

# SUERTE ATRA P ASPALUM

## Its Management And Utilization

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Institute of Food and Agricultural Sciences  
University of Florida, Gainesville

R.S. Kalmbacher, W.F. Brown, D.L. Colvin, L.S. Dunavin,  
A.E. Kretschmer, Jr., F. G. Martin, J.J. Mullahey, and J.E. Rechcigl



For questions or comments regarding this publication contact

[Rob Kalmbacher](#)

## AUTHORS

R.S. Kalmbacher is professor, Range Cattle REC. Contributors include: W.F. Brown and J.E. Rechcigl, professors, Range Cattle REC at Ona; L.S. Dunavin, associate professor, Jay REC; D.L. Colvin and F.G. Martin, professors, Gainesville; J.J. Mullahey, associate professor, Southwest REC at Immokalee; and A.E. Kretschmer, Jr., professor, Indian River REC.

## ACKNOWLEDGEMENTS

Suerte would not be released within 5 years of its introduction without the devotion and hard work of Mr. Art Luke, Technician at the Range Cattle REC, who was involved in every aspect of field testing in addition to his other duties. Nor would the Cultivar be released without the special support provided by Dr. Findlay Pate, Director at the Range Cattle REC. Finally, we are grateful to Mr. David Ward, friend and neighbor, who provided cattle and use of land for the registered seed nursery.

## SUMMARY

**Description:** 'Suerte' atra Paspalum is a warm season, perennial bunchgrass which remains leafy and productive through November in central Florida. If allowed, it flowers and sets seed in October. Suerte, with its ability to provide high cattle weight gains from May to October, can be a part of a pasture program that includes bahiagrass, limpograss, or stargrass, all of which have their own special attributes.

Well adapted to flatwoods soils that are seasonally wet. Not recommended for soils that tend to be droughty. Has some cold tolerance ( 17° F) and grows from Jay, FL in the Panhandle to Immokalee near the Everglades. Leaves are very frost sensitive.

**Establishment:** Drill at 5.0 lb/A or broadcast at 8 to 10 lb/A from June to mid-September in central Florida.

**Fertilization:** Soil pH requirement is 5.5. Fertilization for full season grazing is 150 (to 200) lb N/A split between 100 lb/A in March, and 50 lb/A in June (and August). Annually apply 40 and 80 lb/A of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively.

**Grazing:** Rotationally graze and avoid under-utilization. Graze at the equivalent of 2.0 to 2.5, 500-lb yearlings/A (or a 1000 lb cow and calf) from late-April to mid-October. Excellent for growing cattle. Two-year average daily gain at 2.8 steers/A over 168-day seasons was 1.2 lb/head/day with liveweight gains at 580 lb/A.

**Insects:** Armyworms can be a problem (late-summer and fall). Some mole cricket damage observed.

**Disease:** No problem to date.

**Nematodes:** No problem to date.

Cover: Eighty yearling heifers at Quail Creek Ranch, Hardee Co., FL, grazed 40 acres of Suerte from April 25 to August 23, 1994 with an average gain of 1.25 lb/head/day and total gain of 300 lb/A for the 119-day period. Cattle were removed in August to allow for a seed harvest, which occurred on October 28 when 88 lb/A (see inside back cover for metric) of seed was harvested. Mature forage remaining after seed harvest made 3.8 tons/A of hay on November 10.

## IMPORTANT CHARACTERISTICS

### Suerte Atra Paspalum

#### *Advantages*

- Adapted to wet, acid soils.
- Quickly established: 75 days from June seeding to grazing.
- Good seedling vigor; very competitive, perennial.
- Tolerates close grazing.
- Excellent cattle performance.

#### *Disadvantages*

- Bunchgrass with open spaces for weeds.
- Leaves very frost sensitive.
- Little cool or dry season forage production.
- Relatively short grazing season (about 170 days when grazed at 2.5 yearlings/acre).
- Relatively low crude protein in summer.
- 2-year average daily gain of 1.2 lb/steer, liveweight gain of 580 lb/A in 168 days at 2.8 steers/A.
- Seedlings are killed by 2,4-D.
- Not recommended for dry sites.
- Remains leafy and vegetative until late-September in central Florida.
- Survived 17° F.

- Will reseed itself.
- Young plants intolerant of vehicular traffic (1 st year).
- Can become coarse with stems at seed set (if allowed).

## INTRODUCTION

'Suerte' atra paspalum *Paspalum Paspalum* Swallen, has the potential to be of benefit to Florida cattlemen and perhaps cattlemen in other parts of the tropical world. It has a unique combination of rapid establishment from seed and adaptation to wet, acid, and infertile soils. Leafy, palatable, highly digestible forage is produced and, consequently, young cattle perform well.

The name Suerte, which means luck in Spanish, reflects the ease with which we came upon a grass with these attributes, but luck has been followed by considerable hard work to develop the introduction to this point. It has been systematically tested at four research centers in Florida and has been observed on four ranches. This circular contains results of our testing and observation, which is by no means exhaustive after only 5 years. All environments cannot be tested, all the problems cannot be encountered, and the many innovations which ranchers will use to establish and manage Suerte are yet to be discovered.

Suerte is a Cultivar owned by the University of Florida. Seed is sold only through licensed seedsmen (see back cover for list) in cooperation with the Florida Foundation Seed Cooperative in Greenwood, FL.

## ORIGIN AND DESCRIPTION

Seed of a *Paspalum sp.*, thought to be *P. plicatum*, was collected by Mr. P.R. Rayman in a seasonally flooded area near Campo Grande, Mato Grosso, Brazil. A few grams of seed were sent to Florida in February 1990 by Mr. Rayman to Dr. A.E. Kretschmer, Jr. at the Indian River Research and Education Center (REC) at Fort Pierce, where it was cataloged as IRFL 658 and grown in the field. IRFL 658 was later identified as *P. atratum* Swallen by Mr. Tarciso Filgueiras, Brazilian botanist. Based on this identification, it was given the group name, atra Paspalum.

Atra Paspalum is a tetraploid ( $2n=4x=40$ ), and reproduction is the result of obligate apomixis (Cytological work was done by Dr. Byron Burson, USDA, Texas A&M University.). It is a bunchgrass forming tussocks 4- to 12-in. in diameter, depending on plant density, age, and degree of grazing. Short (1 to 2 in.) rhizomes give rise to tillers. When grazed very closely (2 to 3 in.) for several months, tussocks can lose identity and can be replaced by scattered tillers from these rhizomes. It has a very dense fibrous root system, and when growing on saturated soil, smooth, white pithy roots are found along with the darker, fibrous roots.

The leaf canopy of ungrazed plants can be 2.5- to 3-ft. tall and leaves are upright. Plants which are continuously and heavily grazed can be 3- to 4-in. tall with leaves growing almost flat on the ground. Leaves of establishing seedlings have this decumbens habit of growth, which gives the plant a competitive nature.

Leaf blades of ungrazed plants are 12- to 18-in. long and  $\frac{3}{4}$  to  $1\frac{1}{4}$ -in. wide. Basal leaves do not have trichomes (hairs), however at flowering the upper 6 to 7 leaf blades (those attached to the culm) have randomly and thinly scattered hairs up to about  $\frac{1}{2}$  in. long. These are only found on the outer quarters of the upper side of the leaf blade surface beginning near the collar and ending about 2 to 4 in. from the leaf-blade tip. There is a  $\frac{1}{32}$ - to  $\frac{1}{16}$ -in. long ligule at the collar (Fig. 1b).

At flowering, which occurs in October in Florida, this perennial grass is about 5- to 7-ft. tall (from ground level to the top of the seed head). The Inflorescence is about 6- to 8-in. long and is composed of about 10 to 13 or more rather narrowly ascending racemes (Fig. 1a). Lower racemes range from about 3.5- to 4.7-in. long, while upper racemes range from 2 to 3-in. long. There are about 100 to 140 spikelets on each lower raceme and about 40 to 100 on upper racemes. Spikelets are about  $\frac{1}{8}$ -in. long and  $\frac{1}{16}$ -in. wide, elliptic, slightly obovate, and glabrous (Figs. 1c, 1d). The tan seed has a chaffy cover (lemma and palea remain attached), which conceals a dark reddish-brown, shining fruit (Figs. 1e, 1f).

