

# Pasture Based Dairy Systems Overview



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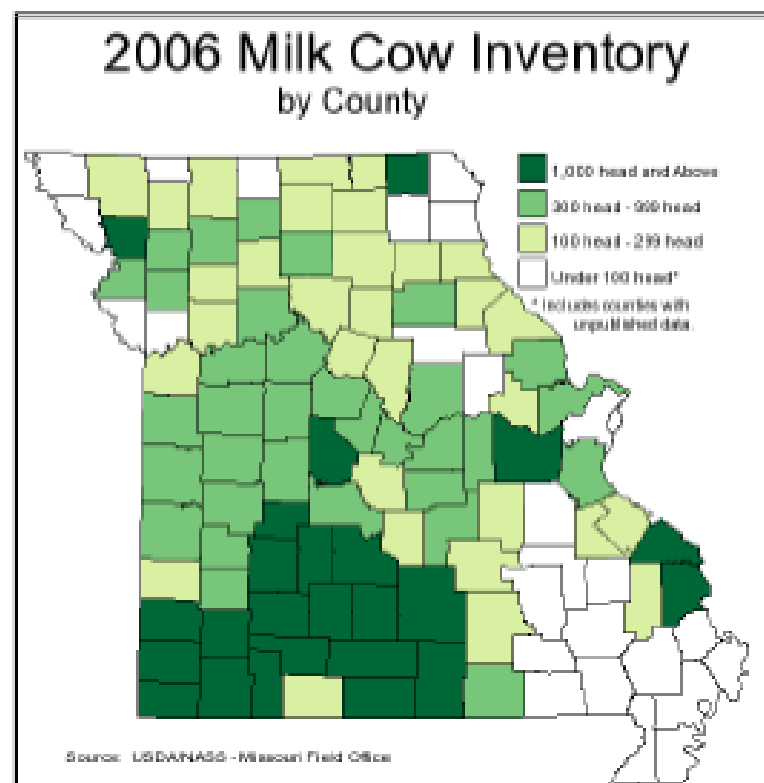
# Dairy Grazing History in Missouri

- Traditionally all Missouri dairies were pasture-based.
- 1970s - dairies moved towards confinement
- 1991- 1st grazing dairy demonstration held in SW Missouri.
- 1994 – 1st dairy grazing school was held.
- 1999 - MU Southwest Center established a seasonal rotational grazing dairy.
- Established local grazing groups that hold monthly meetings to share ideas, experiences and tour other farmers' operations.
- 2001 – 1<sup>st</sup> edition of the dairy grazing manual was published

