

Using Goats in Agroforestry

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Want to sell Multiflora rose, Buckbrush, Sericea, Honeysuckle or Ironweed for over \$600.00/ton?

- Get goats!
 - It takes about 5 pounds of intake to get 1 lb. gain
 - Current 60 – 70 lb kid prices = \$1.70/lb
 - $\$1.70/5 = \0.34
 - $\$0.34 \times 2000 = \680



Vegetation Management

- Goats are being used to reduce fuel loads to reduce wildfires
- Goats are being used to control unwanted vegetation on public lands, environmentally sensitive areas where chemicals cannot be used, where mechanical means are too expensive and where landowners or the public desire an environmentally friendly alternative



Goats being used to control unwanted understory vegetation at Elsberry PMC



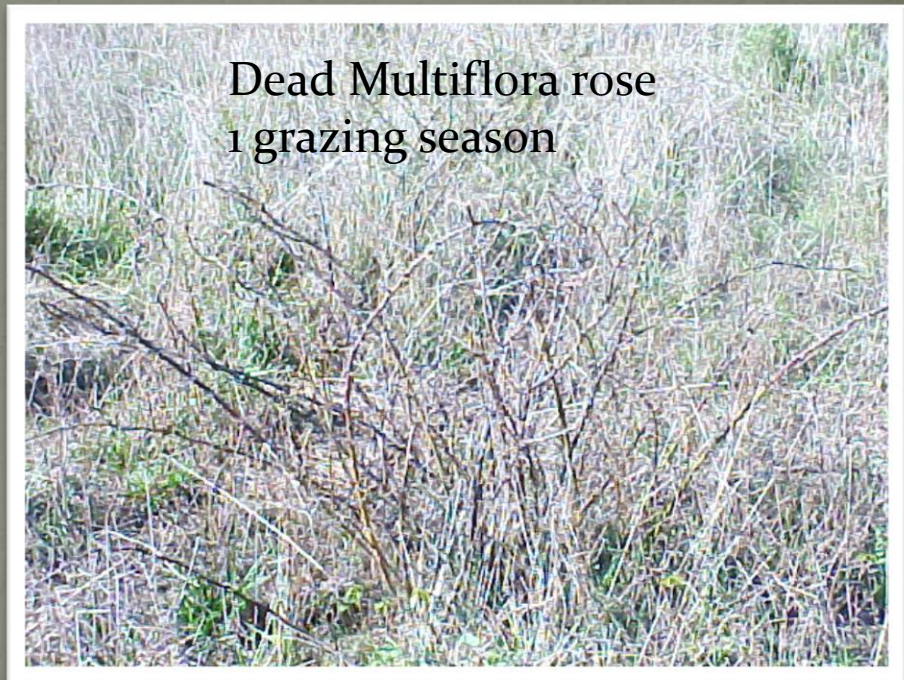
Goats in Land and Forage Management

- In a NC State study, after 4 years of goat grazing pastures containing herbaceous weeds, vines, multiflora rose, blackberry and hardwood sprouts, pastures became dominated with grass and clover
- In a West Virginia study goats reduced brush cover from 45% to less than 15% in one season.



Goats in Land and Forage Management

- In an Ohio State University study, goats eliminated 92% of the multiflora rose in 1 season, however it took up to 4 years for total elimination



Kerr Center demonstration project using goats to control brush from 1988 – 1993

- 32 acre pasture
 - 43% brush cover
 - Blackberry, greenbrier, winged elm, hickory, buckbrush, red cedar
 - 1.5 goats/acre
 - Brush cover reduced to 16% after 2nd growing season
 - Cattle added in 1990
 - Sheep added in 1991 to control some weeds
 - 1993 – less than 10% brush and weeds
- 24 acre pasture
 - 62% brush cover
 - Same brush species
 - 1.5 goats/acre
 - Brush cover reduced to 38% after second growing season
 - Cattle added in 1990
 - Sheep added in 1991 to control some weeds
 - 1993 – less than 20% brush and weeds remained