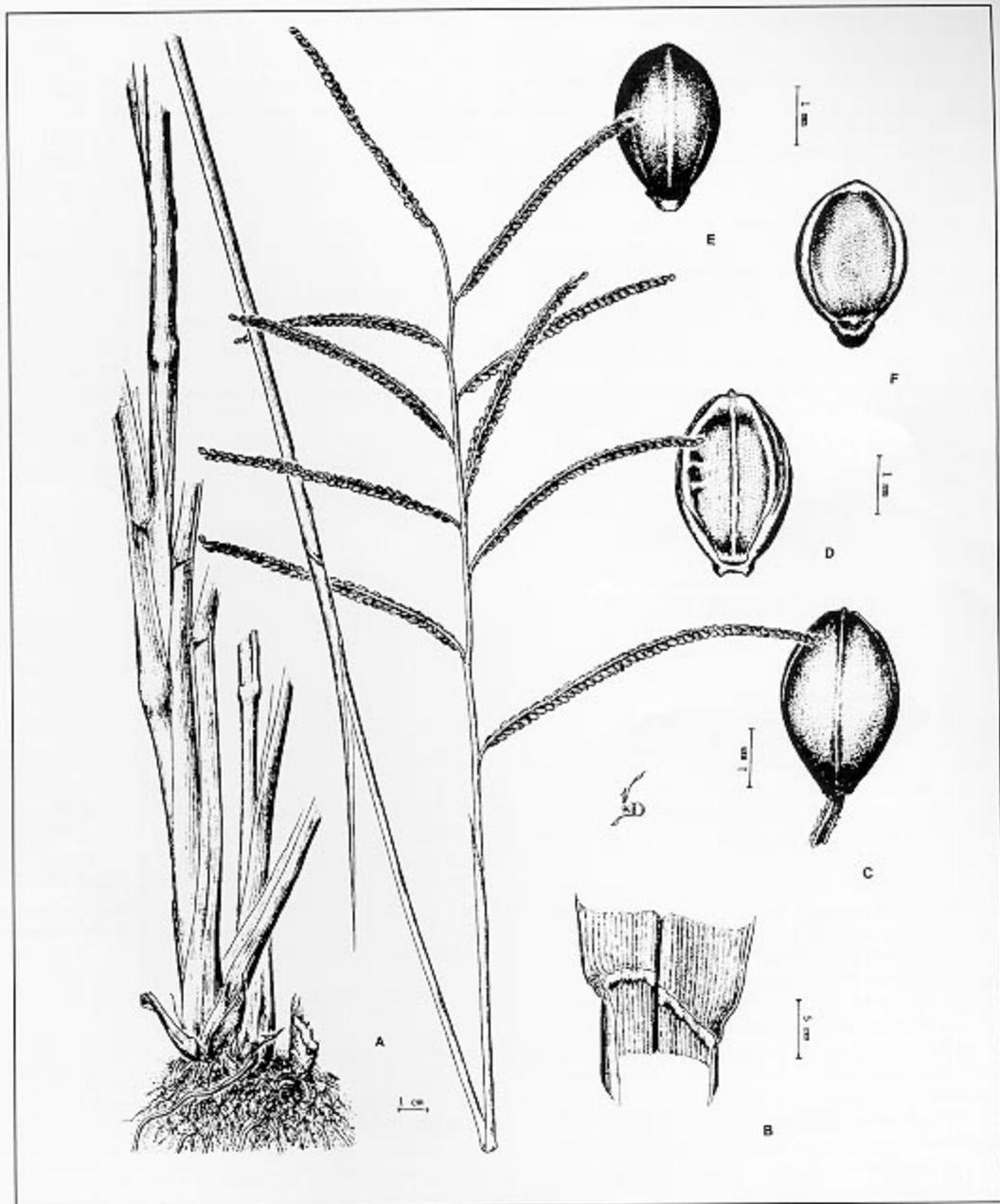


Figure 1. a) Portion of a tussock of 'Suerte' atrapaspalum emphasizing the base of a single tiller with leaf sheath, culm, and inflorescence as it appears in late-October; b) collar region showing the ligule; c and d) dorsal and ventral sides of a floret; e and f) dorsal and ventral sides of a caryopsis with lemma and palea attached (seed).  
 Footnote: Drawings by Vladimiro Dudas. Instituto de Botanica Darwinion. Buenos Aires, Argentina.

## REGION AND SITE ADAPTATION

Suerte can be grown from the Florida Panhandle to the Everglades. Although it has been tested for cold tolerance at Tifton, Ga.(2), where unharvested plants have survived 17°F, it has not been systematically tested outside of Florida. Plants did not survive the 1993-94 winter at Overton, TX(2) or Raleigh, N.C(2).

Suerte should be grown on soils that tend to be wet, such as seasonally saturated flatwoods. It will not establish from seedbeds flooded after seeding, but 2- to 3-week-old seedlings will tolerate standing water for several days. Established plants will tolerate flooded (up to 2 in.) soil for 3 to 4 weeks and saturated soil for several months. By comparison, limpgrass (*Hemarthria altissima*) will probably tolerate more water for a longer time than Suerte. On the other extreme, Suerte is **not recommended for deep, dry, sandy soils.**

## ESTABLISHMENT

### Seedbed Preparation

As with all perennial grasses, establishment success is related to the effort that goes into seedbed preparation. The best weed-free seedbed will result from pasture renovation that involves plowing or disking in the fall, planting a winter annual, followed by disking and seeding Suerte the following spring or summer. Second best is renovation that involves plowing and repeated disking in the late winter through the dry spring months and seeding at the beginning of the rainy season in June. Total failure can be expected by disking or chopping bahiagrass (*P notatum*) just prior to seeding Suerte. We have not succeeded when Suerte seed was broadcast on disked sod, or drilled in glyphosate-treated and untreated bahiagrass.

Insufficient soil moisture in the spring and the first frost in the fall limit the period when Suerte can be established. Late February or early-March seedings that utilize soil moisture from winter rain can be successful if seedlings can reach 5 to 6 weeks of age before the April and May dry season. Seed sown on dry soil will not germinate, and seedings made under these conditions run the risk of failure when rainfall is sufficient for germination, but not enough to assure establishment. On the other extreme, flooding for more than 24 hours will ruin a stand if it occurs during germination or before seedlings are about 2-in. tall.

The best time to seed Suerte in central and south-Florida is between June-1st and September-15th. In north-Florida, plants from an August 19, 1994 seeding at Jay did not survive 20° F on February 9, 1995, whereas plants from a July 26 seeding at Greenwood did survive 19° F on February 9. In light of the possibility of freeze damage, it may be best to seed before mid-July in north Florida.

### Soil pH

Soil pH above 5.5 is adequate for establishment. Forage production is not greatly affected by soil pH (Fig. 2). If bahiagrass pasture is being renovated to establish Suerte, soil pH is probably adequate. Land converted from native vegetation (pH 4.2 to 5.0) should receive about 3000 lb/A of limestone, preferably dolomite, which supplies Mg as well as Ca. When liming material is needed, it should be incorporated into the seedbed about 6 months before seeding to allow time to increase pH.

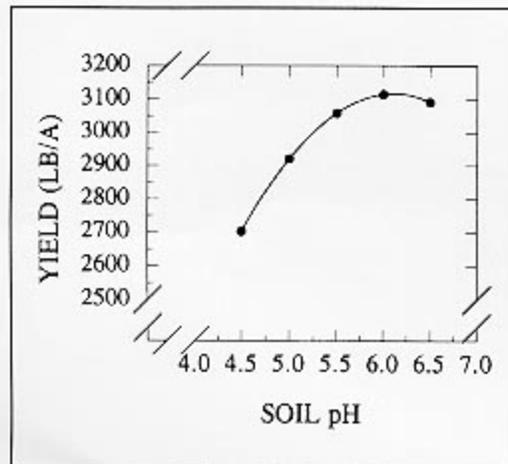


Figure 2. Average forage yield (dry matter) of 'Suerte' atrapaspalum cut every 42 days as a function of soil pH (Pomona fine sand). Curve and data points are predicted values based on field trials. Ona, FL. 1992 and 1993.

Footnote: Suerte was cut to a 6-in. stubble on 42-day intervals April 15 to August 31 and fertilized with a total annual application of 200-40-200 lb/A (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively), split into 4 equal applications.

### Seeding Rates and Methods

The recommended seeding rate for Suerte pasture is 5 lb/A if seed is drilled or 8 to 10 lb/A if seed is broadcast. Good seedlots have about 85% total germination (including dormant seed). There are about 163,000 seed/lb, which, at 50% germination (the minimum for certified seed by Florida law), has the potential to result in about 9 seedlings/ft<sup>2</sup> at 5 lb/A. In practice, 5 lb/A results in about 2 to 3 mature plants/ft<sup>2</sup> at 90 days after seeding, which is a good stand for grazing.

