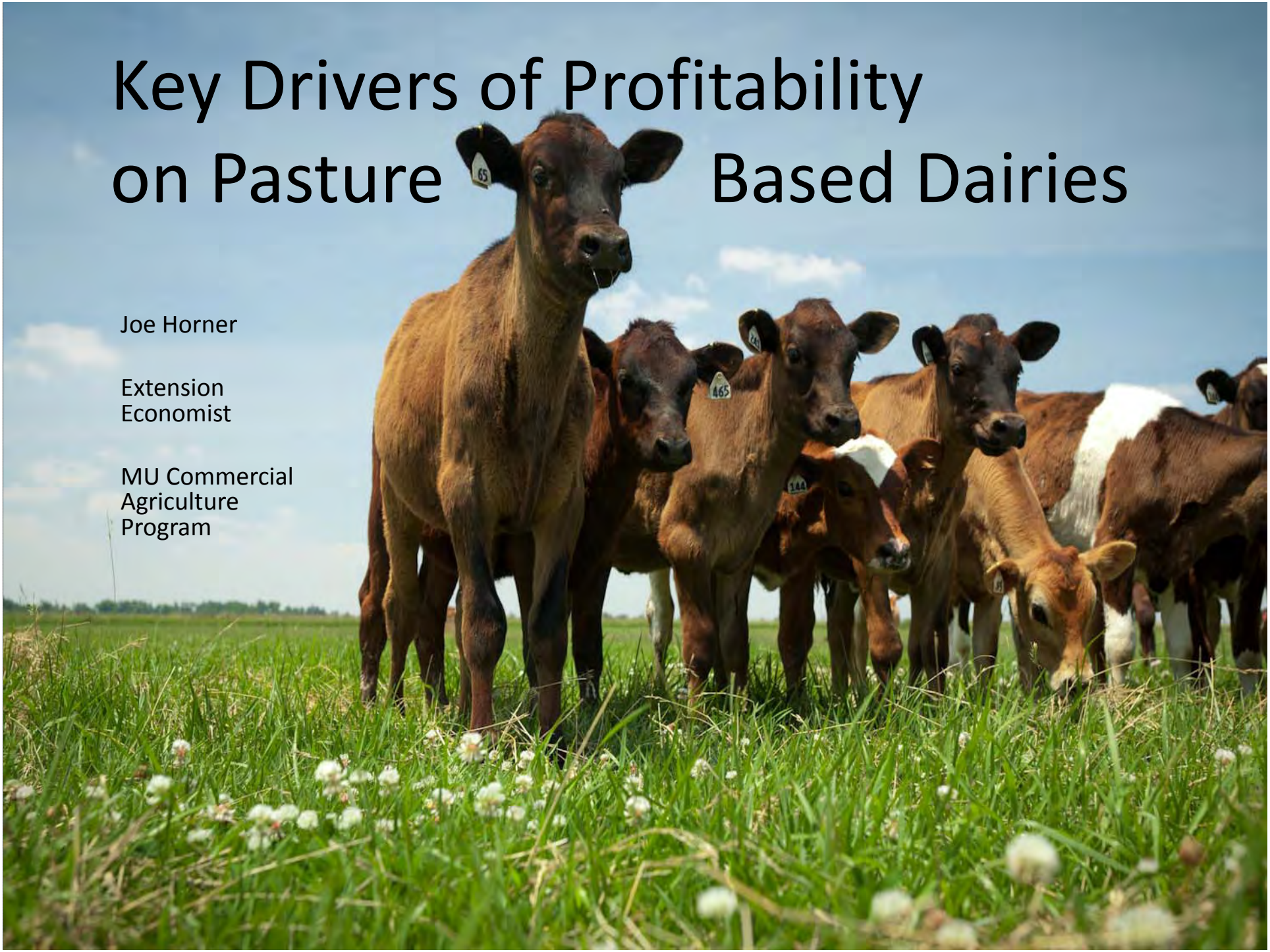
Key Drivers of Profitability on Pasture Based Dairies



Joe Horner

Extension Economist

MU Commercial Agriculture Program

If your goal is anything but profitability - if it's to be big, or to grow fast, or to become a technology leader - you'll hit problems.

Michael Porter
Institute for Strategy & Competitiveness
Harvard Business School

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4 Keys to Profitability

1.) A simple forage system managed for quality

2.) Cows that calve in large seasonal batches

3.) High speed and low investment parlors

4.) A balance of volume, margin and overhead that creates attractive returns and a desirable lifestyle

What is a Key Business Driver?

- Key business drivers are those factors that influence a farm's profit the most.
- Why do some farms make more money?
- Managers need to focus attention on these areas to improve profitability the fastest.

