

Forage legumes: new opportunities for pollinators and wildlife

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Virtual Forage Legume Conference, May 6th 2021



The benefits of diversity

HOW TO GO FROM...

... the traditional enterprises...



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... through improved pastures...



Jesse Morrison



Jose Dubeux



... into new opportunities?





The role of legumes for white-tailed deer

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Dietary preferences

		Type of Diet (%)		
Animal Species		Grasses	Legumes	Browse
<i>Grazers</i>	Cattle	65-75	20-30	5-10
	Horses	70-80	15-25	0-5
	Sheep	45-55	30-40	10-20
<i>Intermediate</i>	Goats	20-30	10-30	30-50
<i>Browsers</i>	White-tailed deer	30-60	40-50	10-30



Nutrient-dense forages

- Small ruminants = small size = High requirements in relation to body weight
- Rumen size is small – roughage (low nutritive value) fills the rumen and limits intake
- High turn-over rate and high feeding rhythm
- An average adult white-tailed deer requires 4-8 pounds of forage dry matter per day



Importance of nutrition

- Determinant of performance and reproduction
 - and antlers
- Foundation of good health
 - Animals on high plane of nutrition are more resistant to many diseases
 - Nutritional problems are second only to respiratory problems in frequency of occurrence
 - Penned deer frequently raised on concentrate – physiological problems because lack of fiber



Nutrient requirements by category

Age	Activity	Protein level
Fawn	Average growth	14 to 18 %
Fawn	Excellent growth	16 to 20 %
Yearling	Maintenance	11 %
Adult	Maintenance	6 to 10 %
Adult (female)	Late pregnancy	11 to 15 %
Adult (female)	Lactation	14 to 22 %
Adult (male)	Antler development	15 to 16 %