Procedures used to seed Suerte are similar to those for bahiagrass. Drilling or uniformly broadcasting seed on a well prepared, recently disked moist seedbed is recommended. Packing the seedbed immediately after seeding with a roller or cultipacker is very important to retain soil moisture, level the seedbed, provide good seed to soil contact, and result in greater and more uniform germination.

### Fertilization for Establishment

Fertilize with 50-30-40 lb/A (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively, plus micronutrients if needed) at seeding or after seedlings begin to emerge. Assuming good soil moisture at seeding, seedlings will begin to emerge after 1 week, and emergence will continue over the next several weeks. Apply an additional 50-0-40 lb/A of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively, 6 to 8 weeks after emergence. The pasture can be grazed about 10 to 12 weeks after a June seeding.

### Weed Control During Establishment

If a good seedbed has been prepared, the major annual weeds will be sedges (*Cyperaceae*) and broadleaf weeds. Competition from annuals will reduce tillering of Suerte seedlings and slow their development. Mowing is an option for weed control, but Suerte seedlings will not tolerate much

vehicular traffic. Marks left by the tractor and mower wheels, and places where clumps of mowed weeds have laid will be obvious for weeks.

One pt./A (0.5 lb/A active ingredient [ai]) of Banvel (dicamba) applied when Suerte seedlings are about 28-days old will do little to control sedges, but will provide good broadleaf control, provided weeds are small (< 6 in.) . At this time, Suerte seedlings should be 3- to 6-in. tall with 2 to 3 tillers, each with 3 to 4 leaves. Spraying Suerte seedlings with Banvel within 14 days after their emergence may result in injury or death.

Herbicides containing 2,4-D, such as Weedmaster, will injure or kill seedlings regardless of their age. For example, at 7 weeks after treatment with Weedmaster at 0.75 and 1.5 qt/A, Suerte seedling density was reduced 15 and 53%, respectively, compared to no herbicide. Even though some Suerte seedlings grew out of the damage from treatment with 0.75 qt/A of Weedmaster, they were stunted. Seedling loss and damage from 1.5 qt/A of Weedmaster was unacceptable.

### **Natural Reseeding in Pasture**

When a Suerte plant dies, adjacent plants will not spread into the vacant area by stolons or "runners" as will bahiagrass or bermudagrass (*Cynodon* spp.). The only way Suerte plant density can be maintained or increased is by the plant reseeding itself. The grass must produce seed which gives rise to seedlings that add to the population of plants. Not much is known about this aspect of Suerte except that it does occur. It may be desirable to allow Suerte to set seed every 2 to 3 years to assure a supply of seed in the soil. Allowing the grass to go to seed will also help shade-out competition from bahiagrass and common bermudagrass (*C. dactylon*).

Pastures that are lightly stocked (1 yearling/A) will produce abundant seed if cattle are removed by early September. Pastures that are stocked at 2 to 2.5 yearlings/A will produce almost no seed unless cattle are removed from pasture by early August. Removing cattle allows the grass to produce seed and prevents cattle from eating the seed heads. Cattle should be returned to heavily graze the pasture **after** seed has shattered. Mature Suerte can also be made into hay, which is discussed later. Burning the pasture in January or February to remove plant residue will help seedlings to develop after seed germinates in March. Graze as needed to keep new seedlings from being shaded out.

## **FORAGE YIELD AND NUTRITIVE VALUE**

This section contains information from small-plot clipping trials at three locations in Florida. All results are on a dry matter basis unless otherwise specified. The work was designed to provide information on how Suerte responds to defoliation. Such trials do not always approximate what occurs under grazing conditions and should be considered accordingly.

### **Jay (North Florida)**

*Comparative Study.* Suerte was seeded on April 22, 1992 and was compared to 9 other grasses in a replicated trial. Forage was harvested 4 times annually by cutting to a 4-in. stubble height. In 1993, plots were fertilized with 24-72-72 lb/A of NP<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively, in April; 68 lb/A of N in June; and 34 lb/A of N in July and August (total of 160 lb/A/yr of N). In 1994, fertilization was 32-96-96 lb/A of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively, in April; 68 lb/A of N in June, July, and August (total of 236 lb/A/yr of N).

Suerte produced little forage until July 1993 due to dry late-May and early-June conditions. Much of the growth of Suerte comes in July to September. Total forage production was 8000 and 8760 lb/A for 1993 and 1994, respectively (Table 1). Both 'Tifton 9' and 'Tifton 18' bahiagrasses tended to produce more forage than did Suerte because of their greater production in the spring.

Suerte survived 20° F in January 1994 and February 1995, which injured rhodesgrass (*Chloris gayana*). Average plant density of Suerte in May 1994 was 1.1 plants/ft(2) and 3 year old stands in June 1995 were still very good.

<b>Table 1. Yield, crude protein concentration and in vitro organic matter digestion (IVOMD) of 'Suerte' atra 'Paspalum compared to nine other grasses at Jay, FL.</b>				
Entry	Total Yield		1993 Average	
	1993	1994	Crude Protein	IVOMD
	DM,lb/A		%	
Suerte atra Paspalum	8000	8760	10.6	58.6
Tifton 18 bahiagrass	10200	11130	10.9	55.4
Tifton 9 bahiagrass	8750	10900	10.0	55.6
Pensacola bahiagrass	6300	6620	10.9	54.3
Argentine bahiagrass	6000	8200	11.5	54.9
Florakirk bermudagrass	4900	8250	11.3	62.0
Tifton 78 bermudagrass	3300	5100	12.3	57.3
Tifton 85 bermudagrass	1770	8060	11.9	57.0
Floralta limpograss	3100	6980	12.4	59.7
Callide rhodesgrass	6480	5970	11.1	62.6

LSD (P<0.05)	1460	2370	(1)	(1)
(1) Since crude protein and IVOMD are based on samples composited over replicates, there was no statistical analysis.				

Crude protein and in vitro organic matter digestion (IVOMD) of Suerte in 1993 averaged 10.6% and 58.6%, respectively (Table 2). Crude protein in June, July, August, and September was 10.6%, 10.0%, 8.4%, and 13.5%, respectively. Digestibility in June, July, August, and September was 64.9%, 63.2%, 62.0% and 44.4% IVOMD, respectively. Nutritive value of Suerte, based on whole plant samples, was greater than that of bahiagrasses and similar to bermudagrasses.

### Ona (Central Florida)

*Comparative Study.* 'Mott' dwarf elephantgrass (*Pennisetum purpureum*) has provided a high standard of forage quality against which other tropical grasses are often compared. Mott and Suerte appear similar in habit of growth, and their comparison in a replicated clipping trial is useful. Both grasses received 0, 100, 200, or 300 lb/A/yr of N and were cut (6-in. stubble) every 21, 42, or 63 days beginning on March 28 and ending on November 16, 1994.

Mott yielded more forage (9500 lb/A) than Suerte (8340 lb/A) during the 261-day growing season (Table 2). Both grasses were vegetative (all leaves) during the trial. The yield of grasses responded similarly to harvest frequency and N fertilizer. The major difference between the grasses was the time when forage was produced. Mott has very good drought tolerance and produced much of its forage between March and June when it was dry and relatively cool. Suerte produced most of its forage between July and September when it was wet and hot.

Nutritive value of Mott was greater than Suerte at all harvest frequencies and N fertilizer rates (Table 2). Average (March to November) crude protein in Suerte was below 6.0% when cut at greater than a 42-day interval. Suerte does not contain high levels of protein, especially when mature. High rates of N fertilizer do little to improve crude protein. Digestibility (IVOMD) of Suerte declined with an increase in harvest interval, but the loss was not as great as that of many grasses formerly tested in Florida. Suerte lost only 3.1 percentage units between 21- and 63-days of age. Suerte IVOMD did not improve with increases in N fertilizer. Mott, a grass that maintains a very high IVOMD level with age, increased in IVOMD as N fertilizer rate increased.

*Clipping Trials.* Suerte was established in a replicated trial in May 1991 and was cut to a 4-in. stubble height every 20, 40, and 60 days beginning on April 7, 1992 and 1993. Plants were fertilized with an annual total of 200-40-200 lb/A of NP<sub>2</sub>O, -K<sub>2</sub>O, respectively, split in four equal applications in March, May, July, and September.

Forage production from March 18 to November 13 was confined mostly to the rainy season (June to September) (Fig.3). Dry conditions in April and May and short days with cool temperatures in October limited production in the spring and fall, respectively. Periods of protracted drought in early June can curtail forage production. This is reflected in lower steer gain during this period, which will be discussed later.