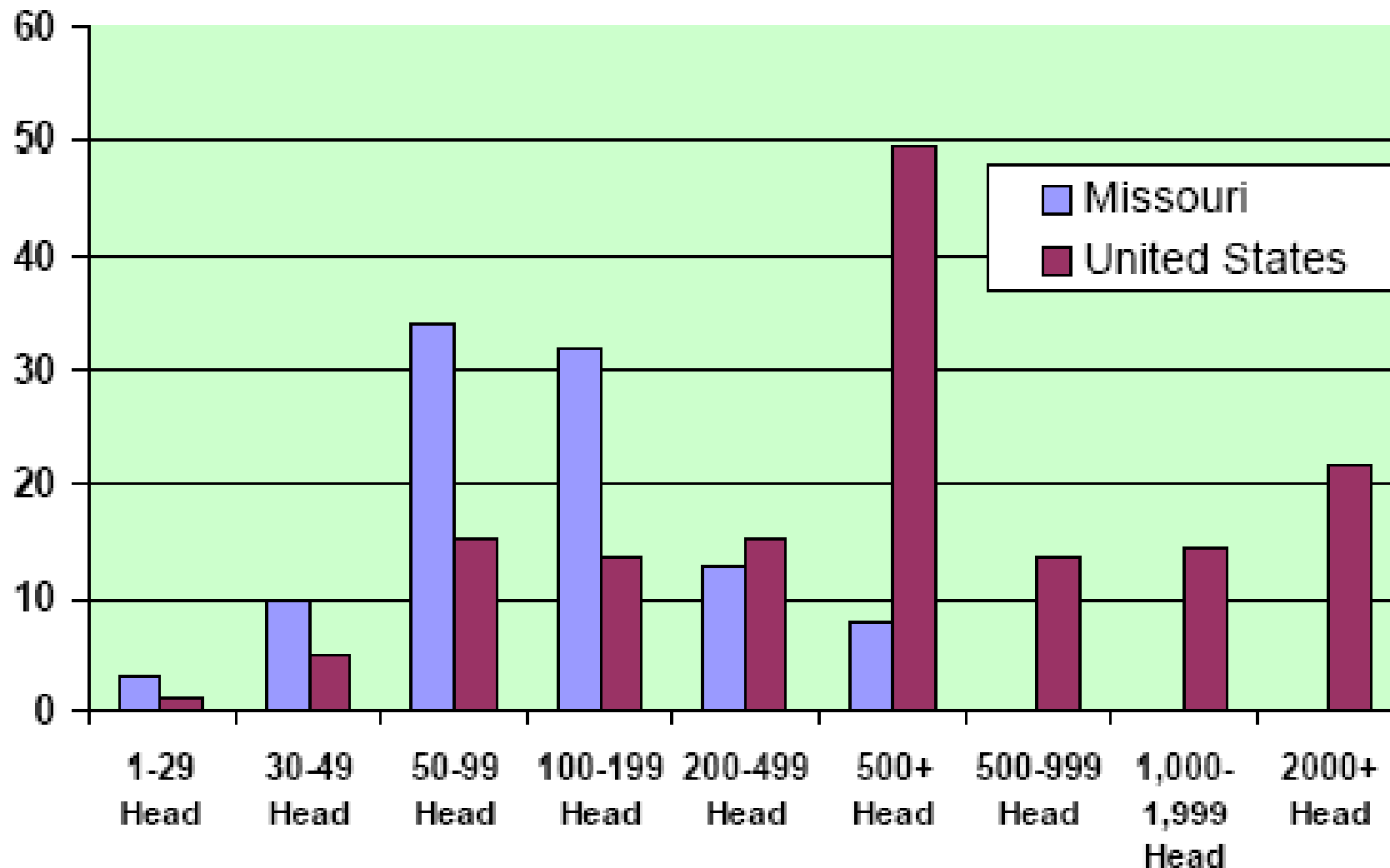
- 2003 - early Missouri adopters of pasture-based dairying start to scale up.
- 2004 - New Zealand dairy farmers explored Missouri and other states for dairying opportunities.
- 2006 - MU extension specialists and Missouri farmers went on a dairy systems study trip to New Zealand.
- 2006 - a national grazing conference was held in Missouri, with over 200 people in attendance from 21 different states.
- 2008 - MU extension specialists went on a pasture systems study trip to Australia and New Zealand.
- 2008 – Held pasture based dairy training for Extension & NRCS
- Between 2005 to 2008, over \$100 million has been invested in infrastructure of pasture-based dairying in Missouri.

# Missouri's Dairy Industry

- **1,361** Grade A Dairy Farms (2006)
- **410** Manufacturing Grade Farms (2006)
- **114,000** Dairy Cows (2006)
- Economic Impact (2005)
  - **\$298 million** in cash receipts
  - **\$929 million** in total impact
  - **8,299** total jobs



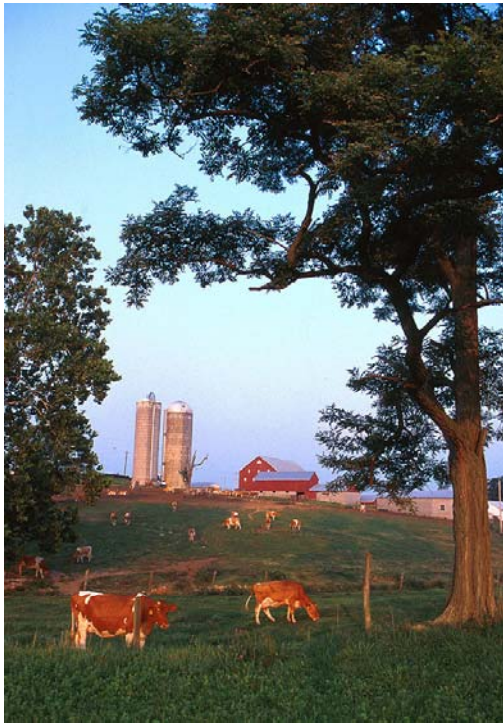
# Milk Production Percent by Size of Operation



Source: USDA, NASS 2005

# Why?

- Why graze dairy cows?
- Why Missouri?



