable of adapting to changes now and into the future.

Advanced Evaluation

In June 2009, seed increase plots of each accession were planted at the PMC by transplants from their original seed. Evaluation of harvest characteristics, seed set and timing, and adaptability to agronomic production were conducted in 2009 and 2010. All accessions performed well in this evaluation with similar growth rates and seed maturity dates.

Forage production

In April 1996, 2 accessions of multiflower false Rhodes grass along with buffelgrass (*Cenchrus ciliaris*) and kleingrass (*Panicum coloratum*) were transplanted at the PMC and at Texas AgriLife Station in Beeville, Texas. We installed the plots with a randomized complete block design with 4 replications. On July 31, 1996 we randomly clipped ten plants from each of the four replications at the PMC. There was no significant difference between the species. Kleingrass produced the most forage at 24,955 lbs/ac. Multiflower false Rhodes grass produced 24,658 lbs/ac and buffelgrass produced 19,981 lbs/ac. On December 18, 1996 we randomly clipped another ten plants from each of the replications. At this time, buffelgrass produced significantly more forage than the other species (22,651 lbs/ac). Kleingrass produced 16,553 lbs/ac and multiflower false Rhodes grass produced 16,117 lbs/ac.

At Beeville 20 plants were harvested per replication on May 3, 1997. There was no significant difference between kleingrass (4449 lbs/ac) buffelgrass (4522 lbs/ac) and multiflower false Rhodes grass (3466 lbs/ac).

Seeding trials

Three replications of 100 ft² plots of multiflower false Rhodes grass were broadcast planted in May, 2007 at 3 seeding rates (high=30 pure live seeds (PLS)/ft²; standard=20 PLS/ft²; and low=10 PLS/ft²) at 3 planting dates (spring, summer, autumn) and monitored for 3 years after planting at the Rancho Blanco test site in Webb County Texas. Stand density, canopy cover, and competitive ability with buffelgrass were recorded at 1, 3, 6, 12, 24 and 36 months after seeding. One year after seeding, canopy cover of multiflower false Rhodes grass in all plantings ranked 8th of the 10 native grass species planted in these trials. Mean first year canopy cover

across seeding rates and planting dates was 3%. In the second year, canopy cover averaged 6% across treatments. A significant difference in canopy cover x seeding date was found. Fall seedings produced a 16% canopy cover compared to less than 1% canopy coverage from the spring and summer seedings. By the third year, buffelgrass had invaded all multiflower false Rhodes grass plots from surrounding stands and the seed bank. No multiflower false Rhodes grass plants were detected from the samples taken during the third year. A comparison of seeding rates found that the greatest canopy cover was attained from plots seeded at a rate of 10 PLS/ft². Higher seeding rates did not result in a better stand of multiflower false Rhodes grass.

Multiflower false Rhodes grass was planted on March 20, 2008 as part of a mix of 29 native species at the Taormina Unit of the Texas Parks and Wildlife, Las Palomas Wildlife Management Area. Soil type of the study area was a Harlingen clay. Site preparation consisted of mowing, moldboard plowing, double disking and leveling. Eight hectares were planted using a combination of drilling and broadcast seeding. Multiflower false Rhodes grass was 3.5% of the seed mix planted. Mean canopy cover contribution of multiflower false Rhodes grass during the 2.5 year study was 2.2% of total native cover of seeded plants. In terms of the resulting percent canopy cover based on the contributing percent of the seed mixture, multiflower false Rhodes grass was the 11th best performing species of 29 planted in the experiment. Seedlings of multiflower false Rhodes grass were not detected until six months after the seeding in March despite good moisture throughout the summer months. Plants of multiflower false Rhodes grass appeared to compete poorly with invading Kleberg bluestem (*Dichanthium annulatum*) plants on the clay soils in this study.

Seed Increase

Seed was harvested twice from the 2010 seed increase plot of multiflower false Rhodes grass at the PMC. The first harvest in June averaged 87 bulk pounds per acre per accession. The second harvest in August averaged 16 bulk pounds per acre per accession.

Seed harvested from these seed increase rows will be blended by equal amounts of pure live seed (PLS) at/ (+/-10%) per accession, and distributed to interested commercial seed producers as first generation (G0) seed.

Seed Production, Harvest, and Cleaning

Seed increase plots have been planted on 36" bedded rows, however flat plantings may be possible with frequent weeding. Multiflower false Rhodes grass generally produces seed two times during the growing season. Seed is harvested with a Flail-Vac or similar brush-type harvester. The use of slow travel and RPM speeds while harvesting results in relatively clean seed, needing little cleaning or processing. To clean stems and chaff from harvests, seed is run through a *Westrup Laboratory* brush machine and then through a Clipper seed cleaner. No attempt is made to clean caryopsis from the bur or glumes, as seed damage or reductions in seed life are likely to occur.