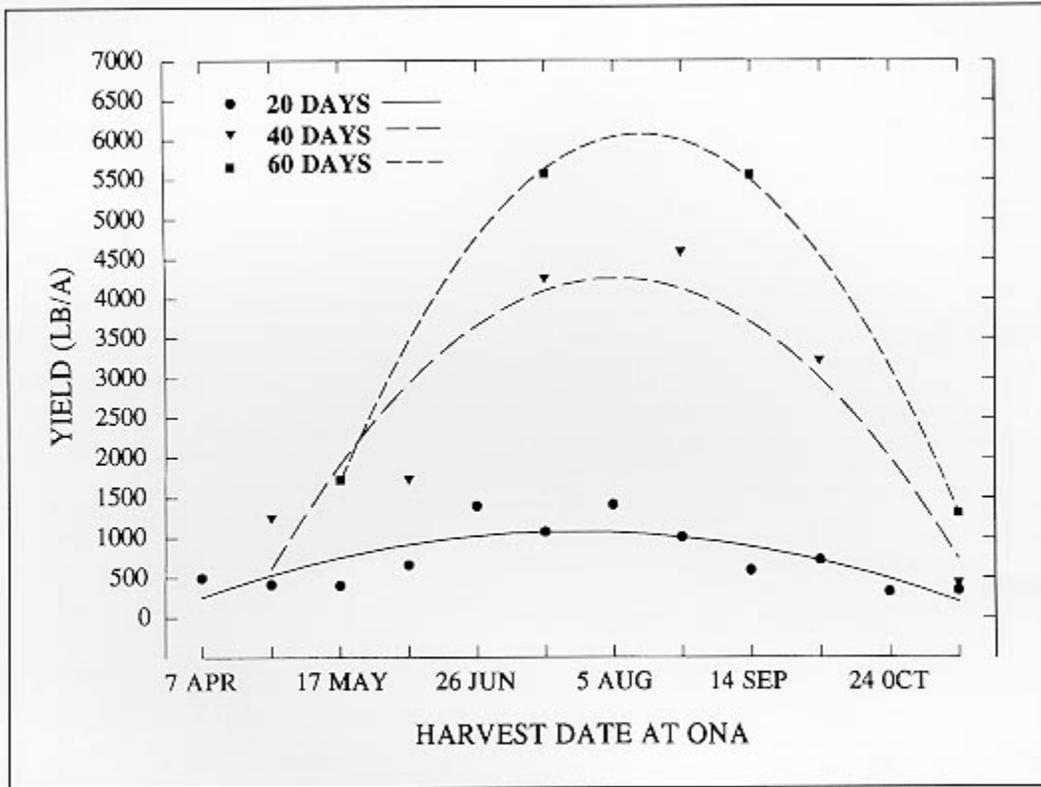


Figure 3. Forage yield (dry matter) of 'Suerte' atrapaspalum cut at a 4-in. stubble height. Average observed and predicted yields each 20-, 40-, and 60-day cutting interval are shown. Ona, FL. 1992 and 1993.  
Footnote: Total annual fertilization was 200-40-200 lb/A (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively) split into four, equal applications in March, May, June, and September.

**Table 2. Comparison of total forage yield, average crude protein and in vitro organic matter digestion (IVOMD)(March to November 1994) of 'Suerte' atrapaspalum vs. 'Mott' dwarf elephantgrass for effects due to harvest frequency and N fertilizer. Ona, FL.**

Harvest	Total Forage Yield(1)		Crude Protein		IVOMD	
	Suerte	Mott	Suerte	Mott	Suerte	Mott
Days	DM,lb/A		%			
21	5970	7640 **	7.3	11.6 **	57.7	69.9 **
42	8880	9870 **	5.7	8.6 **	56.3	67.1 **
63	10160	10990 **	4.9	7.1 **	54.6	64.1 **

	L(2)	L	L	L	L	L
N Fertilizer(3)						
lb/A/year						
0	6980	7690 **	5.7	8.6 **	56.4	66.7 **
100	7710	9380 **	5.7	8.9 **	56.4	66.7**
200	8860	9900 **	6.0	9.1 **	56.2	67.3**
300	9800	11030 **	6.6	9.7 **	55.9	67.5 **
	L	L	L	L	NS	L
(1) There was no interaction between grass and harvest or grass and fertilizer for yield or nutritive value, however, interaction means are shown for convenience.						
(2) L = response over harvest or fertilizer is linear (P<0.01).						
(3) 50 lb/A of N was applied per application. For 100 lb/A, N was applied in Mar. and June. For 200 lb/A, N was applied in Mar., May, July, and Sep. For 300 lb/A, N was applied in Mar., Apr., May, July, Aug., and Sep.						
** Difference between Suerte and Mott (P<0.01).						
ns No difference (P>0.05).						

Two-year average yield of forage cut every 20 days (12 times/year) was 740 lb/A at each harvest, and total annual production averaged 8850 lb/A. Average production over 6 dates when forage was cut every 40 days was 2580 lb/A at each harvest, and total annual production averaged 15,500 lb/A. Average production over 4 dates when forage was cut every 60 days was 3540 lb/A at each harvest, and total annual production averaged 14,150 lb/A.

When Suerte is cut repeatedly, it will not flower. Growing points (flower buds) are cut and removed in August. When the growing point is removed, those tillers die and are replaced by new vegetative tillers.

Cool season production from November 1992 to April 1993 (no frost during this period) averaged 410,1060, and 1640 lb/A for Suerte that had been Cut every 20, 40, and 60 days, respectively, during the previous (1992) growing season. Repeated defoliation to a 4-in. stubble in the growing season reduced cool season forage production.

Leaves of Suerte are very sensitive to cold (32° F) and are killed by frost. New growth is initiated within a few days after frost, but production is slight. Frosted grass deteriorates to about 4% crude protein and 35 to 40% IVOMD.

Crude protein and IVOMD of whole plant samples collected every 20, 40, and 60 days in the growing season are shown in Fig. 4. Two points are important here. First, Suerte, like other grasses in Florida, declined in crude protein and IVOMD in July and August. Declines in nutritive value, such as those observed in this clipping trial, are reflected in steer performance in July and August, as will be discussed later. Second, Suerte at 60-days of age was below the crude protein level suggested for maintenance of a dry cow. Two-year average crude protein of Suerte cut at 20, 40 or 60 days was 9.4, 7.5, and 6.2%, respectively. Digestibility was maintained fairly well through 60-days of age. Average IVOMD of 2(-), 40-, and 60-day-old Suerte was 58.1, 55.7, and 52.2%, respectively.

