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Bahamas Agricultural Research Training And Development Project

PERFORMANCE OF SEVERAL PERENNIAL GRASSES PROPAGATED VEGETATIVELY

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Performance of Several Perennial Grasses Propagated Vegetatively on North Andros Island, Bahamas

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Perennial grasses, either alone or in combination with legumes, are used widely in the tropical and subtropical pastures of the world. In contrast to grasses of the temperate zones many of the most useful pasture grasses in the tropics are propagated totally or partially vegetatively, i.e., by either root or stem cuttings or both.

Prior to the initiation of the BARTAD project there was little or no information available relative to the adaptability and performance of many perennial grasses on the limestone soils of the Bahamas. This study was initiated, therefore, to determine the performance of a number of perennial tropical grasses propagated totally or primarily by vegetative parts.

Soils and Weather

Soils at the BARTAD site are composed of oolitic limestone sediments formed during the Pliestocene Era. Solution of the limestone by rain and sea water during the ice age resulted in the typical flat topography containing numerous sink holes and solution channels. The water table at the experimental site is approximately 4 feet below the soil surface.

The pH values of the soils on site range from 7.8 to 8.2. Typically for the site soil P levels are very low, K levels are low to medium, calcium levels are very high and magnesium levels medium. Typical soil levels of several other elements are: aluminum .20 ppm (very low), manganese 3 ppm (very low), iron 10 ppm (low), copper 14 ppm (normal), zinc less than 20 ppm (low) and sodium less than 50 ppm (normal).

Rainfall and temperature data for the period of the study taken from official BARTAD records are given in Table 1. Precipitation at the site is approximately 46-52 inches annually with the dry season beginning in December and ending in May. However, as indicated in Table 1, seasonal rainfall from year to year may be highly variable and has a marked influence on total and seasonal crop production.

Materials and Methods

Species and Varieties

Species used in this trial were chosen in consultation with Dr. Albert E. Kretschmer, Agricultural Research Center, Ft. Pierce, Florida, Dr.'s A. Sotomayor-Rios and Jose Vicente-Chandler, Puerto Rico Agricultural Experiment Station, and Dr. A. J. Oakes, USDA-ARS, Beltsville Based on known characteristics of the species, observations of their growing in the Bahamas, their performance in Florida and Puerto Rico, and the availability of planting materials. Except for common pangolo, vegetative materials used in

Table 1. Average Temperature and Rainfall Data by Months, Jan. 1975 - Sept. 1977 (BARTAD).

	1975				1976				1977			
	Rainfall Inches	Temperature F° Avg.	Min.	Max.	Rainfall Inches	Temperature F° Avg.	Min.	Max.	Rainfall Inches	Temperature F° Avg.	Min.	Max.
January	4.43	70	51	84	.55	64	42	80	.61	63	28	84
February	3.65	70	55	86	3.95	66	44	84	1.80	66	48	89
March	1.42	69	47	88	.16	72	50	86	.46	73	51	88
April	.69	73	51	89	1.14	73	52	87	.66	73	50	90
May	5.63	75	59	90	6.85	77	62	89	14.73	83	62	94
June	6.75	78	63	91	14.35	76	62	86	6.59	78	65	91
July	5.19	79	66	90	.89	79	67	94	3.87	80	68	91
August	2.33	80	63	91	4.30	79	66	92	5.33	80	72	89
September	5.39	80	68	89	7.48	78	64	91	10.25	79	70	88
October	4.41	78	60	88	7.93	76	56	90				
November	6.44	74	50	85	3.78	74	55	91				
December	1.80	68	48	83	2.23	70	42	85				
Total	48.13				53.88							

this study were obtained either from the Ft. Pierce or the Puerto Rico Experiment Stations.

Brachiaria brizantha (Palisadegrass). A native of tropical Africa it is a variable, coarse, rhizomatais, somewhat erect perennial grass. It is adapted to a wide range of soil conditions but prefers warm humid climates. It is said, however, to continue growth for extended periods after rains cease. It is considered a valuable pasture grass in the more humid tropical areas, forming a coarse open turf when grazed and is considered compatible with several tropical viny forage legumes such as siratro. Material evaluated in this trial was an increase of PRPI 1525 brought in from Puerto Rico in January 1974.

