# Spring Ranchers Forum Proceedings

a program by the

## Central Florida Livestock Agents Group

## Thursday, March 16, 2017

## Yarborough Ranch

1355 Snow Hill Rd.

Geneva, Florida 32732

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CENTRAL FLORIDA LIVESTOCK AGENTS GROUP

# Spring Ranchers Forum
# March 16, 2017
# Proceedings

**Central Florida Livestock Agents Group**

## Agents

Jonael Bosques-Mendez (Hardee County)
Sharon Fox Gamble (Volusia County)
Ed Jennings (Levi County)
Megan Mann (Lake County)
Dennis Mudge (Volusia County)
Francisco Rivera (Hillsborough County)
Mark Shuffitt (Marion County)
Joe Walter (Brevard County)
Mark Warren (Multi-County)
Tim Wilson (St. Johns County)
JK Yarborough (Multi-County)

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# SPRING RANCHERS FORUM

**a program by the**
**Central Florida Livestock Agents Group**
**THURSDAY, MARCH 16, 2017**
**YARBOROUGH RANCH**
**1355 Snow Hill Road, Geneva, FL 32732**

## AGENDA

**8:00 Arrival and Registration**

**8:15 Field Demonstration: "Farm Animal Health"**
Dr. Matt Hersom, Beef Cattle Specialist, Animal Science, UF/IFAS
Tim Wilson, Extension Director, UF/IFAS St John's County

**9:30 Trade Show Break**

**10:20 Poisonous Plant Update**
Sharon Gamble, Livestock Agent IV, UF/IFAS Volusia County
Dennis Mudge, UF/IFAS Extension Director, Volusia County

**11:05 Bahia Decline Pasture Research**
J.K. Yarborough, Livestock Agent, UF/IFAS Orange and Seminole Counties

**11:50 Official Welcome, Steak Lunch, and Trade Show**
**Steak Lunch -Yarborough Family & Local Cattlemen**

**12:35 Allied Giveaways and Presentations**

**12:45 Legume Recommended Varieties for Central Florida**
Dr. Ann Blount, Forage Breeding and Genetics, UF/IFAS North Florida Research Education Center

**1:30 Over-seeding Pastures and Hay Fields with Legumes**
Joe Walter, Livestock Agent, UF/IFAS Brevard County
Mark Warren, Livestock Agent, UF/IFAS Flagler and Putnam Counties

**2:30 CFLAG Agent Panel Discussion: Identification of Common Weeds**
Dennis Mudge, Jonael Bosques-Mendez, J.K. Yarborough, Sharon Gamble, Megan Mann, Joe Walter, Mark Warren, Tim Wilson, Mark Shuffitt, Ed Jennings, Francisco Rivera-Melendez

**3:15 Evaluation and Final Giveaways**

# The Veterinary Feed Directive - What You Need to Know

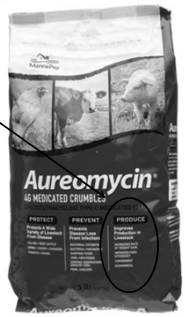
Dr. Matt Hersom
Associate Professor, Extension Beef Cattle Specialist
UF/IFAS Dept. of Animal Sciences

## Veterinary Feed Directive (VFD)

- What is the VFD
  - Federal regulation from the Food and Drug Admin.
  - Regulate the use of drugs, in this case animal drugs
  - History
    - Originally passed in 1996
    - Created to classes of drugs
      - Over the counter (OTC)
      - Prescription
    - Now VFD and Prescription classes


## Veterinary Feed Directive (VFD)

- What Does the VFD Do?
  - Changes Product Labeling
    - Remove production claims
  - Change Drug Designation
    - From OTC to VFD
  - VFD form
    - "paperwork"

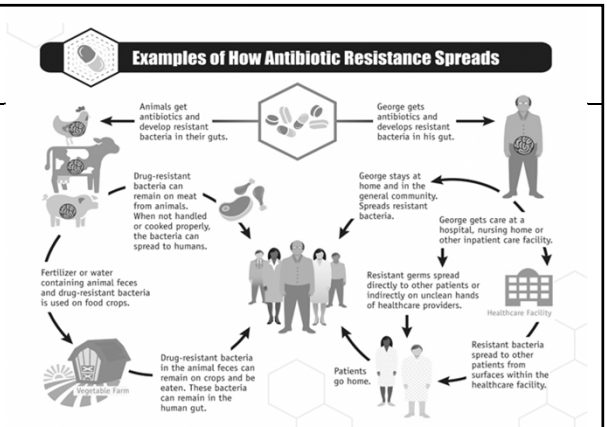



## Veterinary Feed Directive (VFD)

- Why the VFD
  - Historically antimicrobial drugs added to feed of cattle, pigs, poultry
  - For production purposes (weight gain, efficiency) not health
  - Not being used to promote human health
  - Use of antimicrobials in humans and animals ***contributes*** to antimicrobial-resistant bacteria

## Veterinary Feed Directive (VFD)

- Why the VFD
  - According to Michael Taylor- FDA Deputy Commissioner for Foods and Veterinary Medicine
    - 2 million people become infected with antibiotic-resistant bacteria
    - >23,000 people die each year from these infections
    - Non-therapeutic use of antimicrobial drugs in animals in the food supply contribute to this problem



http://www.shfwire.com/node8388/

## Veterinary Feed Directive (VFD)

- Why the VFD
  - Regulate and Preserve efficacy of antibiotics used in human medicine – "judicious use"
  - Limit animal antibiotics to the following uses
    - Prevention
    - Treatment
    - Control

    } of specifically identified diseases
  - Makes vets responsible for feed use of all antibiotics considered medically important to humans
  - Oversight by veterinarians based on scientific and clinical training

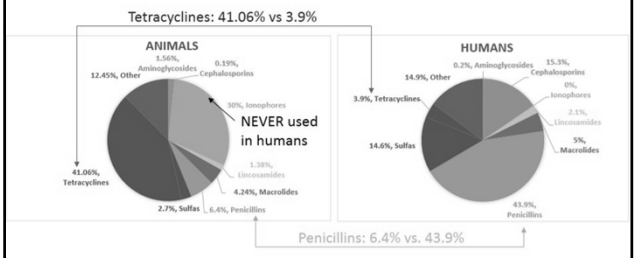
## Veterinary Feed Directive (VFD)

- **Prevention** means that a disease risk must be present and the use prevent infection prior to animals becoming sick/infected.
- **Treatment** means that animals are exhibiting signs of disease that can be treated by a VFD additive.
- **Control** is invoked when a percentage of the animals are already sick, exhibiting signs of disease and the use of a VFD can decrease the spread of the disease.

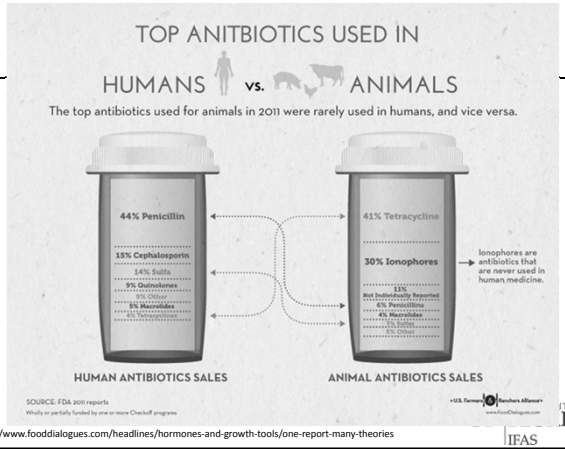
## Veterinary Feed Directive (VFD)

- Why the VFD
  - Develop plans for collecting additional data
  - Antibiotic use in addition to just sales data
    - Species
    - Indication
    - Dose
    - Duration
  - Incidence/patterns/trends of antibiotic resistance

## Human vs Animal Antibiotic Sales are Relatively Different in U.S.

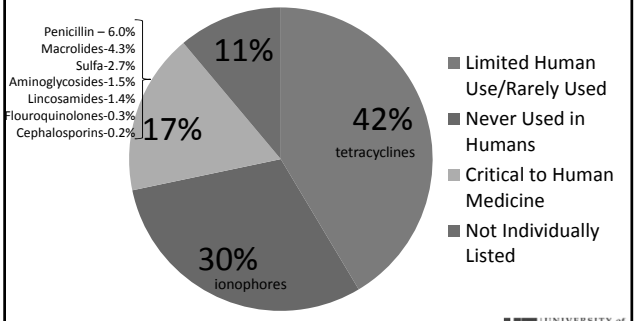



Human data (2010): http://www.fda.gov/downloads/Drugs/DrugSafety/InformationbyDrugClass/UCM319435.pdf
Animal data (2011): http://www.fda.gov/downloads/forindustry/userfees/animaldruguserfeeactadufa/ucm338170.pdf




http://www.fooddialogues.com/headlines/hormones-and-growth-tools/one-report-many-theories

## Antibiotics Sold for Animals – Key Categories




## Veterinary Feed Directive (VFD)

**Who Will This Affect?**

- Cattle owners
- Veterinarians
- Feed retailers


**How Will This Affect?**

- Valid vet-client-patient relationship
- VFD form
- Paperwork retention

❖ *Some thought/planning*

## Florida Statues Title XXXII CHAPTER 474 VETERINARY MEDICAL PRACTICE

- 474.202.12 "Veterinarian/client/patient relationship" means a relationship where the veterinarian has assumed the responsibility for making medical judgments regarding the health of the animal and its need for medical treatment.

## Veterinary Feed Directive (VFD)

- Veterinarian-client-patient-relationship (VCPR) key elements
  1. Veterinarian engage client (cattle producer)
  2. Assume responsibility for clinical judgement (health)
  3. Sufficient knowledge of patient (exam or visit facility)
  4. Provide necessary follow-up evaluation or care


## Veterinary Feed Directive (VFD) Vocabulary

- **Expiration date**: last day the VFD feed can be fed
- **Duration of use**: length of time the feed is to be fed
- **Extra-label use**: actual or intended use of a drug in manner not in accordance with approved label
- **Prescription drug**: controlled drug not for use in/on animal feed/water
- **VFD drug**: controlled drug approved for use in/on feed or water
- **Distributor**: any person who distributes medicated feed containing a VFD drug

## Veterinary Feed Directive (VFD)

- Written order by a licensed veterinarian to use a VFD drug or combination in an animal feed
  - Not a prescription
  - Does not apply to injectable antibiotics

## Veterinary Feed Directive (VFD)

- Items required on VFD form
  - Name, address, phone of owner and veterinarian
  - Premises of the animals in the VFD
  - Date of VFD issuance
  - Effective date and Expiration date
  - Name of VFD drugs
  - Species and production class of animal
  - Approximate number of animals to be fed VFD by the exp. date
  - Indication for VFD use
  - Level and duration of VFD drug in feed
  - Withdrawal time, instructions, caution statements
  - Number of refills (if permitted)
  - Stmt "Use of feed containing this veterinary feed directive (VFD) drug in a manner other than as directed on the labeling (extra-label use) is not permitted"
  - Affirmation of intent and veterinarian's electronic or written signature

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## Veterinary Feed Directive (VFD)

- What Drugs are Affected?
  - Chlortetracycline (Aureomycin, CLTC, Pennchlor)
  - Chlortetracycline + Sulfamethazine (Aureo S 700)
  - Neomycin + Oxytetracycline (Neo-Terramycin, Neo-Oxy)
  - Oxytetracycline (Terramycin, Pennox)
  - Tylosin (Tylan)
  - Virginiamycin (V-Max)

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## Veterinary Feed Directive (VFD)

- What Drugs are Not Affected?
  - Ionophores, Parasite controls, Insect controls
    - Amproluim (Corid)
    - Bacitracin (Albac, BMD)
    - Bambermycin (Gainpro)
    - Decoquinate (Deccox)
    - Fenbendazole (Safe-Guard)
    - Laidlomycin (Cattlyst)
    - Lasalocid (Bovatec)
    - Melengestrol Acetate (MGA)
    - Methoprene (Altosid)
    - Monensin (Rumensin)
    - Morantel (Rumatel)
    - Poloxslene (Bloat Guard)
    - Ractopamine (Optaflexx, Actogain)
    - Tetraclovinphos (Rabon)

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## VFD Approved Medicated Feed Mills Florida

- Current as of 1/10/2017

- Site Name License No Address City State Zip Code Country/Province
- **Cargill, Inc., Nutrena Feeds** 500-606 1845 Avenue 'A' Kissimmee FL 32741
- **Gator Feed Co., Inc.** 501-497 1205 N Hwy 98 Okeechobee FL 34972
- **Manna Pro Corporation** 500-441 7000 Adamo Tampa FL 33619
- **Pilgrim's Pride Corporation** 500-772 1306 West Howard Street Live Oak FL 32060
- **Purina Animal Nutrition LLC** 500-045 890N Prairie Indust. Pkwy Mulberry FL 33860
- **Purina Animal Nutrition LLC** 500-062 637 NW Lake Jeffrey Road Lake City FL 32055
- **Ridley USA, Inc.** 500-834 2801 South Combee Eaton Park FL 33840
- **Wayne Farms LLC** 500-340 2654 US Highway 90 E DeFuniak Springs FL 32433
- **Westway Feed Products LLC** 500-584 2701 Talleyrand Avenue Jacksonville FL 32206
- **Westway Feed Products LLC** 501-476 111 Ponce de Leon Avenue Clewiston FL 33440

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## VFD Approved Distributors Florida