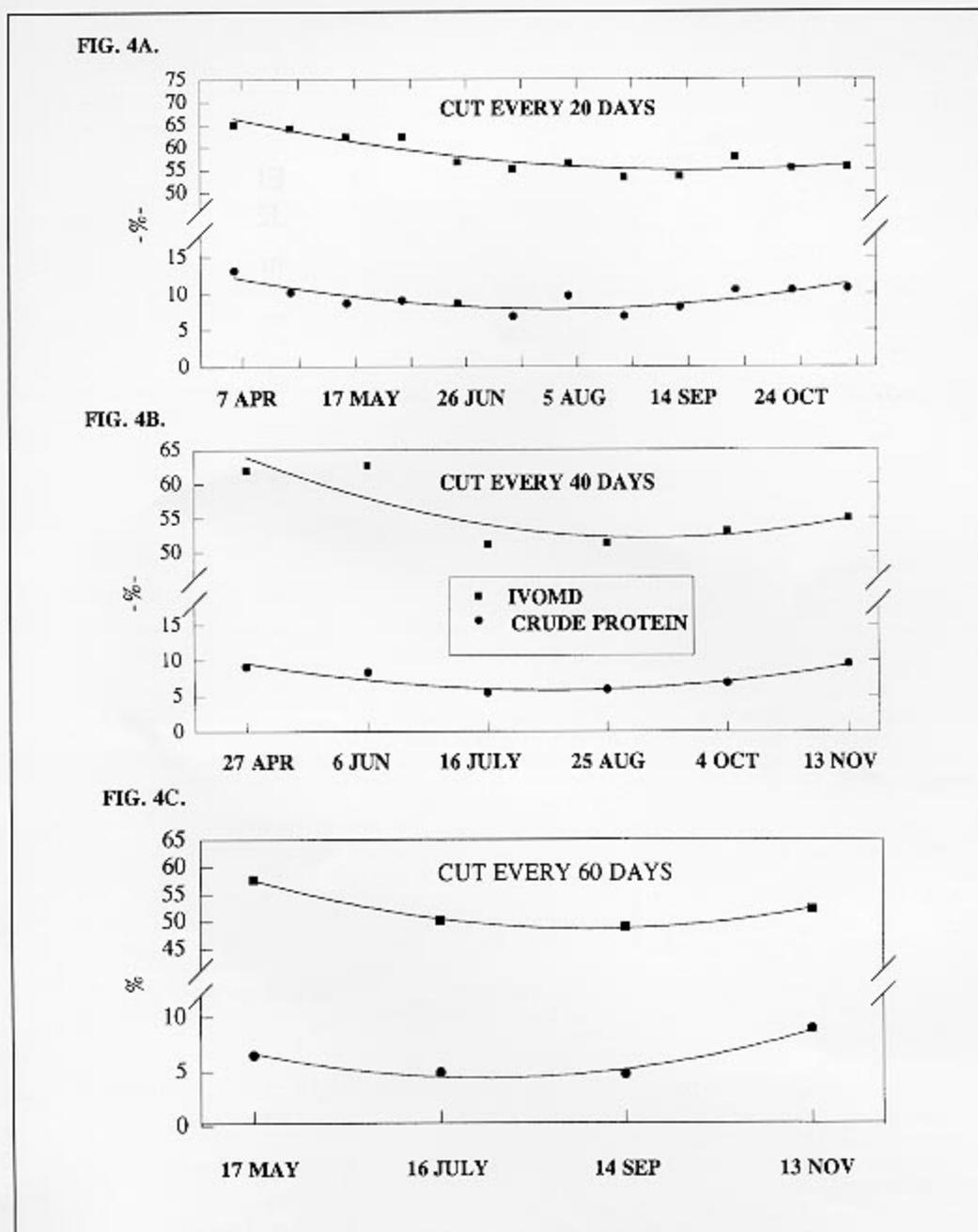


Figure 4. Crude protein and IVOMD (dry matter basis) in 'Suerte' atrapaspalum cut at: a) 20-day intervals, b) 40-day intervals, and c) 60-day intervals. Ona, FL. 1992 and 1993.

At the end of 2 years, after 24 cuttings to a 4-in. stubble, no plants had been killed. Defoliation every 20 days reduced plant vigor compared to cutting every 40 or 60 days, which was illustrated earlier through its effects on winter production. Tiller number at the end of the study averaged 41 tillers per plant, when cut every 20 days, compared to 52 and 65 tillers per plant when cut at 40- and 60-day intervals, respectively.

## Immokalee (South Florida)

*Clipping Trials.* Suerte was established in a replicated trial at the Southwest Florida REC in July 1992. In 1993 and 1994, the grass was subjected to the same cutting interval treatments used in the trial at Ona.

The response to cutting interval at Immokalee (Fig. 5) was similar to that at Ona (Fig. 3), but forage yields at Immokalee were about one half that of the "sister" trial at Ona. Average yield over 12 dates when cut at 20-day intervals was 430 lb/A at each harvest with total annual yield of 5190 lb/A (Fig.5). When cut every 40) days, average yield over P. dates was 1400 lb/A at each harvest with total yield of 8390 lb/A. At 60-day intervals, yield averaged 1600 lb/A at each harvest, and total yield was 6410 lb/A. The lower yields at Immokalee (compared to Ona) reflect a dry site and a dry 1993 growing season. During periods of drought, Suerte will roll its leaves inward and produce little forage. Nematodes were suspected at Immokalee, but an assay for nematodes proved negative. Immokalee data strongly suggest that Suerte should not be grown on a dry site.

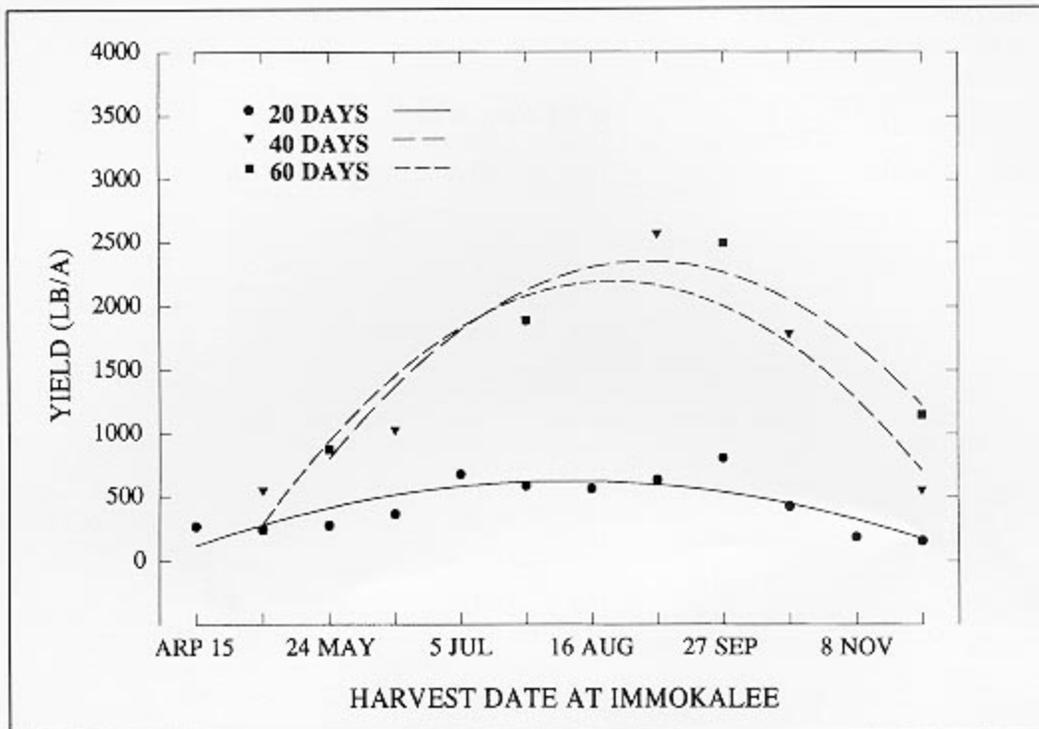


Figure 5. Forage yield (dry matter) of 'Suerte' *atraspalum* cut at 4-in. stubble height. Average observed and predicted yields each 20-, 40-, and 60-day cutting interval are shown. Immokalee, FL, 1993 and 1994.  
Footnote: Total annual fertilization was 200-40-200 of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively, split into four, equal applications in March, May, June and September.

## MANAGEMENT AND UTILIZATION

## Grazing and Animal Performance

*Stocking Rate Study.* Suerte was seeded in July 1992 at the Range Cattle REC at Ona. Treatments were 1.4, 2.8, and 4.2 steers/A with 2 replicates. Initial 2-year average shrunk weights (weight after withholding feed and water for 15 hours) of these yearlings was 526 lb, and grazing began April 27, 1993 and 1994. Steers received no supplementation except minerals. Grass was fertilized with a total of 150 lb/A of N in 1993 and 200 lb/A in 1994 split into 3 and 4 equal applications, respectively. Shrunk weights of steers were obtained at the beginning and end of each grazing season (year), and unshrunk weights and estimates of available forage were obtained on 28-day intervals during each year.

Average daily gain (ADG) decreased as stocking rate increased, while live weight gain (LWG) at first increased up to about 3.0 steers/A, then declined (Fig. 6a). A stocking rate of about 2.0 to 2.5 yearlings/A may be a good compromise between ADG, LWG, length of the grazing season, and vigor of Suerte.

x

Average daily gains of steers grazing Suerte have been high compared to gains of steers grazing most other perennial grasses previously tested in Florida. There may have been some compensatory gains of these 16-month-old steers because they had been carried through the winter on a maintenance diet. They were probably lighter at the beginning of the trial in April than equal-age replacement heifers would be on a ranch.

Average daily gains for all stocking rates started out high in May (Fig. 6b). Reduced gains in late-May and early-June reflect a limited forage supply due to typical dry weather at that time. This emphasizes the lack of drought tolerance in Suerte. Conditions for forage and animal growth are good in late-June and July, and this is reflected in good steer gains. There were four consecutive 28-day periods in 1994 when ADG at the 1.4 steers/A stocking rate was at or above 2.0 lb/head/day. Declining forage quality, flooded soil, and hot weather in August and September can reduce gains. In August and September 1994, rain totaled 32 in., which resulted in very poor conditions for the grass and steers. All pastures had intermittent standing water for over 60 days. Although steers were still gaining weight through mid-September 1994, there were weight losses in the 28-day period that preceded October 13 for steers stocked at 1.4 and 2.8 head/A (-0.1 and -0.8 lb/head/day, respectively).

