Characterization of Pasture-Based Dairy Farms in Florida and Georgia

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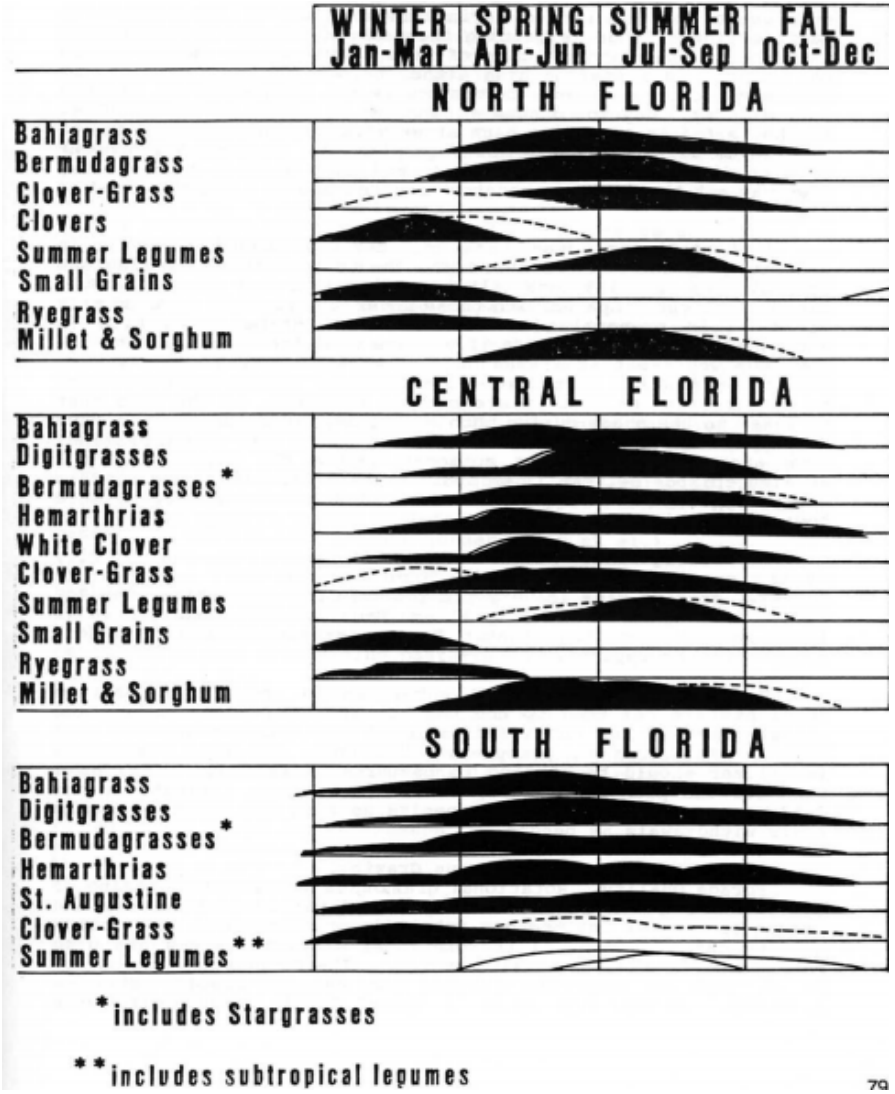
Introduction

- Most dairy farms in the Southeast United States use confinement systems (Fontaneli et al., 2005)
- A lot of capital is tied up in buildings, machinery, and manure management systems
- Cost of purchased feed and fuel has risen rapidly in the last 5 years (USDA, 2013)
- Growing interest in pasture-based dairy farms

Possible advantages of pasture-based dairying

- Long forage or grasses availability
  - 4 to 5 months in WI vs. 9 to 11 months in FL and GA (Gillespie et al. 2009)
- Low cost (?)



Staples et al., 1994

Possible disadvantages of pasture-based dairying

- Milk production is lower (?)
- Reproduction decreased (?)
- Quality of warm season grass is low (Minson and McLeod, 1970)


Florida dairying in 1920-1950

Characteristics of pasture-based farms

- The management of pasture-based dairy farms in FL and GA appears to vary widely.
- Little is known about:
  - Herd management
  - Milk production
  - Reproduction management
  - Use of facilities
  - Pasture management
  - Supplemental feeding

Objective

- To characterize pasture-based dairy farms in FL and GA with regards to young stock, milking herd, pasture and crops, feeding, manure and nutrients
- Not interested in financial data

Materials and methods

- This study is part of a large SARE project
  - *LS11-243 Improving the Welfare of Southeastern Dairy Families Through the Adoption of Sustainable Production Systems*
  - U of Georgia, U of Florida, Fort Valley State U.

Materials and methods

- An 18-pages survey was designed and consisted of 62 questions that covered the 7 areas:
  - farm business structure, young stock, milking herd, pasture and crop, feeding, manure and nutrients, and sustainability

Southeast Sustainable Dairy Farms Project: Practices Survey 2012 version 10/8/2012

SARE Sustainable Agriculture Research & Education · Southeast Sustainable Dairy Farms Project · UF University of Florida · Fort Valley State University · The University of Georgia

This survey is being conducted by the University of Florida, University of Georgia, and Fort Valley State University to identify current production and grazing practices on dairy farms in the Southeast. Participation in the study is **voluntary**. All answers to questions in this survey will be kept **strictly confidential.** Your data will only be used in summarized results. Individual farm information will not be identified in any publication. **All producers who complete a survey will receive a $100 reward.** Thank you for participating. University of Florida, IRB Exemption of Protocol #2012-U-0206.

We welcome your comments and suggestions. Contact information:
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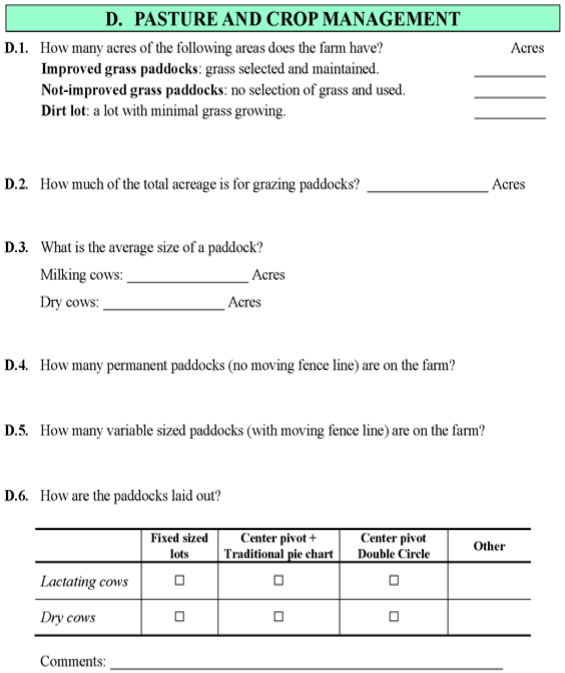
Dr. Mohammed Ibrahimm 478-825-6815 ibrahimm@fvsu.edu (Fort Valley State University)

ENUMERATOR:

DATE OF SURVEY: SURVEY STARTING TIME: SURVEY ENDING TIME:

FARM:



D. PASTURE AND CROP MANAGEMENT

D.1. How many acres of the following areas does the farm have? Acres
Improved grass paddocks: grass selected and maintained. _____
Not-improved grass paddocks: no selection of grass and used. _____
Dirt lot: a lot with minimal grass growing. _____

D.2. How much of the total acreage is for grazing paddocks? _____ Acres

D.3. What is the average size of a paddock?
Milking cows: _____ Acres
Dry cows: _____ Acres

D.4. How many permanent paddocks (no moving fence line) are on the farm?