F. Area of adaptation

The best performance of Hidalgo Germplasm will be predominantly in the Rio Grande Plain. Multiflower false Rhodes grass is not cold tolerant and is unlikely to perform well outside of the Rio Grande Plain Ecoregion.

G. Procedure for maintaining stock classes of seed

First generation (G0) seed will be produced and maintained by the USDA-NRCS E. "Kika" de la Garza Plant Materials Center, Kingsville, Texas.

H. Description of how variety is to be constituted, etc.

Hidalgo Germplasm multiflower false Rhodes grass is released as Selected Texas Native Ecotype. First generation (G0) seed will be made up of equal amounts (by percent PLS, +/-10%) of each of the six accessions. Second generation (G1) seed is that which is grown from plantings of the G0 seed blend. Third generation (G2) seed is that which is grown from plantings of the G1 seed. Increase using G2 seed is prohibited.

I. Additional restrictions, etc.

G1 and G2 seed fields have a 7 year production limit. Will application be made to the Plant Variety Protection Office? YES__ NO X

If yes will the application specify that the variety is to be sold by variety name only as a class of certified seed? YES__ NO__

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by NRCS, and the best available information for this species. Results of this evaluation determined that Hidalgo Germplasm multiflower false Rhodes grass was suitable for release based on the criterion contained in this document. This conclusion is mainly because multiflower false Rhodes grass is a naturally occurring species in Texas and planting it would therefore not constitute an introduction of an exotic species into local ecosystems. Any negative impacts on other native plant species would likely be minimal to non-existent. Also, release of this species will make available an additional native species for rangeland planting, will provide a good seed source to upland avian wildlife species and provide unknown benefits by maintaining and contributing habitat that harbors beneficial insects and butterflies.

Conservation Use: Hidalgo Germplasm multiflower false Rhodes grass will provide a native plant species for rangeland planting and wildlife habitat improvement.

Availability of Plant Materials: G0 Seed will be maintained by USDA-NRCS E. "Kika" de la Garza Plant Materials Center, Kingsville, Texas. G0 seed will be available by September 2011. At this time, release of the germplasm will be limited to a single commercial grower who will establish the. multiflower false Rhodes grass seed fields within the Rio Grande Plain Ecoregion.

References:

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O'Neill, G. A., and S. N. Aitken. 2004. Area-based breeding zones to minimize maladaptation. Canadian Journal of Forest Research 34:695-704.

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Figure 1. Collection, evaluation, and experimental planting sites used in development of Hidalgo Germplasm.