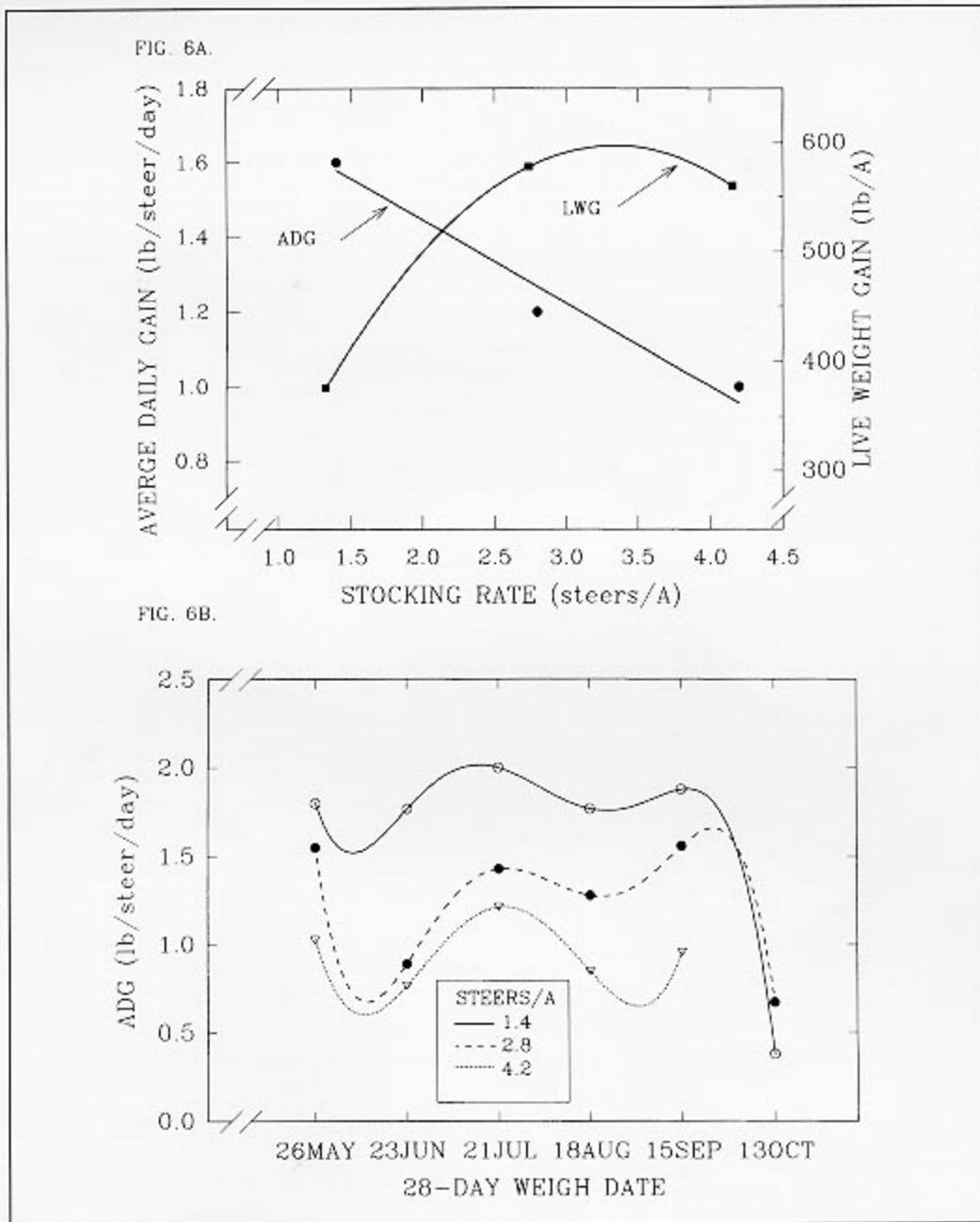


Figure 6.a) Two-year average daily gains (ADG) and live weight gains (LWG) of yearling steers grazing 'Suerte' atra paspalum. (Based on shrunk weights). b) Trends in 2-year average ADG through 168-day grazing seasons at three stocking rates. (Based on unshrunk weights). Ona, FL. 1993 and 1994.

In the fall of both years, grass became limiting so that steers in the 4.2 head/A treatment had to be removed on September 14, 1993 and 1994 (after 140 days) (Fig. 6b). Steers in the 2.8 head/A treatment had to be removed on October 13, 1993 and 1994 (after 168 days). At 1.4 head/A, steers remained until December 7, 1994 (224 days), which is not illustrated in Figure 6b. Average

daily gain from October 13 through December 7 in the 1.4 head/A treatment was 1.9 lb/head/day, and for the 224-day period, ADG was 1.5 lb/head/day and LWG was 465 lb/A.

*Quail Creek Ranch.* In Hardee Co., a 40-acre pasture, formerly bahiagrass, was renovated by plowing and disking in March and April and seeded to Suerte at 5.0 lb/A in June 1993. This was a typical flatwoods pasture with a Myakka fine sand with pH=5.5; P=8 ppm; K=9 ppm; Ca=500 ppm; and Mg=27 ppm according to IFAS soil test. It was grazed from April 25 to August 23, 1994 with 80 heifers, which had an average weight (unshrunk) of 670 lb at the start (see cover photo). The pasture received 60 lb/A of N in March 1994 and another 50 lb/A in June, and heifers were grazed rotationally between 3 units. Heifers were removed on August 23 because the pasture was intended for use as a seed field. Average daily gain of 20 heifers (randomly selected in April) was 1.25 lb/head/day over the 119-day period.

*Recommended Stocking.* Suerte should be stocked at the equivalent of 2.0 to 2.5 head/A of 500-lb yearlings for grazing from mid-April to mid-October. A 1000-lb cow and calf per acre would also be appropriate. Lighter stocking results in spot grazing and inefficient use of grass. When appropriately stocked and cattle are rotated in a 3 to 4 pasture system with 1 week grazing and 2 to 3 weeks rest, cattle may experience limited grass during the dry May and early-June period. There will be abundant grass in the rainy season, and by October new grass production will become limited, while former excesses from summer production have been consumed.

If a lower stocking rate is used, cattle should be removed from pasture by early December, and pasture should not be grazed between mid-December and mid- to late-April. We have not kept cattle on pasture during winter, and do not know what effects grazing will have on Suerte when new growth is initiated and grazed after repeated frosts. Because grass production in winter is minimal, it may be best to give Suerte an opportunity to rest at that time. Cattle should not be returned to pasture until there is sufficient forage. Since forage production will not be great during the dry April to early-June period, a surplus of grass will act as a "cushion" until rapid grass growth resumes.

### **Fertilization of Pasture**

After rainfall, N fertilization is the second most important factor within the growing season that determines when and how much forage is produced. A 2-year replicated trial was conducted at the Range Cattle REC with the following N fertilizer treatments: five treatments were 0, 50, 100, 200, and 300 lb/A/year of N applied **once** in March, and five treatments were 0, 50, 100, 200, and 300 lb/A/year of N **split** between application in March and June. An additional treatment was 50 lb/A of N applied at each of the 6, 35-day interval harvest dates (300 lb/A/year). Phosphorus and K were applied to all plots at 50 and 100 lb/a of P-O and K<sub>2</sub>O, respectively, in March and June.

Regardless of N fertilizer amount, little Suerte forage was produced before June without rain, and little forage was produced after September (Fig.7). Suerte is not like bahiagrass, which will remain fairly productive with little or no N fertilizer. Total 2-year annual forage production without N was only 920 lb/A.