Profitability

- Return on Assets % (ROA):

  (Net farm income + interest expense– value of operator labor & mgt.)/total farm assets

- Three distinct levels of ROA
  - Negative
  - Between 0 and the farm's cost of capital ~ 6.5%
  - Above the cost of capital

Small ROA differences can make huge differences in wealth

Mr. Average

- 25 years old
- Inherits $200,000
- Invests in his own dairy
- Earns & reinvests at 4% return over next 40 years
- Retires at 65
- Net Worth = $ 960,204

Mr. Excel

- 25 years old
- Inherits $200,000
- Invests in his own dairy
- Earns & reinvests at 6% return over next 40 years
- Retires at 65
- Net Worth = $ 2,057,143

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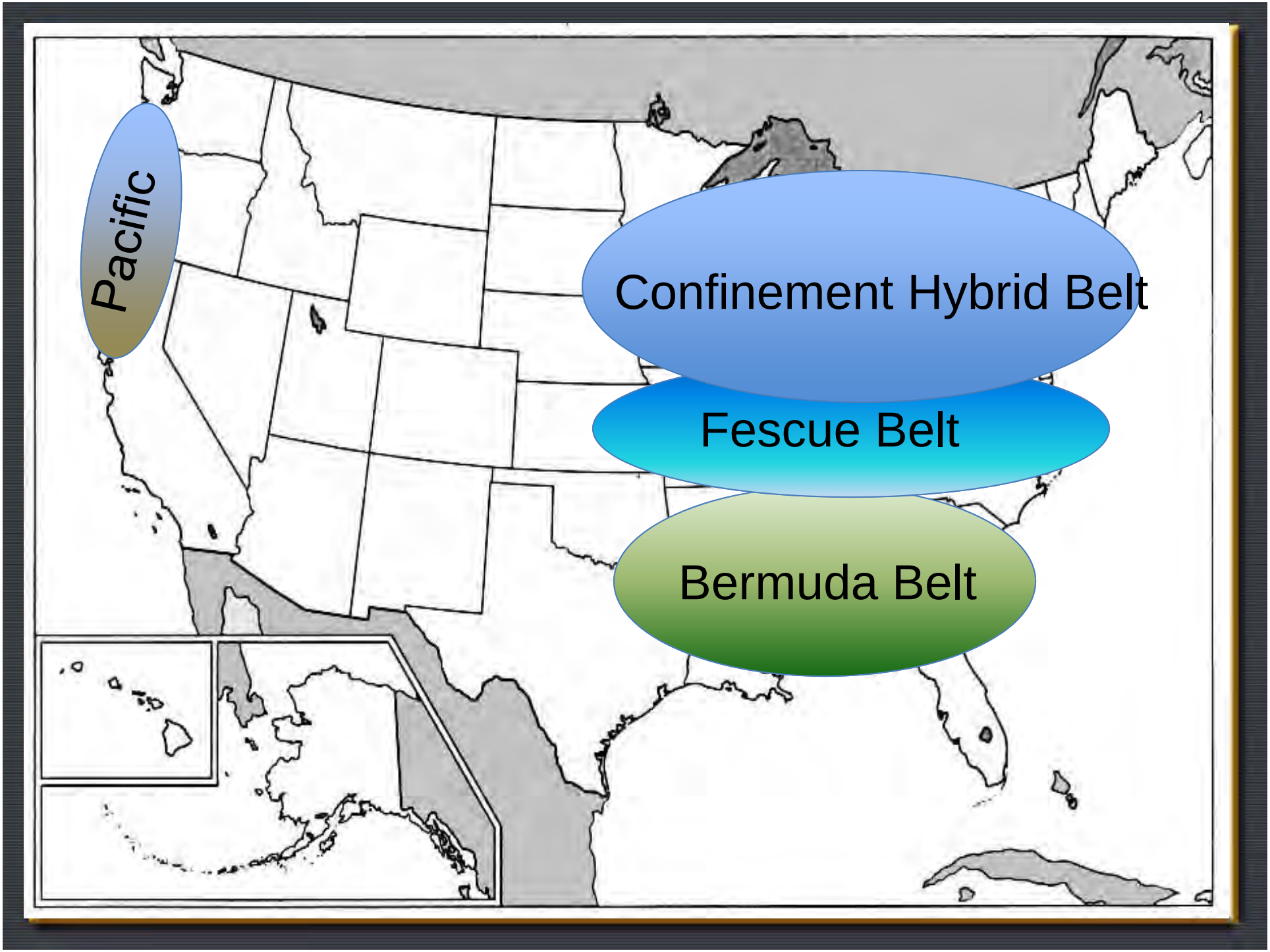
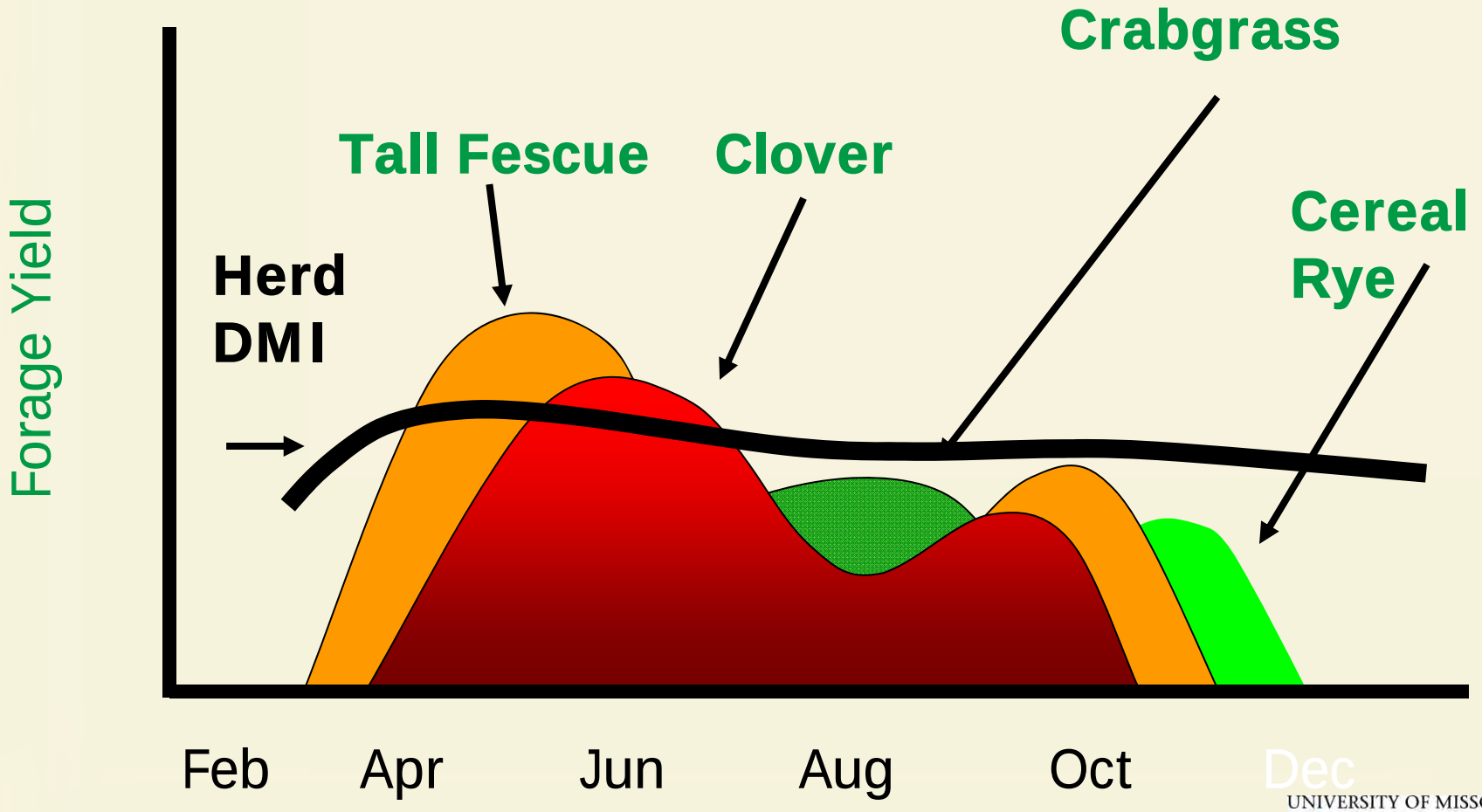