Pierce et al – University of Missouri

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45°F

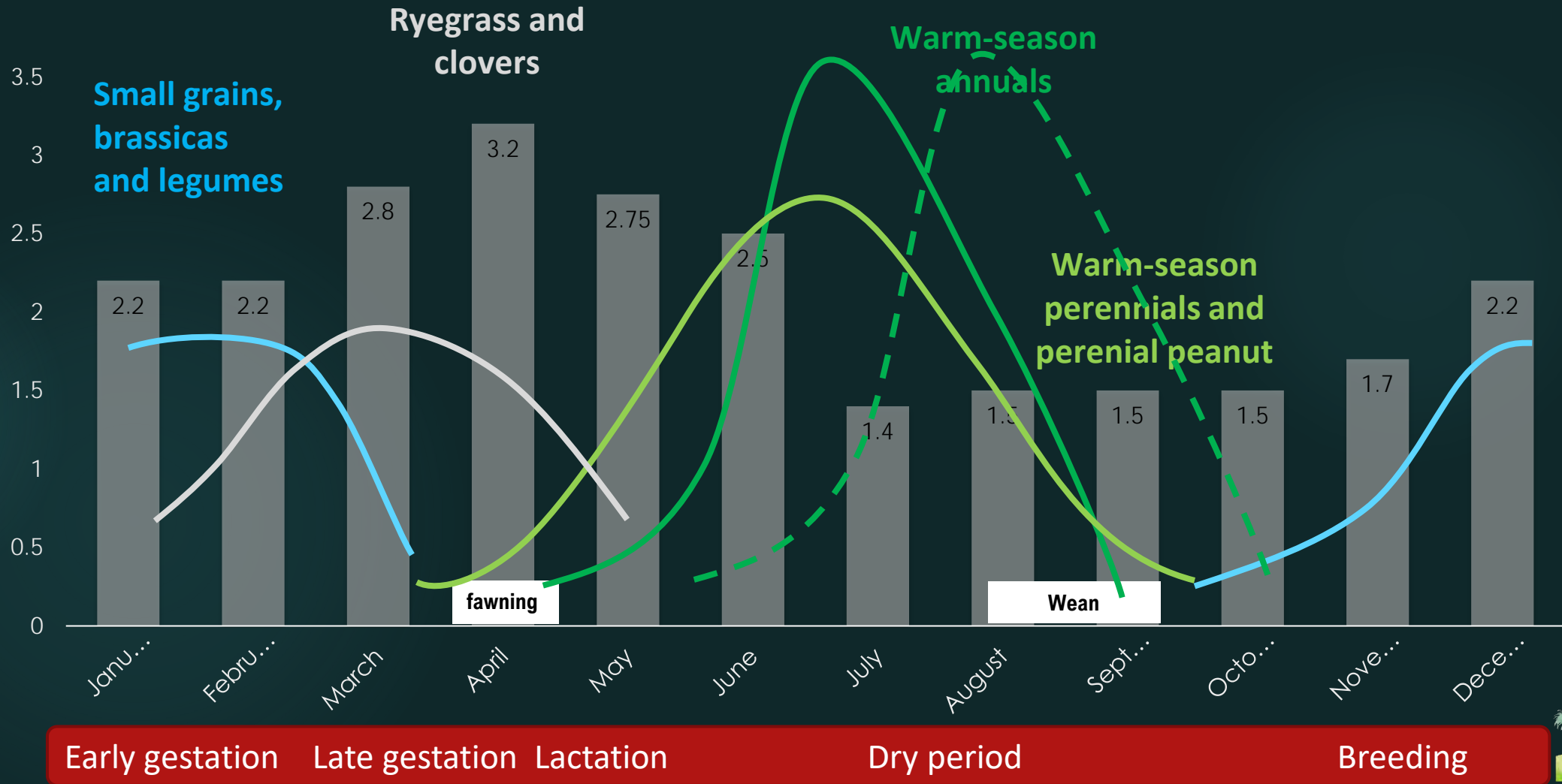


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CAMERA 1

Energy requirements of does (176 lbs, lbs TDN/d) Spring (April) fawning



Nutritive value

Species	Crude protein	Digestibility
Perennial Peanut	14 - 21	64 - 74
Chicory	8 - 15	67
Turnips	12 - 18	65
Annual ryegrass	12 - 18	65 - 70
Oat	12 - 18	65 - 70
Clovers	15 - 22	65 - 75
Sunn hemp (leaves)	25 - 30	>80
Sunn hemp (total)	14 - 20	55 - 60

Sunn hemp
Cowpeas
Pearl millet
Velvet beans
Buckwheat

Summer