The goats returned a profit each year without getting credited for brush control

Controlling Sericea Lespedeza with Goats

- Research and field experience in OK & KS
 - Reduced seeds per stem from 960 to 3
 - No new seedling spread
 - Reduction in stem count (25 – 30%)
- Research at Langston University in OK
 - Stocked at 6-8 goats/ac year 1, 4 – 6/ac. year 2, 3 – 4/ac. year 3
 - End of 3rd year virtually no live sericea plants
 - Left 1 goat/ac. thereafter to control germinating seedlings
 - Weaned goats gained about .3 lb/hd/day during the summer on Sericea

Personal Experience

- I have eliminated buckbrush, ironweed, multi-flora rose and blackberry from pastures/woodlots in 1 grazing season when that was my goal

Dead Multiflora rose
1 grazing season



Dead buckbrush
1 grazing season



Goats in Woodland Management

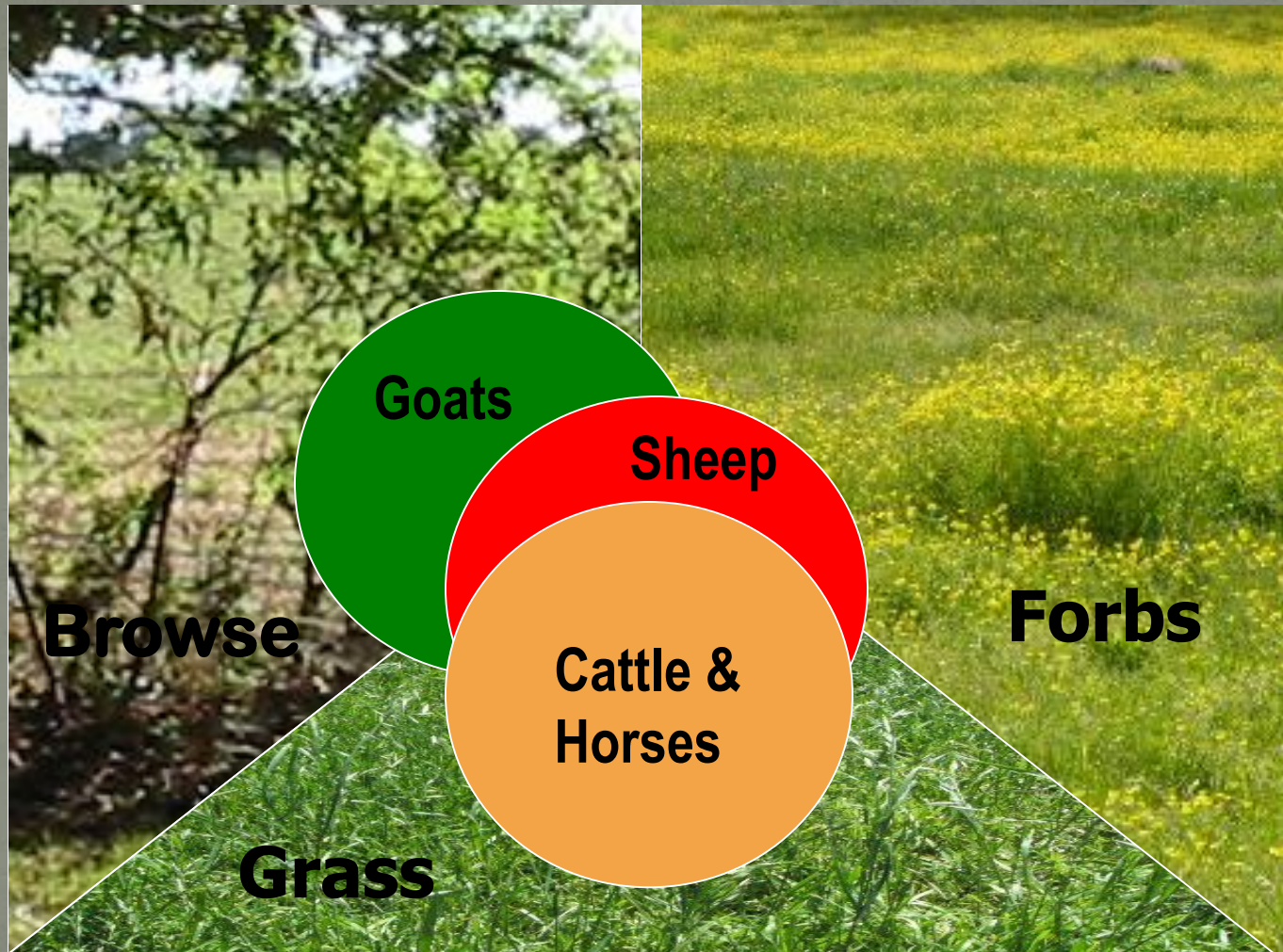
- Have great potential as biological agents to control undesirable understory vegetation in mixed hardwood forests.
- Studies show that 65% of the diets of goats during July & August were made of vining species: honeysuckle, greenbriar, rattan, Virginia creeper, poison ivy and wild grape.