D.5. How many variable sized paddocks (with moving fence line) are on the farm?

D.6. How are the paddocks laid out?

	Fixed sized lots	Center pivot + Traditional pie chart	Center pivot Double Circle	Other
Lactating cows	☐	☐	☐	
Dry cows	☐	☐	☐	

Comments: _____

Data collection

- Dairy farms were invited by phone calls, emails, letters and announcements
  - Recruitment by Extension agents
  - Farm visits to complete survey
  - $100 for completed survey
- Target time period:
  - Summer 2011 through Spring 2012
- Data collection:
  - 42 farms were contacted
  - 23 farms completed surveys
  - September 2012 – April 2013

Data analysis

- Descriptive data in Microsoft Excel
- Procedure GLM in SAS

Results

Farm description

Characteristic	Georgia	North Florida	South Florida	Total	P-value (regions)
# of farms	4	13	6	23	
# of FTE	5.1 ± 1.4	7.1 ± 4.2	43.2 ± 60.6	372	0.063
# of heifers	363 ± 25	306 ± 274	1976 ± 3439	17,288	0.158
# of cows*	588 ± 63	569 ± 589	3169 ± 3397	28,768	0.020

* ≈15% of all dairy cows in FL and GA (NASS, 2012)

Record keeping

- 11 farms participated in DHIA program

Dairy breeds distribution

Breed or cross	% of total herd <25	25-75	>75	Farms #	Cows #	Cows %
Brown Swiss	4	0	0	4	11	<0.1
Holstein (H)	3	5	9	17	20,328	70.7
Jersey (J)	5	1	0	6	1,257	4.4
Holstein x Jersey	3	3	0	6	608	2.1
Jersey x Holstein	2	7	1	10	4,464	15.5
Montbeliard x H	1	0	0	1	20	0.1
Norwegian Red x H	1	0	0	1	30	0.1
J x Milking Shorthorn	0	0	1	1	31	0.1
Unsp. crossbreed	1	1	0	2	296	1.0
H x J x Swedish Red	1	0	0	1	6	<0.1
J x H x Swedish Red	0	1	0	1	125	0.4
J x H x S/M/A	0	2	0	2	300	1.0
Other unspecified	1	0	1	2	570	2.0

75% pure breeds, 25% crossbreeds;
19 farms > 1 breed or cross;

Annual cull rate

Breed or cross	Annual cull rate (%)
Brown Swiss	14 ± 10
Holstein	28 ± 10
Jersey	24 ± 6
Holstein x Jersey	21 ± 2
Jersey x Holstein	22 ± 12
Montbeliard x H	20
Norwegian Red x H	17
Jersey x Milking Shorthorn	5
Unspecified crossbreed	27 ± 10
H x J x Swedish Red	22
J x H x Swedish Red	16
J x H x S/M/A	25 ± 0
Other unspecified	20 ± 0
Average	22 ± 9%

Traits

		Importance		
Breeding goals	# of farms	# as top 1	# as top 2	# as top 3
Reproduction	11	9	1	1
Longevity	11	5	2	4
Milk volume	9	4	3	2
Udder	8	0	2	6
Feet and legs	6	0	3	3
Calving ability	5	1	4	0
Net merit dollars	2	2	0	0
Fluid merit dollars	2	0	2	0
Body capacity	3	0	3	0
Strength	1	1	0	0
Fat and Protein	1	0	0	1
Functional type	1	0	0	1

Most important traits from grazing survey (Gay, 2012)

- Genetics survey, including grazing
  1. Productive life (2)
  2. Udder (4)
  3. SCC
  4. Feet and legs composite (5)
  5. Calving ability dollars (6)
  6. Daughter pregnancy rate (1)
  7. Fat yield and percentage
  8. Body size
  9. Protein percentage
  10. Milk yield (3)

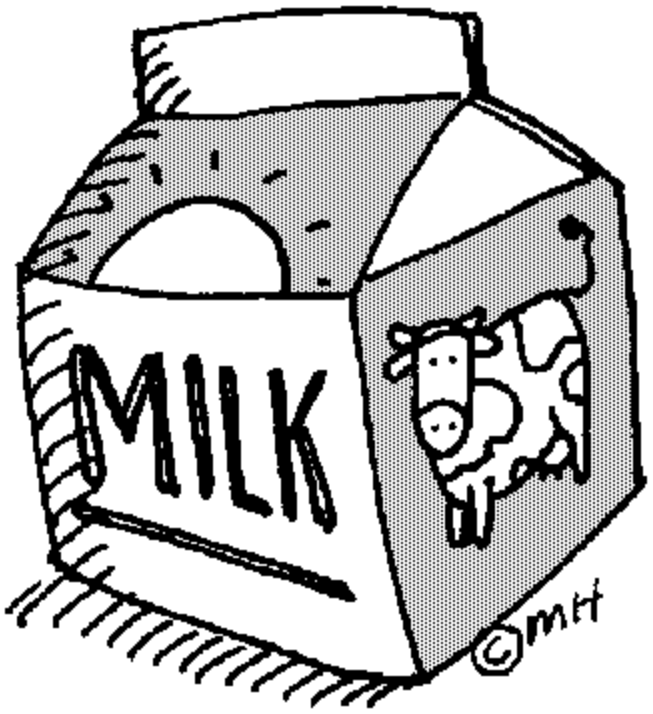
Major culling reasons

		Importance		
Cull reasons	# of farms	# top 1	# top 2	# top 3
Failure to get pregnant	19	9	6	4
Low milk production	14	5	5	4
Mastitis	11	4	3	4
Bad udder	8	2	4	2
Feet and leg problems	8	2	3	3
Death	5	0	2	3
Disease	3	0	0	3
Temperament	1	1	0	0

Culling reason from Gay (2012)

- Genetics survey, including grazing
- Top 5
  1. Fertility (1)
  2. High SCC (3)
  3. Low production (2)
  4. Feet and legs
  5. Old age