FL Alachua Farm and Lumber 14101 NW 145th AVE Alachua 32616
FL Altha Farmers Co-op Altha Branch 15543 NE Mount Olive Cemetery Rd Altha 32421
FL Dan's Discount Feed and Fence 41000 SR 19 North Altoona 32702
FL Anthony Agronomy 9655 NE 21st Ave Anthony 32617
FL Smith's Ranch & Garden 117 W Magnolia ST Arcadia 34266
FL Midwest Feed and Farm 13046 SW St rd 45 Archer 32618
FL Glade and Grove Supply Co., LLC 305 County Rd 17 AW Avon Park 33825
FL Florida Farm & Ranch Supply 2975 HWY 60 E Bartow 33830
FL Farm Service Center - Bascom 5122 Basswood Road Bascom 32423
FL Altha Farmers Co-op Blountstown Branch 18453 Main St North Blountstown 32424
FL West End Quick Pic Inc. 16937 Central Ave West Blountstown 32424
FL Rural King Supply 268315 Tamiami Trl Bonita Springs 34134
FL Des Champs Corner, LLC 15738 Ponce de Leon Boulevard Brooksville 34601
FL Campbellton Farm Service 5221 Highway 231 Campbellton 32426
FL Gulf West Supply 215 E Rodgers Blvd Chiefland 32626
FL Quincey Cattle Co Inc 2350 NW 120th Street Chiefland 32626
FL Franz & Jacobs, Inc. 491 LE Mills Rd Chulhota 32766
FL Corbin Farm & Ranch Supply 544 E. Sugarland Hwy Clewiston 33440
FL Amber Acres 1629 West King Street Cocoa 32926
FL Caraway Farm Supplies LLC DBA Lake Crescent Feed 2620 South Highway 17 Building 4 Crescent City 32112
FL American Farm & Feed 717 NE 5th Street Crystal River 34429
FL Rural King Supply 1802WW US Highway 19 Crystal River 34428
FL Anigro/Xtraformance Feeds 15720 Lake Iola Rd Dade City 33523
FL Wayco Farms LLC Feed Mill 2604 US Hwy 90 East Defuniak Springs 32433
FL Hamilton Feed Brandon, Inc. DBA Harold's Farm Supply 12590 Martin Luther King BLVD Dover 33527
FL Dundee Feed & Hardware 307 East Main St Dundee 33838
FL Gunters Farm and Feed 3187 W Dunnellon Rd Dunnellon 34433
FL Thomas Feed 10700 Okeechobee Road Fort Pierce 34945
FL North Florida Aquatic Veterinary Services 843 SW Pathfinder Glen Fort White 32038
FL Chiodos 231 Express Market LLC 17935 Lazy Lane Fountain 32438
FL T & J Hitching Post 8355 Orange Avenue Ext. Ft. Pierce 34945
FL Greenville Fertilizer & Chemical Com., Inc. 13293 W 90 Greenville 32331
FL Stone's Home Centers - Stone's Inc. - Havana 702 Highway 27 South Havana 32333
FL Carroll's Farm Supply 5616 SE U.S. Highway 301 Hawthorne 32640
FL Midwest Feed & Farm 17870 NW US HWY 441 High Springs 32643
FL Clyde Mizell, Inc 3456 Turkey Trot Trail Hilliard 32046
FL MWI Animal Health 4103 Springrose St Jacksonville 32209
FL Jasper Hardware & Supply Co 202 NW Central AVE Jasper 32052
FL Cargill, Inc., Nutrena Feeds 1845 Avenue A Kissimmee 34758-2001
FL Purina Animal Nutrition LLC 3575 Lake Jeffrey Road Lake City 32055
FL Rural King Supply 1970 State Road 60 E Lake Wales 33898
FL Lakeland Animal Nutrition 2725 S Combee Road Lakeland 33803
FL Purina Animal Nutrition LLC 4760 Gateland Blvd Lakeland 33811
FL Anigro/Xtraformance Feeds 4010 NE SR 6 Lee 32059
FL Hillandale Quality Feeds, LLC 9561 SW SR 121 Lake Butler 32054
FL Rural King Supply 1715 Citrus Blvd Leesburg 34748
FL Schiro Hay LLC 16529 CR 672 Lithia 33547
FL The Granite Group DBA Crossroads Ace Hardware 10425 C.R. 39 S. Lithia 33547
FL Farmers Cooperative Live Oak 1841 West Howard St Live Oak 32064
FL Pilgrim's Pride Corp - Live Oak Feed Mill 1306 West Howard St. Live Oak 32064
FL Dixie Feed 16932 W Aintree Drive Loxahatchee 33470
FL Farmers Cooperative 748 SW Horry AVE Madison 32340
FL L. McArthur Company, Inc. 5199 8th Ave. Malone 32445
FL Altha Farmers Co-op Marianna Branch 2981 Penn Ave Marianna 32448
FL Southern States 2971 Pierce Street Marianna 32448
FL Animal Health International, Inc. 296 Southeast Industrial Park Cr Mayo 32066
FL Russells Feed 4479 CR 218 Middleburg 32068
FL B and D Feed 8441 Hwy 87 South Milton 32583
FL Monticello Milling 500 South Jefferson St Monticello 32344
FL Waukeenah Fertilizer 9643 Waukeenah Hwy Monticello 32344
FL Going Coastal Cattle Products 18651 SE 47th Place Morriston 32668
FL Purina Animal Nutrition LLC 850 N. Prairie Industrial Pkwy. Mulberry 33860
FL Q4 Exchange Coop 9521 Bayshore Rd N. Ft. Myers 33917
FL Laura's Pet and Horse Supply 1051 John Sims Parkway Niceville 32578
FL Animal Health International, Inc. 5875 Southwest 6th Place Ocala 34474
FL Hay Movers, LLC 3383 W HWY 326 Ocala 34475
FL J & J Tack Shack 6625 W Hwy 40 Ocala 34482
FL Midwest Feed and Farm 3152 NW Blitchton Rd Ocala 34475
FL Animal Health International, Inc. 2297 Northwest 9th Street Okeechobee 34972
FL Anigro/Xtraformance Feeds 6490 NW 151st Terrace Okeechobee 34972
FL Country Feed of Okeechobee, Inc. DBA Rabon's Country 1852 NW 9th St. Okeechobee 34972
FL Innes Supply A.I. Sales & Service, Inc. 801 SW Park St. Okeechobee 34972
FL Okeechobee Feed Inc. 1579 State Road 70E Okeechobee 34972
FL Bull Run Farm Supply 1020 N US Hwy 1 Ormond Beach 32174
FL Country Feed and General Store 2420 Reid Street Palatka 32177
FL Malabar Farm 1366 Malabar Road SE Palm Bay 32907
FL J + M Farm and Feed Inc 1405 South Jefferson Street Perry 32348
FL Caraway Farm Supplies LLC DBA Pierson Feed 307 S. Center St Pierson 32180
FL Southside Stores, LLC 30174 James L. Redman Parkway Plant City 33566
FL Stone's Home Centers - Stone's Inc. - Quincy 18785 Blue Star Hwy Quincy 32351
FL The Granite Group DBA Crossroads ACE Riverview 13364 Lincoln Rd Riverview 33578
FL Stockyard 1010 Cattlemen Road Sarasota 34232
FL Gibson Animal Supply Inc 4525 US Hwy 27S Sebring 33870
FL Timsamilee Associates Inc., dba Sparr Building and Farm 13033 NE Jacksonville Rd Sparr 32195
FL Rural King Supply 2468 Commercial Way Spring Hill 34606
FL Starke Landscape Supply 5469 S Walnut St Starke 32091
FL Florida Mineral Salt & Agricultural Products 4014 N 40th St Tampa 33610
FL Snell's Feed and Garden Supply, Inc. 9513 N Nebraska Ave Tampa 33612
FL Suwannee Valley Feeds, LLC 617 NE Lancaster Street Trenton 32693
FL Trenton Plant 7730 SE SR 47 Trenton 32693
FL D&J Apiary 17732 SE 283rd Ave. Umatilla 32784
FL Harris Farm Supply Inc. 3302 Creek Rd Vernon 32462
FL The Trading Post Feed Store 175 43rd Avenue Vero Beach 32968
FL Waldo Feed & Hardware 14720 Waldo Road Waldo 32694
FL Escambia Grain Corporation 5650 Arthur Brown Road Walnut Hill 32568
FL Hardee Ranch Supply, Inc. 1309 US HWY 17 S Wauchula 33873
FL Webster Farm Supply 120 Market Blvd. Webster 33597
FL Furst McNess Company PO Box 188 Wellborn 32094
FL Deseret Cattle & Timber 5831 Highway 22 Wewahitchka 32462
FL Timsamilee Associates Inc., dba Sparr Building and Farm 6000 Signature Drive Wildwood 34785
FL Anigro/Xtraformance Feeds 15720 SW 191 Ave Williston 32696
FL Quality Hay Sales, Inc. 21093 NE HWY 27 Williston 32696
FL Timsamilee Associates Inc., dba Sparr Building and Farm 240 Main St Williston 32696
FL Doty Farm & Garden Supply Inc 299 6th St SW Winter Haven 33880
FL Mid-South Lumber Hardware and Feed Store 12904 Hwy 231 Youngstown 32466
FL Bliss Feed & Supply 36703 Chancey Road Zephyrhills 33541

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## Veterinary Feed Directive (VFD)

- Legal So What?
  - Must have a valid VFD to feed a VFD medicated feed
  - Violate the federal Food, Drug, and Cosmetic Act Without VFD, feed would be considered unsafe, adulterated, and misbranded
  - Animal consuming a VFD feed with out a valid VFD form is considered **adulterated**
  - Penalties (21 U.S.C. Sections 331-334)

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## Veterinary Feed Directive (VFD)

- Legal So What?
  - Penalties (21 U.S.C. Sections 331-334)
  - FDA seek imprisonment, monetary penalty, injunctive relief, and/or seizure of property
  - 1 year in prison and fine up to $1,000
  - Repeat offenders: 3 yrs and $10,000
  - Veterinarian violation: liability and penalties from state vet board

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## VFD - Simplified Scenario

**Calves at Weaning**
- Experience pneumonia
- Vet visit or previously discussed diagnosis triggers

**VFD Written**
- Feed Antibiotic treatment indicated
- VFD details are written, specific, time and use limited

**Feed Treatment**
- Obtain product from distributor/retailer
- Feed according to VFD instructions/restrictions

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## Responsibilities

**Producer/Client/Owner**

- Create a valid VCPR
- Only feed VFD feed to animals based on order by vet
- Don't feed VFD past expiration date
- Provide copy of VFD to feed distributor
- Maintain copy of VFD for 2 years
- Produce copy upon request by FDA

**Veterinarian**

- Be licensed to practice
- Create a valid VCPR
- Issue VFD in compliance for approved use of drugs
- Prepare and sign VFD with all required and supplemental information
- Provide client and distributor copy of VFD
- Maintain copy of VFD for 2 years
- Produce copy upon request by FDA

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## VFD FAQ's

- **Will cattle owner/manager have to see a vet to get a VFD?**
  - *Not necessarily, if a VCPR is in place with developed use guidelines and training.*
- **Will a VFD antibiotic be allowed in breeding cattle?**
  - *It depends on the approved label. The one product that exists needs to go through VFD approval by the company.*

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## VFD FAQ's

- **Will one VFD cover cattle in multiple states?**
  - *No. Separate VFDs are required one from a vet licensed in each state.*
- **Will one VFD cover cattle in multiple pastures?**
  - *Yes, for the same health condition on the same premises. Still have to follow drug label relative to confinement or feed mixing.*

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## VFD FAQ's

- **What flexibility will producers have for dosing with a VFD medication?**
  - *None. Follow the label, follow the VFD or it is off-label, extra-label use.*
- **What flexibility will there be for mixing a VFD medication?**
  - *Essentially the same as there has been before. Restrictions exists for combinations, dosing, etc.*

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## VFD FAQ's

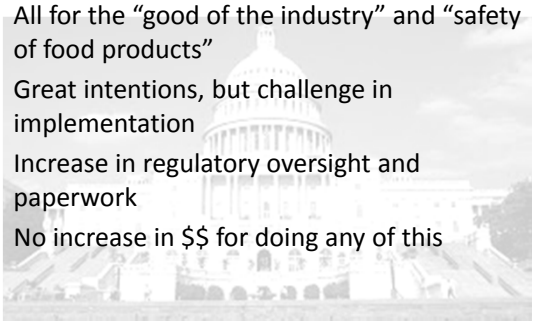
- **Can I feed a VFD feed past the expiration date?**
  - *No, a VFD feed or combination VFD feed can't be fed after date, need a new VFD order.*
- **How long does a VFD remain in effect after written?**
  - *Each VFD will have an "effective date" and "expiration date".*
  - *Expiration date will depend upon the product used, limit to 180 days. Product can't be fed after expiration date, requires a new VFD.*

## VFD FAQ's

- **Will VFD antibiotics have withdrawal times?**
  - *Yes, it will depend on the VFD antibiotic.*
- **VFD order will expire before the feeding duration is over, what to do?**
  - *Contact veterinarian and request a new VFD order.*
- **What constitutes extra label use?**
  - *Feeding for a duration time that is different from order*
  - *Feeding different amount of feed*
  - *Formulated with different drug level*
  - *Feeding to different animal species*

## Summary

- All for the "good of the industry" and "safety of food products"
- Great intentions, but challenge in implementation
- Increase in regulatory oversight and paperwork
- No increase in $$ for doing any of this



## Take Home

- Create a valid veterinarian-client-patient-relationship
- If you use/need a medicated feed get a VFD
- Follow the directions
- Create a filing system
- Don't worry if you only use injectable antibiotics

# Toxic Plant Update

**Situation:**

Livestock owners in Central Florida have experienced or heard of farm animal poisonings that have lit up the internet with conversations. Creeping indigo and Coral ardisia poisoned horses and cattle commonly enough so new publications were published by UF/IFAS addressing the issue. Animal owners should print them from EDIS if they have not already. However these two plants have not accounted for most farm animal poisonings.

Creeping indigo

Coral ardisia


**Central Florida Livestock Agents**

**Fact Sheet #031617**

**Dennis Mudge**
**Sharon Gamble**

University of Florida IFAS Extension Education Center
Volusia County
3100 E. New York Ave.
DeLand, FL 32724


## Farm and Ranch Visits

Central Florida livestock Agents regularly make ranch and farm visits and several important factors are consistently found:

1. Florida farm animals commonly ingest toxic plants without showing obvious signs of harm or causing death.
2. Some animals are able to eat harmful toxic plants with greater tolerance than others
3. Death in farm animals resulting from eating toxic plants is less common than parasites, disease, and lack of adequate forage.

