Silvopasture Economics: Three Case Studies

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Topics

- Benefits of Silvopasture Practices
- Published Economic Studies
- Unpublished Economic Case Studies

Benefits of Silvopasture Systems

- The Value of Shade
- The Value of Multiple Income Streams
- The Value of Expanding Usable Pasture
- The Intrinsic Value of Silvopasture

The Value of Shade

- Heat stress reduces an animal's appetite and can cause:
  - Reductions in weight gain,
  - Cessation of milk production,
  - Reductions in breeding efficiency,
  - Increased calving mortality, and
  - Increased veterinary costs.
- Shade reduces heat stress in animals

The Impact of Shade on Weight Gain

- Beef cattle with shade had the following increases during late Spring and early Summer (University of Kentucky Animal Research Center) :
  - 1.25 lbs/day for cows
  - 0.41 lbs/day for calves
  - 0.89 lbs/day for steers
- Cattle grazing on endophyte-infected pastures with shade gained 0.72 lbs/day over those without shade (University of Missouri).
- Cattle with shade had an ADG that was 20% more than cattle without shade (University of Arkansas).

The Impact of Shade on Milk Production

- Dairy cows provided with shade produced 10-19% more milk than non-shaded cows (University of Florida)
- When temperatures exceed 90°F, milk production can decrease by 20 to 30% (10-25 lbs. of milk per day) (Virginia Tech. University).
- Cows that were shaded produced up to 9 lbs. more milk per day over non-shaded cows.

The Impact of Shade on Reproduction and Fertility

- Cattle provided with shade had conception rates of 44.4%, as compared to conception rates of 25.3% for cattle without shade (University of Florida).
- Shade increased overall pregnancy rates of cattle by nearly 40% (87.5% with shade/50% without shade)(University of Missouri).

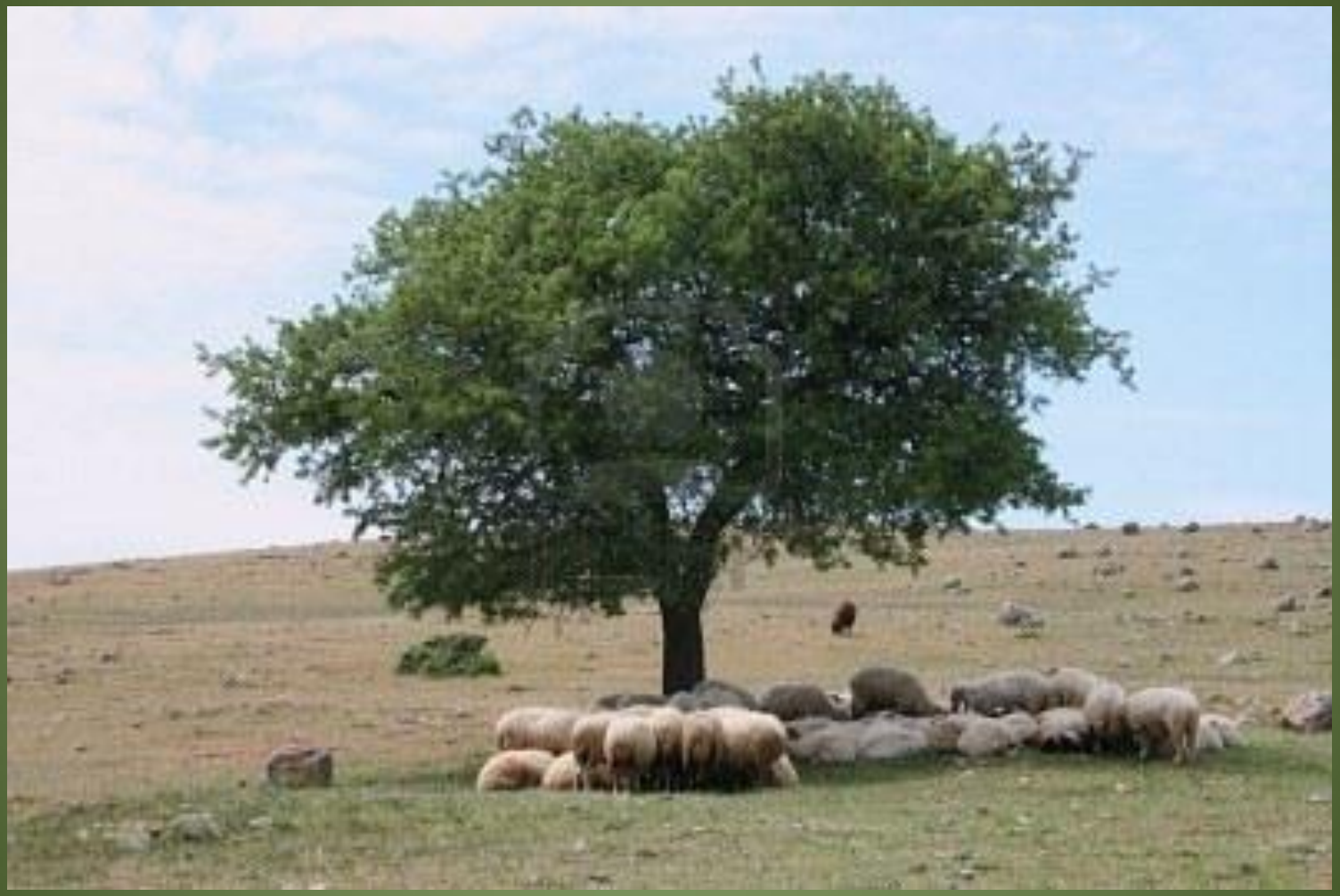
Estimated Annual Production Losses by Dairy Cows Under Minimum Heat Abatement Intensity