Milk production



Milking procedures

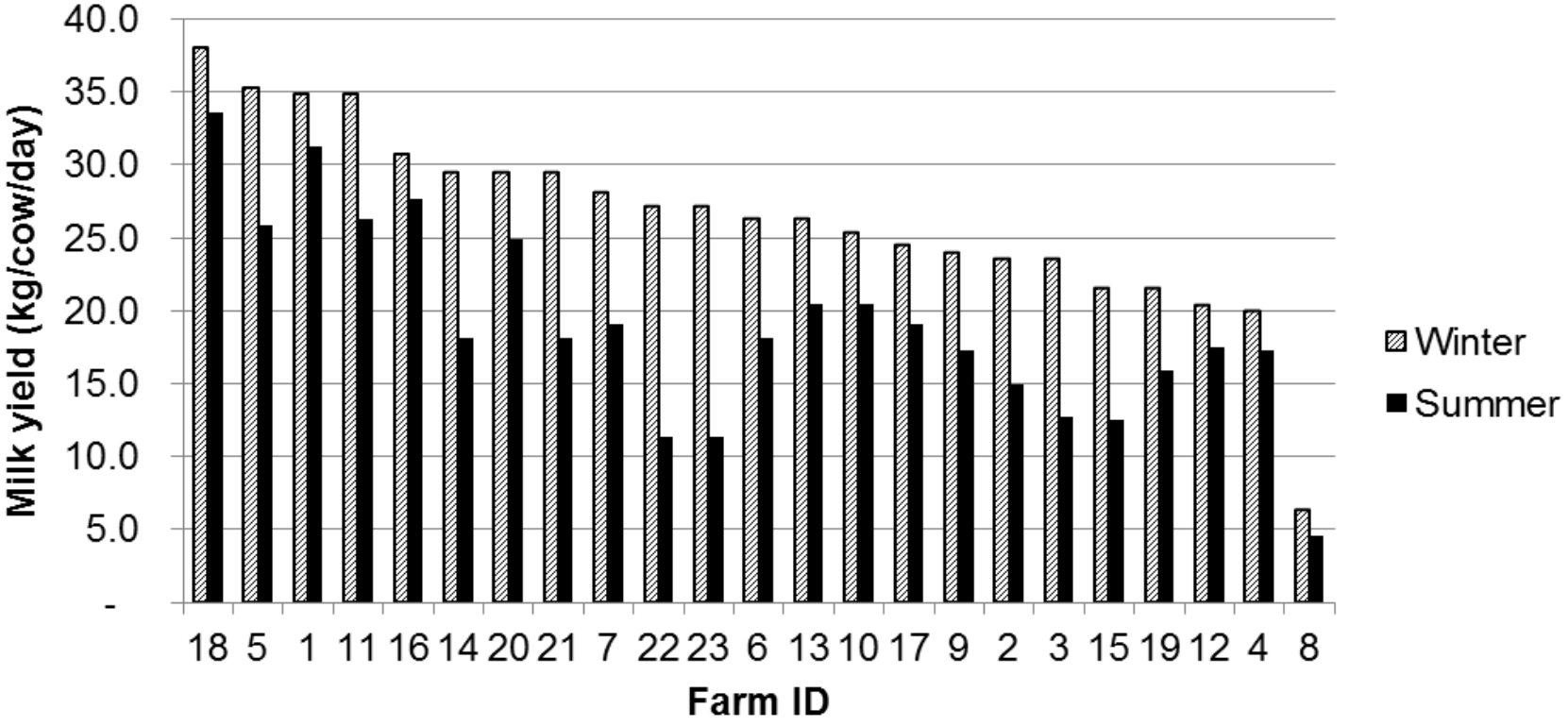
Wash udders	Strip	Pre-dip	Wipe	Post-dip	# of farms
No	Yes	Yes	Yes	Yes	7
Yes	Yes	Yes	Yes	Yes	4
No	No	Yes	Yes	Yes	4
No	No	Yes[1]	Yes[2]	Yes	3
Yes	No	Yes	Yes	Yes	2
Yes	No	No	Yes	Yes	1
No	No	Yes	No	Yes	1

[1]On fresh cows or during raining weather only
[2]When dirty

Milk frequency:

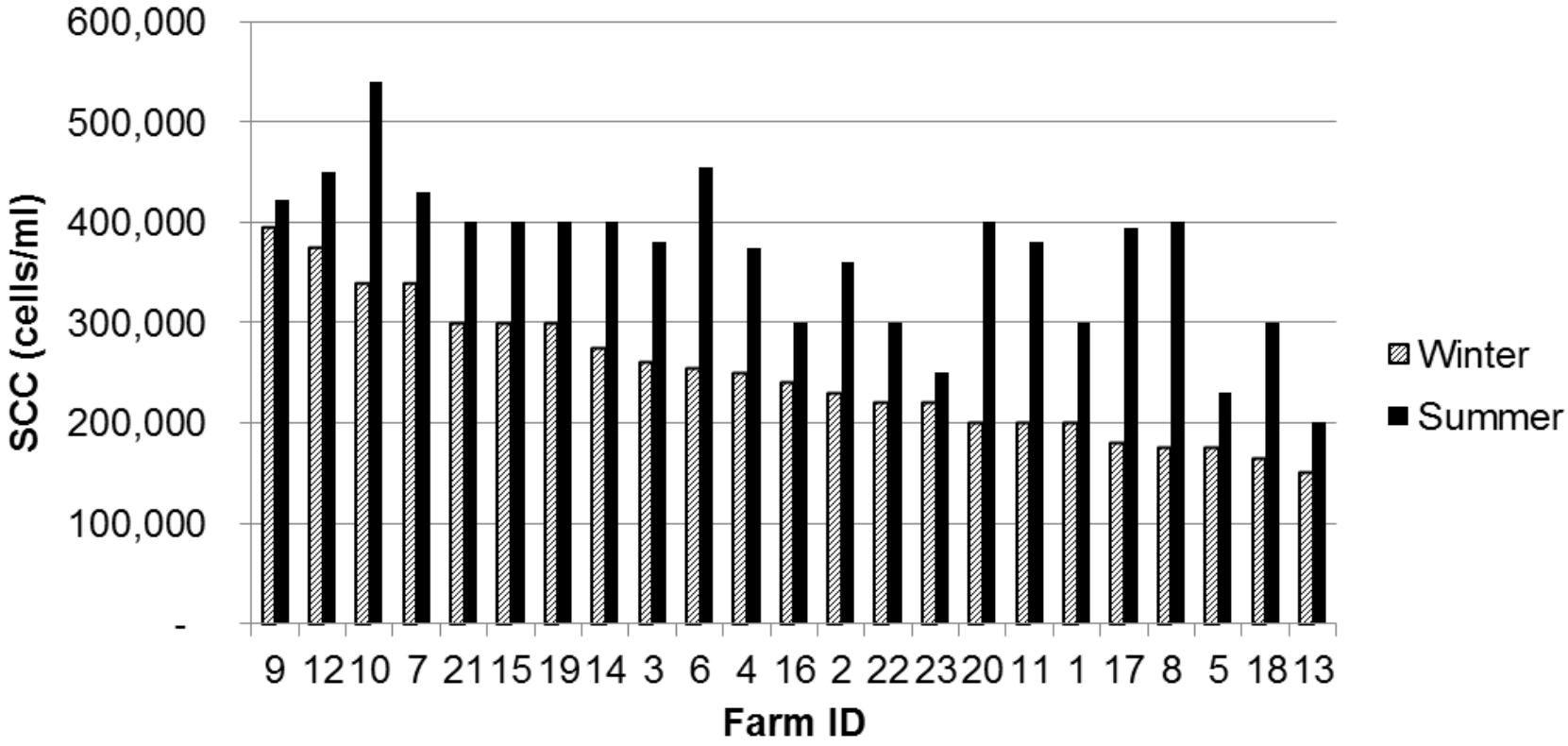
- 1 farm: 1x
- 20 farms: 2x
- 1 farm: 3x
- 1 farm: 4x

