

Using Livestock As Biological Control Agents

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What is Prescribed Grazing

- ◆ Prescribed Grazing involves managing the intensity, frequency, duration, timing, and number of grazing animals on pastureland

Limitations:

- ◆ site production limitations
- ◆ rate of plant growth
- ◆ physiological needs of forage plants for production and persistence
- ◆ nutritional needs of the grazing animals

Develop a Prescribed Grazing Plan

Connecticut Rotational

Grazing Plan

This Grazing Plan Has Been Developed For:

1- Farm Name:

Smith Farm

2- Grazing Manager:

James Smith

Farm Contact Address:

77 Smith Road, Tolland CT

Telephone Number:

Prepared By:

3- Planner Name:

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4- Date:

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CERTIFICATION OF PARTICIPANTS

Purpose of Prescribed Grazing

- ◆ Improve or maintain quantity and quality of desired forage species
- ◆ Improve or maintain animals' health and productivity.
- ◆ Improve or maintain surface and/or subsurface water quality and quantity.
- ◆ Improve or maintain riparian and watershed function.
- ◆ Reduce accelerated soil erosion, and maintain or improve soil condition.

Diet Preference Animal Species	Type of Diet		
	Grasses	Broadleaf weeds and legumes	Browse ¹
Cattle	65 – 75	20 – 30	5 – 10
Horses	70 – 80	15 – 25	0 – 5
Sheep	45 – 55	30 – 40	10 – 20
Goats	20 – 30	10 – 30	40 – 60
White-tail deer	10 – 30	30 – 50	30 – 50
Elk, red, and fallow deer	30 – 60	40 – 50	10 – 30

¹ Shrubs or trees

SOURCE: D. Forbes and G.W. Evers, Texas A&M Univ.; D.I, Bransby, Auburn Univ.; M.A. McCann, Virginia Tech Univ.; and W>R> Getz, Fort Valley State Univ. in Southern Forages 3rd Edit.

Invasive Plants are nutritious, and delicious!

Chemical composition of various plants browsed by goats (%)

Browse type	Crude protein	Neutral detergent fiber	Calcium	Phosphorous
Multiflora rose	18.2	34.5	0.99	0.32
Black locust	23.0	44.0	1.26	0.21
Honeysuckle	16.0	34.5	1.21	0.30
Brambles	17.1	24.5	0.23	0.84
Privet	20.0	26.8	0.89	0.34
Green briar	16.1	39.5	0.60	0.18
Trumpet creeper	16.7	43.1	0.42	0.22

Goats require 10-15% Crude Protein for weight gain

Source: Grazing Program for Goats, Greg Brann, NRCS Grazing Specialist, TN

Stocking Density

- ◇ The number of animal units present on the grazing unit
- ◇ Goats- 8-12 adults per acre for brush eradication, 1-3 per acre for sustainable browse management
- ◇ Cows- 1 Animal Unit (1000 lbs) per acre
- ◇ Pigs- 15-45 per acre
- ◇ Sheep- 2-6 per acre
- ◇ Exmoor ponies 1-2 per acre

- ◇ * The stocking density will depend on the forage/browse available

Paddock Size

- ◇ The field is broken into smaller areas or paddocks based on the number of animals, the amount of forage available, residency period, and the desired outcome of the area.



Fencing

- ◇ Permanent or temporary?
- ◇ Woven wire fence, HT electric, temporary electric, cattle panels



Fencing



Picture Credit: Lisa Turoczi

Watering Facilities

- ◈ Water hauled in with tanks or a pipeline system



Predator Control

- ◆ Guard animals- dogs, donkeys, Llamas, or a tall electrified fence



Photo Credit: Mark Kennedy, USDA-NRCS Missouri

Residency Period

- ◆ Depends on the objective of the grazing- % Control of invasive plants
- ◆ Depends on the numbers of animals and the forage available



Goats

- ◊ Prefer browse over grass
- ◊ Prefer taller plants and graze from the top down b/c of Parasites- Tannins are natural de-wormers
- ◊ Effective biological control agents to control brush and invasive plants
- ◊ Goats can girdle/eat bark
- ◊ Good for rocky or steep areas
- ◊ An Ohio State University study using goats had a 92% control of multiflora rose in 1 season, but took 4 years for elimination.
- ◊ Kerr Center demonstration project using 1.5 goats per acre had a 27% reduction in brush (black berry, greenbrier, hickory, and red cedar) in 2 years, then added cows and sheep years 3-5 to get a 33% reduction in brush and weeds!