# Why Graze Dairy Cows?

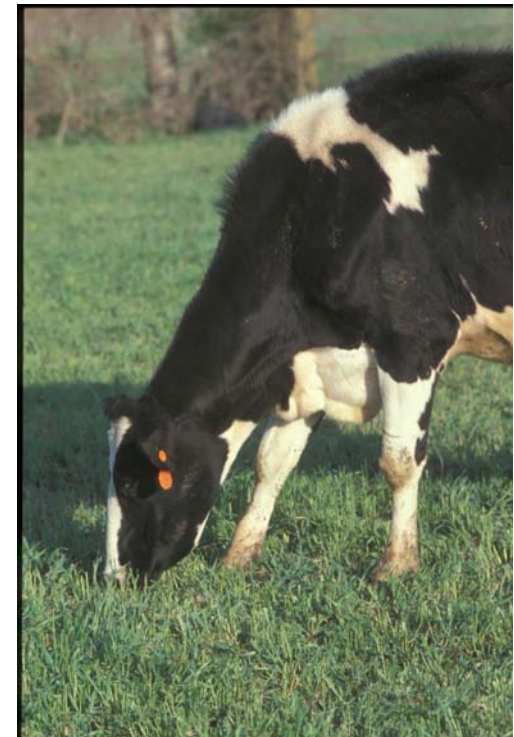
- Economically viable
- Environmentally friendly
- Lifestyle



# Economics

- **Relative Cost of Supplying a Unit of Energy to Ruminants**

– Pasture	100
– Alfalfa hay	152
– All types of hay	162
– Corn silage	195
– Dehydrated forage	320
– Grains	457



## Comparison of Missouri MIG dairies to large conventional operations

	2002		2003		2004		2005	
	Grazing	Conv.	Grazing	Conv.	Grazing	Conv.	Grazing	Conv.
# Milk shipped/cow	12,064	25,505	12,671	24,270	12,510	24,472	13,380	25,668
Cost/CWT Milk	\$10.22	\$11.01	\$10.32	\$11.30	\$10.94	\$12.12	\$11.86	\$12.01
Operating Margin	\$651	\$265	\$724	\$92	\$978	\$831	\$723	\$786
# Cows	113	1578	153	2496	156	2031	157	2343
% Cull Rate	19	32	17	41	17	30	17	27

Conv. Data derived from  
G&M data; Washington State

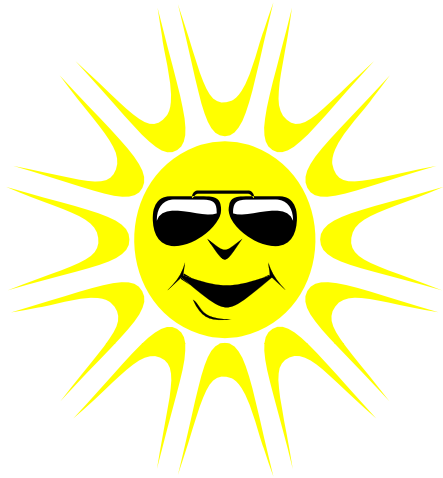
# Income for University of Missouri SW Research Center seasonal MIG dairy

		1999	2000	2001	2002	2003	2004	2005	
								\$cow	CWT
<b>Income</b>									
Milk Sales		13.29	13.67	16.53	12.85	13.10	17.94	\$2,070	15.99
Cattle Sales		1.76	1.61	1.84	1.56	1.34	2.66	\$224	1.74
Govt./Dividends					1.27	2.31	0.04	\$3	0.02
Total Income/cwt		15.05	15.28	18.37	15.68	16.75	20.64	\$2,297	
	/cow	1527	1943	2380	2150	2132	2849		17.75
<b>Total Expenditures</b>									
	\$/cwt	9.07	8.31	9	9.1	9.82	8.74		9.28
	\$/cow	921	1055	1166	1248	1251	1207	1202	
<b>Operating Margin</b>									
	\$/cwt	5.98	6.97	9.37	6.58	6.93	11.9		8.47
	\$/cow	606	888	1214	902	881	1642	1095	