Brachiaria mutica (Paragrass). A native of tropical Africa and tropical South America this species is now widely distributed in most humid tropical and subtropical areas. It grows best on moist soils, but is said to make little growth during dry weather. It is generally propagated by planting stem cuttings, or scattering cut stems on the surface and covering by disking. The strain Paragrass is widely cultivated on Southern Rhodesia and is considered much more palatable than usual strains. Material evaluated in this trial was an increase of PRPI 6451 brought in from Puerto Rico, in January 1974.

Brachiaria ruziziensis (Congograss or Ruzigrass). A native of the Ruzizi plains in the Congo, Congograss is described as an insect and disease resistant, vigorous, stoloniferous perennial with erect to decumbent stems which root at the base. It can be propagated by both seed and stem cuttings. This species is very similar to Brachiaria decumbens except that it is said to produce light green, broader leaves. Material evaluated in this trial was an increase in USDA PI 247404 brought in from Puerto Rico in January 1974.

Cynodon dactylon (Coast Cross 1 Bermudagrass). The most important pasture grass in the Southeastern United States, Bermudagrass is a very variable, fine-leaved perennial spreading by stolons and rhizomes and forming a dense sod. In the tropics this species is most common in areas with 25 to 70 inches of rainfall. It is adapted to a wide range of soils from sands to heavy clays but grows best on moist, well-drained medium to heavy soils. Coast Cross 1 is an F^1 hybrid between coastal Bermudagrass and an introduction from Kenya. In U. S. trials it has been taller growing, higher yielding, more drought tolerant and more palatable than other Bermudagrass varieties.

Cynodon nlemfuensis var. nlemfuensis (Stargrass selection 2341). Originally known as C. plectostachyus this species was later re-classified in Puerto Rico as C. nlemfuensis. Stargrass selection 2341 is considered one of the outstanding vegetatively propagated forages in the Caribbean and surrounding countries. The material evaluated in this trial was an increase of PRPI 2341 brought in from Puerto Rico in January 1974.

Cynodon plectostachyus (African Stargrass). A native of Each Africa this species is a low growing, dense, turf producing perennial grass that spreads by easily rooting creeping stems. A tropical species it is widely adapted to a wide range of soil conditions and grows well at 25 inches annual rainfall and above. It is used primarily for pasture either alone with nitrogen or in combination with other low growing species of grasses and legumes. The material evaluated in this trial was an increase of USDA PI 300935 brought in from Puerto Rico in January 1974.

Digitaria decumbens (Common Pangolagrass). A native of South Africa, pangola is a low growing, creeping perennial that spreads by long, trailing rooted runners, and by spreading leafy flowering stems often rooting at node. It grows well on a wide range of soils and flourishes with abundant rainfall, requiring more than 40 inches yearly. It produces an open turf and as a result grows well with a number of tropical legumes such as siratro. Material evaluated in this trial was an increase of pangolagrass already growing on North Andros.

Digitaria decumbens (Transvala digitgrass). The African origin of Transvale is between Nelspririt and White River in Transvaal, South Africa. Similar to pangola in general growth characteristics Transvala is resistant to pangola stunt virus and sting nematode, two serious pests of pangola in many areas of the tropical world. Material evaluated in this trial was an increase of Transvala brought in from Ft. Pierce, Florida in January 1973.

Hemarthria altissima (Bigalta). A native of Africa, H. altissima is a highly variable, widely adapted tropical grass. Established vegetatively it is a very aggressive and competitive grass with a rapid growth rate and recovery following defoliation. It is tolerant of both drought and cold, is said to tolerate heavy grazing and trampling and has high livestock acceptance. The material evaluated in this trial was an increase of USDA PI 29995 originally collected in South Africa by Dr. Jack Oakes and brought in to Andros from Puerto Rico in January 1974. This cultivar has been jointly released by the University of Florida and Soil Conservation Service as "Bigalta".

Hemarthria altissima (Redalta). General description the same as for Bigalta except that morphologically the plants are smaller, including finer stems with a reddish cast and a finer, leafier growth. The material evaluated in this trial was an increase of USDA PI 29993 originally collected in South Africa by Dr. Jack Oakes and brought to Andros in January 1974 from the Ft. Pierce, Florida Agricultural Research Center.

Land Preparation:

The area in which the experiment was established was rough cleared in the fall of 1973, disked several times with the D-8 tractor and Rome disk and then rolled several times with a grid roller.

Prior to planting in 1974 larger rocks were removed by hand, the area was redisked with a small disk, cultipacked and prepared for planting.