Woody plants consumed by goats

- ◆ Multiflora rose
- ◆ Autumn Olive
- ◆ Honeysuckle,
- ◆ privet, mulberry,
- ◆ Oak, Walnut, Cedar, Hickory
- ◆ Virginia Creeper, poison ivy,
- ◆ wild grape, blackberry,

- ◆ sumac, sassafras, kudzu,
- ◆ ragweed, pokeweed,
- ◆ curly dock, thistle,
- ◆ burdock, Queen Anne's lace

Some plants are poisonous to goats:

- ◆ Wilted Cherry leaves, Mountain laurel, Elderberry, Milkweed, Jimsonweed, Nightshade

Using goats as biological control agents

Plant control/reduction

- ◆ Start with 2-5 paddocks, begin browsing when leaves are $\frac{1}{2}$ - $\frac{2}{3}$ full size
- ◆ Size paddocks to get 80% defoliation within 1-2 weeks
- ◆ Rotate back to the paddock when the plants re-sprout

Sustainable browsing

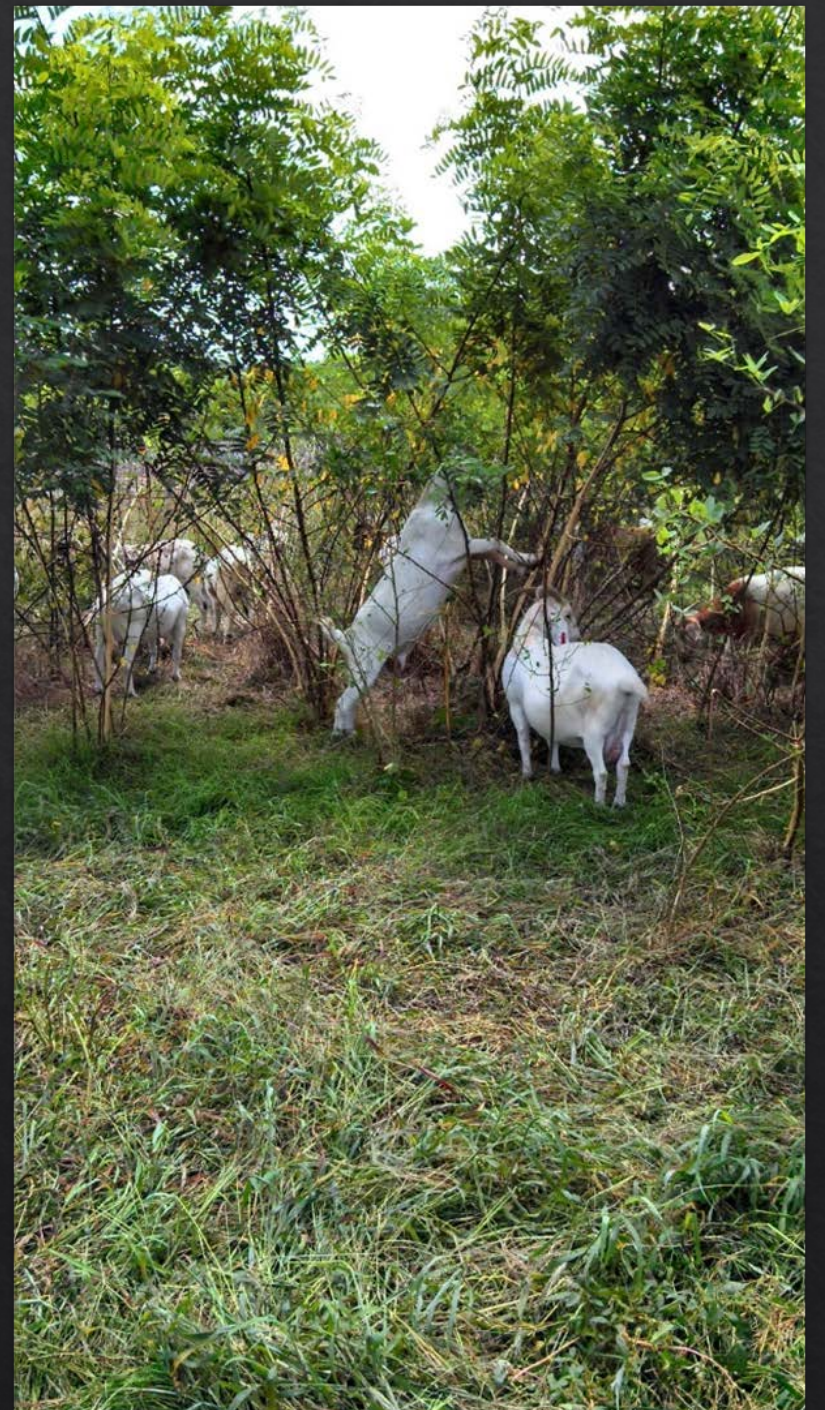
- ◆ Start with 4-8 paddocks
- ◆ Only defoliate 25% of plants then rotate
- ◆ Don't graze the area more than twice a year or the goats will kill the plants