Pacific
Confinement Hybrid Belt
Fescue Belt
Bermuda Belt

Fescue Belt



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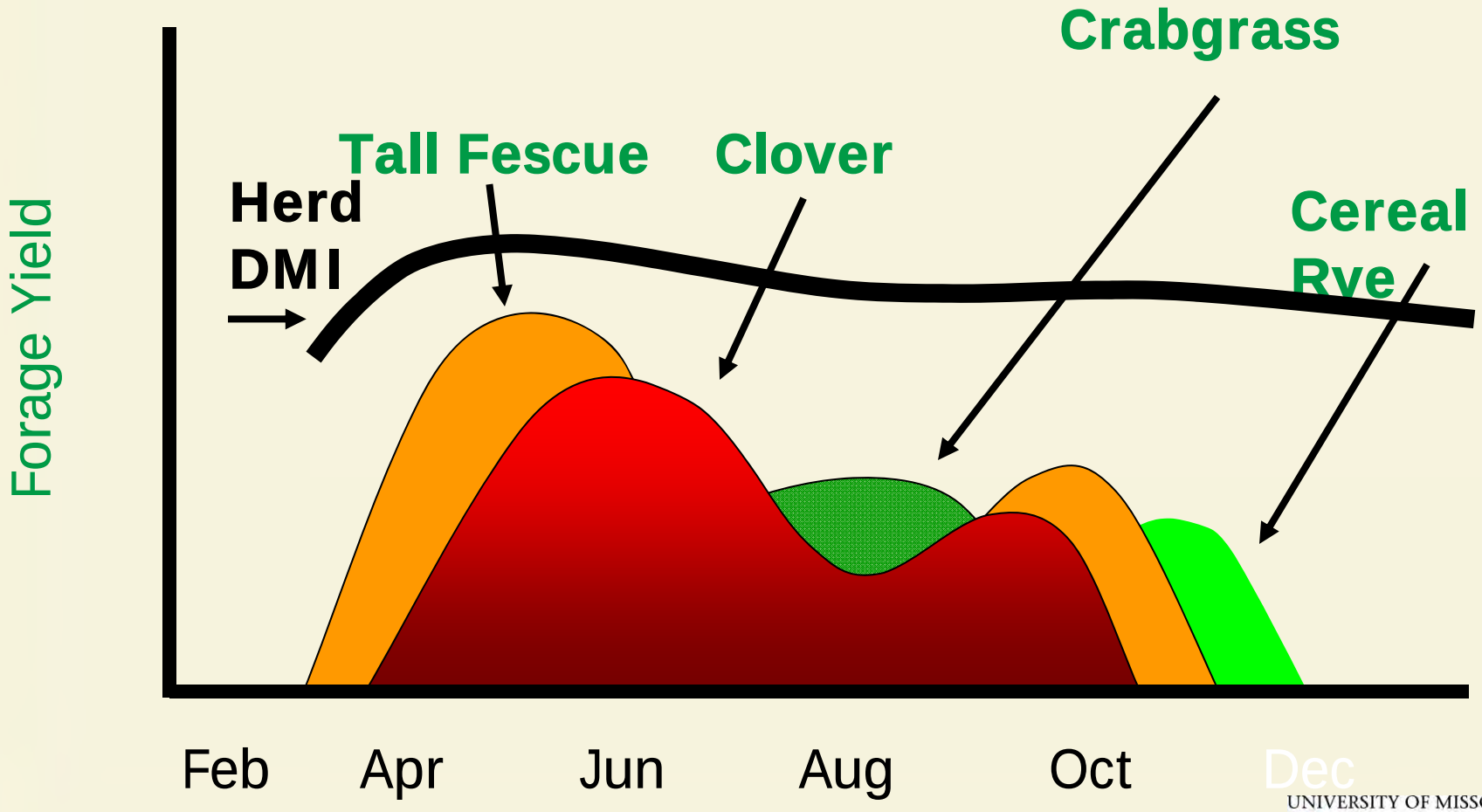
Fescue Belt



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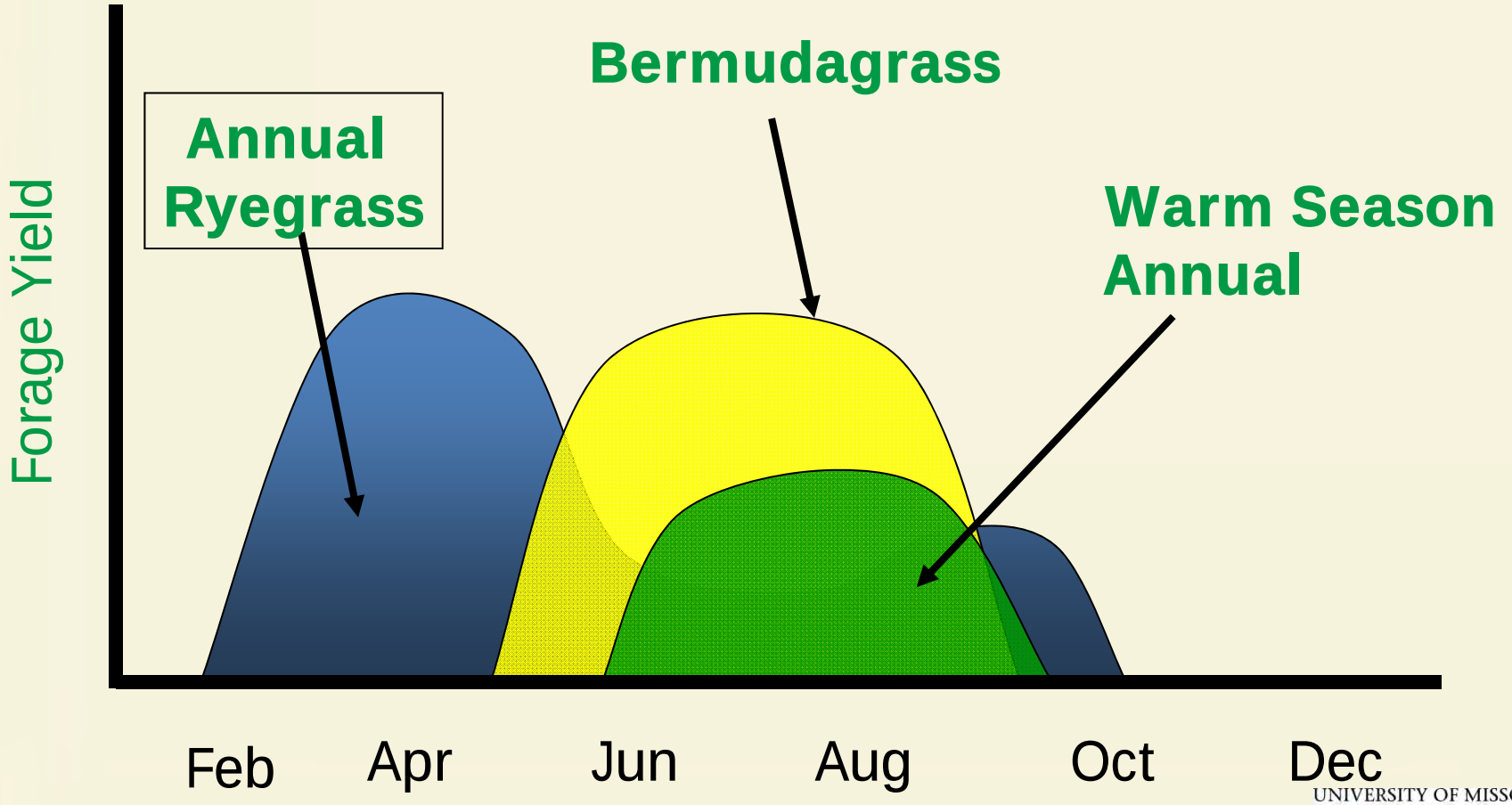
Bermudagrass Belt