State	DMI Reduction (lbs/cow/yr)	Milk Production Loss (lbs/cow/yr)	Increase in Average Days Open	Annual Reproductive Cull (per 1000 cows)	Deaths to Heat Stress (per 1000 cows)
NY	152.15	306.50 ($49.90)	7.3	5.1	1.0
PA	350.60	707.81 ($115.23)	13.2	10.6	2.2

Based on :

St-Pierre, N.R., B. Cobanov, and G. Schnitkey. 2003. Economic losses from heat stress by US livestock industries. J. Dairy Sci. 86: (E. Suppl.): E52-E77.

This is not silvopasture !



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Lightning kills 20 cows

by By Kelli Easterling
07.08.11 - 12:01 am

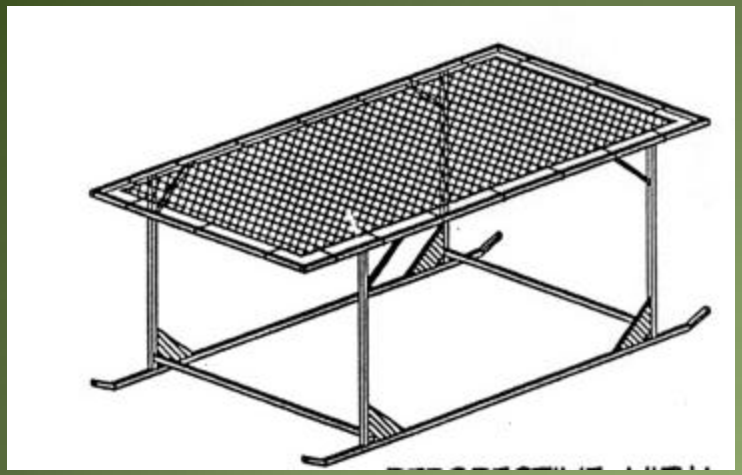
A lightning storm Wednesday afternoon claimed the lives of 20 Angus cows belonging to Wesley and Sammy Anderson, of Ellerbe.

The cows congregated underneath a tree when the storm rolled in, and were killed when lightning struck and traveled through the group.