After 4 days: Photo Credit: Lisa Turoczi



Photo Credit: Brett Chedzoy, Using Goats for Vegetation Management in the Northeast, Cornell University. 01/25/2011



Pigs

- ◊ Pigs forage and root
- ◊ Need to wallow in mud to cool down
- ◊ Respect electric fences when properly trained, but hard to keep in
- ◊ Good up rooters and land clearers. BE CAREFUL OF SOIL EROSION
- ◊ Forage for acorns and nuts
- ◊ Pig manure is nutrient dense



Pigs



Photo Credit: <http://www.grit.com/animals/plowing-with-pigs-woodland-edition>

Sheep



- ◆ Eat broadleaf weeds more than goats or cattle
- ◆ Eat browse more than cattle
- ◆ Good in brushy pastures where they get grass, forbs, and browse
- ◆ They don't eat Cyprus spurge
- ◆ Easy to fence in

Cows

- ❖ Can be trained to eat weeds and some brush easier than goats.
- ❖ Can be combined with goats to graze in brushy pastures
- ❖ They can knock brush over and clear out the understory.
- ❖ Are easier to keep fenced in than goats or pigs



Photo Credit: www.livestockforlandscapes.com



Photo Credit: http://eattheinvaders.org/wp-content/uploads/2013/11/well_pics_141.jpg

Exmoor ponies

- ◇ An old breed from Great Britain
- ◇ Can be trained to eat invasive plants including Japanese Barberry and Multiflora Rose
- ◇ Requires good fence to keep in



Photo Credit: Fernando Rincon, NRCS, CT

Pros

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Cons

- ◆ No chemicals or machinery needed-environmentally friendly
- ◆ Works on rocky or steep areas where machinery is limited
- ◆ Effective control
- ◆ Invasive plants are excellent feed for animals and are nutritious.
- ◆ Areas get cleaned up
- ◆ Animals can be sold for meat

- ◆ Effective treatment takes time- 3-4 years- patience!
- ◆ Fencing and water are needed for animals
- ◆ Potential soil erosion, compaction, and nutrient loading into the soil, streams or wetlands
- ◆ Predators

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- ◆ Kennedy, Mark. Controlling Invasive Species with Goats, USDA NRCS