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Profitability Model

Operating Efficiency		Capital Efficiency		Financing		
Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity
Net Income / Sales	X	Sales / Assets	X	Assets / Equity	=	Return on Equity

= Percentage Return on Equity (ROE)

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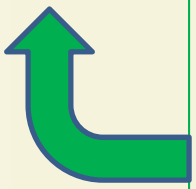
Profitability Model

Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity

$$\frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}} = \text{Return on Equity}$$



- Plant high energy but reliable pastures, fertilize as needed, allocate paddocks for annuals during seasonal flat spots
- Monitor, Measure & Manage pastures for high energy feed using a grazing wedge
- Calve in seasonal batches in sync with pasture growth curve.
- Use good nutrition, right genetics, attention to health & assisted reproduction technologies to keep cows within 12 month windows
- To lower labor costs, invest in a labor efficient parlor, holding area, calf facilities, & preventative animal health care

Profitability Model

Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity
$\frac{\text{Net Income}}{\text{Sales}}$	X	$\frac{\text{Sales}}{\text{Assets}}$	X	$\frac{\text{Assets}}{\text{Equity}}$	=	Return on Equity

- Stock the farm to its potential, given the constraints of resources, management, and the total system in place
- Avoid machinery purchases by hiring custom operators or buying forage crops
- Raise asset turnover by overstocking and feeding partial TMR when systems are in place to do so without impacting other costs
- Avoid buying non-performing "stranded assets" when purchasing farms, i.e.: wasteland, extra houses, silos, barns, etc.

Profitability Model

Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity
$\frac{\text{Net Income}}{\text{Sales}}$	X	$\frac{\text{Sales}}{\text{Assets}}$	X	$\frac{\text{Assets}}{\text{Equity}}$	=	Return on Equity

- Use leverage to raise returns only if the expected long term returns on assets are above the long term cost of capital
- When ROA > cost of capital, use leverage, but mitigate risks with forward contracting and using fixed rate loans.

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Standard 300 Cow MU Dairy Model

- 300 crossbred cows
- 10 pounds grain mix
- 12,700 pounds of milk sold per cow
- Stocking rate = 1.25 cows per acre
- 85 day average dry period
- Forage purchased: Dry cows needs, plus 5 pounds hay per lactating cow during season
- $5,023 investment per cow

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300 Cow MU Dairy Model

Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity
Net Income / Sales	X	Sales / Assets	X	Assets / Equity	=	Return on Equity
19.4%	X	0.5	X	1/1	=	9.2% (ROE)

= Percentage Return on Equity (ROE)

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300 Cow MU Dairy Model

- 300 crossbred cows
- 15 pounds grain mix
- 12,700 pounds of milk sold per cow
- Stocking rate = 1.25 cows per acre
- 85 day average dry period
- Forage purchased: Dry cows, + 5 pounds hay per lactating cow
- $5,023 investment per cow

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300 Cow MU Dairy Model

Add extra 5 lbs. grain/cow/day

Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity
$\frac{\text{Net Income}}{\text{Sales}}$	X	$\frac{\text{Sales}}{\text{Assets}}$	X	$\frac{\text{Assets}}{\text{Equity}}$	=	Return on Equity
12.9%	X	0.5	X	1	=	6.4% (ROE)

= Percentage Return on Equity (ROE)

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300 Cow MU Dairy Model

- 300 crossbred cows
- 10 pounds grain mix
- 12,700 pounds of milk sold per cow
- Stocking rate = 1.25 cows per acre
- 85 day average dry period
- Forage purchased: Dry cows, + 5 pounds hay per lactating cow
- $6,023 (+$1,000 machinery) investment per cow