From: Crawford, Hamilton, Rickard,  
Davis, Prewitt & Horner

Heifer expenses not included

# Environmentally Sustainable



**Well-managed forage-based dairy systems can be part of the solution**

Control Soil Erosion  
Protect Water Quality  
Recycle Nutrients  
Provide Habitat



# Locations: % of Events Pasture Based Systems

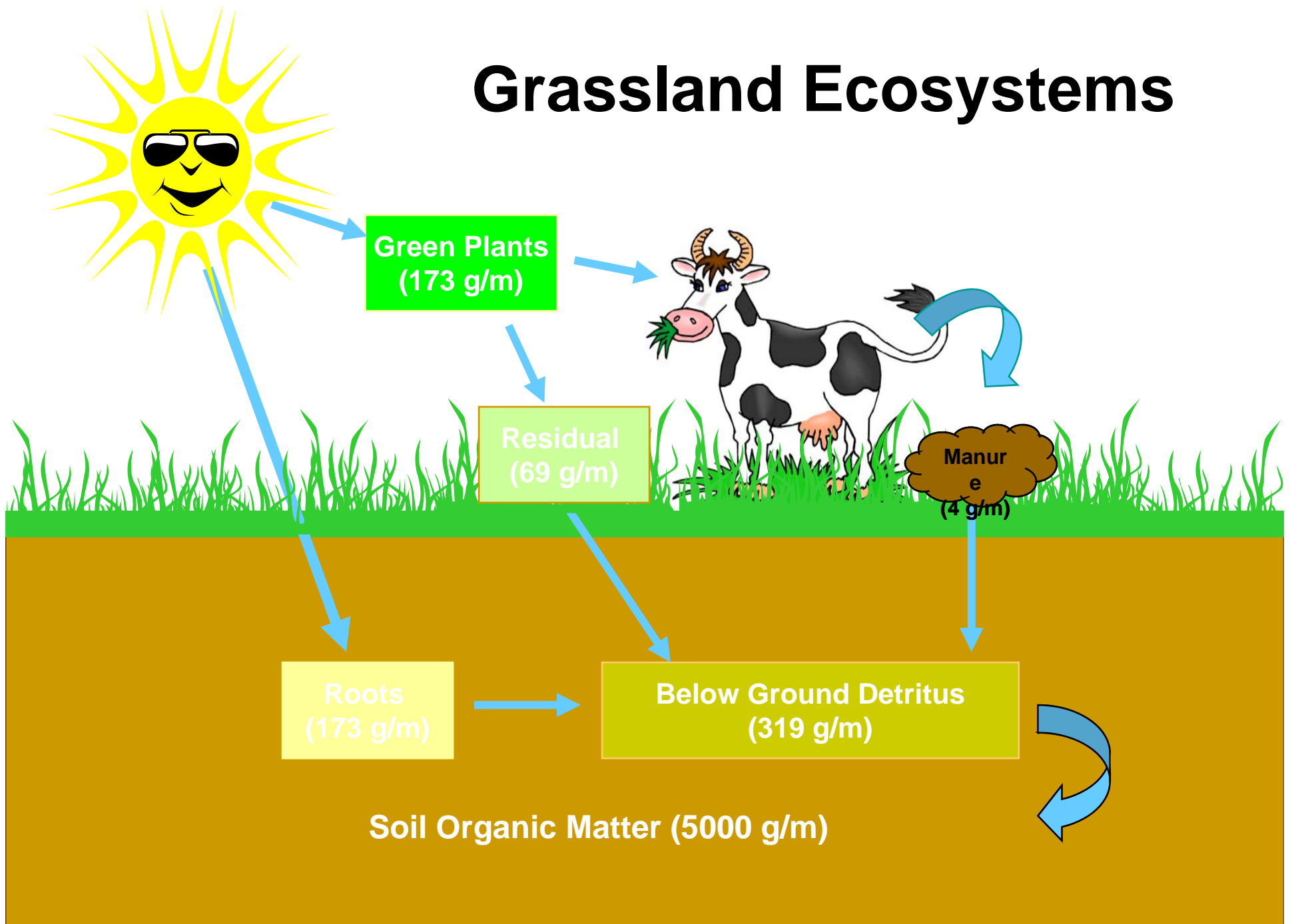
<b>Location</b>	<b>Urine <math>\pm</math> S.E.</b>	<b>Feces <math>\pm</math> S.E.</b>
Feed Area	12.4 $\pm$ 0.08	9.4 $\pm$ 0.08
Parlor Area	3.1 $\pm$ 0.08	4.6 $\pm$ 0.08
Lanes	0	1.3 $\pm$ 0.08
Paddock	84.5 $\pm$ 0.12	84.7 $\pm$ 0.16