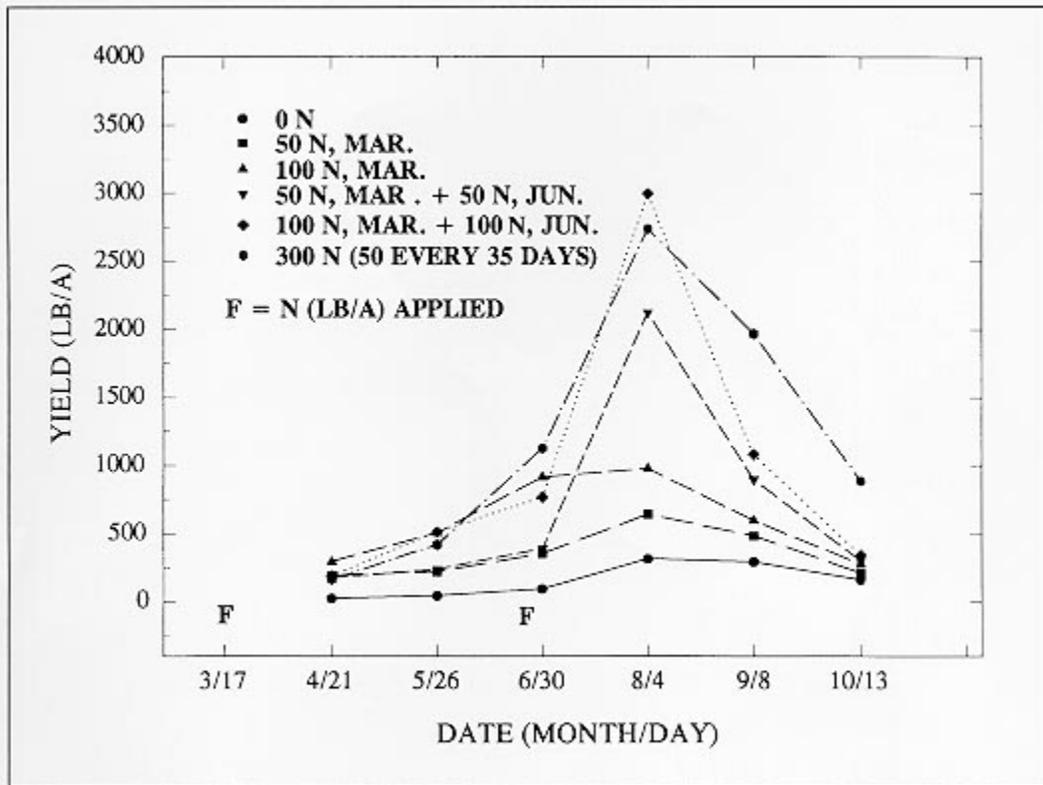


Figure 7. Forage yield (dry matter) of 'Suerte' atrapaspalum resulting from various N rates that were applied once in March or applied at various times during the growing season. Ona, FL. 1993 and 1994.

Application of 100 lb/A instead of 50 lb/A of N fertilizer in March will help increase forage production early in the season. A single application of 100 lb/A of N on March 17 resulted in a total of 1700 lb/A of forage by June 30 and a 2-year total annual forage yield of 3560 lb/A. That can be compared with yield from 50 lb/A of N applied once on March 17, which was a total of 760 lb/A by June 30 and a 2-year total annual forage yield of 2100 lb/A. The difference in March to June production (940 lb/A) is not great, but the timing of this forage production is important.

Splitting N fertilizer application helps provide more forage later in the growing season (Fig. 7). Because most of the growth of Suerte takes place during the rainy summer months, a second (June) N fertilizer application may not need to be greater than 50 lb/A. Fifty lb/A of N applied in June (50 lb/A March + 50 lb/A June treatment) resulted in 3320 lb/A of forage between July 1 and October 13, whereas 100 lb/A in June (100 lb/A March + 100 lb/A June treatment) resulted in 4410 lb/A of forage during this period. The additional 50 lb/A of N in June resulted in 1090 lb/A of grass, but at this time of year, more forage might not be worth the cost of the extra 50 lb/A of N.

Crude protein in Suerte (whole plant samples) fertilized with 50 lb/A of N in March was 9.3% on April 21 (Fig. 8). Without any additional N during the year, crude protein declined to 4.8% in August, then increased to 6.0% in October.

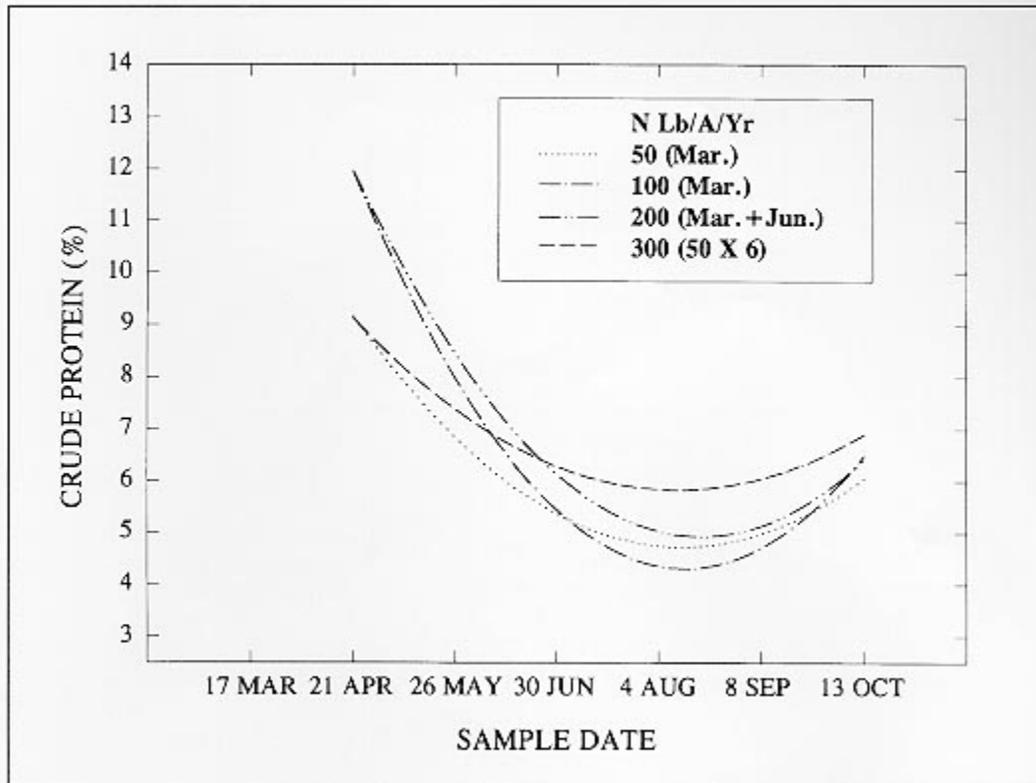


Figure 8. Crude protein (dry matter basis) in 'Suerte' atrapaspalum resulting from various N rates that were applied at various times during the growing season. Ona, FL. 1993.

Applying a second 50 lb/A in June (100 lb/A total) increased yield, but it did little to improve crude protein. Within the confines of practical N fertilizer application, crude protein will be low from July to September in Suerte. Even with 300 lb/A of N applied as six applications of 50 lb/A each every 35 days, which resulted in the greatest 2-year average total annual yield (7290 lb/A) of forage (Fig. 7), crude protein still declined to 6.0% in August (Fig.8). Crude protein did increase when higher N rates were used in the spring. At 35-days after a March application of 50 lb/A of N, crude protein was 9.3% compared to 12.4% with 100 lb/A of N.

*Recommended N Fertilization.* Suerte should be fertilized with 150 to 200 lb/A of N annually. The March application should be 100 lb/A and subsequent applications of 50 lb/A can be made in June or both June and August, depending on need for forage.

*Recommended P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O Fertilization.* Phosphorus and potassium should be based on tests performed by the IFAS Extension Soil Testing Laboratory. Target levels for P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O in the soil should be the same as those for other improved perennial grasses (excluding bahiagrass). For grazed, established stands, apply 40 lb/A of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O in March. Apply another 40 lb/A of K<sub>2</sub>O when Suerte is fertilized with N in June.

## Weed Control in Pasture

Broadleaf weed control in established stands (year after seeding) can be accomplished with some of the herbicides used on other perennial grasses. However, Suerte will show leaf burn and forage production will be curtailed when 2,4-D is applied, especially between March and mid-June when grass is not rapidly growing. Leaves show little injury from Weedmaster in July at rates up to 2 qt./A (0.5 lb ai/A Banvel + 1.5 lb ai/A 2,4-D).

Banvel is the preferred herbicide for most broadleaf weed control in Suerte because effective control of dog fennel (*Eupatorium* spp.) and similar weeds is best accomplished by herbicide application in spring and early summer when 2,4-D causes leaf injury in Suerte. Established Suerte is tolerant of up to 3 qt. (3 lb ai/A) of Banvel. Remedy will cause leaf burn at 1 pt./A (0.5 lb ai/A). None of the organo-auxin herbicides have been shown to kill mature Suerte plants. Smutgrass (*Sporobolus* spp.) control can be obtained with mid-June to mid-August application of Velpar, but **no more than 1 qt./A (0.5 lb ai/A) of Velpar should be used**. Velpar at 2 qt./A (1.0 lb ai/A) will injure Suerte severely for about a month after application, but the grass has recovered after 80 days in test plots. As with all herbicides, follow the label and observe grazing restrictions.