Feed and habitat – grazing behavior and stress

Sunn Hemp and condensed tannins

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Many other species

- Alyce clover
- Aeschynomene
- Hairy indigo
- Forage soybeans
- Desmodium
- Lab Lab



Flickr - Scamperdale



Dennis Hancock

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Perennial peanut

Hay and permanent pasture on preserves



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Winter

Clovers



Winter pea



Vetch



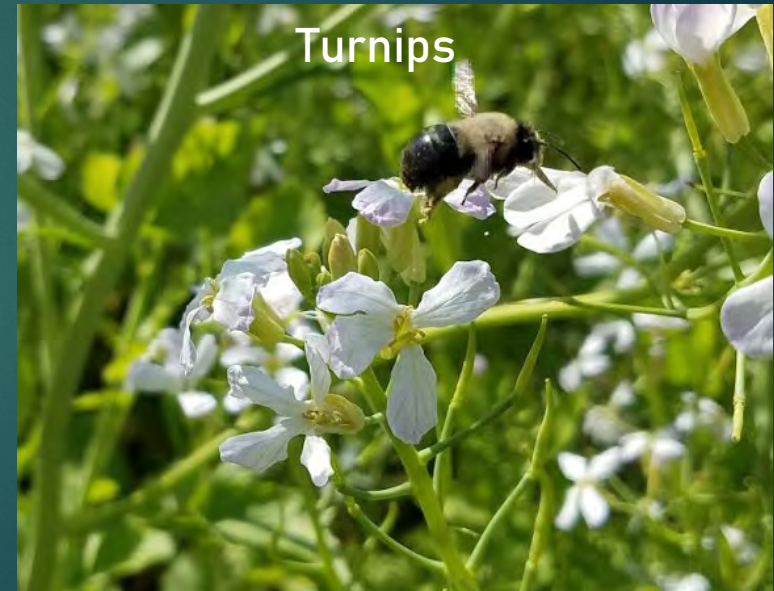
Small grains and ryegrass



Chicory



Turnips





What about pollinators?