Milk production



	Average
Winter (kg/cow/day)	26 ± 7
Summer (kg/cow/day)	19 ± 7

Somatic cell count

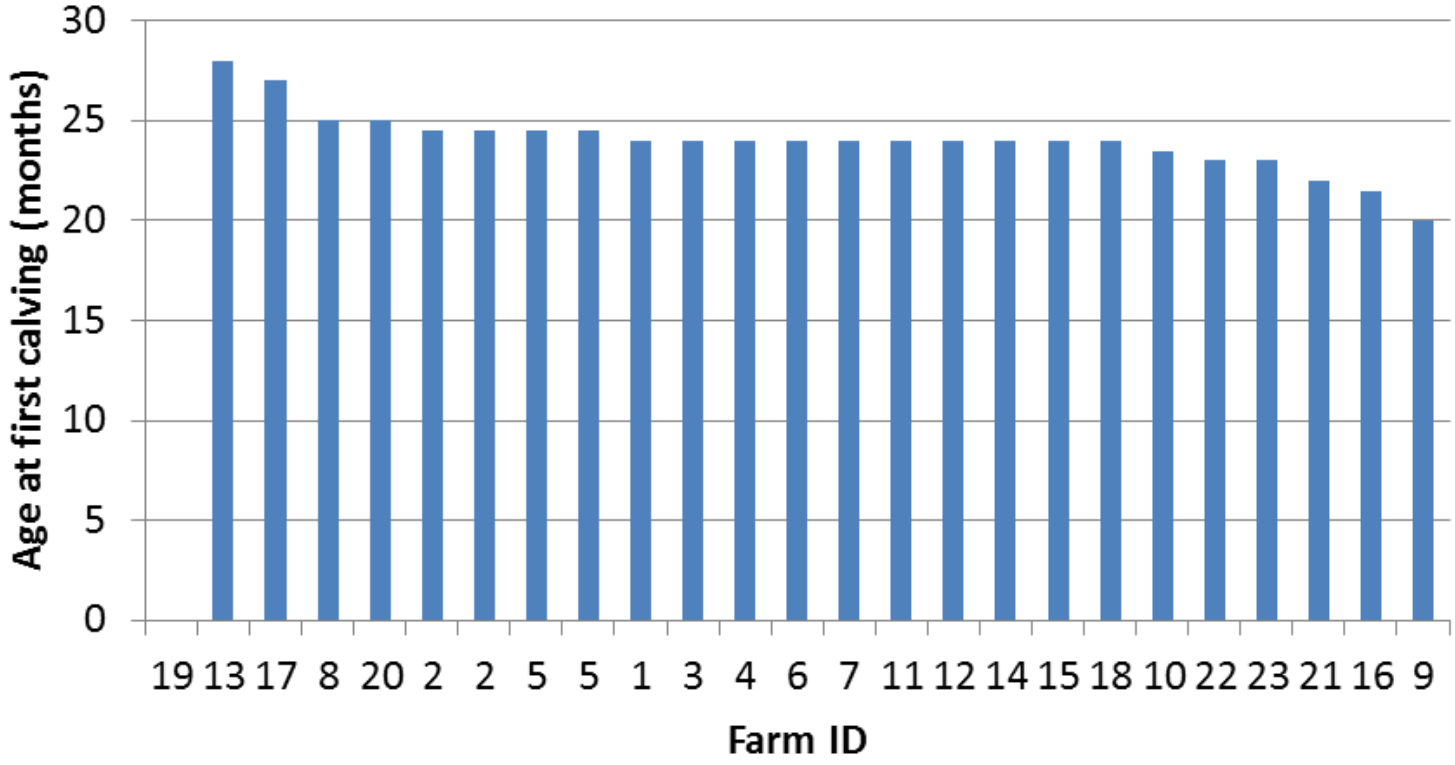


	Average
Winter (cells/ml)	246,000 ± 70,000
Summer (cells/ml)	365,000 ± 79,000

Reproduction

Age at first calving

- Average: 24.0 ± 1.6 months



Heifer calvings

Farm ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5[1]												
6												
7												
8												
9[1]												
10[1]												
11												
12												
13[1]												
14[1]												
15												
16												
17[1]												
18[1]												
19												
20												
21[1]												
22												
23												

Cow calvings

Farm ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5[1]												
6												
7												
8												
9[1]												
10[1]												
11												
12												
13[1]												
14												
15												
16												
17[1]												
18[1]												
19												
20												
21[1]												
22												
23												

Cow inseminations

Farm ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5												
6												
7												
8												
9[1]												
10[1]												
11												
12												
13[1]												
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16												
17[1]												
18[1]												
19												
20												
21[1]												
22												
23												

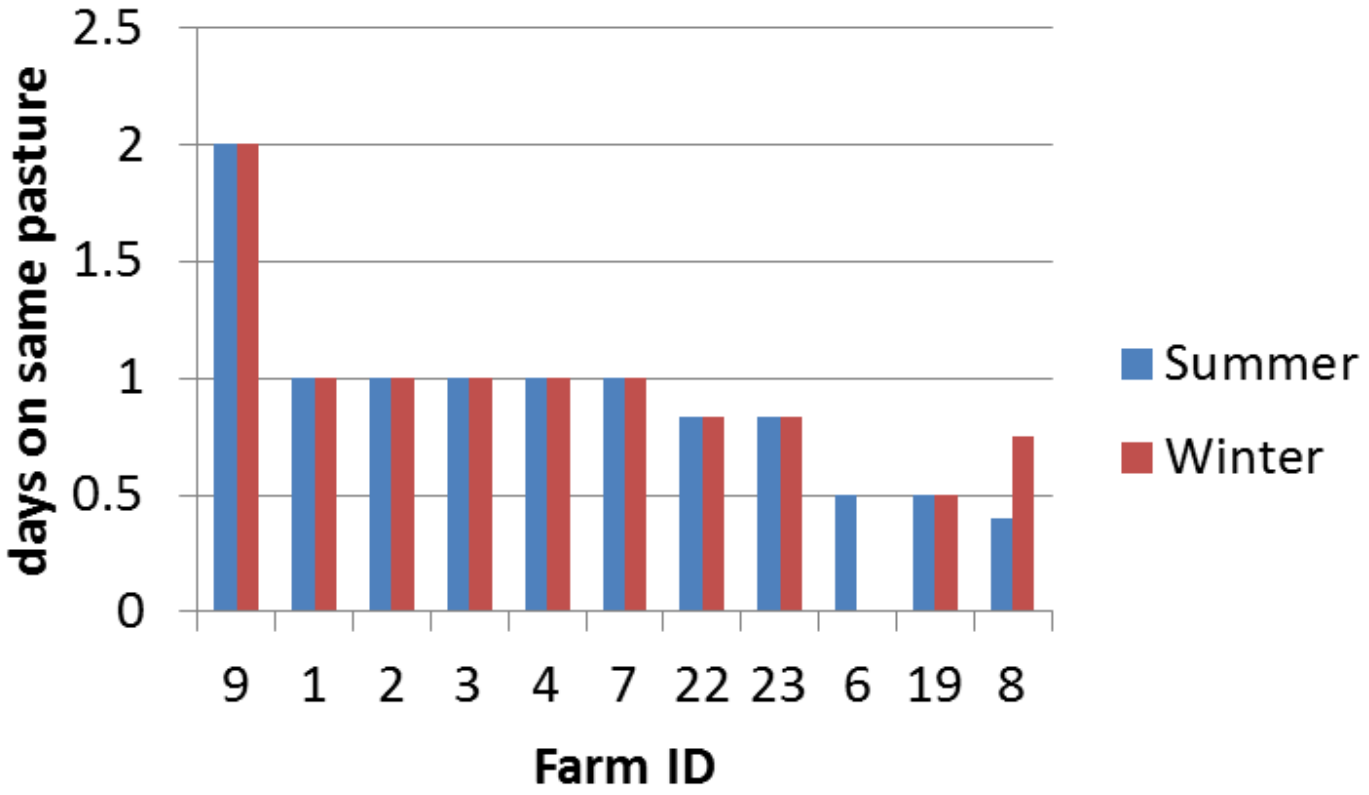
Reasons for not inseminating animals

Reasons	# of farms
Calving problems in the summer	10
Failure to get cows pregnant	7
Quality and quantity of grass	4
Labor availability	4
Maintain seasonality of milk production	4
Heat stress	3
Feed availability	1
Time off or vacation	0