"We're fourth generation farmers, and my dad and I don't ever remember seeing anything like this," said Sammy. "I've heard of cows being hit standing in ponds, but not this many - and I've never seen it myself."

Sammy said that it's normal for cows to congregate under trees during storms.

Widely spaced trees enhance forage use, improve manure distribution, and reduce animal clustering while still allowing for a good forage system.



This portable shade structure covers an area 15’ x 20’ and costs about $1000 ($750 in materials and $250 in labor).

CASE STUDIES

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The Tomazi Farm

- 210 acres divided into 31 paddocks
  - 6 - 9 acres each paddock
  - 84 head cow/calf operation
  - Rotational grazing system
- Reason for adopting silvopasture:
  - Improved weight gain in the heat of the summer,
  - Increased grass acreage without purchasing or renting (put non-productive land into production)

Edge 1 = 0.98 acres
Edge 2 = 0.56 acres
Edge 3 = 1.40 acres
2.94 acres total

Edge 1: Established in 2010, area cleared was approximately 85 ft x 500 ft

Edge 2: Established in 2010, area cleared was approximately 60 ft x 407 ft

Edge 3: Established in 2011, area cleared was approximately 84 ft x 723 ft

Economic Analysis

- From June 15 – Aug 15, 2010
  - ADG: 1.6 - 2.1 lbs/hd/day
    - (Typical ADG: 0 –(– 1) lb/hd/day)
  - ≅ 96 – 126 lbs/hd
  - $130 - $170/hd
  - $10,920 - $14,280 increase in profit
- The silvopasture edges are estimated to cost about $1200/acre ($3,500 total).
- B/C ratio: 3.12 – 4.08

The Williams Farm

- 7 acres divided into 2 paddocks
  - Eastern black walnut (*Juglans nigra* L.) planted in 1977 and grafted in 1980
  - Part of a rotational grazing system
- Reasons for adopting silvopasture:
  - Personal interest in producing black walnut for the nut and timber market
  - Increased pasture rental income


NE 1001 Rd
Image © 2011 DigitalGlobe
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Economic Analysis