VALUE OF POLLINATORS GOES BEYOND HONEY PRODUCTION

>100 crops depend on insect pollination, \$18 to \$27 billion in the United States

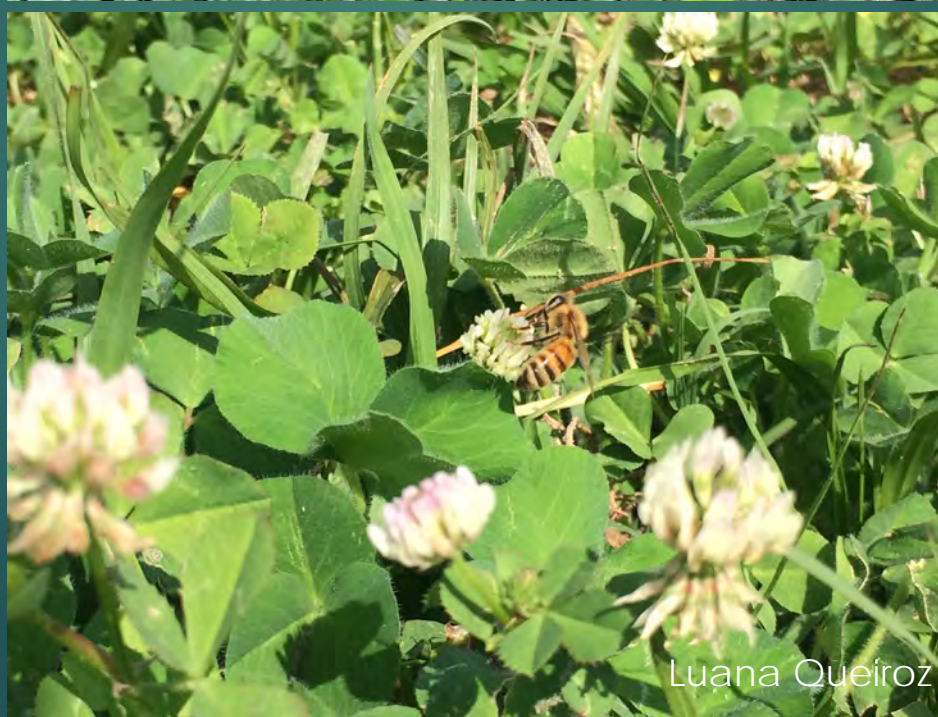
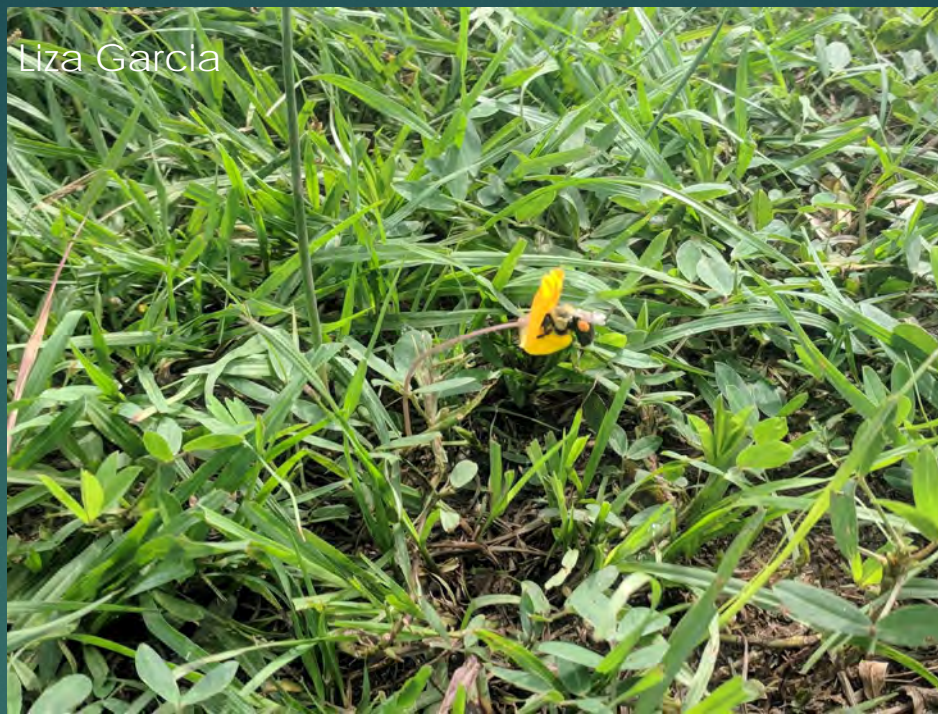
BEEES OF FLORIDA