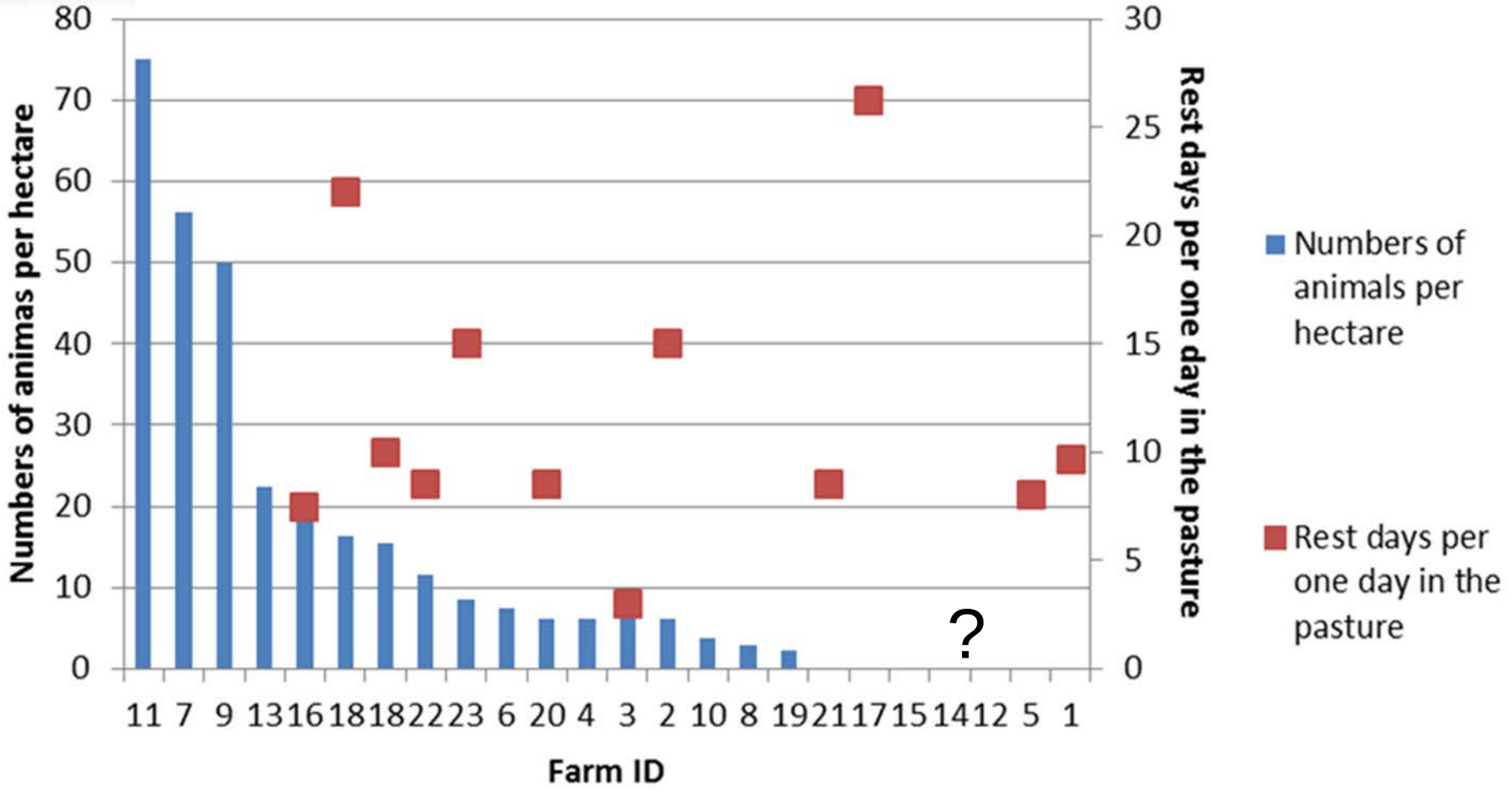
Rotational stocking management

- Summer: 14 (61%) farms
- Winter: 13 (57%) farms

Days on same pasture



Stocking density and rest days



Grass height measurement

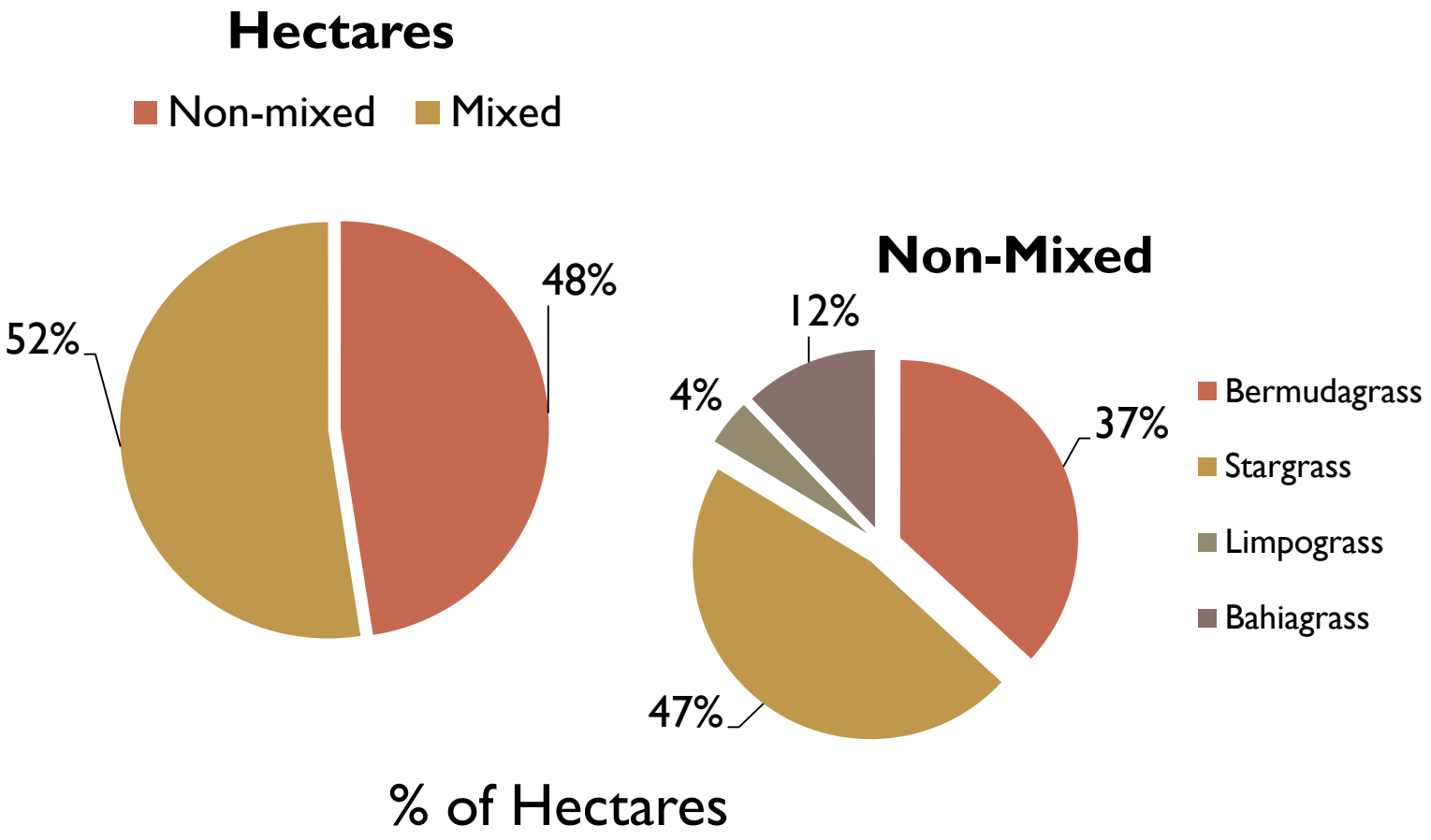
- Regrowth and quality and quantity of grass
- # farms
  - 10 visual estimation
  - 9 no estimation
  - 3 visual estimation + pasture plate meter
  - 1 pasture plate meter