Fertilization:

The over-all fertility program was based on soil samples taken at the time the Project was initiated. A total of 1700 pounds/A of an 8-18-8 special misfertilizer containing micronutrients was broadcast by hand and disked into a depth of approximately three inches prior to planting. Sources of the primary foods in the fertilizer were sulfate of ammonia, mono-ammonium phosphate, sulfate-potash-magnesium, and ammonium nitrate. Amounts and sources of secondary plant foods, were magnesium MgO 6.75% (sulfate-potash-magnesium), manganese MnO 1.70%

(manganese frit), boron B_2O_3 .28% (borax), copper CuO .93% (copper sulfate) and zinc ZnO 1.9% (zinc sulfate).

Forty pounds of nitrogen from sulfate of ammonia were broadcast after each harvest while 200 pounds per acre from triple superphosphate and 200 pounds per acre of K_2O from sulfate-potash-magnesium were applied annually.

Establishment:

Following fertilization and disking the plot area was cultipacked. Individual 5 x 13 plots consisting of four rows of vegetative material, cut into approximately six inch lengths, were planted twelve inches apart across each plot using a Bermuda King sprigger on May 8 and 9, 1975. The mechanical planter was disconnected and two men rode on the machine to drop the material into the rows. A randomized block design with four replications was used. Irrigation was applied immediately after planting and several times during the first week. No further irrigation was used.

Harvest Methods:

The first three harvests were made using a tractor drawn flail harvester. Plots harvested for yield were 32 inches wide by 10 feet long. The remaining harvests were made using a Carter Flail harvester 36 inches wide. For all harvests the total sample was weighed and a subsample taken for moisture determination.

Moisture samples were dried in a fuel-oil heated forced air dryer at 135°F for seven days. After weighing the dry subsamples were composited across replications and ground with a Wiley Mill through a 1 mm screen. Ground samples for six of the first seven harvests (approximately one year) were analyzed for crude protein and IVDMD (in vitro dry matter disappearance) at the Pennsylvania State University. Samples from the sixth harvests were destroyed in a dryer fire on site.

Results and Discussion

Dry Matter Yields:

Dry matter yields by cuttings for the ten grasses by approximately twelve month periods are presented in tables 2 and 3. Total production for the two years is summarized in table 4. As indicated the first harvest was made August 25, 1975, 108 days after planting. Cutting intervals during the two years ranges from a minimum of 35 days to a maximum of 80 days depending on rainfall, temperature, day length and other factors.

Total dry matter yields for the two year perios (16 harvests) ranged from 9.55 T/A for palisadegrass to 13.71 T/A for bigalta grass (table 4). Bigalta, the top yielding grass, outyielded the next most productive grass, redalta by 2.08 T/A. This difference was statiscally significant. The next six

Table 2. Dry Matter yield of 10 Vegetatively Propagated Grasses Tons Per Acre for the First 7 Harvests (approximately one year).

	Harvest Date							
Entry	8/25/75	10/10/75	12/15/75	3/5/76	5/12/76	6/24/76	9/2/76	Total
	DM Tons/A							
H. altissima (Bigalta)	1.38	1.41	.62	.53	1.56	3.16	1.09	9.75
H. altissima (Redalta)	.66	1.25	.32	.50	.83	2.67	1.22	7.45
B. mutica (Paragrass)	2.84	.82	1.26	.60	.60	1.79	.62	8.53
C. Plectostaahyus (African Star)	1.57	.70	.55	.65	.69	2.24	.86	7.26
D. decumbens Pangola)	1.39	.84	.34	.54	.76	2.40	.87	7.14
B. ruziziensus (Ruzi)	2.48	.74	.24	.13	.34	2.61	.79	7.33
C. dactylon (Coast Cross 1)	1.57	1.13	.60	.75	.77	1.64	.93	7.39
D. decumbens (Transvala)	.83	.79	.45	.49	.71	2.05	.68	6.00
C. nlemfuensis (Stargrass 2341)	1.28	.95	.45	.73	.72	1.44	.93	6.50
B. Brizantha (Palisada)	.73	1.05	.29	.57	.50	2.14	.79	6.07
L.S.D. .05	1.05	.46	.45	.21	.41	1.02	.34	1.91

Table 3. Dry Matter yield of 10 Vegetatively Propagated Grasses in Tons Per Acre for the Second 9 Harvests (approximately one year).