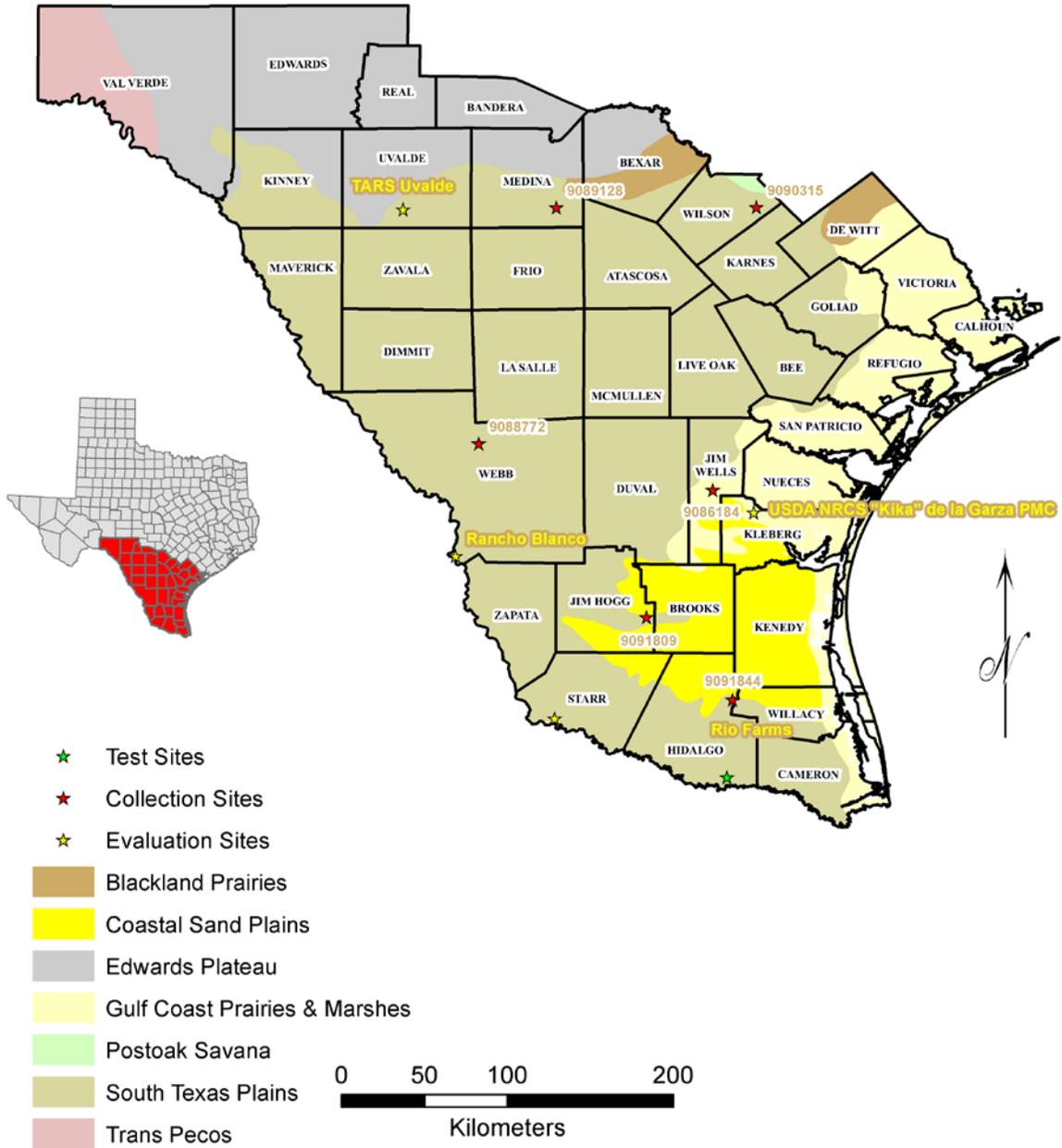


Figure 2. Seed increase field of Hidalgo Germplasm multiflower false Rhodes grass.



Figure 3. Representative plant of Hidalgo Germplasm multiflower false Rhodes grass.



MARKETING PLAN

HIDALGO GERMPLASM MULTIFLOWER FALSE RHODES GRASS

June 2011

Finalize and obtain approval for release, and print supporting documents (fact sheet & brochure)

Spring/Summer 2011

Distribute G0 seed to *South Texas Natives* for G1 seed increase.

Winter 2011

Draft press release once seed is commercially available to a seed dealer

Publish “notice of release” article in *Native Plant Journal*.

Spring/Summer 2012

Draft press release once seed is commercially available to consumers.

Staff information booths at 2 landowner and consumer oriented symposiums or conferences in south Texas

Winter 2012

Present results and overview of development process at International Meeting of the Society for Range Management

SEED AVAILABILITY

HIDALGO GERMPLASM MULTIFLOWER FALSE RHODES GRASS

As of April, 2011 there is at the E. “Kika” de la Garza Plant Materials Center 90 lbs. of bulk seed which converts to approximately 20 lbs. of pure live seed of first generation (G0) Hidalgo Germplasm that is available for establishing second generation seed fields. This will seed approximately 20 acres of G1 commercial row production.

SEED PRODUCTION ESTIMATE/PLAN

HIDALGO GERMPLASM MULTIFLOWER FALSE RHODES GRASS

As of April, 2011, 0.04 acres or greater of seed increase rows of each of the 6 accessions that comprise the blend are established at the E. "Kika" de la Garza Plant Materials Center in Kingsville, Texas. Total production acreage for the blend components is 0.25 acres, which if harvested twice annually yields an average of 20 pounds pure live seed/year. This production level will be sustained until commercial production has reached an acceptable level, and seed for establishment of at least 50 acres of G1 commercial seed fields is in cold storage. Seed harvests of the fields will be obtained annually and stored at the E. "Kika" de la Garza Plant Materials Center in Kingsville to provide material for expansion or re-establishment of the germplasm if fields are lost.

Signatures for release of:

HIDALGO GERMPLASM MULTIFLOWER FALSE RHODES GRASS

Trichloris pluriflora Fourn.



Dr. Fred C. Bryant
Leroy Denman, Jr. Director of Wildlife Research
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
Kingsville, TX

8/17/11

Date



Dr. George Allen Rasmussen
Dean
Dick and Mary Lewis Kleberg College of
Agriculture, Natural Resources and Human Sciences
Texas A&M University-Kingsville
Kingsville, TX

8/18/11

Date



Salvador Salinas
Texas State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Temple, TX

8/24/11

Date



for Terrell Erickson
Director
Ecological Sciences Division
United States Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.

9-27-2011

Date