James R. Weaver, Shiala M. Naranjo, Emily Noordyke, Rachel E. Mallinger

Did you know there are over 320 species of bees in Florida and over 4,000 in the United States? Wild bees vary widely in behavior, color, size, and shape. This is an abridged introductory guide to some common bee groups and species you may encounter in Florida.

Note that images of bees in this guide are not to scale.





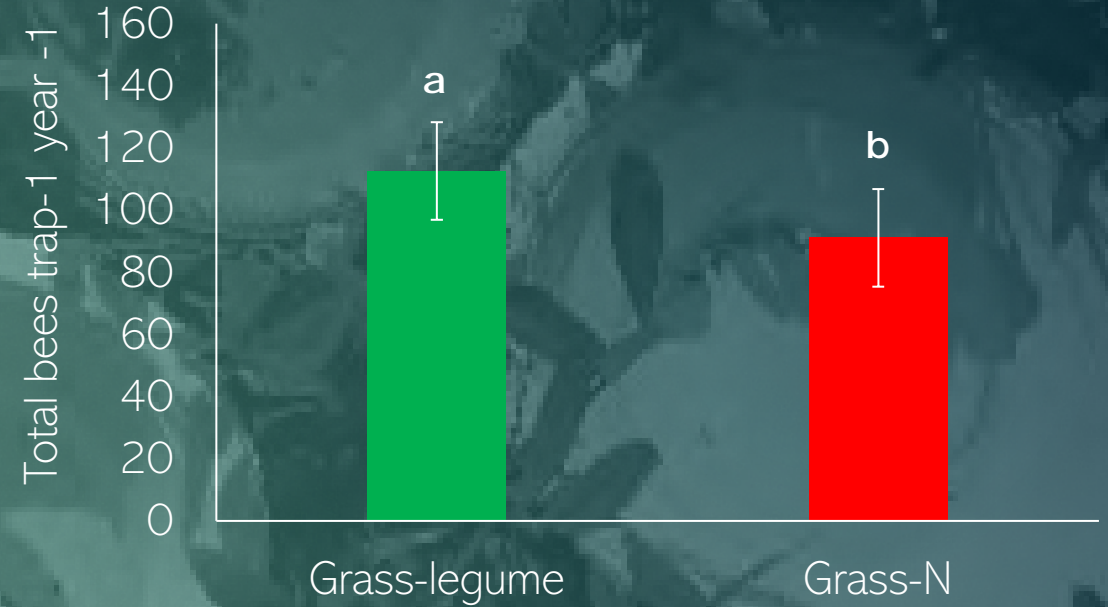
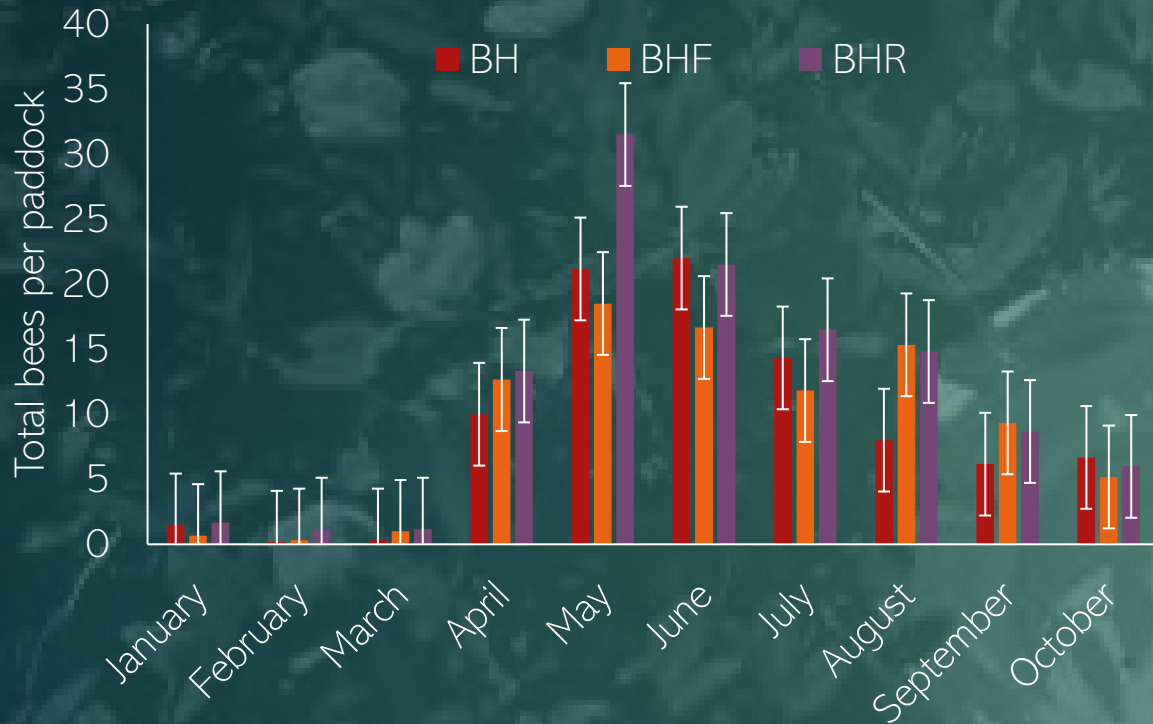
Liza Garcia