## Serious Situations

Even with these facts, when any farm animal is sick or dies due to poisonous plants, it is too often and sad to experience if it could have been avoided.

## Help available

Excellent UF Extension publications are now available along with assistance from your local UF Livestock Agent. Learning the most common problem plants that are commonly toxic is a learned skill that livestock owners cannot put off. Especially when most deaths occur from several plants common in Florida.

## Serious Toxic Plants

Recent animals deaths have been caused in Central Florida from these plants in addition to the ones mentioned on page one:

Lantana

Coffee senna

Cherry Laurel

Chinese Tallow

Nightshade

Crotolaria

Sicklepod

Pokeweed

Castor Bean

Taro

Wedelia

# POTASSIUM FERTILIZATION EFFECTS ON BAHIAGRASS HERBAGE ACCUMULATION, NUTRITIVE VALUE, AND CRITICAL TISSUE K CONCENTRATION

*J.K. Yarborough, Livestock Agent, UF/IFAS Orange and Seminole County*

## Justification

Bahiagrass (*Paspalum notatum* Flügge) is an important warm-season grass used for beef cattle (*Bos* spp.) production in tropical and subtropical regions of the world. Bahiagrass production and nutritive value are adequate for mature beef cattle during the growing season, and it is persistent under adverse climatic conditions and management practices (Vendramini et al., 2010). However, bahiagrass has decreased production in early spring and autumn and decreased nutritive value during mid- to late summer in Florida (Sollenberger et al., 1988). The variation in nutritive value and productivity of bahiagrass throughout the year may impact cattle performance and consequently decrease the profitability of beef cattle operations.

Fertilization increases warm-season grass quantity and may increase quality; however, commercial fertilizers are the costliest input in warm-season grass forage production. Fertilizer costs have increased over the last decades in response to high energy demand and increased cost of fossil fuels. Nitrogen is routinely the first nutrient applied to warm-season grass pastures due to its effect on forage production and nutritive value. However, repeated fertilization or high amounts of N may cause an insufficiency of other nutrients in the soil, potentially impacting forage production and nutritive value negatively.

Potassium is an important macronutrient for production and persistence of warm-season grasses. Due to the limited cation exchange capacity of sandy soils (predominant in Florida) and limited K fertilization, warm-season grasses may face K deficiency, which may become the limiting nutrient in bahiagrass pastures. According to Adams and Twersky (1960), K fertilization may increase, production, persistence, and winter survival of bermudagrass [*Cynodon dactylon* (L.) Pers.]. Kalmbacher et al. (2005) tested combinations of N, P, and K fertilization on bahiagrass plots and reported that the response to K fertilization was variable. Although K levels in the soil may be limited, the plant may still not respond to K fertilization, if K is not the most limiting nutrient.

Therefore, it is necessary to determine the relationship between tissue K concentration and herbage accumulation (HA) to predict K deficiency in warm-season grass species and optimize K fertilization. The objectives of this study were to evaluate N and K fertilization

strategies on established bahiagrass pastures (Experiment. 1) and determine the relation between tissue K concentration and HA in bahiagrass (Experiment. 2).

## Materials and Methods

### Experiment 1

The study was conducted in two locations at the Deseret Ranch, located in Deer Park, FL from May 2014 to December 2015. The locations were described as Location 1 and Location 2. The soils were classified as a Riviera Sand in Location 1, and a Myakka Fine Sand in Location 2. The initial soil and tissue nutrient concentrations are presented on Table 1. Location 2 received 1 Mg $ha^{-1}$ of dolomite in February 2014 to raise soil pH to target 5.5, and Location 1 received 11 kg P $ha^{-1}$ according to the UF/IFAS standardized fertilization recommendations for agronomic crops (Mylavarapu, 2002).

Treatments were the split-plot arrangement of three levels of N fertilization including 0 (control), one application of 50 kg N $ha^{-1}$ in May (1N), or two applications of 50 kg N $ha^{-1}$ in May and August (2N, main plots), combined with 0 or 42 kg K $ha^{-1}$ (subplots) distributed in a completely randomized design with three replicates. Plots (experimental units) were established in existent 'Argentine' bahiagrass pastures (13-and 8-yrold for Locations 1 and 2, respectively), and N fertilization treatments were applied in May and August 2014 and 2015. The K fertilization treatments were applied in May 2014 and 2015 only. Plots were 12 x 15 m. The existent forage was staged with the mob stocking technique for 2 days before fertilization in the spring and subsequently after every harvest. Plots were grazed to an approximate 7.5-cm stubble height with 6-wk regrowth intervals on 25 June, 11 August, 19 September, 3 November, and 12 December 2014, and 8 June, 22 July, 7 September, 20 October, and 1 December 2015.

Prior to grazing, three areas were harvested per plot with a rotary blade mower to determine HM (Herbage Mass) and nutritive value. Total fresh weight was determined and a subsample taken for determination of DM concentration and another taken for nutritive value

Prior to the initiation and at the termination of the study, four root and rhizome samples were collected using a circular soil core (10.5-cm diam. by 20-cm depth). Roots and rhizomes were separated from the soil by washing with water over a standard window screen (~1.5-mm mesh).

**Experiment 2**

The study was conducted at the University of Florida Range Cattle Research and Education Center, Ona, FL under greenhouse conditions from July to December 2014 and 2015. The “E” horizon of a Pomona sand was collected and used as a growing medium. Before the initiation of the study, mean soil pH was 5.7 and Melich-1 extractable P, K, Mg, and Ca were 2, 2, 7, and 84 mg $kg^{-1}$, respectively.

Treatments were the factorial arrangement of N fertilization levels (0, 50, and 100 kg $ha^{-1}$) and K fertilization levels (0, 17, 33, and 66 kg $ha^{-1}$) distributed in randomized complete block design with four replicates. Nitrogen and K treatments are described in the text as 0N, 50N, and 100N, and 0K, 17K, 33K, and 66K, respectively. Argentine bahiagrass was seeded in propagation trays and transplanted after 3 wk. Bahiagrass was clipped in three consecutive 42-d periods at a 5-cm stubble height for HA (Herbage Accumulation), and N and K tissue concentrations. Treatments were re-applied after every harvest. At the termination of the study, root and rhizome mass were determined. Roots and rhizomes from the entire pot were separated from the soil by washing with water over a standard window screen (~1.5-mm mesh

## Results and Discussion

**Experiment 1**

Potassium fertilization did not affect average pre-grazing HM, CP (Crude Protein), and IVDOM (In Vitro Digestible Organic Matter) concentrations; however, pre-grazing bahiagrass tissue K concentration increased from 10.6 to 11.2 g $kg^{-1}$ with increasing K fertilization levels from 0 to 42 kg K $ha^{-1}$. Greater levels of K in the soil due to fertilization increased the plant uptake and tissue K concentrations, as observed by Burton et al. (1997). Potassium concentration observed in this study was above 8.0 g $kg^{-1}$, reported by McDowell (1985) as an average value found for warm-season grasses collected in different countries. The lack of increase in HM with greater K fertilization and tissue K concentration levels indicated that K was likely not the most limiting nutrient and the tissue K concentration level of 10.6 g $kg^{-1}$ was sufficient to promote optimum growth under these conditions.

There was a N fertilization effect on HM, and CP and K concentrations of bahiagrass pastures (Table 2). Treatments 1N and 2N had greater HM than the control; however, there was no difference between 1N and 2N. Excessive rainfall during the summer in Florida (Table

3) may have leached some of the N fertilizer applied in August, decreasing the efficiency of fertilization at that time. Kalmbacher et al. (2005) observed that the benefit of two N-fertilization events on bahiagrass pastures in Florida was minimal and there was no difference between one application in March or two applications in March and June. Forage from treatments 1N and 2N had greater CP than the control, but similar to the HM response, there was no difference between 1N and 2N. In spite of the greater CP concentration on N-fertilized plots, the levels were relatively low and only sufficient to maintain the body condition score of a non-lactating mature beef cow (NRC, 1996). Reduced CP concentration levels are related to the extended regrowth period between grazing events and relatively low N fertilization levels. Pitman (2013) observed that bahiagrass harvested with greater frequency and N fertilization levels had greater CP and in vitro true digestibility.

Tissue K concentration was greater in the 1N and 2N treatment than the control, but there was no difference between the 1N and 2N treatments. Kalmbacher et al. (2005) also observed that bahiagrass receiving N fertilization had greater tissue K concentration. They attributed this effect to greater root development of the N-fertilized bahiagrass and increased ability to explore a larger soil volume and take up a greater amount of nutrients. In addition, Mouat (1983) found that the cation exchange capacity of the roots increased with increasing N fertilization levels, and this may be partially responsible for greater tissue K concentration. There was a N × K fertilization interaction on root-rhizome mass (Table 5). Potassium fertilization increased root-rhizome mass with no N fertilization; however, there was no effect of K fertilization when N fertilization was applied at 1N or 2N. But if we adjusted our alpha value to $P \geq 0.1$ there was a trend to increase root-rhizome mass with K fertilization. It has been observed that K fertilization can increase root-rhizome mass in bermudagrass (Kiesling et al., 1979); however, N fertilization promotes above-ground growth and the plants may have mobilized nonstructural carbohydrates for the greater above-ground growth observed in the treatments with N fertilization, as described by Alderman et al. (2011). As root-rhizome mass is related to pasture persistence, greater root-rhizome mass with K fertilization and no N fertilization may be an indicator that K fertilization may be an important management practice to promote persistence in extensive grazing systems with no or very limited N fertilization.

**Experiment 2**

Increasing K fertilization levels increased bahiagrass HA, tissue K concentration, and root-rhizome mass (Table 6). There was no difference in HA between 33K and 66K; however,

66K had greater HA than 17K and the control (Table 6). Similarly to HA, tissue K concentrations increased from 12.6 g $kg^{-1}$ to 24.5 g $kg^{-1}$ with K fertilization from 0 to 68 kg $ha^{-1}$. Potassium is a macronutrient involved in maintaining the water status of the plant, the turgor pressure of its cells, and the opening and closing of its stomata. In addition, it is required for the accumulation and translocation of newly formed carbohydrates in the plant (Jones Jr., 1930). With multiple roles in the plant, the mechanisms for greater HA with increasing K is not known, but these factors together led to greater HA on treatments receiving K fertilization. These results were contrasting with the effects of K fertilization in Experiment. 1; however, it is important to note that the pots were fertilized with K after every harvest under controlled moisture conditions, which ultimately resulted in greater HA. There was a quadratic relationship between HA and tissue K concentration (Figure 1). The tissue K concentration found for maximum HA was 17 ± 1.5 g $kg^{-1}$. The tissue K concentration found in Experiment. 1, 10.6 g $kg^{-1}$, is substantially lower than the value found for maximum HA in Experiment. 2, 17 g $kg^{-1}$. However, the greater levels of HA and tissue K concentration in Experiment. 2 were achieved with three N and K fertilization events per year in a greenhouse with controlled conditions. In addition, the range of K fertilization levels in Experiment. 2 was greater than in Experiment. 1, with the greatest fertilization level of 66 kg K $ha^{-1}$.

There was no N × K fertilization interaction effect for HA or tissue K concentration; however, N fertilization increased HA, N tissue concentration, and root-rhizome mass (Table 7). The regrowth interval used in this study (42 d) allowed the plants to likely reach their maximum above-ground HA and increase root-rhizome mass with greater levels of N fertilization. Vendramini et al. (2013) observed that bahiagrass plots harvested at 28-d intervals achieved 94% light interception and according to Brougham (1957), when the pasture canopy intercepts 95% of the available light, the HA accumulation rate of the pasture declines and the maximum accumulation is reached relatively quickly. Silveira et al. (2011) observed that greater N and P fertilization levels increased root-rhizome mass in bahiagrass cultivated in pots in a greenhouse.

## Summary

Nitrogen fertilization in the spring increases production and nutritive value of bahiagrass pastures; however, N fertilization in the summer was not beneficial in this location characterized by sandy soils and high summer rainfall. Potassium fertilization in the spring with 42 kg K $ha^{-1}$ may not increase HA of bahiagrass pastures in extensive grazing systems

with limited N fertilization, but it did increase root-rhizome mass when no N was applied This may have impacts on bahiagrass persistence in the very extensive managed pasture systems in Florida where N is often not applied.

It was clear that the tissue K concentration was highly variable between Experiment. 1 and 2 and there are several factors affecting tissue K concentrations. In Experiment. 2, under controlled greenhouse conditions and greater levels of N and K fertilization levels, the tissue K concentration for maximum HA was 17 g $kg^{-1}$. However, it is not reasonable to use this value as an indicator of K sufficiency in different forage production systems. Nitrogen and K fertilization decisions for bahiagrass pastures should be based on agronomic aspects and economic viability. Bahiagrass in extensive grazing systems may benefit from K fertilization by increasing root-rhizome mass and likely increasing stand persistence. Conversely, intensive grazing systems with greater levels of N fertilization may benefit from K fertilization due to the greater HA and K update.