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300 Cow MU Dairy Model

Add $1,000/cow more machinery

Profit Margin	X	Asset Turnover	X	Leverage	=	Return on Equity
Net Income / Sales	X	Sales / Assets	X	Assets / Equity	=	Return on Equity
12.8%	X	0.4	X	1	=	5.1% (ROE)

= Percentage Return on Equity (ROE)

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300 Cow MU Dairy Model

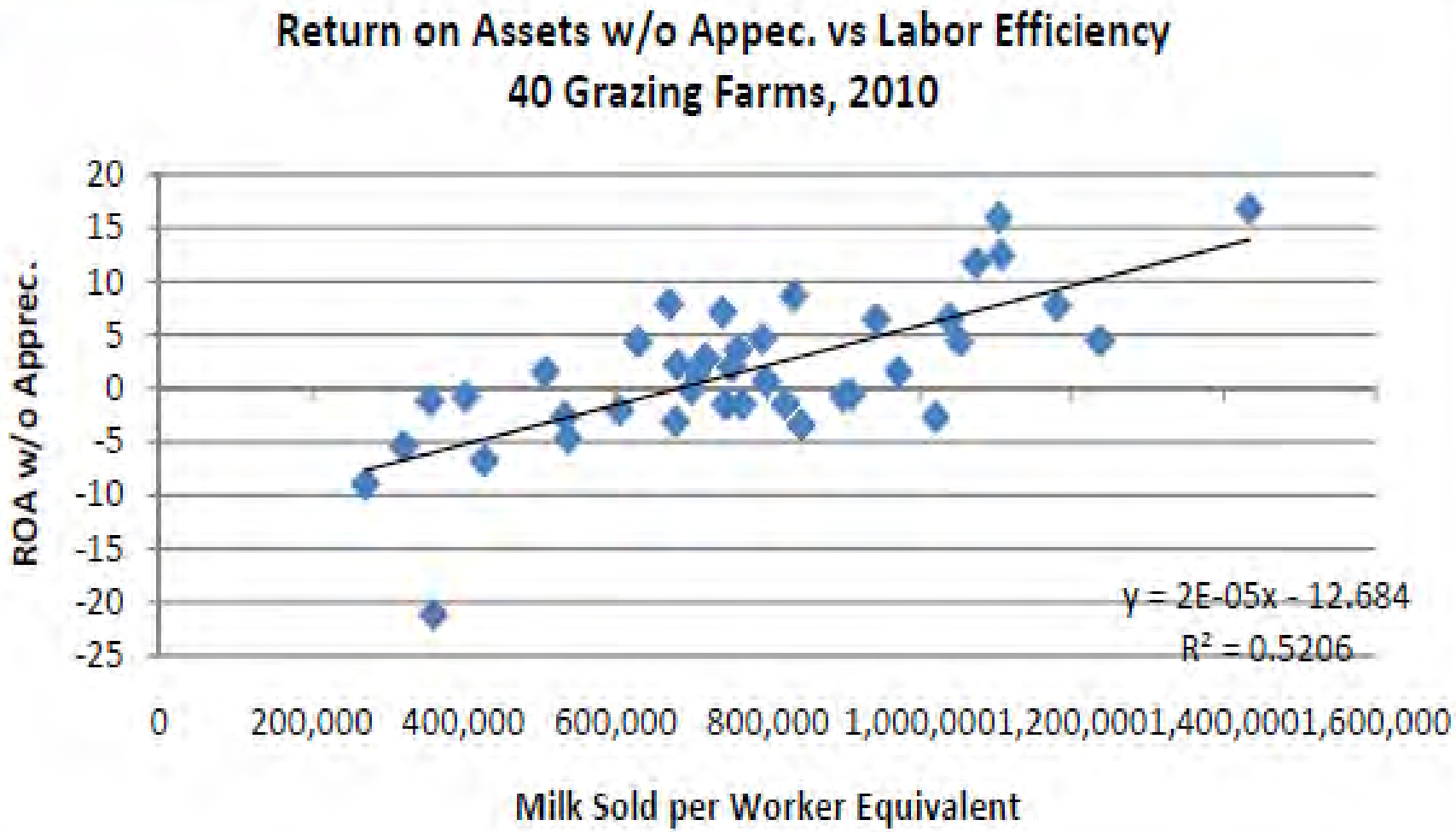
Summary

Profit Margin X Asset Turnover X Leverage = Return on Equity

$\frac{\text{Net Income}}{\text{Sales}}$ X $\frac{\text{Sales}}{\text{Assets}}$ X $\frac{\text{Assets}}{\text{Equity}}$ = Return on Equity

Scenario	Profit Margin	Asset Turnover	Leverage	Return on Equity
Standard Model	19.4	0.5	None =1	9.2%
Grain raised from 10 to 15 pounds with no change in production	12.9	0.5	None =1	6.4%
Increase machinery investment per cow $1,000 with no change in production	12.8	0.4	None =1	5.1%
Leverage Standard Model with 50% debt at 6.5% per year	12.4	0.5	2.1	13.0%