Luana Queiroz



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Garcia, 2019 – improving pastures for cattle and for bees!



Contrast, $P = 0.01$
a,b Means differ, $P < 0.05$

Small bees foraging on short radius especially during summer
Flower diversity and different phenology favored presence of bees

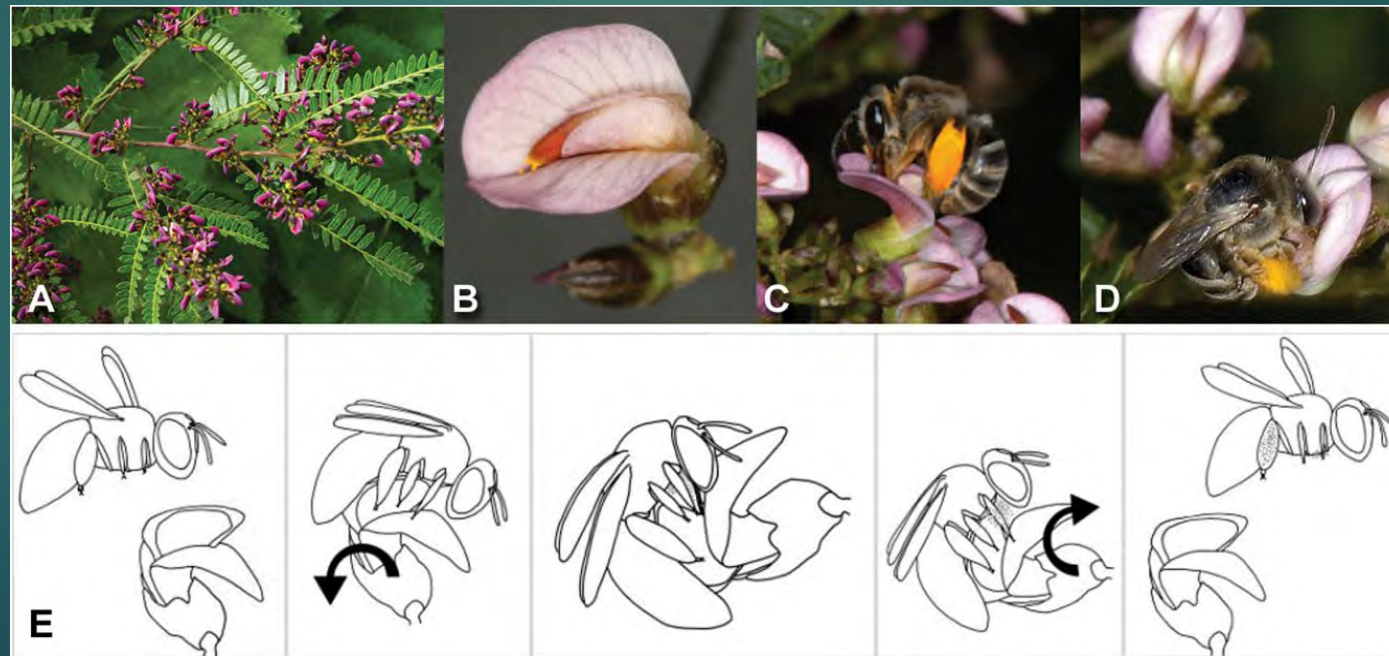


Floral resources of common legumes

Common Name	Scientific Name	Mean Volume of Pollen Per Flower (μL)	Mean Mass of Nectar Sugar per flower (μg/day)	Mean Nectar Volume per 100 Florets (μL/day)	Honeybee Value	Native Bee Value	Provides Nectar?	Provides Pollen?	SE Blooming period
Red Clover	<i>Trifolia pratense</i>	0.020 (1)	48.366 (1)		Questionable (5)		yes (4)	yes (4)	Mar-May
Crimson Clover	<i>Trifolium incarnatum</i>				High (5)		yes (4)	yes (4)	Feb-May
White Clover	<i>Trifolia repens</i>	0.028 (1)	12.135 (1)		High (3)	High (3)	yes (7)	yes (7)	April-May
Alfalfa	<i>Medicago sativa</i>			67.73 (2)	High (3)	High (3)	yes (4)	yes (4)	
Medic	<i>Meidicago spp.</i>				Low (3)	Low (3)			
Sunn Hemp	<i>Crotalaria juncea</i>				Moderate (3)	High (3)			Summer-Fall
Vetch	<i>Vicia spp.</i>				Moderate (3)	High (3)			Feb-May
Hairy Vetch	<i>Vicia villosa</i>						yes (6)	yes (6)	Feb-May
Cowpea	<i>Vigna unguiculata</i>				Moderate (5); High (11)	Hight (11)	yes (4)	yes (4)	Summer-Fall
Velvet Bean	<i>Mucuna pruriens</i>								Summer-Fall
Aeschynomene	<i>Aeschynomene spp.</i>				Moderate (10)	Moderate (10)			Summer-Fall
Perennial peanut	<i>Arachis glabrata</i>					Moderate (9)			April-October
Soybean	<i>Glycine max</i>	0.022 - 0.127 (9)	16 - 134 (9)		moderate (9)		yes (9)	poor (9)	Jun-Aug