Table 1. Soil and tissue nutrient concentrations in established bahiagrass pastures in two locations at Deseret Ranch, FL (Experiment 1).

| | Location 1 | Location 2 |
|---|---|---|
| Soil test[†] | | |
| pH | 5.3 (L)[‡] | 4.9 (L) |
| P (mg $kg^{-1}$) | 3 (L) | 24 (L) |
| K (mg $kg^{-1}$) | 12 (L) | 14 (L) |
| Mg (mg $kg^{-1}$) | 50 (H) | 21 (M) |
| Ca (mg $kg^{-1}$) | 402 | 444 |
| Tissue test | | |
| N (g $kg^{-1}$) | 15 | 20 |
| P (g $kg^{-1}$) | 1.2 (L) | 1.7 (A) |
| K (g $kg^{-1}$) | 7.4 | 7.2 |
| Mg (g $kg^{-1}$) | 2.5 | 2.2 |
| Ca (g $kg^{-1}$) | 4.7 | 5.3 |
| S (g $kg^{-1}$) | 1.5 | 1.8 |

[†] Melich-3 Extractant

[‡] L = Low, M = Medium, H = High, A = Adequate, according to the University of Florida soil testing interpretation (Mylavarapu, 2002)

Table 2. Nitrogen fertilization effect on pre-grazing bahiagrass herbage mass and tissue in vitro digestible organic matter (IVDOM), crude protein (CP), and K concentrations for pastures fertilized with different levels of N and K (Experiment 1). Data represent 2 yr and 5 harvests year$^{-1}$.

| | N fertilization | | | |
|---|---|---|---|---|
| Response variable | 0[†] | 1N | 2N | SE |
| HM, Mg ha$^{-1}$ | 2.3b[‡] | 2.8a | 3.1a | 0.2 |
| IVDOM, g kg$^{-1}$ | 468a | 463a | 460a | 4.1 |
| CP, g kg$^{-1}$ | 79b | 83a | 84a | 2.0 |
| K, g kg$^{-1}$ | 10.3b | 11.8a | 11.6a | 0.3 |

[†] 0 = 0 N fertilization, 1N = application of 50 kg N ha$^{-1}$ in May 2014 and 2015, and 2N = application of 50 kg N ha$^{-1}$ in May and 50 kg N ha$^{-1}$ in August 2014 and 2015.
[‡] N fertilization means within a row followed by the same lower case letter are not different ($P > 0.05$).

Table 3. Monthly maximum and minimum temperatures and rainfall in Deer Park, FL in 2014 and 2015.

| Month | Temperature | | | | Rainfall | | |
|---|---|---|---|---|---|---|---|
| | 2014 | | 2015 | | | | |
| | Ave Min | Ave Max | Ave Min | Ave Max | 2014 | 2015 | 67-yr average |
| | °C | | | | mm | | |
| Jan | 9 | 21 | 11 | 23 | 105 | 108 | 54 |
| Feb | 12 | 26 | 10 | 22 | 22 | 115 | 66 |
| Mar | 12 | 26 | 16 | 28 | 55 | 17 | 79 |
| Apr | 15 | 29 | 18 | 30 | 43 | 107 | 62 |
| May | 17 | 31 | 18 | 31 | 122 | 23 | 94 |
| Jun | 21 | 32 | 21 | 33 | 189 | 109 | 221 |
| Jul | 23 | 33 | 22 | 33 | 180 | 101 | 212 |
| Aug | 23 | 34 | 22 | 33 | 139 | 228 | 211 |
| Sep | 22 | 31 | 22 | 32 | 213 | 144 | 186 |
| Oct | 17 | 30 | 19 | 29 | 33 | 25 | 78 |
| Nov | 12 | 24 | 18 | 28 | 94 | 68 | 49 |
| Dec | 12 | 24 | 17 | 27 | 26 | 64 | 52 |
| Average | 16 | 28 | 18 | 29 | - | - | |
| Total | - | - | - | - | 1221 | 1107 | 1363 |

Table 5. Nitrogen × K fertilization interaction effects on root-rhizome mass of bahiagrass pastures. Data represent 2 yr.

| N fertilization | Potassium fertilization level (kg K $ha^{-1}$) | | *P* value | SE |
|---|---|---|---|---|
| | 0 | 42 | | |
| | --Root-rhizome mass (kg $ha^{-1}$)-- | | | |
| 0 | 1630a[†] | 2520a | 0.03 | |
| 1N[‡] | 1830a | 2400a | 0.06 | 220 |
| 2N | 1830a | 2600a | 0.09 | |
| SE | 270 | | | |

[†]Means within columns followed by the same lower case letter are not different (P > 0.05)
[‡]0 = 0 N fertilization, 1N = application of 50 kg N $ha^{-1}$ in May 2014 and 2015, and 2N = application of 50 kg N $ha^{-1}$ in May and 50 kg N $ha^{-1}$ in August 2014 and 2015.

Table 6. Potassium fertilization effects on bahiagrass herbage accumulation, plant tissue N and K concentrations, and end-of-season root-rhizome mass when grown in pots in a greenhouse (Experiment 2). Data represent 2 yr and 3 harvests $yr^{-1}$.

| | K fertilization (kg K $ha^{-1}$) | | | | |
|---|---|---|---|---|---|
| | 0 | 17 | 33 | 66 | SE |
| HA, g $pot^{-1}$ | 0.7d[†] | 1.0cd | 1.1bc | 1.4ab | 0.22 |
| N, g $kg^{-1}$ | 19.9a | 18.6ab | 17.2b | 16.6b | 1.93 |
| K, g $kg^{-1}$ | 12.6c | 19.4b | 23.3a | 24.5a | 3.31 |
| Root-rhizome mass, g $pot^{-1}$ | 3.0b | 3.9b | 4.3b | 5.9a | 0.81 |

[†] K fertilization means within a row followed by the same lower case letter are not different (*P* > 0.05).

Table 7. Nitrogen fertilization level effects on bahiagrass herbage accumulation and N and K concentrations when grown in pots in a greenhouse (Experiment 2). Data represent 2 yr and 3 harvests year$^{-1}$.

| | N fertilization (kg ha$^{-1}$) | | | |
|---|---|---|---|---|
| Response variable | 0 | 50 | 100 | SE |
| HA, g pot$^{-1}$ | 0.29b[†] | 1.46a | 1.45a | 0.22 |
| N, g kg$^{-1}$ | 13.4c | 18.8b | 22.0a | 1.80 |
| K, g kg$^{-1}$ | 20.7a | 19.6a | 19.5a | 3.30 |
| Root-rhizome mass, g pot$^{-1}$ | 1.8b | 5.9a | 5.2a | |

[†] N fertilization means within a row followed by the same lower case letter are not different ($P > 0.05$).

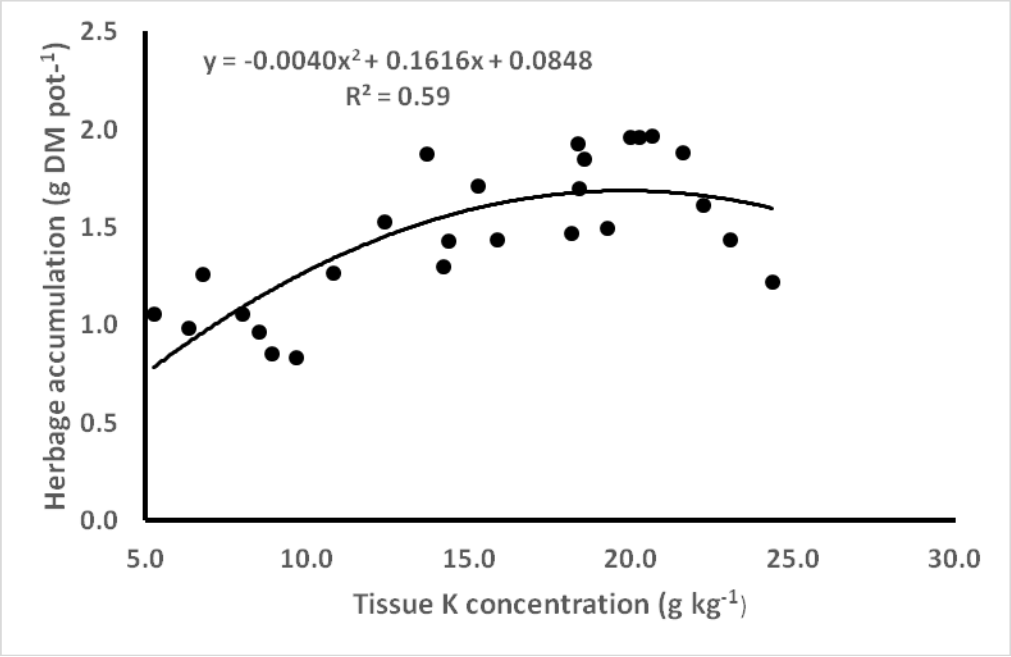



Figure 1. Relationship between bahiagrass herbage accumulation and tissue K concentration. Each point represents the mean across harvests and years (Experiment 2).

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# The Future of the NFREC Forage Breeding Program





**Program Description**: The University of Florida's Forage Breeding Program includes a wide array of forage grass and legumes species because Florida's environment is diverse, ranging from tropical to temperate conditions. Forage breeding at the NFREC is based at both the North Florida Research and Education Center (NFREC-Marianna and Quincy) and at Gainesville. At NFREC we focus breeding on the sub-tropical forages like bahiagrass, perennial peanut and limpograss, and temperate species that include triticale, cereal rye, oat, ryegrass, alfalfa and clover. Our cultivars are also grown world-wide because of their adaptation to areas of the world with similar climates.

**Major Impact**: The University of Florida's Forage Breeding Program has been very successful in forage cultivar development and in basic research related to forage and small grain improvement. Since 2005 through 2016, of new southern forage cultivars released by public institutions in the southeastern U.S., 80 % were developed or co-developed by the University of Florida's Forage Breeding Program.

**Our Strength:** Because of our unique location in northern Florida we have developed a strong multi-state forage program across U.S. state lines. We are very actively involved with forage researchers at a variety of Universities. The University of Florida's Forage Breeding Program is an active member of the SUNGRAINS consortium, a six-university cooperation of plant breeders who work collaboratively on small grains (oat, wheat, triticale and rye) variety development. We also partner on several international projects. At present, we are developing a long-term research agreement with the UNNE, at Corrientes Argentina to co-develop forages for North and South America. Similarly we are working with EMBRAPA forage specialists in Brazil on *Paspalum* and *Arachis*. Recently, we began a collaboration to develop forage small grains for Western Australia. We have also been a major contributor and active participant with the PepsiCo-Quaker Oat Program.

**Our Future:** Our climate and location allows us to successfully develop forages that may fit into livestock-forage systems in developing countries of similar climate, particularly areas in Africa, Asia, India and other countries of sub-tropical and tropical environments. As public U.S. University forage programs are vanishing due to budget cuts and attrition, the UF NFREC's program continues to produce an essential pipeline for sub-tropical varieties well-suited to the southern U.S. and countries with similar climatic conditions.

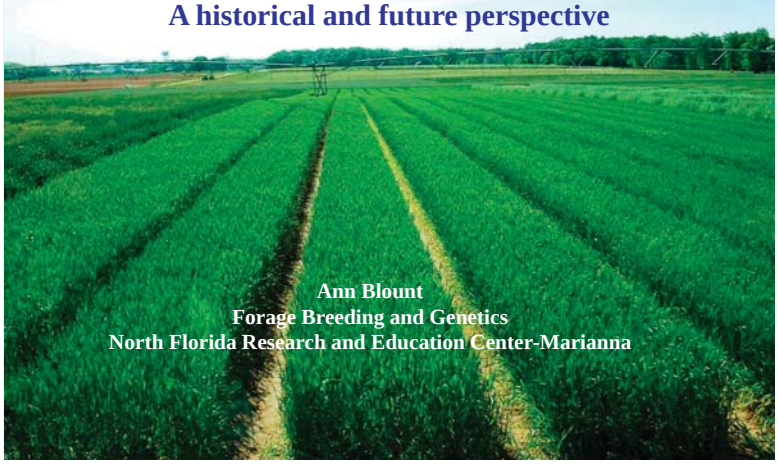
**NFREC Investigators Involved**: Ann Blount, Jose Dubeux, Cheryl Mackowiak, Nicolas DiLorenzo and Cliff Lamb.

**Other Investigators/Units**: Agronomy: Ken Quesenberry, Ali Babar, Lynn Sollenberger, Kevin Kenworthy, and Joao Vendramini, Soil Science: Maria Silveira; Other Universities: University of Georgia, University of Kentucky, North Carolina, Clemson, Auburn, Texas A&M, and Louisiana State Universities, and with scientists at the USDA-ARS (CPES, Tifton, GA) and USDA-NRCS.

UF UNIVERSITY of FLORIDA
Institute of Food and Agricultural Sciences

# Utilizing Legumes in Grazing Systems

## A historical and future perspective



Ann Blount
Forage Breeding and Genetics
North Florida Research and Education Center-Marianna

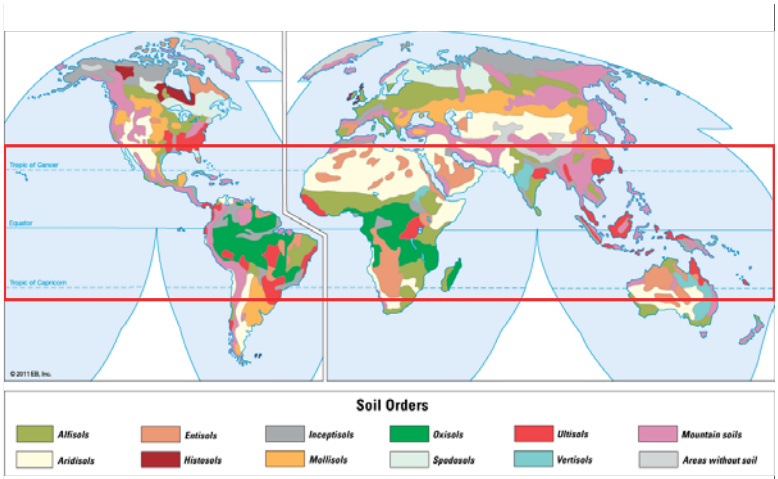
## It's a small world

A very special thanks to Leaning Tree for comic relief throughout!

## It's a team effort

## It takes "Critical Mass"

- Florida Cattlemen (and all our livestock producers)
- Dedicated County Extension Agents
- USDA-ARS STARS, CPES, and NRCS
- Range Cattle REC-Ona
- NFREC-Quincy and Marianna
- UF at Gainesville
- Indentured servants called "graduate students"




UF has a long history forage breeding in Florida.

