

# Pasture Management for Alpacas

A group of alpacas of various colors (white, brown, black) are grazing in a lush green pasture. The background shows a line of trees under a bright sky.

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GREG BRANN, GRAZING AND SOIL HEALTH CONSULTANT



# Miracles

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Managing grass

Living souls

Organic renewable fiber

*Simply feeding the web of life, and loving the land, will result in a magical landscape*







# Overview

(using imagination apply these principals on your operation)

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Grass management

Pasture layout

Pasture Management linked to housing

Multiple or mobile shade structures

Silvopasture



# Fundamentals

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Balanced Soil fertility

Maintain minimum heights

Continuously feeding the herds above  
and below ground

Water distribution

Ration grass

No bare ground!



# Manage What You Have

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Close gates- growing more grass, reserving paddocks

Short-duration grazing, allowing plant recovery

Manage leaf area to initiate carbon cycle

Feed hay on low fertility and or weedy fields, *entice animals to leave the barn*

Inventory vegetation and recognize voids in the forage chain





# Management of Vegetative Forage

Don't halfway manage

Analogy to Mechanic

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Do you want your grass to exist or perform like a race car?

## Basic Grazing Management

- Maintain leaf area and carbohydrate reserves
- Graze a paddock for 3 days or less
- Don't allow stock to take a second bite of the same plant
- Does the field need grazing or recovery?
- Recovery time 21 to 210 days, avg 45 days
- Keep light to desired species
- Don't let desired species go to seed
- Tromp excess forage and weeds intact with the soil
- Periodically graze all vegetation, followed by a long recovery period of ~90 days
- Have paddocks in various states of recovery all year



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**Consider how these principles  
apply to your operation**



# Develop a Goal!

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Quality of Life

Form of Production

Vision of the future



# It's mid July, What to do?

Inventory

Close gates- grow grass

Cull less productive stock

Start prepping fields for  
cool season growth

Evaluate if pastures are too  
mature or not tall enough

## Plan

- Fall seeding
- Strategy for fall grazing
- Fall feeding hay
- Nutrients for fields
- Spraying or alternative management of weeds

# INVENTORY

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# SOIL

## Example:

### PHYSICAL

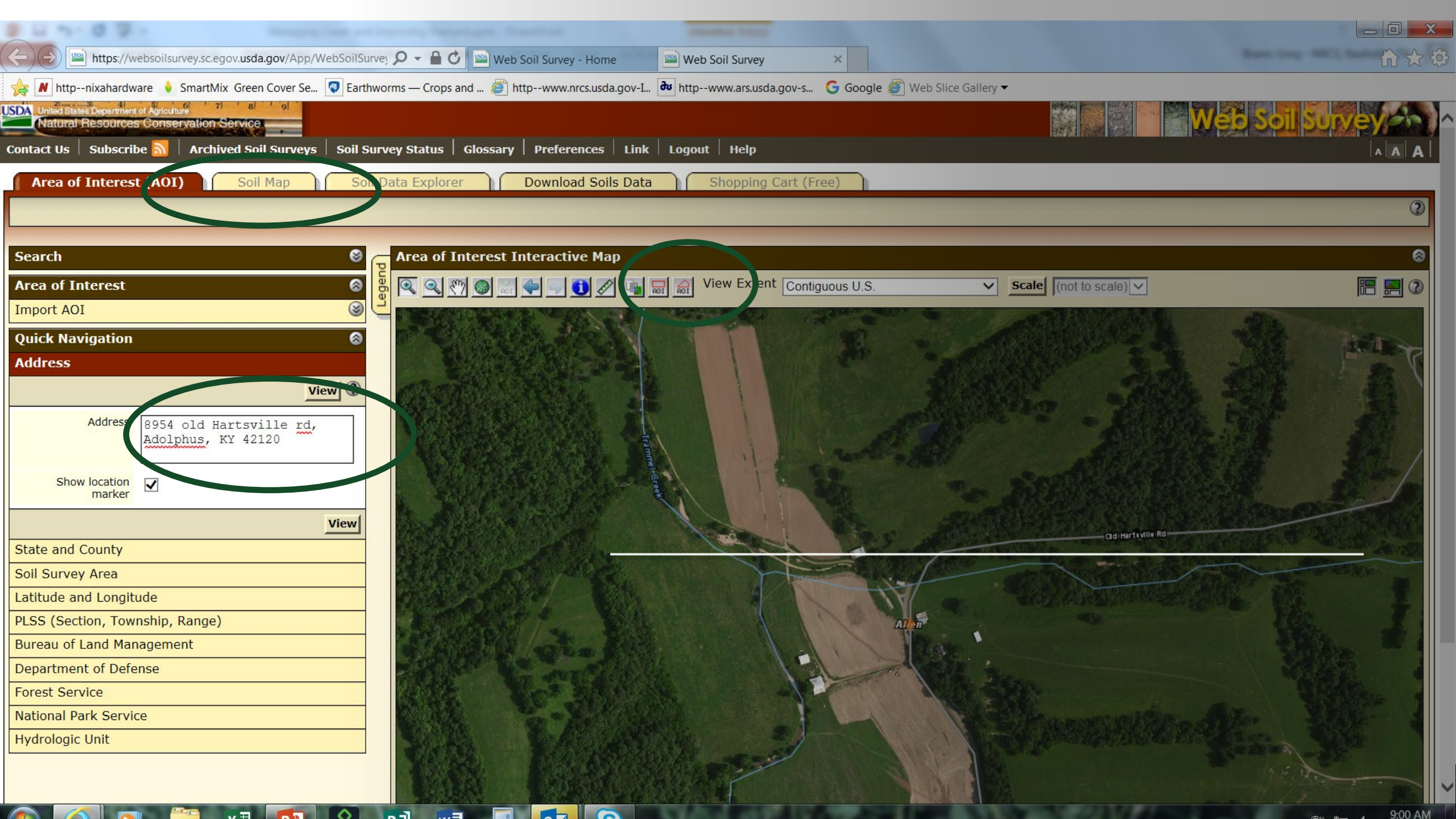
- **TAXONOMIC CLASS:** Fine-loamy, siliceous, mesic Typic Paleudults
- **RANGE IN CHARACTERISTICS:**
  - Depth to bedrock ranges from 60 to more than 100 inches
  - Extremely acid to medium acid
  - Rock fragments are mostly chert, averages less than 35 percent