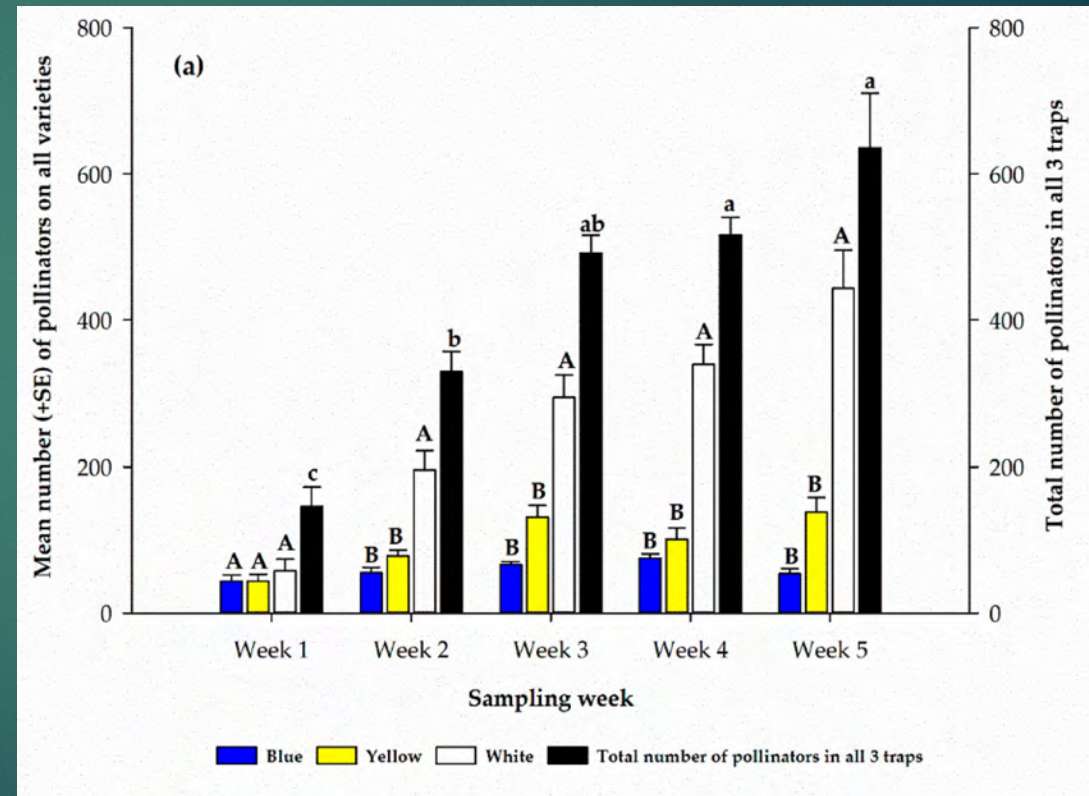
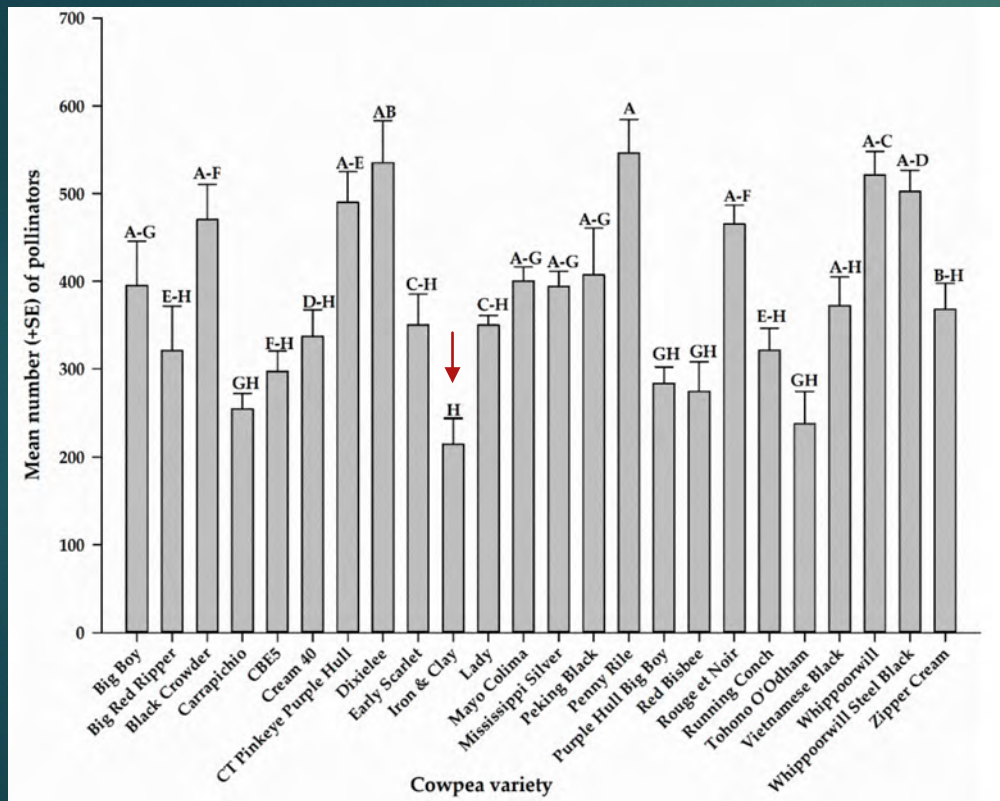
Not all flowers attract all bees?