## Forages come in all shapes and sizes

### Elephantgrass

Roselawn St. Augustine

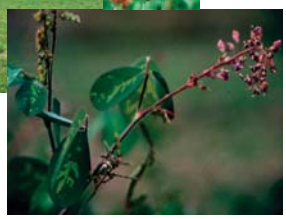
# Perennial vs. Annual Forages


## Perennial

**Bahiagrass**
**Bermudagrass**
**Stargrass**
**Limpograss**
**Fescue (????)**

**Perennial Peanut**
**Alfalfa**
**White clover**
**Carpon desmodium**
**Stylosanthes**

*Grasses*
**Pearl Millet**
**Sorghum**
**Sorghum-Sudangrass**
**Crabgrass**
**Wheat**
**Oat**
**Rye**
**Triticale**
**Ryegrass**



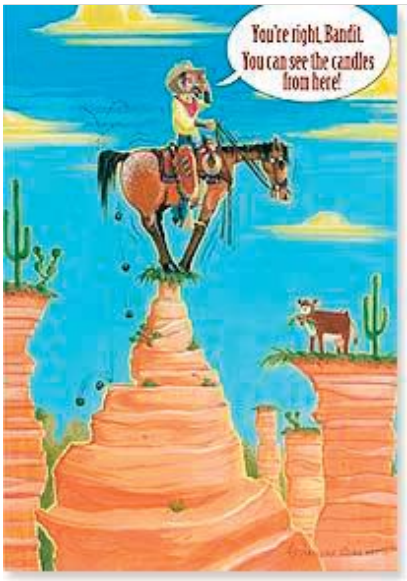
## Annuals

*Legumes*
**White Clovers**
**Red clover**
**Crimson clover**
**Arrowleaf clover**
**Ball clover**
**Berseem clover**
**Lupine**
**Vetch**
**Medic**
**Winter pea**

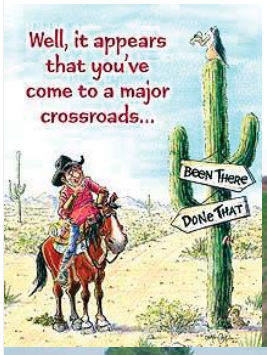
**Soybeans**
**Clay peas**
**Hairy Indigo**
**Alyceclover**
**Vigna**
**Aeschynomene**
**Partridge pea**
**misc. summer tropical legumes**

# The Florida Forage System

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|
| sorghum, switchgrass, gamagrass | | | | | | | | | | | |
| bahiagrass, bermudagrass, limpograss, stargrass | | | | | | | | | | | |
| perennial peanut, soybean, aeschynomene, stylo | | | | | | | | | | | |
| carpon, pearl millet, brown top millet and crabgrass | | | | | | | | | | | |
| brassicas, rye, wheat, triticale | | | | | | | | | | oat | |
| ryegrass, pea, clover | | | | | | | | | | vetch | |

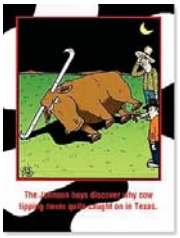



# Soil Type
# Soil Moisture




# Your Management

Not Human Pests!



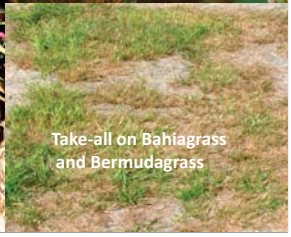
**Insects**
**Diseases**
**Nematodes**

# Pest Considerations










| Perennial Grasses: | FAES release | Country of Origin |
|---|---|---|
| Natalgrass | 1892 | South Africa |
| Japanese cane | 1895 | China |
| Paragrass (brachiaria) | 1910 | Africa |
| Rhodesgrass | 1915 | South Africa |
| Caribgrass | 1917 | Africa |
| Elephantgrass/Napiergrass | 1919 | Rhodesia |
| Roselawn St. Augustine | 1944 | US |
| Mott Dwarf elephantgrass | 1987 | Rhodesia |

Paragrass

Roselawn St. Augustine

| Digit, Star, and Bermudagrass: | FAES release | Country of Origin |
|---|---|---|
| Pangolagrass | 1936, 1943 | South Africa |
| Slenderstem digitgrass | 1969 | South Africa |
| Transvala digitgrass | 1973 | South Africa |
| Tiawan digitgrass | 1978 | Taiwan |
| Survenola digitgrass | 1982 | US |
| McCaleb stargrass | 1975 | South Africa |
| Ona stargrass | 1979 | Rhodesia |
| Florico stargrass | 1988 | Kenya |
| Florona stargrass | 1988 | unknown |
| Florakirk bermudagrass | 1994 | US |

Stargrass

**Coastal**
**Tifton 85**
**Tifton 44**
**Russell**
**Alicia**
**Jiggs**
***seeded types***

## Bermudagrass

Patricio Munoz, new forage breeder

| Limpograss/Hemarthria | FAES release | Country of Origin |
|---|---|---|
| Redalta limpograss | 1978 | South Africa |
| Greenalta limpograss | 1978 | South Africa |
| Bigalta limpograss | 1978 | South Africa |
| Floralta limpograss | 1984 | South Africa |
| GibTuck limpograss | 2014 | Florida |
| Kenhy limpograss | 2014 | Florida |

Limpograss

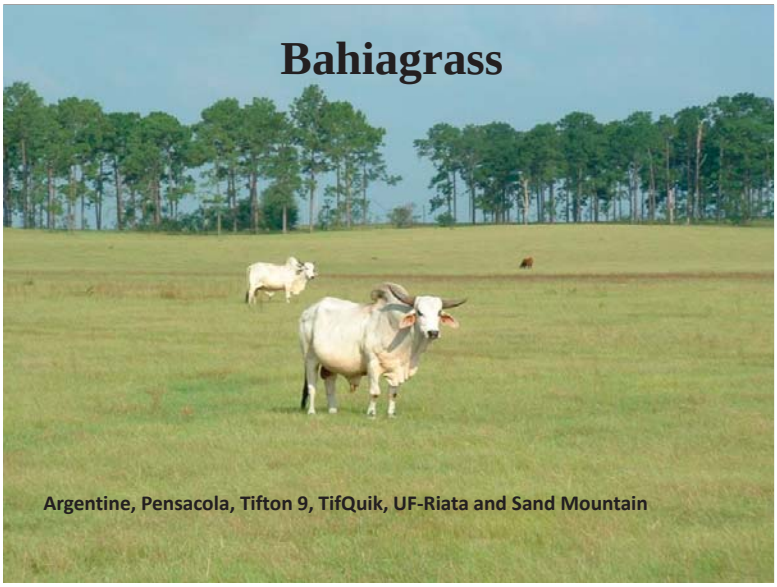
## New Limpograss/Hemarthria Hybrids

**Floralta X Bigalta**

| Paspalum/Bahiagrass: | FAES release | Country of Origin |
|---|---|---|
| Suerte atra paspalum | 1995 | Brazil |
| Common bahiagrass | 1915 | Brazil |
| Paraguay bahiagrass | 1942 | Paraguay |
| Pensacola bahiagrass | 1943 | South America |
| Argentine bahiagrass | 1951 | Argentina |
| Q4188 tetraploid bahiagrass | 2002 | US (Florida) & Argentina |
| Q4205 tetraploid bahiagrass | 2002 | US (Florida) &Argentina |
| UF-Riata bahiagrass | 2008 | US (Florida) |

Suerte

Bahiagrass

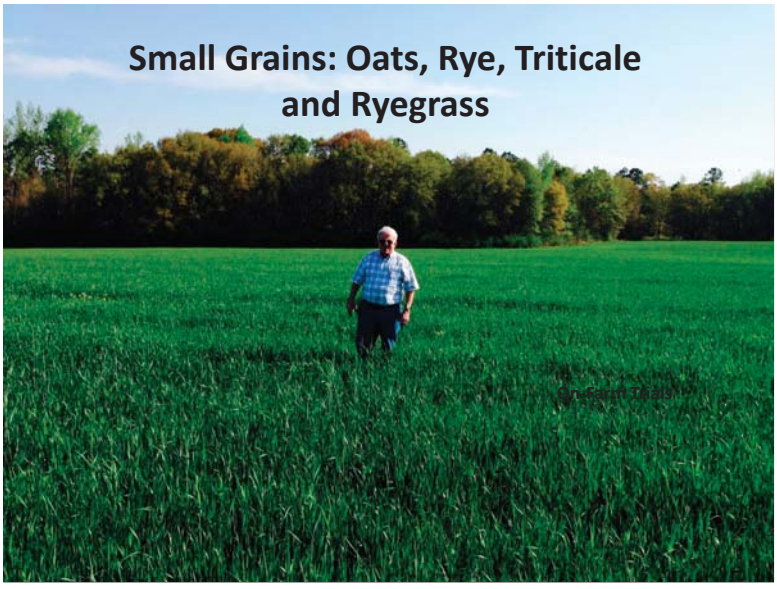





## Utility turf bahiagrass and dwarf types

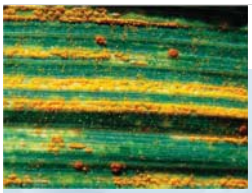
conventional utility turf lines

transgenic lines




| Oat (Small Grains): | FAES release | Country of Origin |
|---|---|---|
| Quincy Red oat | 1940 | US (Florida) |
| Quincy Gray oat | 1940 | US (Florida) |
| Florida 167 oat | 1942 | US (Florida) |
| Florilee oat | 1943 | US (Florida) |
| Southland oat | 1950 | US (Florida) |
| Floriland oat | 1952 | US (Florida) |
| Sunland oat | 1953 | US (Florida) |
| Seminole oat | 1953 | US (Florida) |
| Florad oat | 1961 | US (Florida) |
| Florida 500 oat | 1965 | US (Florida) |

| Oat (Small Grains): | FAES release | Country of Origin |
|---|---|---|
| Florida 501 oat | 1968 | US (Florida) |
| Florida 502 oat | 1983 | US (Florida) |
| Chapman oat | 1996 | US (Florida) |
| Horizon 314 oat | 1999 | US (FL & GA) |
| Horizon 474 oat | 2002 | US (FL & GA) |
| Horizon 321 oat | 2003 | US (FL & GA) |
| Horizon 201 oat | 2007 | US (Sungrains) |
| Ram oat (LA99016) | 2007 | US (Sungrains) FL |
| FL0567 | 2013 | US (Sungrains) |
| FL0720 | 2014 | US (Sungrains) |





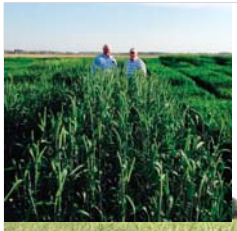

| Rye (Small Grains): | FAES release | Country of Origin |
|---|---|---|
| Gator rye | 1956 | US (Florida) |
| Florida 401 rye | 1984 | US (Florida) |
| Wrens 96 rye | 1996 | US (FL & GA) |
| AGS 104 rye | 2003 | US (FL & GA) |
| Boss rye | 2003 | US (FL & GA) |

| Wheat and Barley: | FAES release | Country of Origin |
|---|---|---|
| Florida 301 wheat | 1980 | US (Florida) |
| Florida 302 wheat | 1984 | US (Florida) |
| FL 74265 wheat (hybrid parent-AgriPro) | 1986 | US (Florida) |
| Traveler wheat | 1986 | US (Florida) |
| Florida 301H wheat (Hessian fly resistant) | 1988 | US (Florida) |
| Florida 303 wheat | 1988 | US (Florida) |
| ATW 270 wheat (Agritech, Southern States) | 1989 | US (Florida) |
| Florida 304 wheat | 1992 | US (Florida) |

| Wheat (Small Grains): | FAES release | Country of Origin |
|---|---|---|
| Morey wheat | 1994 | US (Florida) |
| Roberts wheat | 1997 | US (FL & GA) |
| Fleming wheat | 1987 | US (FL & GA) |
| AGS 2000 wheat | 1999 | US (FL & GA) |
| FFR36803 wheat (Southern States) | 2001 | US (FL & GA) |
| Crawford wheat | 2001 | US (FL & GA) |
| AGS 2485 wheat | 2002 | US (FL & GA) |
| USG 3592 wheat | 2003 | US (FL & GA) |
| McIntosh wheat | 2004 | US (FL & GA) |

New Small Grains Breeder
Ali Babar

| Triticale (Small Grains): | FAES release | Country of Origin |
|---|---|---|
| Beagle 82 triticale | 1982 | US (Florida) |
| Florida 201 triticale | 1985 | US (Florida) |
| Sunland triticale | 1989 | US (Florida) |
| Trical 342 triticale | 2003 | US (FL & GA) |
| Monarch triticale | 2003 | US (FL & GA) |
| FL01143 Awnless triticale | 2013 | US (FL & Sygenta) |