Goats in Woodland Management

- Excessive damage to desirable trees did not occur until all other food sources was consumed and during winter when other food supplies became scarce
- Understory vegetation can be preserved, reduced or destroyed depending on stock density, timing, duration and frequency of grazing/browsing.
- Researchers were able to obtain 400 goat grazing days per acre in one year without damaging the existing desirable vegetation.

Diet Preferences

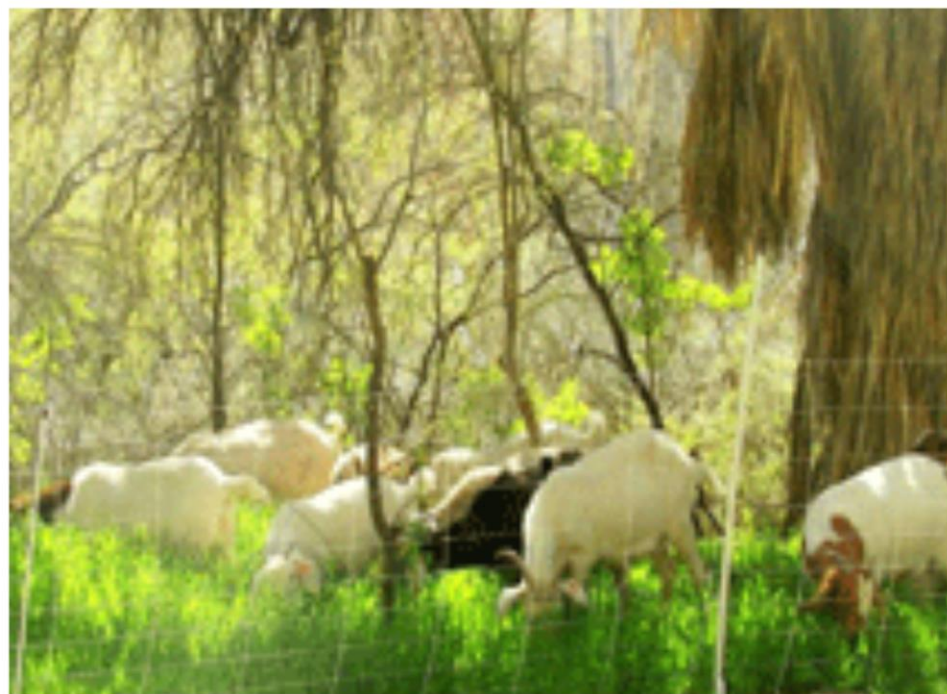


However, there is regular crossover among the 3 types of feeders as diet preferences and food availability changes throughout the year.