PRO-DAIRY



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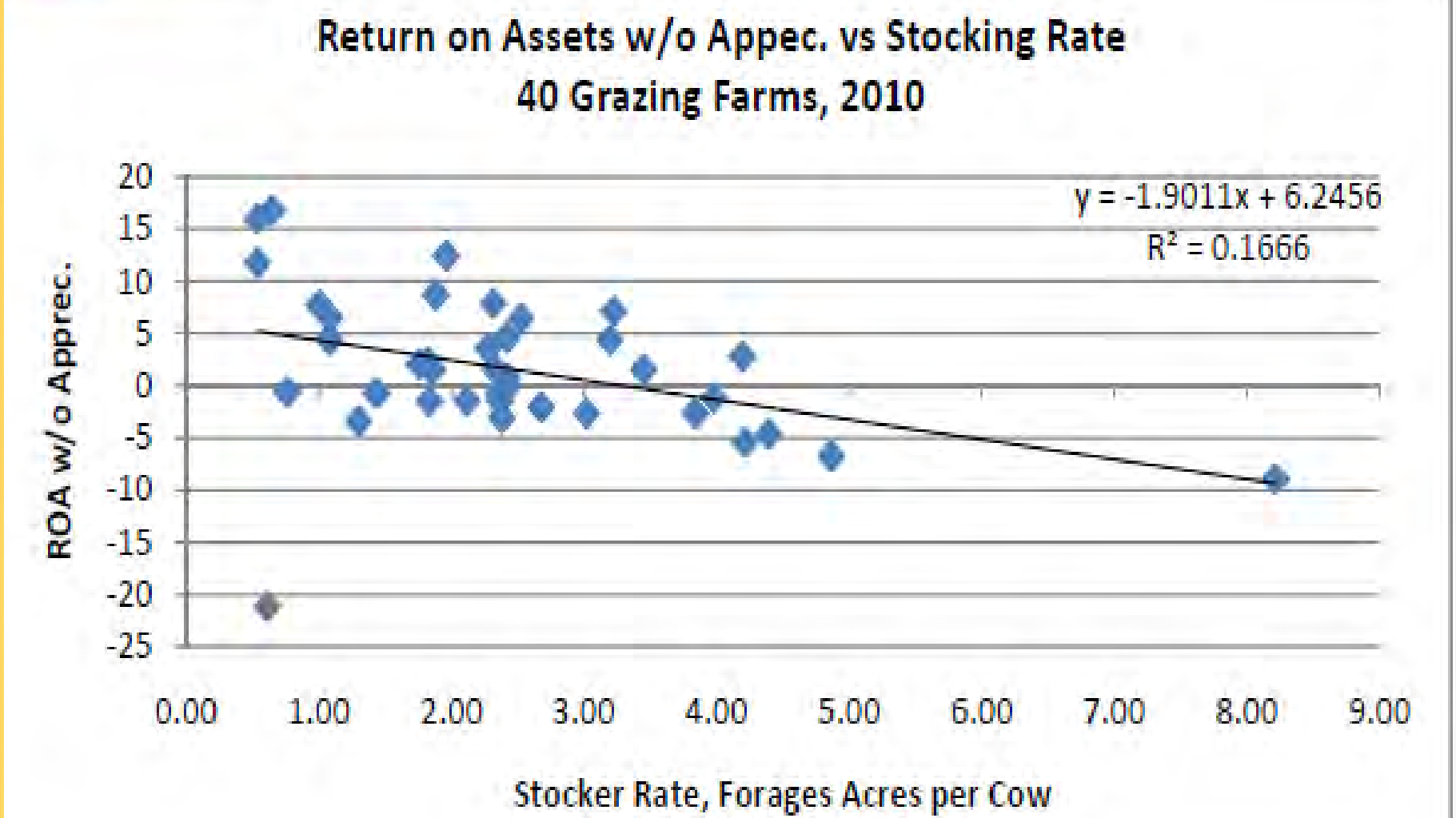
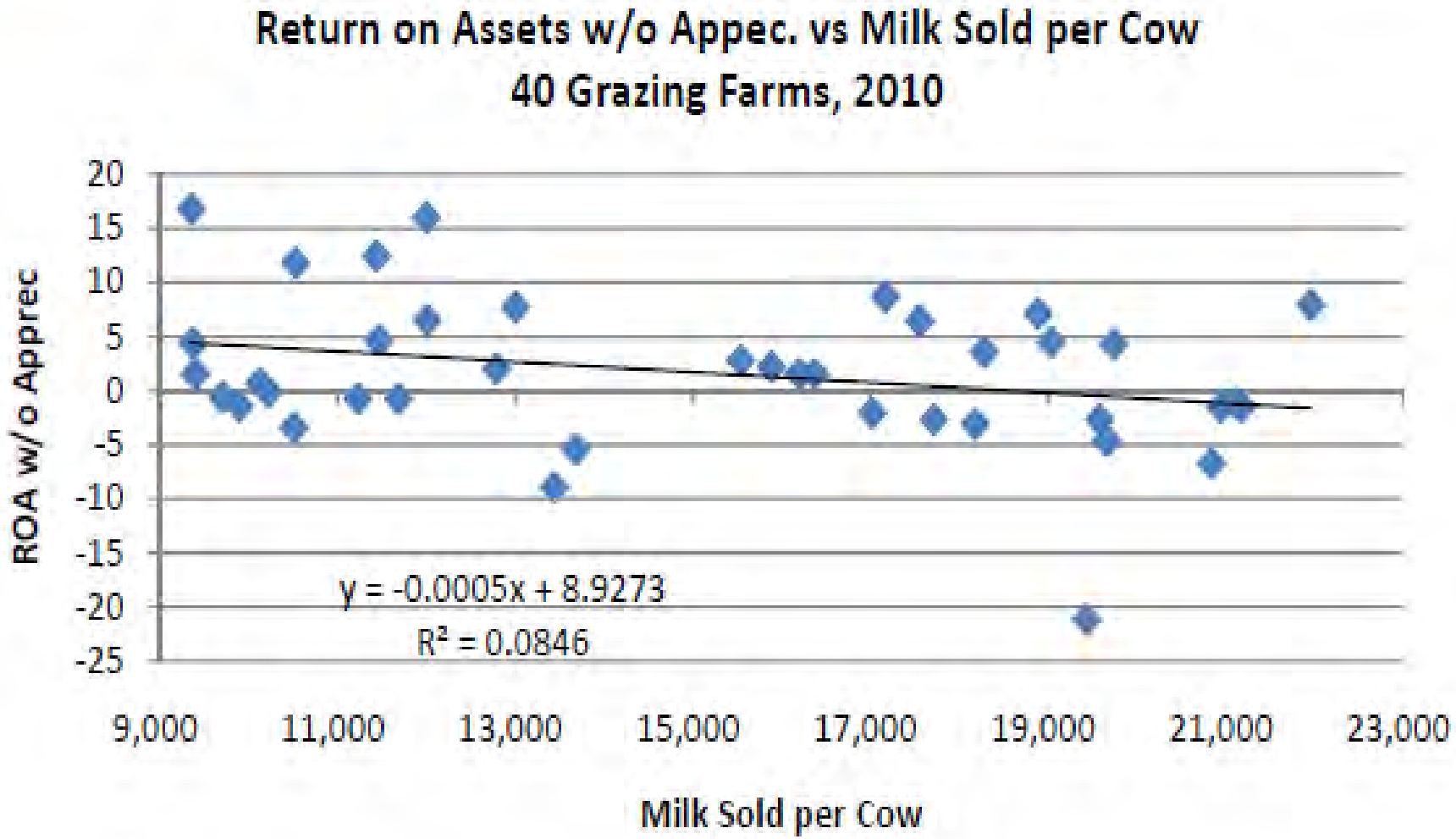
PRO-DAIRY