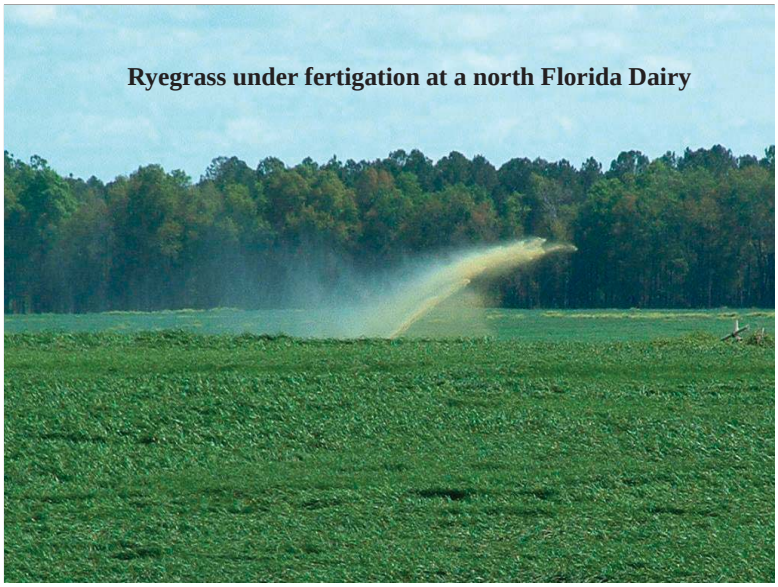
## FL01143 Awnless Triticale

for silage, grazing, and grain

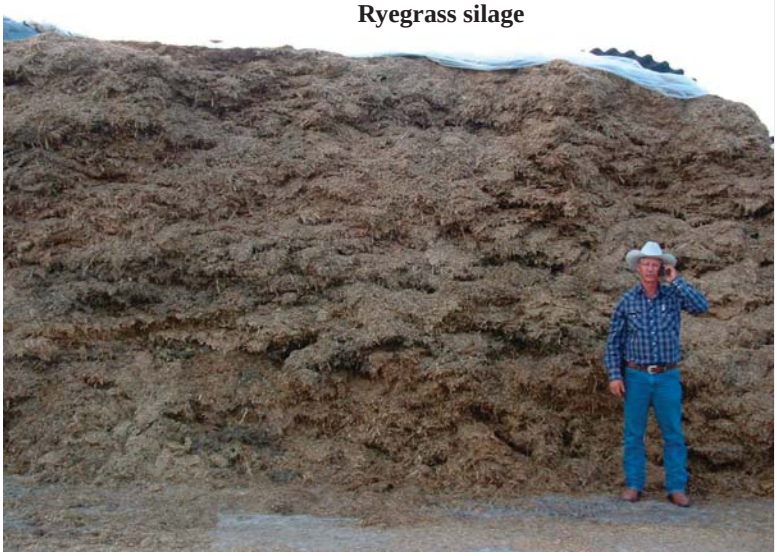
## Ryegrass variety trials at Marianna Beef Unit

| Ryegrass: | FAES release | Country of Origin |
|---|---|---|
| Florida Rust Resistant ryegrass | 1965 | US (Georgia) |
| Florida 80 ryegrass | 1982 | US (Florida) |
| Surrey ryegrass | 1989 | US (Florida) |
| Florilina ryegrass | 1999 | US (Florida) |
| Jumbo ryegrass | 1999 | US (Florida) |
| Fantastic ryegrass | 2001 | US (Florida) |
| King ryegrass | 2001 | US (Florida) |
| Surrey II ryegrass | 2001 | US (Florida) |
| Ed ryegrass | 2001 | US (Florida) |
| Graze-N-Grow | 2001 | US (Florida) |
| Prine ryegrass | 2001 | US (Florida) |
| Brigadier ryegrass | 2001 | US (Florida) |
| Beefbuilder ryegrass | 2002 | US (Florida) |
| Striker ryegrass | 2002 | US (Florida) |
| Attain ryegrass | 2002 | US (Florida) |

| Ryegrass: | FAES release | Country of Origin |
|---|---|---|
| FLX2002 (LA3)LRCR ryegrass | 2004 | US (Florida) |
| FLX2002(DRU)LR ryegrass | 2004 | US (Florida) |
| FLX2002(New)4xMR ryegrass | 2004 | US (Florida) |
| FLX1998(New)ER ryegrass | 2004 | US (Florida) |
| FLX2004(G)4XERLS ryegrass | 2004 | US (Florida) |
| FLX2003 (New 3)LRCT ryegrass | 2004 | US (Florida) |
| Bruiser ryegrass | 2004 | US (Florida) |
| Stockaid ryegrass | 2004 | US (Florida) |
| Big Boss ryegrass | 2004 | US (Florida) |
| FL/NEX2006 (Misc. 2X)LRCT ryegrass | 2006 | US (Florida) |
| Ocala ryegrass | 2006 | US (Florida) |
| M/FLX2005 (4X) LRCT ryegrass | 2006 | US (Florida) |
| FLX1995 (4X) LR Late ryegrass | 2006 | US (Florida) |
| Angus 1 ryegrass | 2006 | US (Florida) |
| FLX2000 (G) ER Early ryegrass | 2006 | US (Florida) |
| FLX2003 (4X) SM ryegrass | 2006 | US (Florida) |
| Ocala | 2010 | US (Florida) |
| Earlyploid | 2010 | US (Florida) |




Ryegrass silage




| Velvetbean and Lupine: | FAES release | Country of Origin |
|---|---|---|
| Florida velvetbean | 1896 | US (Florida) |
| Osceola velvetbean | 1908 | US (Florida) |
| Alachua velvetbean | 1908 | US (Florida) |
| Wakulla velvetbean | 1908 | US (Florida) |
| Blue lupine | 1939 | US (Florida) |
| Alta blue lupine | 1950 | US (Florida) |
| Florida No. 2 blue lupine | 1953 | US (Florida) |
| Richey blue lupine | 1963 | US (Florida) |
| Frost blue lupine | 1970 | US (Florida) |

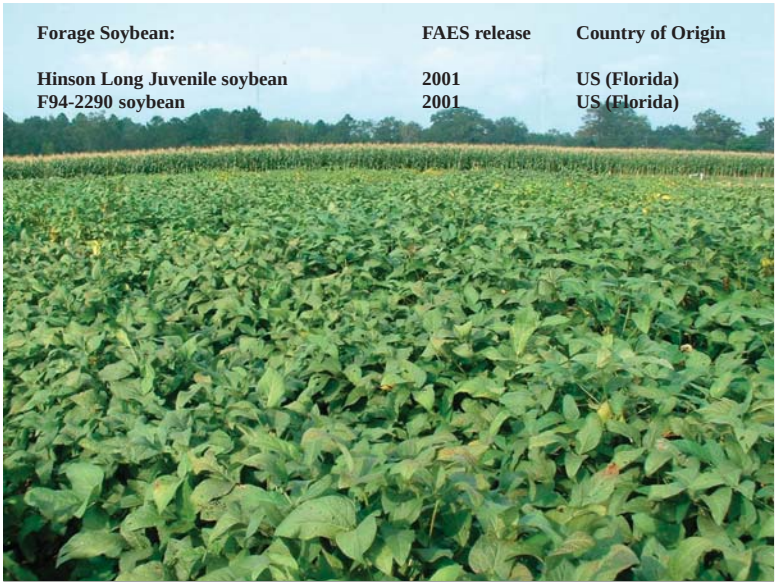
Lupine overseeded on bahiagrass

| Naturalized and Native legumes: | FAES release | Country of Origin |
|---|---|---|
| Alyceclover | 1942 | US (Florida) |
| Early hairy indigo | 1946 | US (Florida) |
| Late hairy indigo | 1947 | US (Florida) |
| Florida carpon desmodium | 1979 | US (Florida) |
| Flamingo hairy indigo | 1988 | US (Florida) |
| FL3 alyceclover | 1988 | US (Florida) |
| Savanna stylo | 1992 | US (Florida) |

Alyceclover

Carpon desmodium

| Forage Soybean: | FAES release | Country of Origin |
|---|---|---|
| Hinson Long Juvenile soybean | 2001 | US (Florida) |
| F94-2290 soybean | 2001 | US (Florida) |



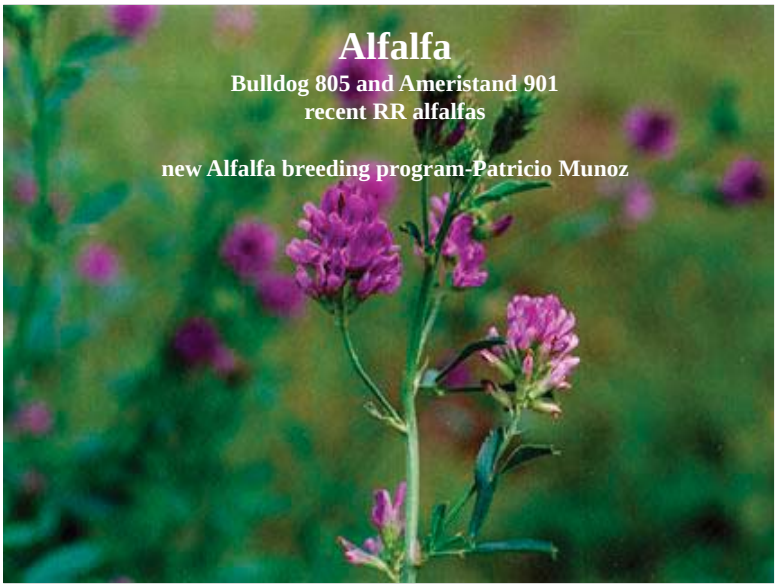
| Alfalfa: | FAES release | Country of Origin |
|---|---|---|
| Florida 66 alfalfa | 1969 | US (Florida) |
| Florida 77 alfalfa | 1980 | US (Florida) |
| Florida 99 alfalfa | 1996 | US (Florida) |

| Clovers: | FAES release | Country of Origin |
|---|---|---|
| Floranna sweetclover | 1952 | US (Florida) |
| Osceola white clover | 1977 | US (Florida) |
| Flame crimson clover | 1987 | US (Florida) |
| Cherokee red clover | 1990 | US (Florida) |
| Southern Belle red clover | 2002 | US (Florida) |
| Ocoee white clover | 2007 | US (Florida) |
| Barduro red clover | 2009 | US (Florida) |
| 2,4 D resistant red clover | 2014 | US (Florida) |