Grazing Habits/Preferences

- **Goats**
 - Prefer browse over grass
 - Prefer some forbs over grass
 - Prefer grass over clover
 - Prefer taller plants
 - Prefer rough, steep land over flat, smooth
 - Tend to graze perimeter before center of pasture
 - Graze from the top down
 - Don't like to graze closer than 4"
 - Graze in uniform layers





Grazing Preference dependent on forages available, animals experience, stock density and timing

❖ Desirable Browse

- Multiflora rose
- Blackberry
- Greenbriar
- Honeysuckle
- Buckthorn
- Honey locust
- Sumac
- Willow
- Persimmon/sassafras
- Oak
- Walnut
- Wild Grape

❖ Desirable Forbs

- Chicory
- Lespedeza
- Red clover
- Ragweed
- Lambsquarter
- Sericea
- Kudzu
- Crown vetch
- Poison ivy/oak
- Spotted knapweed
- Pigweed

Grazing Preference dependent on forages available, animals experience, stock density and timing

❖ Intermediate Forbs

- Ironweed
- Spiny amaranth
- Curly dock
- Pokeweed
- Buttercup
- White clover
- Thistle
- Bur dock
- Ox-eye daisy
- Queen Anne's lace

❖ Intermediate Browse

- Cedar
- Buckbrush
- Hickory



Grazing Preference dependent on forages available, animals experience, stock density and timing

❖ Desirable Grasses

- Tall fescue (vegetative & fall stockpile*)
- Ryegrass
- Rye, wheat, oats
- cheat - spring preference*
- orchardgrass
- Crabgrass (taller)
- foxtail, purpletop, barnyardgrass - pre head
- Most NWSG

❖ Intermediate Grasses

- Bermudagrass
- Bluegrass
- Broomsedge
- Caucasian bluestem

Grazing Preference dependent on forages available, animals experience, stock density and timing

❖ Undesirable Species

- Horsenettle
- Perilla mint
- Woolly Croton
- Lanceleaf Ragweed (until after frost)
- Wild Cherry (poisonous if wilted)
- Switchgrass (may cause photosensitivity)
- Alsike clover (may cause liver damage)

Stocking Rate Comparisons

Pasture Type	Cows	Sheep	Goats	Cows + Goats
Excellent Pasture	1	5 - 6	6 - 8	1 + 1 - 2
Brushy Pasture	1	6 - 7	9 - 11	1 + 2 - 4
Brush Eradication			8 - 12 / ac	.5 + 6 - 8/ac
Sustainable browse mgmt.			1 - 3 / ac	

Sustainable browse/brush management

- Rule of Thumb
 - 2 goats per acre per percent brush cover (minimum)
 - Example: 60% brush cover = $.60 \times 2 = 1.2$ hd/ac



Goats make good agro-foresters with a little guidance

- A site specific plan should be developed
 - List target species to control
 - Owner's objectives (elimination, reduction, or sustainable browse)
 - Number, type and density of grazing animals to use
 - Duration, frequency and timing of grazing/browsing
- Develop a monitoring plan
 - Monitor target species, desirable species, site conditions, animal health/body condition
- Make adjustments as needed

Grazing/Browsing Management by Objective

Plant reduction

- 2 – 5 paddocks
- Begin browsing when leaves are $\frac{1}{2}$ - $\frac{2}{3}$ full size
- Defoliate 80% of target species within 1 – 2 weeks
- Rotate out to another area
- Come back when target species leaves are $\frac{1}{2}$ to $\frac{2}{3}$
- Keep repeating process

Sustainable browse

- 4 – 8+ paddocks
- Begin browsing at full leaf
- Defoliate 25% of target species
- Rotate to next area
- Do not graze each area over 2 times per growing season

Management Considerations

- Predator Control*
- Fencing*
- Facilities
- Parasite Control*
- Pasture & Grazing Management
- Marketing
- Advantages

Useful References:



- Target Grazing Handbook:
<http://www.cnr.uidaho.edu/rx-grazing/Handbook.htm>
- Maryland Small Ruminant Web page:
<http://www.sheepandgoat.com/>
- Livestock for Landscapes:
<http://www.livestockforlandscapes.com>
- Langston University:
<http://www2.luresext.edu/goats>
- North Carolina State University:
http://www.cals.ncsu.edu/an_sci/extension/animal/meatgoat/ahgoats_index.html
- eXtension:
<http://www.extension.org/goat>
- Lincoln University
<http://www.lincolnu.edu/web/programs-and-projects/small-ruminant-program>

Thank You

Questions?
Comments,
Discussion?