Grasses

Grass/forage	# farms			Total (Hectares)	
	Mixture (%)[7]	Pure[8]	Unknown[9]	Irrigated	Non-irrigated
Annual ryegrass	7 (55 ± 16)	2	2	747	206
Argentine bahia	6 (32 ± 21)	2	0	38	1,436
Arrow leaf clover	1 (7.5)	0	0	25	6
Cereal rye	1 (50)	0	0	141	20
Coastal bermuda	8 (50 ± 29)	3	0	240	385
Common bermuda	4 (43 ± 25)	1	4	413	1,804
Corn	0	8	0	947	0
Crab grass	0	0	4	356	11
Crimson clover	0	0	2	202	0
Florakirk bermuda	0	1	0	48	22
Jiggs bermuda	1 (50)	0	1	222	808
Limpograss	0	1	1	222	747
Oats	5 (43 ± 7)	6	2	793	174
Panicum	0	0	3	251	0
Pearl millet	0	3	0	153	16
Pensacola bahia	4 (27 ± 9)	2	0	210	145
Red clover	1 (7.5)	0	0	25	6
Rye	0	2	0	20	26
Smut grass	1(25)	0	0	0	1,042
Sorghum	0	7	0	661	218
Stargrass	3 (57 ± 35)	2	1	250	2,947
Tifton 85 bermuda	2 (43 ± 11)	3	3	540	78
Tifton 9 bermuda	0	1	0	12	47
Triticale	0	1	0	145	0
Wheat	0	1	0	42	48
White clover	1 (33)	0	0	0	53

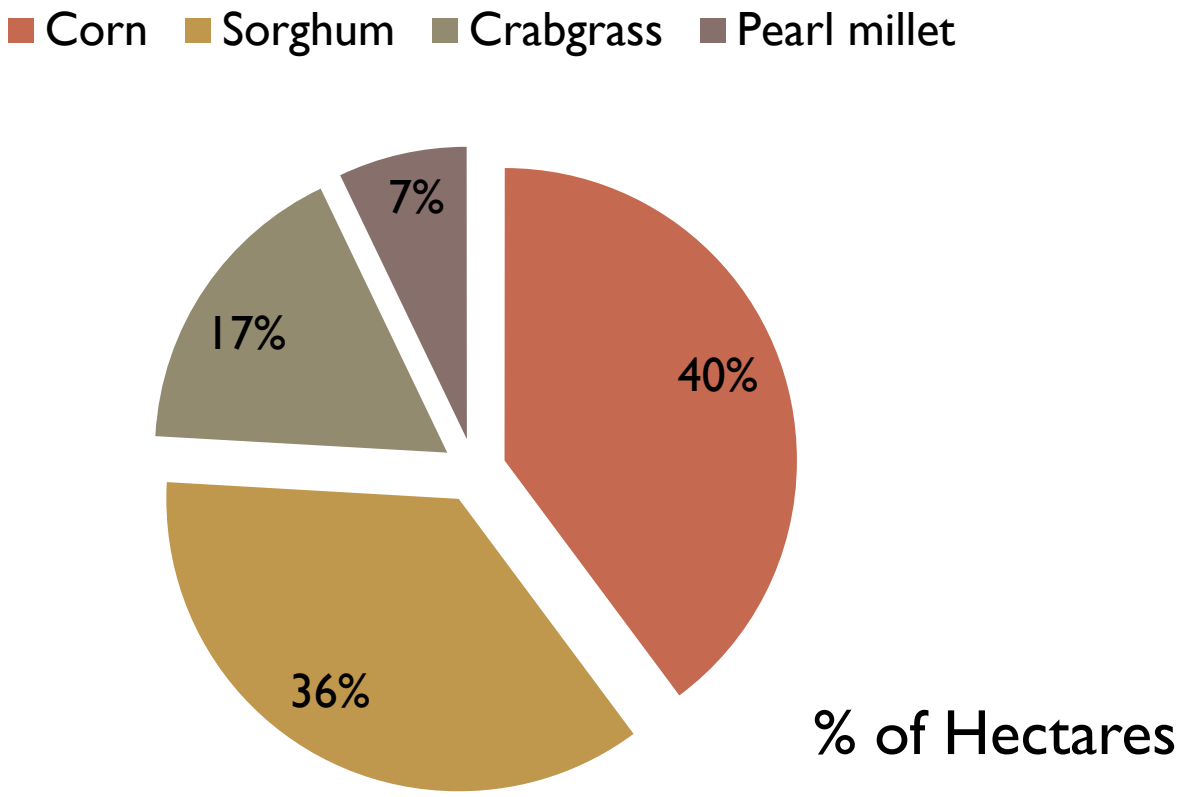
Warm-season perennial grasses

- All farms grew warm-season perennial grasses:



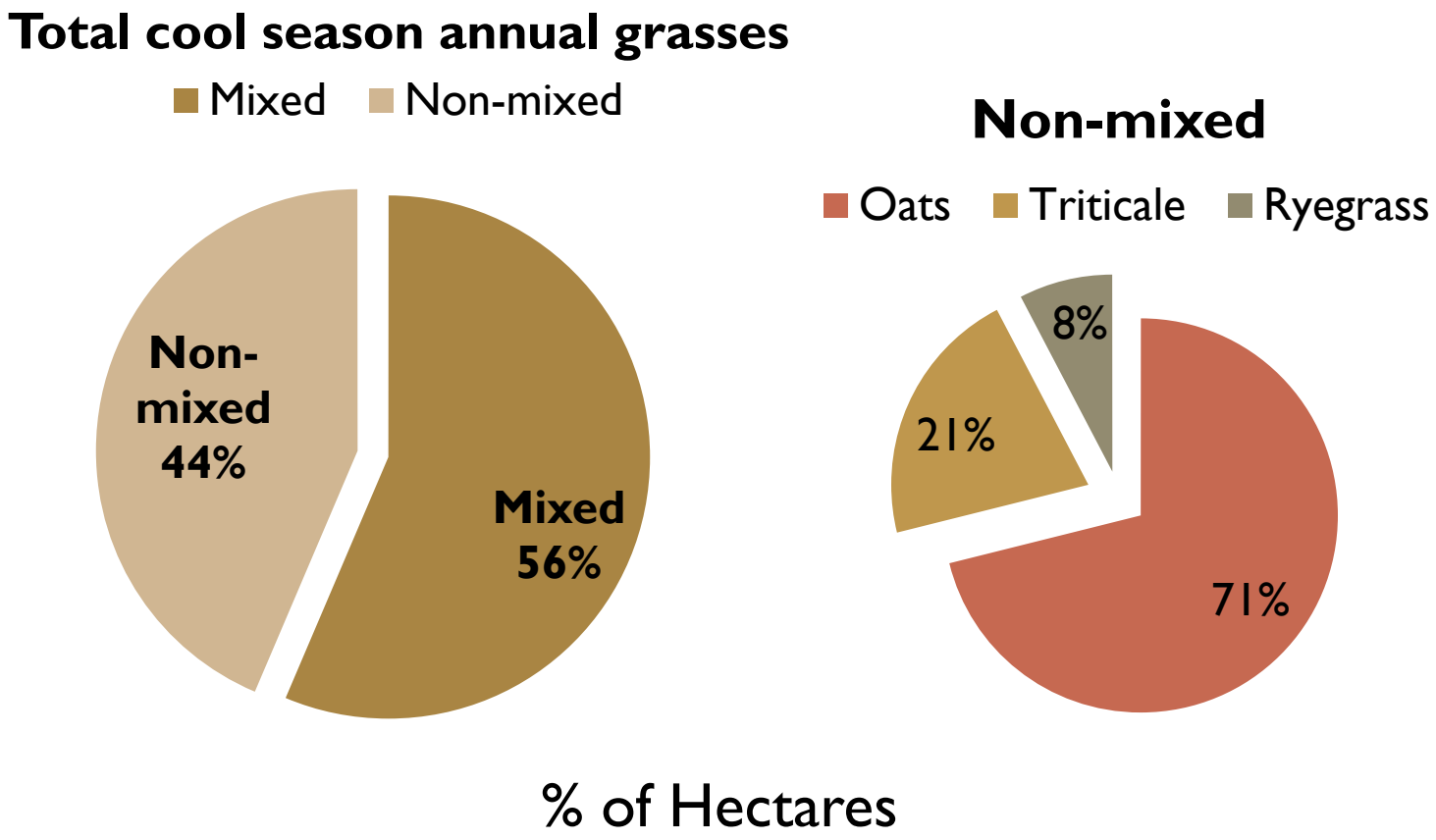
Warm-season annual grasses

- 14 farms grew warm-season annual grasses



Cool-season annual grasses

- 18 farms grew cool-season annual grasses

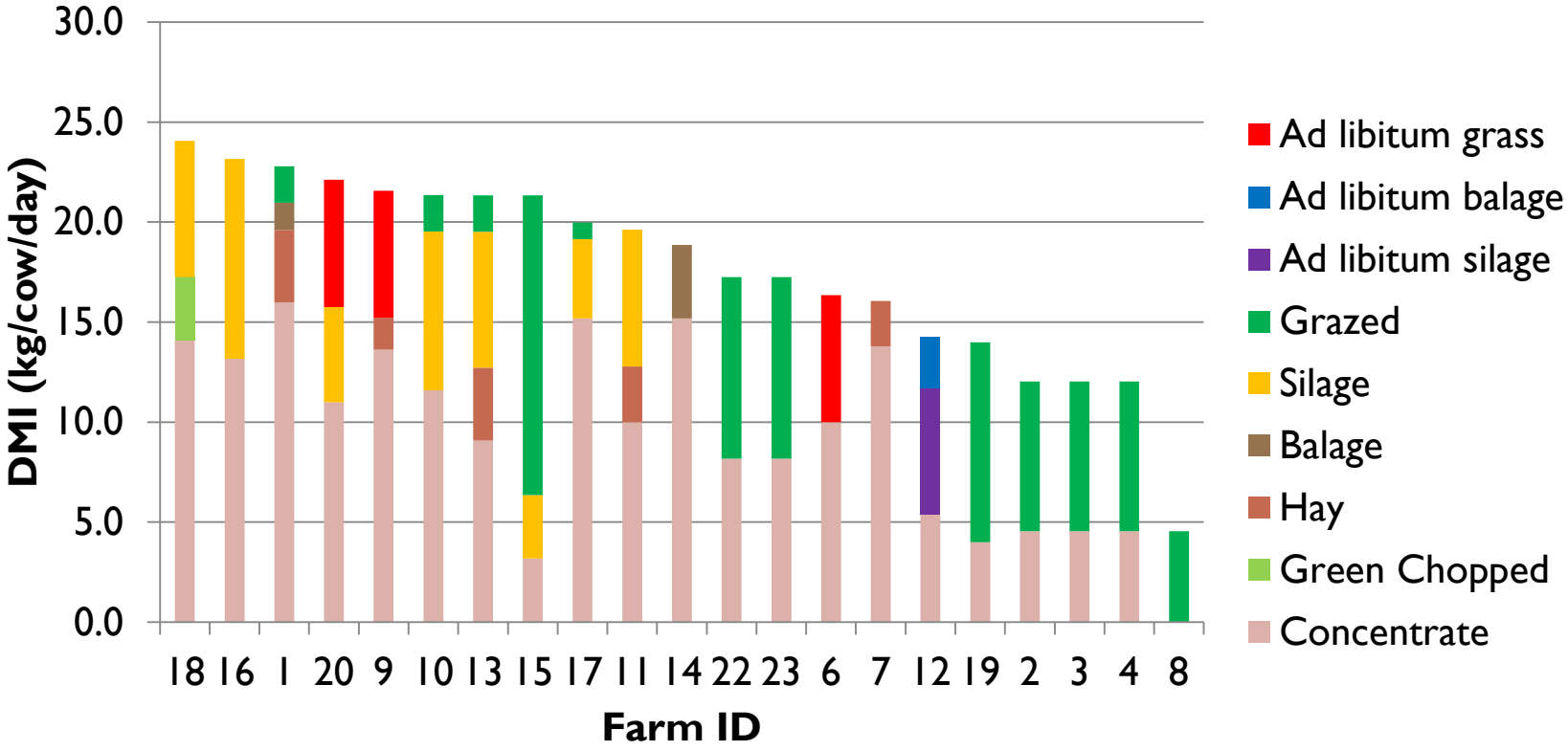


Cool-season perennials

- Example: alfalfa
- Not grown on surveyed farms

Feed intake

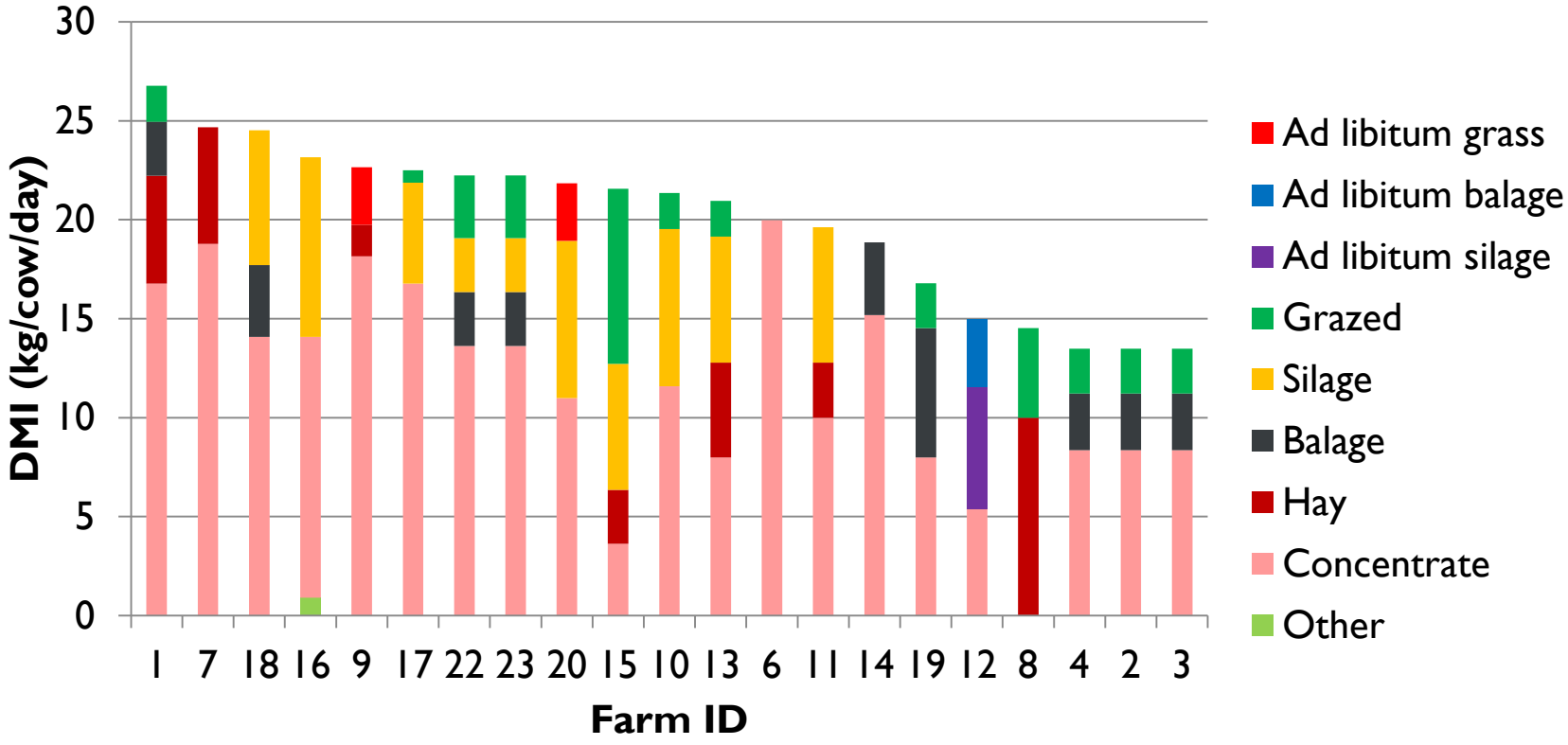
Dry matter intake for wet cows in summer



Average DMI: 17.7 ± 4.9 kg/cow/day

% concentrate: 49 ± 21

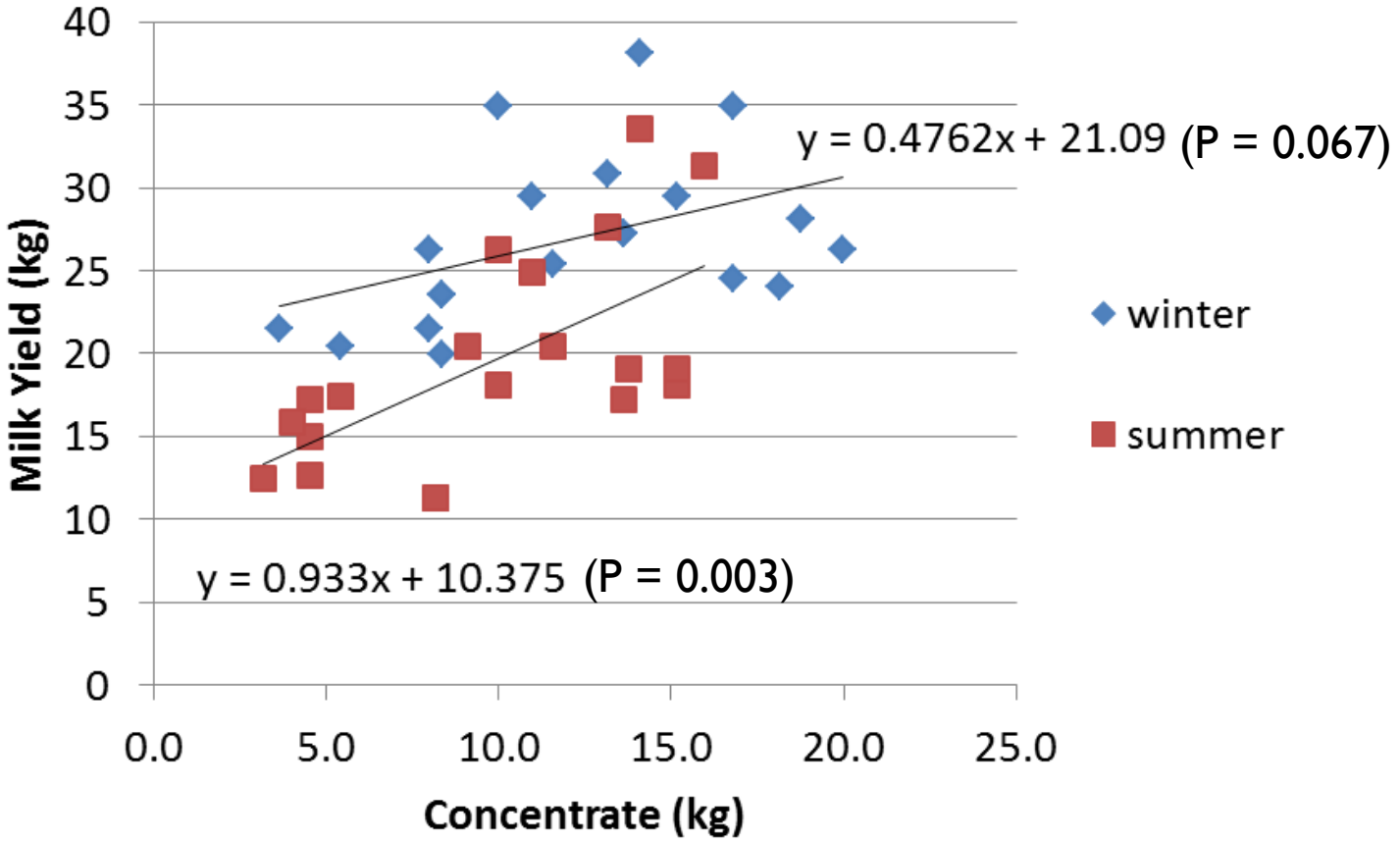
Dry matter intake for wet cows in winter



Average of DMI: 20.0 ± 4.0 kg/cow/day

% concentrate: 60 ± 18

Concentrate vs. milk yield



Discussion

- Objective of SARE project:
  - Characterize pasture-based dairy farming in FL and GA
  - Associate characteristics with financial performance
  - Help dairy farms understand best pasture-based practices
- Almost no comparable literature available
- Data collection challenges
  - Farm participation
  - Lack of quantitative answers

Conclusion

- Grass varieties, feed practices, milk production and reproduction all varied widely between seasons and among pasture-based dairy farms in FL and GA.

Acknowledgement

- SARE grant
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  - Dr. Linda Young
  - Dr. Charles Staples
  - Dr. Albert De Vries