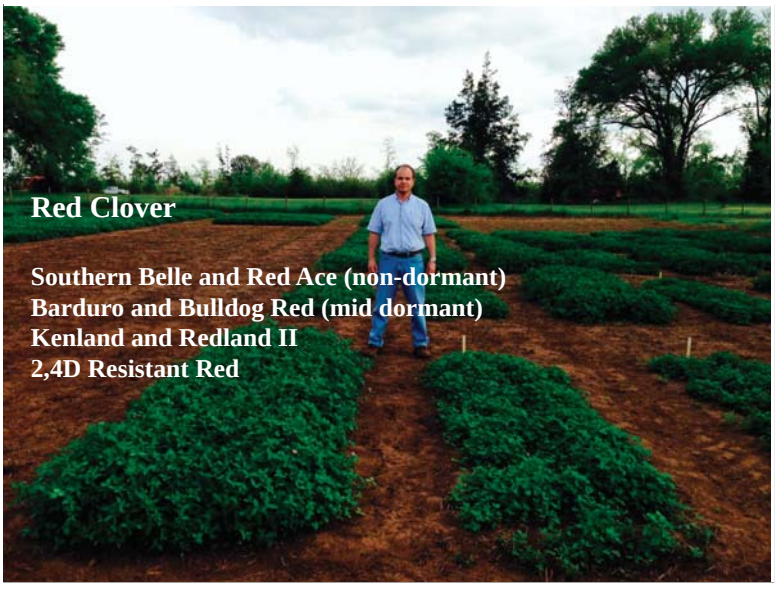
Crimson clover

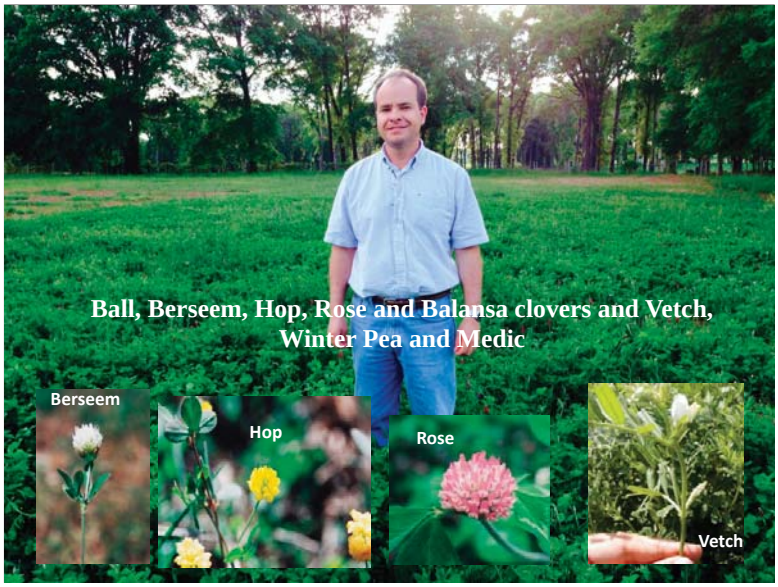
White clover

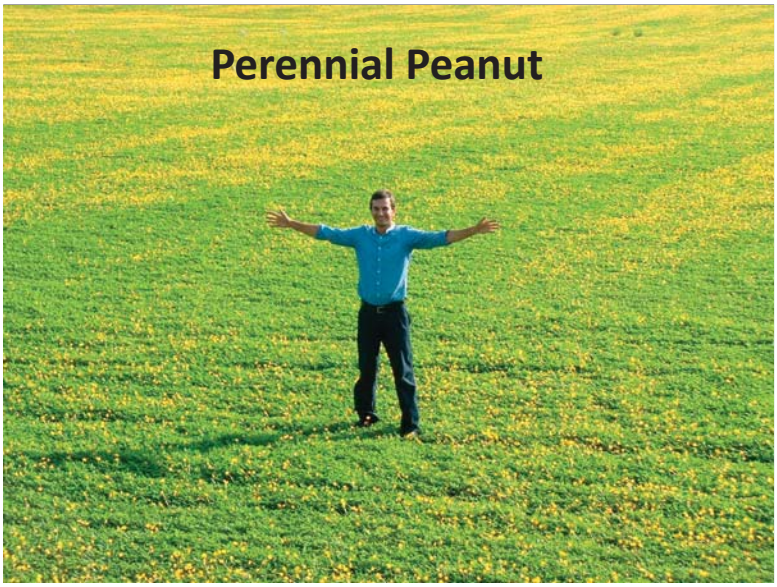
Red clover









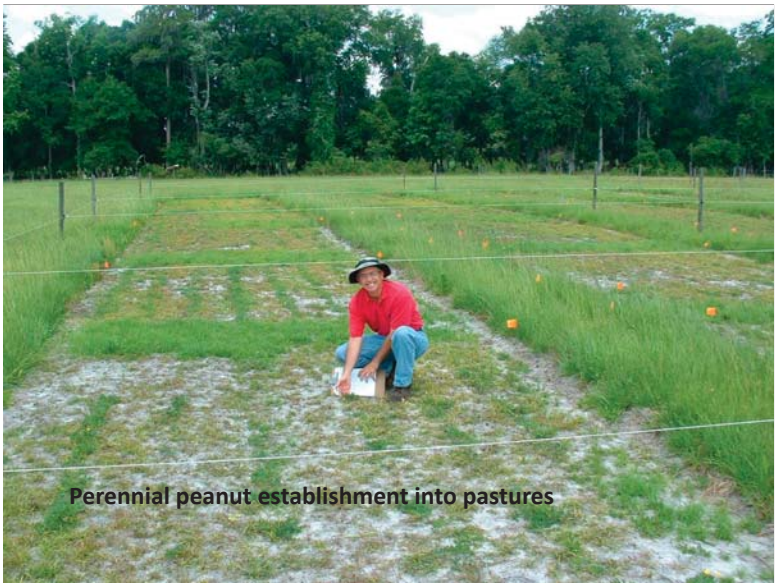



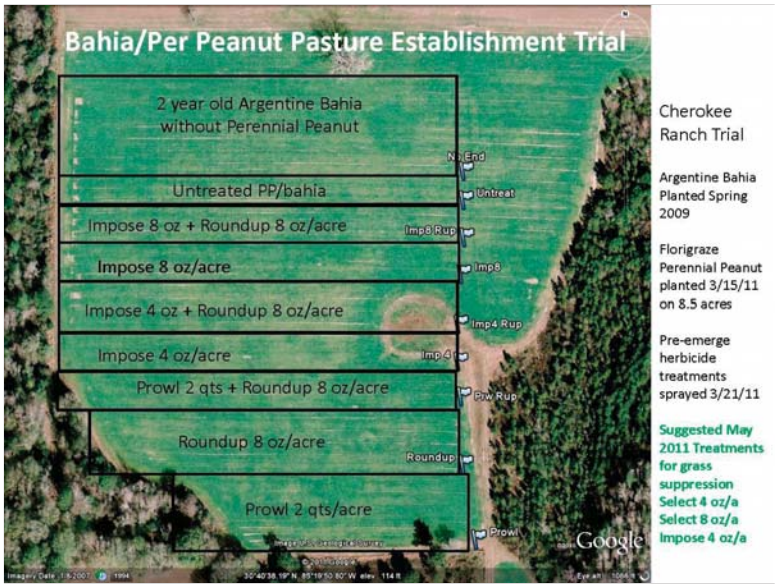

Perennial Peanut


| Perennial Peanut: | FAES release | Country of Origin |
|---|---|---|
| Floragraze perennial peanut | 1981 | US (Florida) |
| Arbrook perennial peanut | 1984 | Paraguay |
| Arblick perennial peanut | 2008 | Brazil |
| Ecoturf perennial peanut | 2008 | Brazil/Paraguay |
| UF-Tito perennial peanut | 2008 | Paraguay |
| UF-Peace perennial peanut | 2008 | US (Florida) |
| Latitude 34 | 2010 | Paraguay |
| Cowboy | 2012 | Unknown, plant introduction |


## Combining summer perennial grass and summer perennial legumes together

Perennial peanut sprigged in bahiagrass pasture




## Subtropical forage systems

Expanding the season of forage availability

Selecting varieties within or across species for complimentary production

Using mixtures of both temperate and sub-tropical forages

Using forage blends to aid in reducing disease concerns

Using legumes in blends to add a nitrogen fixing plant into the sward

## Subtropical forage systems

Utilizing row crop residues for pastures

Overseeding perennial summer grass pastures with other forages

Using conventionally tilled land for winter and summer annual forage production

Combining summer perennial grass and summer perennial legumes together

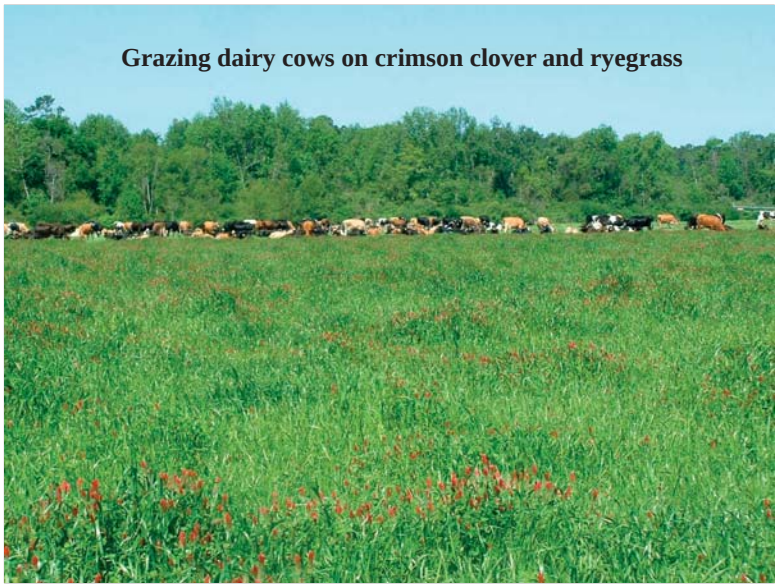
## Utilizing row crop residues for pastures

Row crops are overseeded with winter forages, like ryegrass
Seed may be sown by airplane or ground broadcast

Grazing dairies and beef cattle producers:

Summer grazing (bermudagrass and bahiagrass)
Winter grazing (rye, oats, triticale, ryegrass, clovers)

**Grazing dairy cows on crimson clover and ryegrass**



Conventionally tilled land with oat, Austrian winter pea and crimson clover

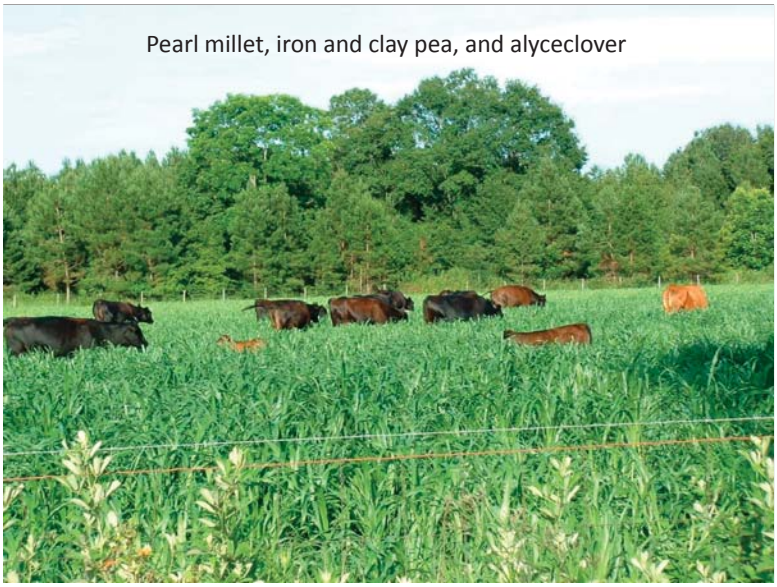
Stockers grazing overseeded red clover and ryegrass on bahiagrass pastures in North Florida

Common Ball Clover overseeded on Pensacola bahiagrass

Using conventionally tilled land for winter and summer annual forage production

Pearl Millet, Ryegrass abd Red Clover Blend

Pearl millet, iron and clay pea, and alyceclover



## Overseeding perennial summer grass (bahiagrass and bermudagrass) pastures with other forages

Red, ball and crimson clover in Argentine bahiagrass

## Summer perennial bunch grasses

Eastern Gamagrass with white clover in the winter and hairy indigo and alyceclover in the summer


Suerte with white clover in the winter and aschynomene in the summer

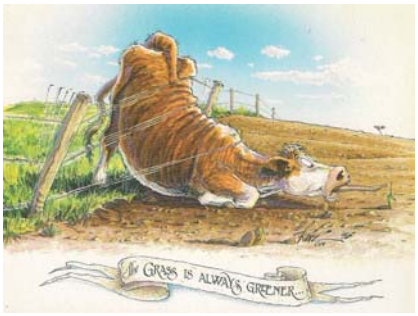

Red clover overseeded on bahiagrass in August, North Florida

## Outcome and Impacts

**Over 80% of southeastern publicly-developed varieties have been developed or co-developed by the UF-Forage Breeding Program**

## Future of plant genetic resource exchange

**Our future may be based on collaborations among public institutions or in partnership with private entities**

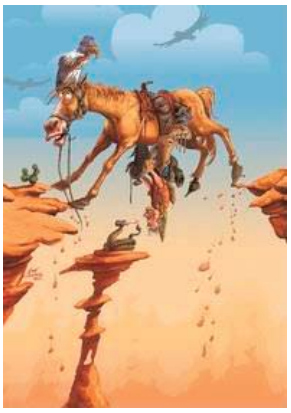



- **International Centers**
  - **CIAT**
  - **CIMMYT**
- **Federal Institutions**
  - **Ag Research**
  - **CSIRO**
  - **EMBRAPA**
  - **INIA**
  - **INTA**
  - **USDA-ARS**
- **Private Collections**


## Forage Variety Testing

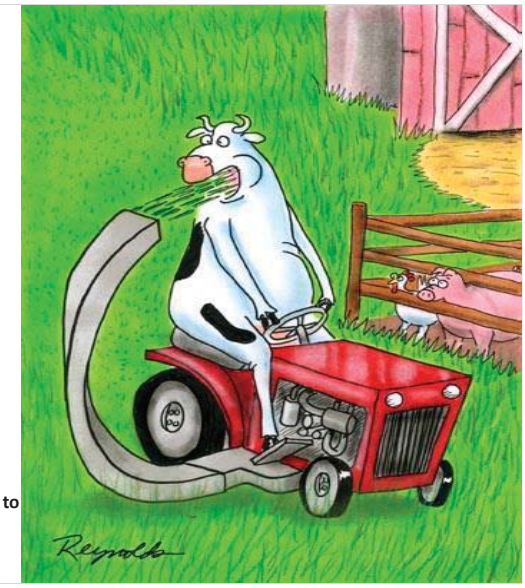
http://agronomy.ifas.ufl.edu/**ForagesofFlorida**
http://www.georgiaforages.com/
http://www.caes.uga.edu/commodities/swvt/

**Above all, be FLEXIBLE!**



## Questions?

**Once again: A special thanks to Leaning Tree for comic relief!**



**Pasture Weed Profile: Broomsedge (*Andropogon virginicus)***

Jonael Bosques, UF/IFAS Extension
Hardee County

***Alternate Names*** - Broomsedge, yellowsedge bluestem, Virginia bluestem**,** whiskey grass

Broomsedge is an emerging problem weed in South and Central Florida. This weed forms clumps in hayfields and pastures and provides little nutrition to livestock while competing for resources in pastures and rangeland. It does provide habitat for wild birds such as quail and turkey and its seed are consumed by birds in the winter time.

*Picture: Mature Broomsedge and seed.*

***Characteristics*** **-** Broomsedge is an opportunistic plant part of the bluestem family. It takes advantages of situations that decrease competitiveness of desirable forage plants. It is not highly competitive in fertile soils, but under inadequate grazing pressure and poor soil fertility it can overtake pastures and hayfields.

***Identification*** **-** Broomsedge bluestem is a native warm season perennial bunchgrass that grows 2 to 4 feet tall. The leaves are flat to partly folded 10 to 15 inches long and approximately 1/8 inch wide. The fringed ligule is 1/16 inch long. The flattened basal leaf sheaths are colorless or yellow. The rest of the plant is a pale greenish yellow. Broomsedge bluestem produces many seeds on the upper half of the plant that are distributed by the wind. At a distance the inflorescence may appear silvery in the sunlight.

Broomsedge bluestem grows where average rainfall is greater than 25 inches. It is found throughout the eastern portion of the United States. The grass is found in open areas such as abandoned fields, overgrazed pastures, cut-over timber sites, and rights of way. Broomsedge grows on a wide variety of soils, preferring loose, sandy, moist sites with low fertility and is an indicator of low phosphorus soils. It also is a shallow rooted plant.

***Population Management Strategies:***

**Routine soil nutrient mornitoring.** Maintaining soil fertility and pH is your best option for controlling broomsedge emergence. If broomsedge is already a problem, bringing soil fertility

and pH back to the recommended level (5.5 for Bahia grass pastures) based on soil test recommendations is the first step!

**Maintain adequate stocking rates**: Early in the growing season broomsedge is quite palatable and continued defoliation at this stage will help decrease plant vigor. However, as broomsedge is allowed to mature, it becomes highly fibrous and unpalatable and cattle will not eat it. Inadequate defoliation pressure reduces stress on the broomsedge while increasing stress on desirable forage plants, therefore creating a competitive advantage for the broomsedge.

**Mechanical Control methods**: Mowing does not provide effective broomsedge control. Burning has limited effect on plant populations.

**Chemical control methods:**

The recommended chemical control methods for broomsedge will also damage your desirable grass stands. Spot spraying with glyphosate may be your only option.

***References:***


- https://plants.usda.gov/factsheet/pdf/fs_anvi2.pdf
- http://www.aces.edu/anr/forages/FAQs/Broomsedge.php
- http://nwdistrict.ifas.ufl.edu/phag/2015/01/16/pasture-soil-fertility-essential-to-prevent-broomsedge-infestations/

UF IFAS Extension
UNIVERSITY of FLORIDA

SS-AGR-363

# Identification and Control of Johnsongrass, Vaseygrass, and Guinea Grass in Pastures[1]

H. Smith, J. Ferrell, and B. Sellers[2]

Johnsongrass is a common perennial grass that grows throughout the South and Midwest. It is so common and well known as a troublesome weed that any large undesirable grass is often called johnsongrass. This is problematic because it is one of three perennial grasses found in pastures. Vaseygrass and guinea grass are often misidentified as johnsongrass but they have very different herbicide recommendations. Calling a plant johnsongrass when it is really vaseygrass or guinea grass can result in the wrong recommendation and lead to an expensive herbicide failure.

## Identification: Johnsongrass, Vaseygrass, Guinea Grass

All three grasses have a prominent white midrib that extends the length of the leaf. But few similarities exist beyond this characteristic.

### Growth Habit

All three grasses are perennial, but only johnsongrass has a creeping rhizome system and grows in patches rather than in individual bunches. Vaseygrass and guinea grass are both bunch-type grasses without a significant rhizome system. Additionally, vaseygrass is most commonly found in wet fields or along drainage ditches. Johnsongrass and guinea grass prefer dryer sites.