**S.L. White, S.P. Washburn, R.E.  
Sheffield, L.D. King, J.T.Green, Jr.**  
North Carolina State University

# Nitrogen Cycle: Dairy Systems

- Feed-to-milk N use efficiency: **22%**
- Time in pasture: **20 hr / day**
- **65%** of N in supplemental feed excreted in pasture
- A milking cow adds 1/5 to 1/6 lb of N to pasture per 10 lb of concentrate fed in the barn per

# Grassland Ecosystems



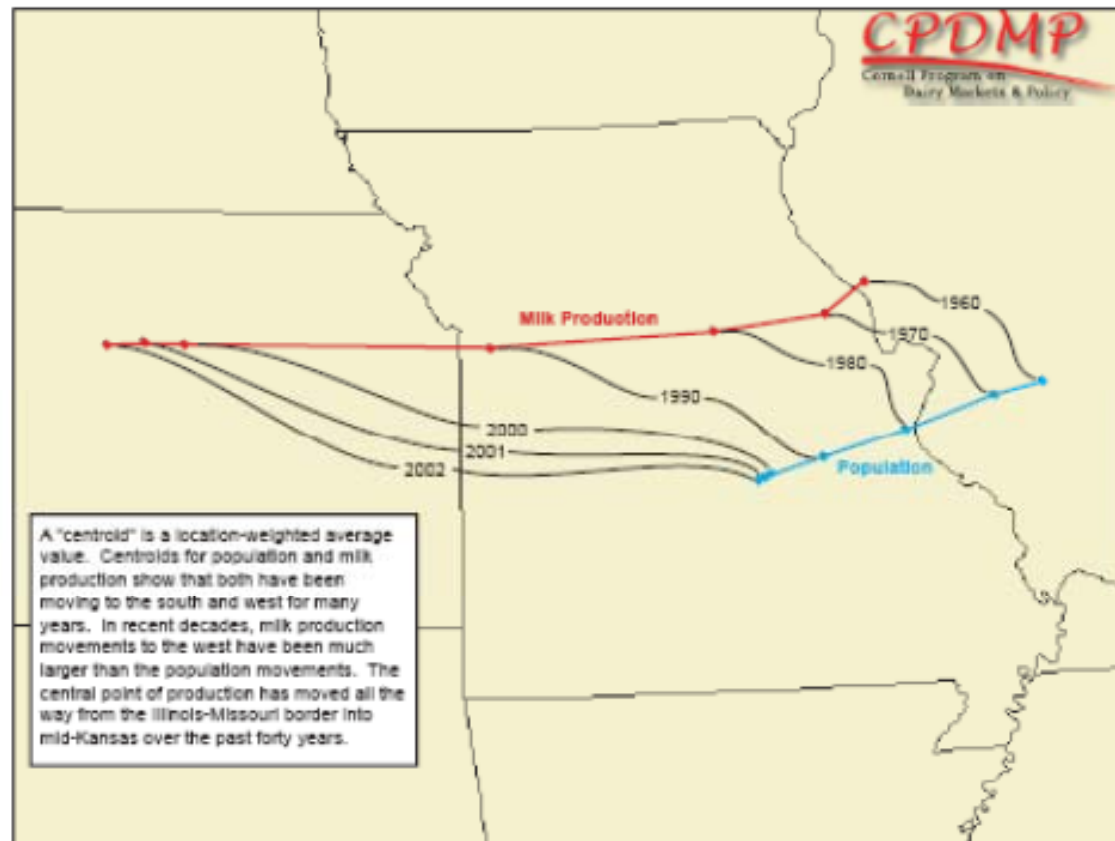
# Lifestyle

- Less time spent harvesting and transporting forages – cows do all the work
- Less time hauling manure back to the field
- Less time working on equipment
- More time monitoring & managing pasture & livestock
- More time with family
- Less stressful