## Disease and Insect Pests

No major diseases have been observed on Suerte. Older leaves of plants that have not been fertilized may show signs of a leaf spot (*Helminthosporium* sp.), which may be associated with periods of stress such as cool weather in March.

The major insect pests have been armyworms, which are a problem in August and September. Armyworms sometimes feed down in Suerte's leaf whorl, much as they do in corn or sorghum. This makes control with insecticides difficult because worms are protected by the grass. Defoliation can be locally heavy, but not fatal to the grass.

There was localized loss of plants in several paddocks of the 1.4 steers/A stocking rate treatment of the grazing trial at Ona. Loss was estimated to be about 40 to 50% and was associated with paddocks which were underutilized. Plants died between November 1993 and January 1994, and the cause was not determined. Chinch bugs (*Blissus leucopterus*) were suspected because conditions were good for these insects, but they were never found.

## Hay Production

The 40-acre pasture seeded in June 1993 at Quail Creek Ranch was fertilized with 50 lb/A of N at the end of August 1993 and cut for hay on September 23. Nearly 80 tons of hay were removed from this field 94 days after seeding. Hay was 12.4% crude protein and 50.3% IVOMD on a dry matter basis. Suerte hay was fed during the winter and proved to be very palatable.

While hay production with Suerte appears promising, it is **not recommended on young stands** (less than 1-year old). We experienced a 26% plant loss because Suerte did not tolerate traffic from hay making equipment when hay was made in the year of seeding.

One year later, Suerte was cut a second time for hay on November 7, 1994. Excellent and rapid regeneration of new growth followed cutting, and older plants were not injured by normal traffic from mowing, a single tedding, raking, baling, and hay removal.

Hay yield averaged 3.9 tons/A in 1994. It contained 26% moisture at baling, which was 3 days after mowing. The percent moisture was about 6% greater than that recommended for safe storage of hay and demonstrates the difficulty associated with drying Suerte when it is stemmy.

In 1994, hay was made after Suerte was harvested for seed, consequently, it was very mature and low in nutritive value. Crude protein was 3.7% and digestibility was 52.9%. This hay contained adequate energy for a dry, pregnant cow, but protein was deficient. Protein supplementation at the time of its feeding would be necessary, or the hay could be ammoniated to increase its crude protein concentration.

Some of the difficulties associated with making hay could be avoided or at least made less severe if the following suggestions are followed:

1. Do not make hay in the year of seeding. Allow two growing seasons for the plants to become established.
2. Fertilize with 75 to 100 lb/A of N with 40 and 80 lb/A of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively, per cutting. Apply fertilizer about 35 to 40 days before cutting.
3. Cut to a 4-in. (or higher) stubble. **Do not scalp the plants.** Remember, if you mow after August 1-st, you will eliminate or greatly reduce seed production. From a practical standpoint, making hay after Suerte has gone to seed may be best. It is doubtful that succulent stems would dry in time to make hay in summer.
4. Try to minimize repeated traffic in the same place. For example, offset tractor and implement tires, and reduce the number of trips over the field. Headlands at the ends of the field may have to be written-off as a loss due to repeated turning.
5. Remove bales from the field within 5 days of baling. Bare places left from dead plants will fill with weeds.

### Seed Production

Pastures may be grazed in the growing season before October seed harvest, but cattle must be removed in time to allow the grass to regrow. Heavy defoliation within 90 days of seed maturity will decrease seed yield by reducing seed head density and seed quality (weight). When cattle are stocked at 2.0 to 2.5 yearlings/A and the pasture is heavily grazed (6- to 12-in. grass residue), cattle should be removed from the pasture by August 1. If pastures are lightly stocked and cattle leave an 18- to 24-in. plant residue, then remove cattle by September 1. Uniform grazing helps assure uniform date of seed head emergence, uniform ripening of seed, and more harvestable seed. Again, do not mow Suerte after August 1 or seed production will be greatly reduced or eliminated, especially if the field has not been grazed or mowed earlier.

Suerte lodges (falls) when seed heads are heavy with seed. Harvesting severely lodged Suerte is very difficult and slow. It is not unusual for the first cool fronts (or a tropical depression) with accompanying strong winds to arrive in Florida about the time Suerte seed is ready for harvest. For this reason, it is probably not wise to fertilize a seed field that has been fertilized earlier in the year for pasture. If grass has not been grazed or fertilized in summer, then application of 50 lb/A of N in August will improve seed yield.

In central Florida, seed heads begin to emerge the first week in October, but not all the seed heads emerge at the same time. Seed heads in areas of the pasture that had been heavily or more recently grazed will appear later than seed heads in areas lightly grazed. About 50 to 60% of the seed heads will have emerged by 10 days after the date that the first seed heads were observed. Pollination (appearance of anthers) occurs within several days after emergence of a seed head. Seed is generally ready for combining in the fourth week of October in central Florida (Fig. 9). Seed is ready to combine when about 50% of the seed shatters after seed heads are whipped across the palm of the hand. This occurs about 28 days after the appearance of the first seed heads. At this time seed has begun to fall freely from upper racemes, while some seed on

lower racemes are still too immature to be removed by the combine. Mature seed are in the firm "dough" stage of maturity at harvest and contain about 30% moisture. Seed must be dried to 12 to 15% moisture at 95 to 105°F for about 24 hours with forced-air heat.

Little flowering and seed set can be expected in the year of seeding from plants that are established after June. In the second year of production, Suerte can produce as much as 200lb/A of seed, but in practice, a harvest of 100 lb/A of dried and cleaned seed is realistic. There are several problems associated with commercial seed harvest. First, seed is ripe and readily gleaned for about 7 days. Before this time, seed is not fully ripe and much seed will pass through the combine while remaining attached to the seed head. After 7 days much of the seed has already shattered before the seedsman could harvest it. **Timely seed harvest is extremely important.**

## **CONTROLLING SUERTE**

The best way to control Suerte is to prevent it from going to seed. This can be accomplished by mowing between late July and early September. There are several herbicides, such as Command (clomozone), Cotoran (fluometron), Karmex (diuron), Pursuit (imazetnapyr), Sencor (metribuzin), Treflan (trifluralin), and Zorial (norflurazon) that prevent establishment of Suerte from seed. Preventing establishment of Suerte from seed is relatively easy.

Controlling Suerte where it is not wanted is more difficult once it is well established. Round-up (glyphosate) at 3 to 4 quarts/A (3 and 4 lb ai/A) has resulted in about a 50 to 100% kill at 70 days after treatment with remaining plants severely damaged. Addition of diammonium sulfate ( $[\text{NH}_4]_2\text{SO}_3$ ) in the spray solution may improve kill if spray water contains high concentrations of calcium and magnesium salts (see herbicide label). Round-up at 2 quarts/A (2 lb ai/A) plus  $(\text{NH}_4)_2\text{SO}_3$  at 10 lb/A resulted in 90% Suerte kill when Round-up was applied in water (30 gpa) containing antagonistic salts.

### **Seedsmen marketing certified 'SUERTE' ATRA Paspalum Licensed from 1995 to 2003**

1. C. M. Payne & Son. Sebring, FL. 941-385-4642.
2. Haile-Dean Seed Co. Winter Garden, FL. 800-423-7333.
3. Hancock Farm and Seed. Dade City, FL. 352-567-6971.
4. Jack Melton Family, Inc. Dade City, FL. 352-583-3052.
5. Wise Seed Co. Frostproof, FL. 941-635-4473.

### Table of Conversions

Abbreviations and conversion factors used in this publication are listed below. To convert column 1 into column 2, multiply column 1 by column 3.

1	2	3
inches (in.)	centimeters (cm)	2.54
feet (ft.)	meters (m)	3.27
acres (A)	hectares (ha)	0.405
pounds (lb)	kilograms (kg)	0.454
pounds/acre (lb/A)	kilograms/hectare (kg/ha)	1.12
quarts (qt.)	liters (L)	0.95
pints/acre (pt./A)	liters/hectare (L/ha)	1.17
Fahrenheit(F)	Celsius (C)	0.55(F-32)
number/foot(2)	number/meter 2 (no./m <sup>2</sup> )	10.6

The use of trade names in this publication is solely for the purpose of providing specific information. It is not a guarantee or warranty of the products named, and does not signify that they are approved to the exclusion of others of suitable composition.