### Seedhead

Johnsongrass and guinea grass have an open panicle seedhead that is angular. Color and size are the key differences between johnsongrass and guinea grass seedheads. Johnsongrass seeds are much larger and have a red/black mottled color, while the guinea grass seeds are smaller and somewhat green. Vaseygrass has a very different seedhead with alternating spikelets forming silky hairs around the seeds. Seeds are produced along the entire length of the seedhead branch, which does not occur in johnsongrass or guinea grass seedheads.

Figure 1. From left to right, guinea grass seedhead (Credits: Hunter Smith); johnsongrass seedhead (Credits: Brent Sellers); vaseygrass seedhead.
Credits: Brent Sellers

1. This document is SS-AGR-363, one of a series of the Agronomy Department, UF/IFAS Extension. Original publication date August 2012. Reviewed October 2015. Visit the EDIS website at http://edis.ifas.ufl.edu.

2. H. Smith, graduate assistant; J. Ferrell, professor, Agronomy Department; and B. Sellers, associate professor, Agronomy Department, Range Cattle Research and Education Center; UF/IFAS Extension, Gainesville, FL 32611.

## Seeds

Guinea grass has small, oval, light green seeds, which often have wrinkles. Vaseygrass seeds have similar characteristics but are flatter, with the presence of hairs. Johnsongrass has much larger, pointed seeds that develop a reddish/brown tint as they mature.

Figure 2. From left to right, guinea grass seedhead branch (Credits: Brent Sellers); johnsongrass seedhead branch (Credits: Hunter Smith); and vaseygrass spikelet.
Credits: Brent Sellers

## Stems

The stems of johnsongrass and guinea grass can look very similar. Inspection of the stems will show scattered but abundant hairs along the stem of guinea grass. Stem hair on guinea grass varies because of the different biotypes. Johnsongrass stems are totally smooth with no hairs. Vaseygrass stems have hairs where the leaf meets the stem or on the stem toward the base of the plant. This is because vaseygrass will generally lose stem hairs as the stems elongate.

## Leaves

Johnsongrass leaves have a large white midrib and a smooth, glossy appearance. Guinea grass leaves have a less prominent white midrib, and the undersides are rough with stiff hairs. Vaseygrass leaves are long and narrow with an indented midrib and crinkled leaf margins.

## Roots

A fifth and final identification method is to pull or dig up the roots. All three of these grasses are perennial, but johnsongrass has large white rhizomes that are easily seen if the plant is well established. Vaseygrass and guinea grass have smaller, more fibrous root structures compared to johnsongrass.

Figure 4. From left to right, guinea grass leaf blade; johnsongrass leaf blade; vaseygrass leaf blade.
Credits: Hunter Smith

Figure 5. Vaseygrass leaf margin.
Credits: Hunter Smith

Figure 6. Guinea grass root structure
Credits: Hunter Smith

# Control

## Johnsongrass

**Outrider:** For best johnsongrass control, apply 1.33 ounces per acre when grass is actively growing and is at least 18–24 inches tall, up to the heading stage.

**Impose (bermudagrass only):** Use 4–6 ounces per acre on johnsongrass less than 24 inches. Higher rates can be used, but unacceptable injury on bermudagrass will likely occur.

Although 4 oz of Impose can control johnsongrass, some regrowth should be expected on older stands that are large at the time of application.

**Pastora (bermudagrass only):** Use 1 oz/A on seedling johnsongrass (rhizomes < 18") and 1.5 oz/A on mature stands. Bermudagrass injury will occur with Pastora, but will be less than that observed with Impose. Maximum application rate of Pastora is 2.5 ounces per acre per year.

Figure 7. Vaseygrass root structure
Credits: Brent Sellers

Figure 8. Johnsongrass rhizome
Credits: Brent Sellers

## Vaseygrass

**Impose (bermudagrass only):** Vaseygrass control can be accomplished by using 6–8 ounces per acre. This rate of Impose will be highly injurious to bermudagrass and one cutting of hay will likely be lost. This injury can be minimized if the application is made immediately after hay removal and before the bermudagrass leaf-out. Additionally, do not apply Impose until after the first hay cutting when rainfall is common.

**Glyphosate:** Spot spraying with 1% solution (1.2 oz/gal) can be effective. Care should be taken to avoid contact with desirable grasses.

## Guinea Grass

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Circular S-14 June, 1950

UNIVERSITY OF FLORIDA
AGRICULTURAL EXPERIMENT STATIONS
WILLARD M. FIFIELD, Director
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# Torpedo Grass

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**TORPEDO GRASS IS A SERIOUS WEED WHEN ESTABLISHED IN FARM AND GROVE LAND AND INDISCRIMINATE PLANTING WITHOUT REGARD TO FUTURE CROPS OR ADJOINING LAND IS DANGEROUS.** Torpedo grass pasture can be both productive and nutritious and it is well adapted to some central and south Florida soils, thriving on coarse sands and wet, mucky areas. However, other grasses are equal or superior to Torpedo in most places and should be given preference over this potential pest.

## History

This grass, *Panicum repens* L., known also as Bullet grass, was first collected in the United States near Mobile, Alabama, In 1876,[1] and in Florida near Tampa by W. E. Stokes in 1932.[1] Torpedo grass was observed in the lower valley of the Kissimmee river by Stokes and others in the early 1920's. Hitchcock,[2] in his manual of grasses, says it is found along the Gulf Coast from Florida to Texas, along tropical and sub-tropical coasts of both hemispheres and is probably introduced to the United States. There is no record of who first planted it in cultivated land and observed its rapid growth under favorable conditions.

## Nature of Growth

Torpedo grass has an upright habit of growth with stems from one to four feet in height. Leaves are gray-green to blue-green, moderately pubescent, sharp-pointed and erect in growth. The numerous open-type seed heads are suspected of producing

[1]Herbarium collections, Smithsonian and Florida Station, respectively.
[2]Hitchcock—Manual of the Grasses of the United States, 1935. U. S. Government Printing Office.

some viable seed but none has been germinated so far as is known. Sharp-pointed underground stems, from which the name Torpedo is taken, grow out from the parent plants. These stems or rhizomes send up sprouts at the joints to produce new plants. Torpedo grass rhizomes have been seen to extend 10 to 20 feet from the original plant. This grass is very aggressive under certain conditions and the sharp-pointed runners have been known to pierce roots and stems of other plants.

## Adaptation

Torpedo grass has been planted in almost every county in southern Florida and to a small extent in central and north-central counties. Plantings vary in extent from a sprig mistakenly set in a garden to hundreds of acres in single pasture blocks.

This grass grows well under a variety of locations and soil conditions. It is better adapted to coarse sands and organic land than to fine, compact sand. Low wet areas are its natural home and it withstands flooding very well. There are some good Torpedo pastures on high land where conditions are extremely drouthy.

There is no evidence to support the idea that Torpedo grass will produce large yield of nutritious feed on land too poor for other grasses, although it sods well under some unfavorable conditions. Torpedo, as do other grasses, has a tendency to become less productive after it has been planted two to three years without being cultivated or refertilized, a condition commonly referred to as sod-bound. This results primarily from a depletion of available plant food and may be remedied by fertilization. Heavy disking and chopping stimulate the growth of this grass but are no substitute for fertilizer elements.

## Grazing Value

Cattle eat Torpedo grass readily and thrive on it. Its palatability and feeding value are determined by the stage of growth of the plants and by the fertility of the land on which it is grown, which is a characteristic of other grasses also.

Torpedo grass on flatwoods land at the Range Cattle Station made less growth than Pangola and Coastal Bermuda and more than Pensacola Bahia, when all were spring planted. In its

second year of growth Torpedo produced less beef per acre than Pangola grass and about the same as Coastal Bermuda and Pensacola Bahia.

Torpedo and Pangola grasses in a five-month grazing test on the Duda Ranch in Brevard County produced similar amounts of beef per acre. Where given free choice with grass to spare, cattle grazed Pangola in preference to Torpedo.

Although Torpedo grass leaves and stems are easily killed by frost, much of the feeding value is left in the dried grass and it may be used for winter maintenance of cattle.

## Making Pasture

Rhizomes are dug or green stems mowed to obtain planting material. Five hundred pounds per acre of stems will produce a stand if they are evenly scattered and disked and packed into moist ground. Torpedo grass will make a stand while being grazed continuously, but quick coverage and maximum production can be obtained only with controlled grazing. It thrives in some places where Pangola is held back by copper deficiency. This difference in minor element needs accounts for Torpedo grass making superior growth in some locations.

## Torpedo in Fields and Groves

Both fertilization and deep cultivation stimulate the growth of this grass. It spreads rapidly with such treatment, yields a profusion of stems and leaves and a tough sod of roots and rhizomes. These are desirable qualities for a forage grass but make it a pest in cultivated land. Competition by Torpedo grass has been so severe in most cases that the usefulness of the area for farming operations has been severely limited. Where Torpedo has spread to farm and grove land, cultivation costs have been greatly increased.

Torpedo will not tolerate dense shade and does not grow under large citrus trees. There are mature groves of both orange and grapefruit in excellent production despite infestation with this grass. Continuous shallow cultivation is required to keep it away from young trees where there is a great deal of space and little shade.

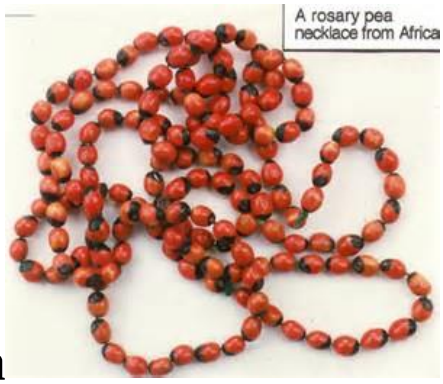
Once established, there is no feasable economic way to kill Torpedo grass in areas where it does well. It has been observed

that procedures effective in subduing other grasses do not control Torpedo grass. Weather and lack of fertility limit its growth but deep disking and plowing serve to stimulate it on sandy soil.

Torpedo grass extends rapidly into fertile cultivated land but does not readily invade solid sods of Carpet, Bahia or Pangola grass. Neither does it spread much into uncultivated upland soil, even when grown on adjacent road-sides and fields for a period of several years. Sodded areas and poor native land serve to retard the extension of Torpedo grass runners and are helpful in reducing the spread of this species. However, stems may be carried by animals, machinery or water and grow readily to produce new plants.

Torpedo grass will invade other sods and remain small and inconspicuous, but as soon as the sod is killed the Torpedo grass which has invaded takes over.

**Where this grass is already established near cultivated land every precaution should be taken to confine it to pasture and prevent further spread.**




# Rosary pea

This plant may sound pious, but it is actually deadly. Rosary peas got their name from their traditional use as ornamental beads for rosaries. They are used in jewelry around the world. Many jewelry makers have died after pricking a finger while handling a rosary pea.

The poison contained within the seed is abrin — a close relative of ricin and one of the most fatal toxins on Earth.

Found in pastures, on fence lines, trash piles, trees, just about anywhere. I see a lot of it in the Melbourne area.

Control: GrazonNext, triclopyr-ester, Glyphosate (Roundup), or Chaparral.


## Do not let it seed!

# **Showy crotalaria** (Crotalaria spectablis)

Showy crotalaria is a fast growing summer annual. Like all summer annuals, it germinates in the early spring, flowers in late summer, and set seeds and dies in the fall. Showy crotalaria has simple leaves that are large and waxy. It has yellow flowers that are born on a large, upright stalk. The flowers resemble those of a pea and are quite attractive hence showy being part of the weed's name. Its other common name, showy rattlebox, comes from its seed pods. The seed pods are short but thick, resembling Vienna sausages, and when dry, rattle profusely when shaken. Showy crotalaria is toxic to all livestock including goats. The seeds contain the highest amount of toxins.

Animals should be prevented from eating the leaves, too, because they contain enough of the alkaloids to be toxic. The leaves of showy crotalaria are toxic even when dried, so producers need to pay extra attention to keep this weed out of hay fields.

**Herbicides:**

| | |
|---|---|
| 2,4-D (generic) | 2-3 pints per acre |
| dicamba+2,4-D (generic) | 2-3 pints per acre |
| aminopyralid + 2,4-D (GrazonNext H/L) | 1.6 to 2 pints per acre |
| Triclopyr (Remedy, Garlon, Element) | 2 pints per acre |
| triclopyr+fluroxypyr (PastureGard) | 2 pints per acre |

# NOTES

**Spring Ranchers Forum**
**Held at Yarborough Ranch**
**Central Florida Livestock Agents Group**
**March 16, 2017**

| **Individual Topic Evaluation: Please rate value for knowledge gained.** | **Very Valuable** | **Valuable** | **Somewhat Valuable** | **Not Valuable** | **Not Applicable** |
|---|---|---|---|---|---|
| **Field Demonstration: "Farm Animal Health"** | | | | | |
| **Poisonous Plant Update** | | | | | |
| **Bahia Decline Pasture Research** | | | | | |
| **Legume Recommended Varieties** | | | | | |
| **Over-seeding Pastures and Hay Fields** | | | | | |
| **CFLAG Agent Panel Discussion: Identification of Common Weeds** | | | | | |
| **Was this the first time you attended an Extension Program?** | ☐ **Yes** | | | ☐ **No** | |

| | | |
|---|---|---|
| How many Spring Ranchers Forums have you attended? (circle one) | 1 2 3 4 5 10 17 | |
| **Overall Program Evaluation. Answer below ONLY if you attended the Spring Ranchers Forum Last Year.** | **YES** | **NO** |
| Did you share last year's information with anyone? | **YES** | **NO** |
| Did you improve your animal science skills because of last year's program? | **YES** | **NO** |
| Did you experience an improved economic return because of last year's program? | **YES** | **NO** |
| If yes, how much would you estimate is the value? (circle one) | $1,000 $5,000 $10,000 $25,000 or $_____ (fill in) | |
| Poisonous plant education saves farm animals lives. Have you experienced saving an animal from toxic plants education received at Spring Ranchers Forum? | **YES** | **NO** |
| If yes, please estimate number of animals you have saved. (circle one) | 1 5 10 25 50 100 or _____ (fill in) | |

Which livestock do you raise?

How did you hear about this year's Spring Ranchers Forum?