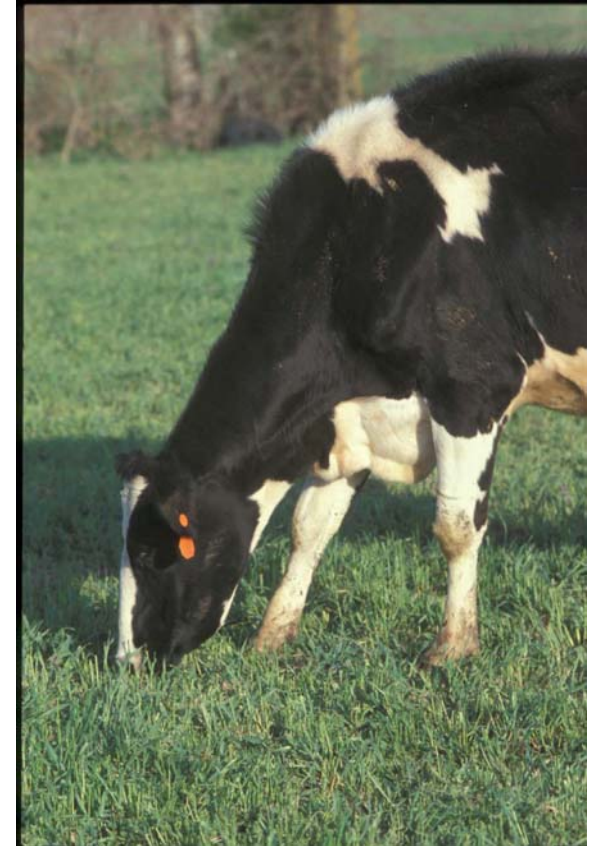
# Why Missouri?

## Missouri: ideal location for dairy?



# Missouri Grass Based Advantages

- Climate
- Forage Base
- Land
- Readily Available Feedstuffs
- Existing Dairy Infrastructure
- Rural/Agricultural Culture



# Climate

- Moderate temperatures (few days below 0, few days above 100)
- Approximately 40 – 45” rainfall
- 240 – 270 day growing season
- Low to moderate snowfall for shorter time
- Ability to winter outside