- Nectar and pollen production
- Flower morphology and timing of opening – bees vary in size and tongue length
- Need for cross pollination or not – specific pollinators
- Length of flowering period, flower abundance



Specialized pollinators – *Aeschynomene amorphoides* (Carleial et al., 2015)

Differences for pollinator visits in cowpea varieties and timing of flowering



Influence of grazing management



Invasiveness potential



I can't ever get it right!

LESSONS FROM DR. Q'S
PRESENTATION ON
ESTABLISHING LEGUMES



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Key points for designing forage plan for pollinators and wildlife

- Target species (use)
- What grows in region/soil
 - Adapted varieties
- Diversity
 - Flowering capacity/length/timing
 - Forage production
- Don't just buy the nice buck on the label

Pasture Mix South		
Lot# RKPASTUREMIXSS		
	Variety	Origin
30%	Pensacola Bahia (coated)	FL
20%	BT Millet	FL
15%	Perennial Ryegrass	OR
15%	Andes Pasture Ryegrass	OR
10%	Kentucky 32 Tall Fescue	OR
5%	Wrangler Bermuda	OK
5%	Crimson Clover (coated)	OR
Purity: 90% Inert Matter: 5.86% Other Crop: 4% Weed Seed: 0.14%		
Noxious Weed: None Found		
Germination: 83% Dormant 6%; Total Germination: 89%		
Test Date: 1/2019		
Net. Weight: 25 Lbs.		

Check variety recommendations



What can we help you with?

GO

A WALK ON THE WILD SIDE: 2019 COOL-SEASON FORAGE RECOMMENDATIONS FOR WILDLIFE FOOD PLOTS IN NORTH FLORIDA¹

A. R. Blount, M. Wallau, H. K. Ober, E. Rios, J. M. B. Vendramini, J. C. B. Dubeux, Md. A. Babar, C. L. Mackowiak, and K. H. Quesenberry²

Nationally, there is great interest in wildlife forages. Florida's light and sandy soils, hot and humid summers, and seasonal droughts pose unique challenges for successful food plot plantings. We recommend using adapted varieties developed for Florida's particular growing conditions. We also suggest the use of forage blends to increase the plot's longevity and stability and to supply variety to suit multiple wildlife components. It is important to perform soil testing and apply fertilizer and/or lime based on the soil test report. Information on soil testing is available on EDIS at https://edis.ifas.ufl.edu/topic_soil_testing.



DOWNLOAD PDF

PUBLICATION #SS-AGR-28

Date: 2019-11-14

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What can we help you with?

2020 COOL-SEASON FORAGE RECOMMENDATIONS FOR FLO

A. R. Blount, M. Wallau, E. Rios, J. M. B. Vendramini, J. C. B. Dubeux, H. Quesenberry²

INTRODUCTION

Perennial warm-season pasture grasses used in Florida become days, cooler temperatures, and frosts. Many livestock producers may choose to establish cool-season annual pasture species to supplement their forage production. These plants are usually higher in total digestible nutrients (TDN) and crude protein (CP) than summer perennial grasses, translating into greater animal performance (Dubeux et al. 2016). Planting and growing these forage crops can involve considerable expense

<https://edis.ifas.ufl.edu/publication/AG139>



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Good soil prep, weed control, liming and fertilization

The start of any good pasture...

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Establishment practices

FORAGE PLANTING AND ESTABLISHMENT METHODS ON PREPARED SEEDBED



Jennifer Bearden



<https://edis.ifas.ufl.edu/publication/ag107>

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Give conditions for plants to succeed



Building exclusions for deer



Lots of new research coming up – keep an eye
on our channels

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