	Harvest Date									
Entry	11/5/76	1/18/77	2/22/77	3/29/77	5/3/77	6/7/77	7/12/77	8/16/77	9/20/77	Total
	DM Tons/A									
Bigalta	.79	.61	.06	.44	.30	.69	.54	.22	.31	3.96
Redalta	.39	.52	.09	.36	.30	.80	.85	.39	.48	4.18
Paragrass	.46	.51	.05	.24	.07	.52	.46	.22	.45	2.98
African stargrass	.69	.52	.03	.38	.17	.34	.45	.25	.35	3.18
Pangola	.36	.26	.03	.50	.15	.60	.44	.34	.46	3.14
Ruzigrass	.58	.24	.02	.28	.03	.50	.41	.36	.46	2.88
Coast Cross 1	.74	.50	.09	.35	.05	.37	.45	.16	.06	2.77
Transvala	.48	.36	.07	.48	.18	.74	.69	.31	.50	3.81
Stargrass 2341	.82	.47	.04	.30	.06	.34	.51	.31	.33	3.18
Palisadegrass	.54	.50	.04	.30	.04	.38	.63	.29	.76	3.48
L. S. D. .05	.19	.20	.07	.27	.15	.26	.32	.15	.28	.92

Table 4. Two year Total Dry Matter Yields of 10 Vegetatively Propagated Grasses in Tons Per Acre.

Entry	First Year	Second Year	Total
	----------DM Tons/A----------		
Bigalta	9.75	3.96	13.71
Redalta	7.45	4.18	11.63
Paragrass	8.53	2.98	11.51
African stargrass	7.26	3.18	10.44
Pangola	7.14	3.14	10.28
Ruzigrass	7.33	2.88	10.21
Coast Cross 1	7.39	2.77	10.16
Transvala	6.00	3.81	9.81
Stargrsss 2341	6.50	3.18	9.68
Palisadegrass	6.07	3.48	9.55
L.S.D. .05	1.91	.92	1.76

grasses yielded from 10.16 T/A to 11.63 T/A and were not significantly different from each other. The total dry matter yields for the first seven harvests, approximately 1 year, ranged from 6.00 T/A for Transvala to 9.75 T/A for bigalta (table 2). Bigalta and paragrass yields were not significantly different during this period. The yield of bigalta was, however, significantly higher than the yields of all grasses except paragran. Redalta had the third highest yield, 7.45 T/A dry matter.

Total dry matter yields during the second year of harvest were approximately one half as large as the first year's yields, (table 3), ranging from 2.77 T/A to 4.18 T/A. Redalta had the highest total yield, 4.18 T/A, but was not significantly different from bigalta, 3.96 T/A, or Transvala, [illegible].81 T/A. The differences in yields during the second year were largely due to two factors. One, the first recorded frost for North Andros occured during January 1977. All of the grasses were severly burned back by the frost and apparently the effects of this damage plus the cool weather that follows affected production the rest of the year. Two, the harvest intervals were shorted to more closely equal the intervals used in grazing trials.

Forage Quality:

Crude protein values for six of the first seven harvests (approximately one year) are shown in table 5. Samples for one harvest were destroyed in a dryer fire on site.

Percent crude protein averaged over the seven harvests ranged from 5.39 to 6.84. In general bigalta and paragrass tended to be low in crude protein while the fine stemmed grasses, Transvala, pangola and coast cross 1 bermudagrass tended to be highest in crude protein. There was no consistent seasonal difference in protein levels among these grasses.

IVDMD values for the 10 grasses are shown in table 6. The value of IVDMD analyses for estimating the nutritive value of tropical grasses is known to be limited compared with its value in estimating the nutritive value of temperate species. For example, with tropical species the relationship between IVDMD and dry matter intake is frequently poor compared with the same relationship with temperate species. However for the purpose of this study it was agreed that IVMDM analyses would provide a satisfactory measure of quality for separating species.

As was true with protein there was considerable variation in IVDMD from grass to grass both within and between harvests. However, bigalta, the highest yielding grass, also appeared to be consistently high in IVDMD, whereas redalta, the stargrasses and bermudagrass were usually low.

Growth Pattern

The grasses evaluated in this study are all of tropical origins. Therefore, they are sensitive to cool temperatures. All of the grasses tended to be shorter during the cooler months (table 7), and all were severly injured by a frost during January 1977.

Table 5. Crude Protein Perventage of 10 Vegetatively Propagated Grasses Over 7 Harvests (Approximately one Year).