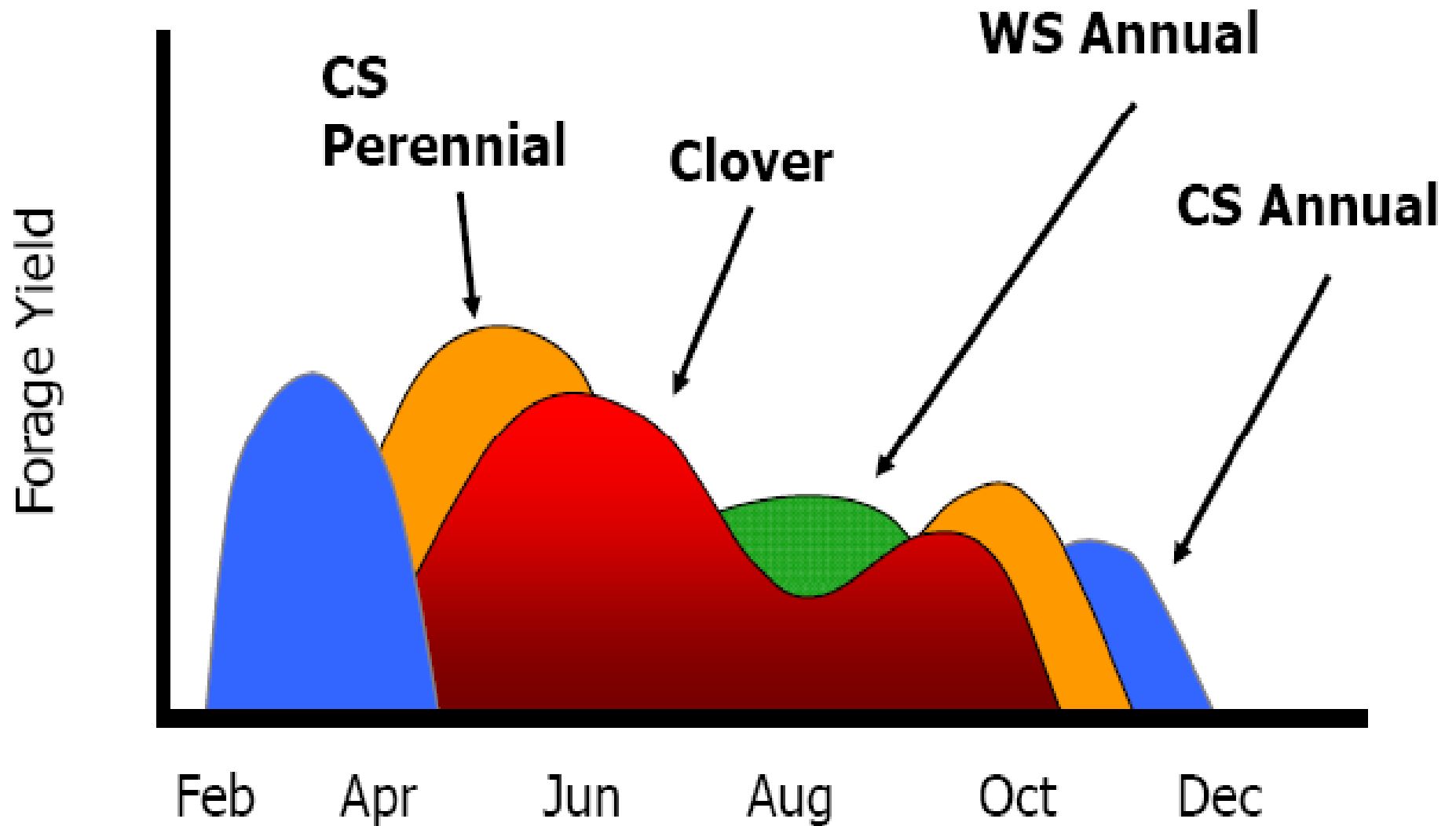


# Forage Base

- Climate allows for forage diversity:
  - Cool season perennials
  - Cool season annuals
  - Warm season perennials
  - Warm season annuals
  - Cool season legumes
  - Warm Season Legumes
  - Forbs



# A Forage System



# Forage Base



- Missouri is a Forage State
  - 18.5 million acres in forage production (pasture, hayland, prairie, CRP) – NRI
  - Ranks 2<sup>nd</sup> nationally in all hay production excluding alfalfa
  - Ranks 3<sup>rd</sup> nationally in total hay production including alfalfa
- High quality forages available at more reasonable prices