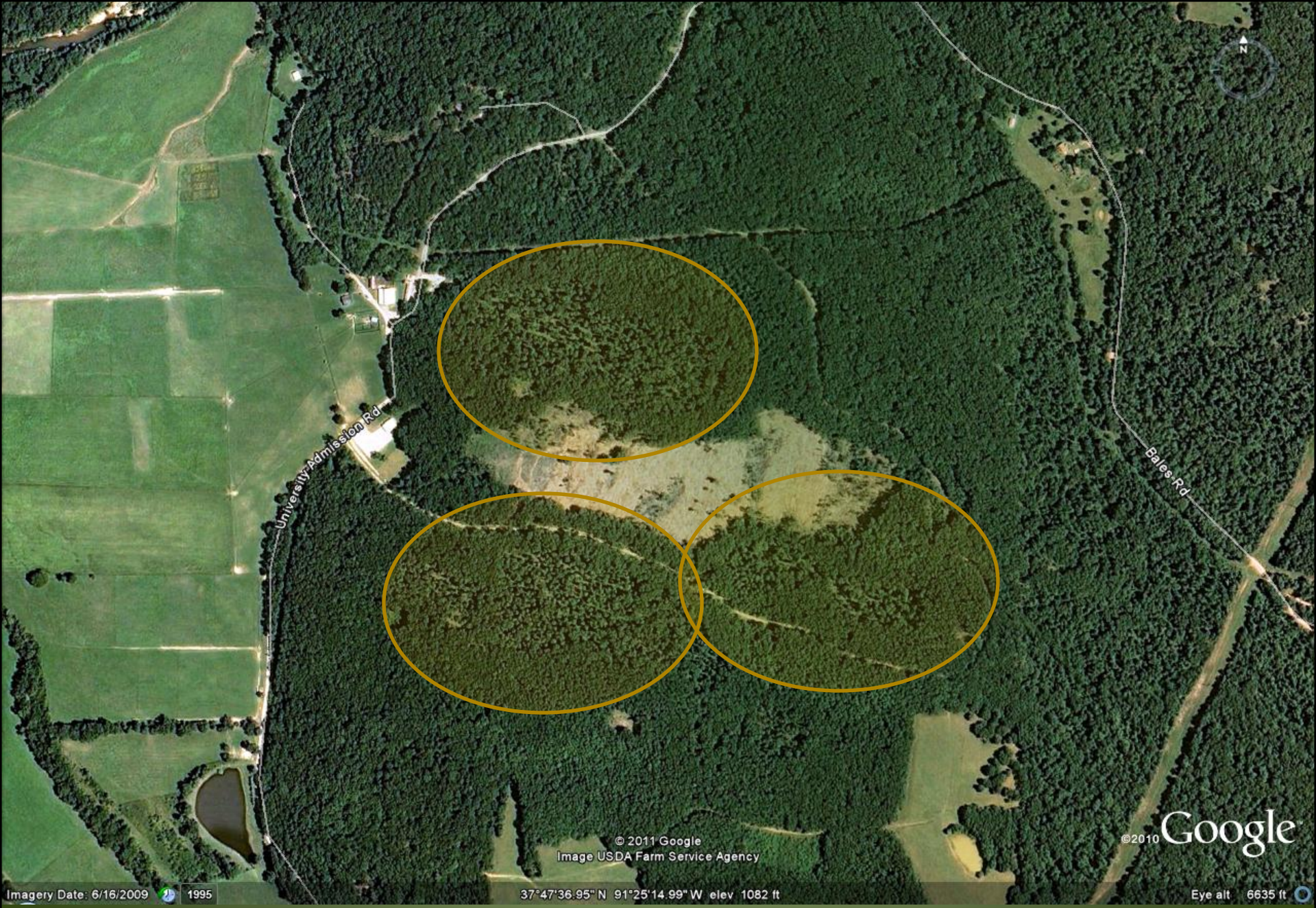
- Additional Income Opportunities
  - Cash rented the pasture to neighbor
    - $35 - $40 per acre
    - 40% - 60% increase over standard pasture rental rates of $25 per acre
  - Black Walnut Markets
    - Sold seed nuts from 1996 – 2008 to a local nursery
      - 800 lbs x $1.50/lb = $1200 per year
    - Sold nutmeat from 1987 – 1996 to a local market
      - 50 lbs per year at $3 per pound (net) = $150 per year
    - Sold nuts to local nut huller from 1987 – present
      - 500 lbs x $0.10 per lb = $50 per year

Economic Analysis

- The silvopasture cost about $5,334 total to establish ($762/acre).
- Annual Maintenance Costs were about $65 per acre per year
- $NPV_{(6\%,44)}$ of the Silvopasture: $2631/acre
  - (pasture at $25 per acre $NPV_{(6\%,44)}$ is $385/acre)
- Rate of Return : 12%
- B/C ratio: 4.21

The Wurdack Farm

- Research site designed to test the interaction between livestock, trees, and forages.
- Established in 2002, beginning with a commercial thinning.
- Establishment costs included clearing of the site in order to establish research plots.


N
University Admission Rd
Bales Rd
© 2011 Google
Image USDA Farm Service Agency
©2010 Google
Imagery Date: 6/16/2009
1995
37°47'36.95" N 91°25'14.99" W elev 1082 ft
Eye alt 6635 ft

Economic Analysis

- Actual cost to establish the silvopasture study plots: $1266/acre
  - Commercial thin income: $150/acre
  - Clearing and site prep: -$717/acre
  - Soil amendments: -$452/acre
  - Grass establishment: -$113/acre
  - Water and fence: -$134/acre

Economic Analysis

- Recommended costs to establish silvopasture site: $398/acre
  - Commercial thin income: $150/acre
  - Clearing and site prep: -$79/acre
  - Soil amendments: -$210/acre
  - Grass establishment: -$125/acre
  - Water and fence: -$134/acre


2002


2003


2005


2005

QUESTIONS?

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