Entry	Harvest Date 8/25/75	10/10/75	12/15/75	3/5/76	5/12/76	6/24/76	9/2/76	Avg all Cuts
	% CP							
Bigalta	5.12	4.95	5.12	6.48	4.35		6.31	5.39
Redalta	5.91	4.43	6.30	7.36	6.53		5.44	5.99
Paragrass	5.60	5.05	4.79	5.65	5.87		(2)	5.39
African Star-grass	6.64	7.05	5.21	5.84	6.17		6.72	6.27
Pangola	5.23	7.98	7.14	7.26	5.62	Missing (1)	5.82	6.51
Ruzigrass	5.26	6.79	5.24	6.17	5.94		6.41	5.97
Coast Cross 1	6.47	7.47	6.19	6.23	6.27		6.72	6.56
Transvala	6.60	6.59	7.62	7.54	6.30		6.41	6.84
Stargrass 2341	5.28	7.49	5.82	5.66	6.52		5.78	6.09
Palisada	5.68	6.40	6.82	8.37	5.91		5.25	6.40
Average	5.78	6.42	6.02	6.66	5.95		6.09	6.14

(1) Samples burned in a dryer fire.
(2) Missing sample.

Table 6. IVDMD Percentage of 10 Vegetatively Propagated Grasses Over 7 Harvests (Approximately One Year).

Entry	Harvest Date 8/25/75	10/10/75	12/15/75	3/5/76	5/12/76	6/24/76	9/2/76	Avg. all Cuts
	% IVDMD							
Bigalta	52.74	62.94	61.14	57.78	53.10		54.39	56.51
Redalta	52.95	51.27	43.83	38.08	44.44		49.23	46.63
Paragrass	46.46	55.68	49.32	46.68	42.43		(2)	48.11
African Stargrass	54.68	51.94	47.85	40.67	43.13		44.91	47.20
Pangola	52.18	53.46	45.87	56.85	49.06		46.12	50.59
Ruzigrass	51.11	61.79	56.15	48.84	52.47	Missing (1)	53.17	53.92
Coast Cross 1	46.11	52.48	45.31	46.81	40.80		44.88	46.06
Transvala	53.14	53.36	47.88	43.91	44.08		48.00	48.39
Stargrass 2341	47.35	50.69	45.30	41.06	40.68		51.54	47.60
Palisada	54.63	55.90	55.55	56.92	50.55		51.47	54.17
Average	51.13	54.95	49.82	47.46	46.07		49.30	49.92

(1) Samples burned in a dryer fire.
(2) Missing sample.

Table 7. Average Height in Inches of 10 Vegetatively Propagated Grasses Over an Approximately Two Year Period.

	Harvest Date															
Entry	8/ 25/ 75	10/ 10/ 75	12/ 15/ 75	3/ 5/ 75	5/ 12/ 76	6/ 24/ 76	9/ 2/ 76	11/ 5/ 76	1/ 18/ 77	2/ 22/ 77	3/ 29/ 77	5/ 3/ 77	6/ 7/ 77	7/ 13/ 77	8/ 16 77	9/ 21/ 77
	In.															
Bigalta	23	33	19	14	18	29	26	20	17	12	15	Not Recorded	25	18	Not Recorded	18
Redalta	19	27	14	14	14	22	17	15	14	12	14		18	17		16
Paragrass	24	25	15	10	9	19	16	17	12	7	8		14	13		15
African Stargrass	23	26	14	9	10	19	17	18	13	8	10		13	13		16
Pangola	24	18	10	11	12	20	14	11	10	10	9		14	13		13
Ruzigrass	24	22	11	10	8	24	18	16	10	8	7		14	13		16
Coast Cross 1	22	24	17	14	12	21	16	20	15	11	16		14	15		12
Transvala	18	18	12	10	11	18	14	12	12	10	9		18	13		14
Stargrass 2341	26	28	13	11	11	20	20	19	11	8	9		12	13		13
Palisadegrass	19	22	9	10	8	16	12	13	11	9	8		10	10		13

Under Androsian conditions all 10 of the grasses produced seed heads at sometime during the experiment (table 8). The largest amount of heading took place during the period of November through May. But some heading occured during the summer months.

Disease and Insect Problems

During the period of the experiment none of the grasses tested showed any serious disease problems.

The only serious insect problem noted on any of the tested grasses was the two-lined spittlebug, Prosopie bicincta. This insect was found on Transvala, pangola, coast cross 1 bermudagrass, african stargrass and stargrass 2341. In the research plots it caused little damage, but in larger grazing trials African stargrass, and especially Transvala, were injured enough to reduce yields and stand.