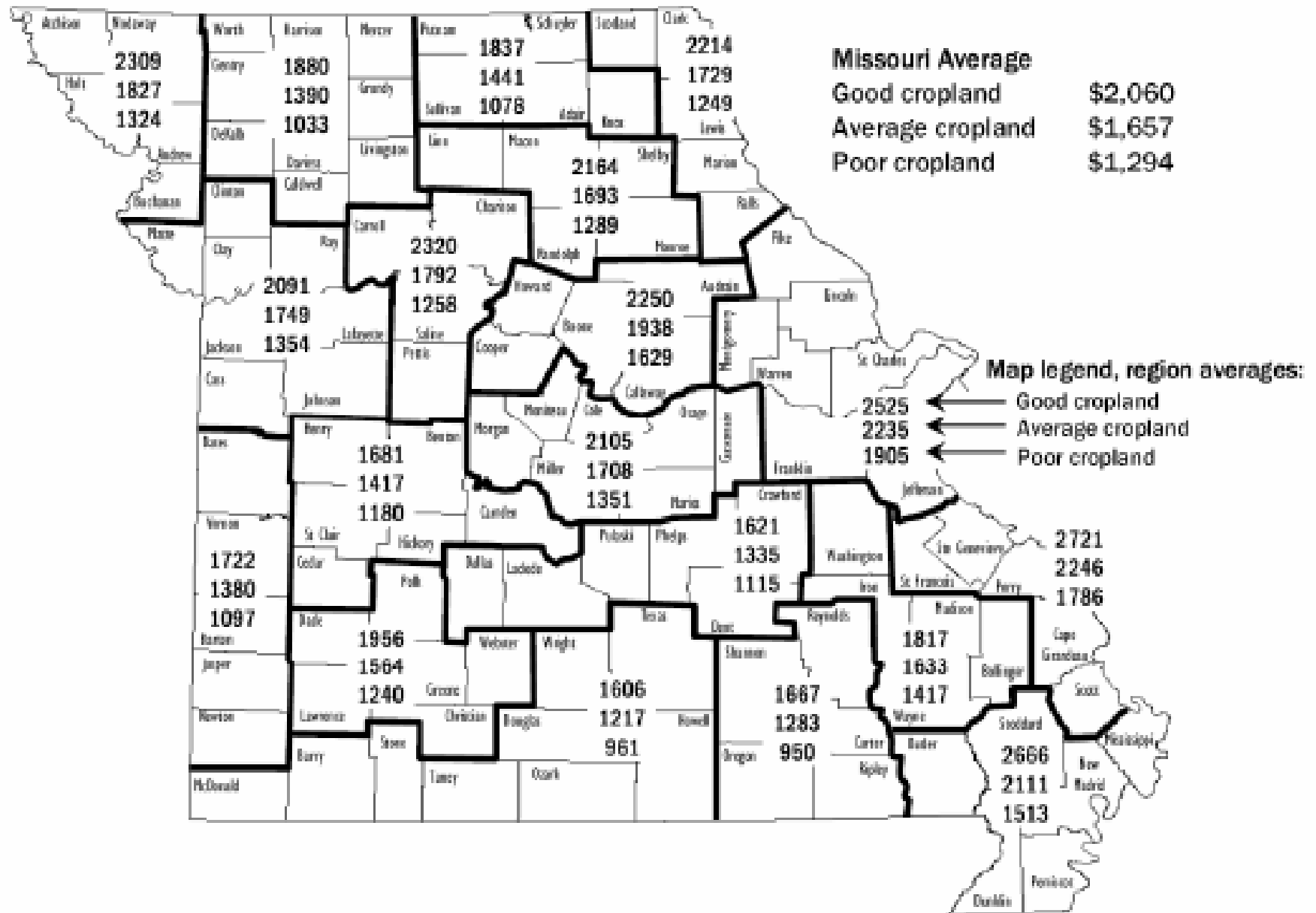


# Land

- 30% of Missouri counties have less than 10,000 people
- Moderate land prices – 2005 USDA report showed Missouri farmland prices averaged \$1740/ac including buildings
- Prices vary based on distance to trading centers and recreational opportunities
- Large, open landscapes



**Map 1. Estimated cropland values per acre for July 2005**



# Readily Available Feedstuffs

- Missouri grain production
  - Ranks 7<sup>th</sup> nationally in soybean production
  - Ranks 9<sup>th</sup> nationally in corn production
  - Ranks 11<sup>th</sup> nationally in wheat production
- Available by-products
  - From corn, soybeans, wheat, rice, cotton
  - From the brewing industry
  - From the distilling/ethanol industry
  - Prices can be accessed weekly at:



<http://agebb.missouri.edu/dairy/byprod/AllProducts.asp>

# Existing Dairy Infrastructure

- Available markets
- Available equipment
- Available feed mills/farm supplies
- Available large animal veterinarians
- Supporting Infrastructure
  - MU Southwest Research Center Seasonal MiG Dairy
  - Knowledgeable specialists
  - Dairy Grazing Groups



South West Center Ag. Exp. Sta.  
Mt. Vernon

# Rural/Agricultural Culture

- Missouri is a forage-based livestock state
  - Ranks 2<sup>nd</sup> nationally in # of beef operations
  - Ranks 6<sup>th</sup> nationally in # of dairy operations
  - Ranks 2<sup>nd</sup> nationally in all cattle and calves
- Grass based livestock production is socially acceptable
- Good place to live and raise family
- Friendly people



# Opportunities for Pasture-based Dairying in Missouri

- Climate
  - Good rainfall, moderate temps, long growing season
- Forage Base
  - Ability to grow diverse, high quality forages
- Land
  - Rural land base, moderate prices
- Readily Available Feedstuffs
  - Grains and by-products
- Existing Dairy Infrastructure
  - Industry, markets, research, support
- Rural/Agricultural Culture
  - Socially acceptable, good place to raise a family
- Economically Viable
  - It Pays \$\$\$
- Environmentally Sustainable



# Credits:

- Dr. Richard Crawford
- Dr. Stacey Hamilton
- Dr. Tony Rickard
- Dr. Barry Steevens
- Joe Horner
- Wayne Prewitt
- Charles Fletcher
- Laura Paine