Return on Assets w/o Appec. vs Stocking Rate
40 Grazing Farms, 2010
y = -1.9011x + 6.2456
R² = 0.1666
ROA w/o Apprec.
20
15
10
5
0
-5
-10
-15
-20
-25
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
Stocker Rate, Forages Acres per Cow

PRO-DAIRY


Return on Assets w/o Appec. vs Milk Sold per Cow
40 Grazing Farms, 2010
ROA w/o Apprec
20
15
10
5
0
-5
-10
-15
-20
-25
y = -0.0005x + 8.9273
R² = 0.0846
9,000
11,000
13,000
15,000
17,000
19,000
21,000
23,000
Milk Sold per Cow

A Balance of Volume, Margin and Overhead that creates Attractive Returns and a Desirable Lifestyle

Benchmark	Conventional Dairy	Grazing Dairy
Income/Cow	$4,000	$2,250
Operation costs as % income	80%	65%
Milk sold per cow (lbs.)	24,000	12,250
Ownership equity (%)	50%	50%
Debt per cow	$5,000	$3,000
Asset turnover	0.4	0.4
Investment per cow	$7,500 to $15,000	$5,000 to $7,000
Return on assets	8%	10%

Conventional Source: The Dairy Dozen, 12 Key Financial Indicators, Gary Sipiorski, Hoards Dairyman, January 25, 2009

Grazing Dairy Source: Personal experience in Missouri, working with dairy grazing operations

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Resources

- Measuring and Analyzing Farm Financial Performance *(Purdue)*

  Website: http://www.agecon.purdue.edu/extension/programs/fbm21/Ec712entry.htm
- Farm Analysis Solution Spreadsheets *(Illinois)*

  Website: http://www.farmdoc.illinois.edu/fasttools/index.asp
- Dairy Business Summary and Analysis *(Cornell)*

  Website: http://dfbs.aem.cornell.edu/
- Farm Accounting Software *(Quicken, Quickbooks, etc.)*


Questions?