Stand Persistance

Stands for all species were considered good to excellent throughout most of the experiment. Stands varied somewhat from harvest to harvest but since all of the grasses spread by rhizomes or stolons, or both, bare on thin areas were usually filled in by growth from surrounding areas. However, by the end of the experiment stands of several of the grasses were thinning out. The poorest stand was coast cross 1 with only a 10% stand (table 9). Other grasses which had thinned out by the end of the trial included: bigalta, paragrass, stargrass 2341, African stargrass and Transvala. As the stands of grass decreased, the percentage of weeds tended to increase (table 10).

The poorer stands which were present at the end of the trial could probably have been improved by applying a larger amount of fertilizer and allowing a longer rest period.

Application of Findings to Andros

The results of this initial study indicates that with reasonable fertility and management several of the vegetatively propagated grasses have the potential to yield 5 or more tons dry matter per acre per yield with bigalta the most productive. Production wise, over a 2 year harvest period, the top yielding vegetatively propagated grasses and the top yielding grasses established from seed were very similar (see Final Report #21, Performance of Several Perennial Grass Species and Varieties Propagated by seed at the BARTAD Project, North Andros Island, Bahamas).

In general crude protein values, even when fertilized with approximately 300 lb/A/year of nitrogen, would be considered inadequate except for nonlactating beef cows and ewes. While there was considerable variation in IVDMD values for

Table 8. Average Percentage of Plants of 10 Vegetatively Propagated Grasses Showing Heads Over an Approximately Two Year Period.

Entry	Harvest Date 8/25/75	10/10/75	12/15/75	3/5/75	5/12/76	6/24/76	9/2/76	11/5/76	1/18/77	2/22/77	3/29/77	5/3/77	6/7/77	7/13/77	8/16/77	9/21/77
	%															
Bigalta	0	0	0	0	0	32	0	0	0	0	0	Not Recorded	0	0	Not Recorded	0
Redalta	0	0	0	0	T(1)	0	0	0	0	0	0		0	0		0
Paragrass	0	T(1)	75	12	14	0	0	1	44	0	0		2	0		0
African Stargrass	0	0	98	100	98	5	0	0	92	0	87		30	44		0
Pangola	0	10	0	0	7	92	12	0	0	0	0		11	27		0
Ruzigrass	0	T(1)	77	2	3	0	0	6	2	0	T(1)		0	1		0
Coast Cross 1	0	0	57	75	90	0	0	0	32	0	60		0	0		0
Transvala	0	0	0	22	21	1	0	0	0	0	2		3	2		0
Stargrass 2341	0	0	94	100	97	4	0	0	98	0	92		35	36		0
Palisadegrass	0	0	19	44	9	36	0	16	0	0	4		1	32		0

(1) T = Trace of heads but less than 1%.

Table 9. Average Percent Stand of 10 Vegetatively Propagated Grasses for the Period of March 1977 through September 1977.

Entry	% Stand 3/29/77	6/7/77	7/13/77	9/21/77
	%			
Bigalta	97	94	91	56
Redalta	99	98	98	97
Paragrass	79	89	91	59
African stargrass	92	87	84	70
Pangola	95	95	96	90
Ruzigrass	85	90	95	82
Coast Cross 1	81	57	59	10
Transvala	94	90	88	71
Stargrass 2341	89	85	84	65
Palisadegrass	95	95	99	98

Table 10. Average Percent Weeds Present in the Stands of 10 Vegetatively Propagated Grasses for the Period of March 1977 through September 1977.

Entry	3/29	6/7	7/13	9/21
	%			
Bigalta	0	1	5	18
Redalta	0	0	0	0
Paragrass	6	1	6	9
African stargrass	2	3	12	15
Pangola	1	1	2	3
Ruzigrass	5	2	3	8
Coast Cross 1	11	26	22	64
Transvala	4	4	10	15
Stragrass 2341	2	6	11	32
Palisadegrass	0	0	0	0

the various grasses appeared to be consistently high whereas the stargrass and bermudagrass were usually low. Crude protein and IVDMD values in this study for bigalta, African stargrass and Transvala are very similar to those found in a grazing trial on the BARTAD project (see Final Report #39, Comparison of Transvala, Stargrass and Bigalta Pastures for Growing Beef Cattle).

On the basis of this and other studies at BARTAD, bigalta and African stargrass would be considered two of the most promising vegetatively propagated grasses for use on Andros. The advantage of these grasses over seeded grasses would be that planting material could be made available from nurseries maintained on the research station. The disadvantage is the high labor input required for establishment. In any case if these grasses are used for pastures on Andros, they should be established in combination with legumes such as siratro, greenleaf desmodium, or glycine.