### CHEMICAL

- **INHERIANT SOIL FERTILITY:**
  - pH 5.6, (**Target 6.2 – 6.7**)
  - OM 3.0 %, (**Target 4% or higher**)
  - P<sub>2</sub>O<sub>5</sub> low and K<sub>2</sub>O medium (**Target Medium High**)

### BIOLOGICAL

- 30 or more earthworms per cubic foot during April or November
- Living and dying plants in all seasons
- Plant residue
- Roots: Fibrous and tap



Area of Interest (AOI)

Legend

Area of Interest Interactive Map

View Extent

Contiguous U.S.

Scale

(not to scale)

Address: 8954 old Hartsville rd, Adolphus, KY 42120

Show location marker

View

Old Hartsville Rd

Allen

Trenton Creek

# Analyze Soil

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Chemical- soil test

Biological- living ecosystem-  
habitat- quorum sensing

“Precision Regenerative  
Farming”

- Soil structure
- Organic matter



# Indicator Plants, Compaction, lack of cover

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Knotweed

Rushes

Goosegrass<sup>species</sup>

Bitter

sneezeweed

Dog fennel

Buttercup

Curly dock



# Indicator Plants, low fertility

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Species

Rabbit tobacco

Red sorrel

Poor joe

Broomsedge

Sweet vernal grass

Oxeye daisy

Yarrow





# Soil Health Management

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## Maintain Cover

- pH of 6.2 to 7.4
- P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O in the medium high category
- Nitrogen from legumes, seed half rate annually (Target 30 to 40% legume)
- Green leaves 7 to 11 layers
- Strive to not let brown leaves shade green leaves
- Strive to not let undesirables shade desirables
- Residue cover up to 3/8"
- Diverse plant community



## Types of Dung Beetles

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- Manure Dwellers
- Tunnelers
- Tumblers

**Biological:**  
**Biomass of organisms above ground in the pasture**  
**and below ground within the pasture soil.**  
**Organisms Standing crop biomass lbs/a**

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**Above ground**

■ 1200 Dairy cow <sup>1</sup> <u>or</u>	587	(518 avg wt @2.67 ac/cow)
■ 1200 Beef cow <sup>2</sup>	450	
■ Pasture <sup>3</sup>	2500	
Total	3,018	

**Below ground**

■ Pasture roots <sup>4</sup>	2500
■ Bacteria	2052
■ Actinomycetes	2052
■ Fungi	6244
■ Algae	219
■ Protozoa	80
■ Nematodes	62
■ Mites	65
■ Collembola	65
■ Earthworms	624
■ Other fauna	40
Total	14,003

Adapted in part from Brady and Weil 2002.

1. Cow producing 40 lbs milk/day 180 days/acre, 50% of forage standing crop consumed, 5 rotations/year.
2. Cow weaning 600 lb calf 3 acres/year.
3. Cool-season grass-clover pasture, 10 inches tall at grazing.
4. Roots equal top growth at grazing.



# Compacted Platy Soil



# Animal

## nutritional allocation

- 1) maintenance,
- 2) lactation,
- 3) growth,
- 4) reproduction

## Estimated Nutrient Requirements of Llamas and Alpacas<sup>1</sup> — Dry Matter Basis (DM).

### Nutrient Level Source

Crude Protein, % 8–14 Johnson, 1989

DE<sup>2</sup>, Kcal/kg BW 33 Carmean, 1992

Calcium, % 0.3–0.85 Van Saun, 1999

Phosphorus, % 0.16–0.40 Van Saun, 1999

Potassium, % 0.5–1.0 Van Saun, 1999

Magnesium, % 0.12–0.20 Van Saun, 1999

Copper, ppm 13–15 Van Saun, 1999

Iron, ppm 60–130 Van Saun, 1999

Manganese, ppm 45–55 Van Saun, 1999

Selenium, ppm 0.4–0.6 Van Saun, 1999

Zinc, ppm 40–50 Van Saun, 1999

Vitamin A, IU/kg 3000–3500 Van Saun, 1999

Vitamin D, IU/kg 3000 Extrapolated

Vitamin E, IU/kg 17–20 Van Saun, 1999



<sup>1</sup>Irlbeck, 2000

<sup>2</sup>DE = Kcal of Digestible Energy (DE) per kg of body weight (BW) of an animal at maintenance (DE is another more definitive energy expression than the traditional method of TDN (Total Digestible Nutrients). Animals that are growing, lactating or in the third trimester of gestation will have a higher energy requirement.

# Reasons for adding Alpacas

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They are very efficient grazers (50% more efficient than sheep in extracting fiber)

2 to 3 times more efficient in converting carbohydrates to vfa than cattle or sheep

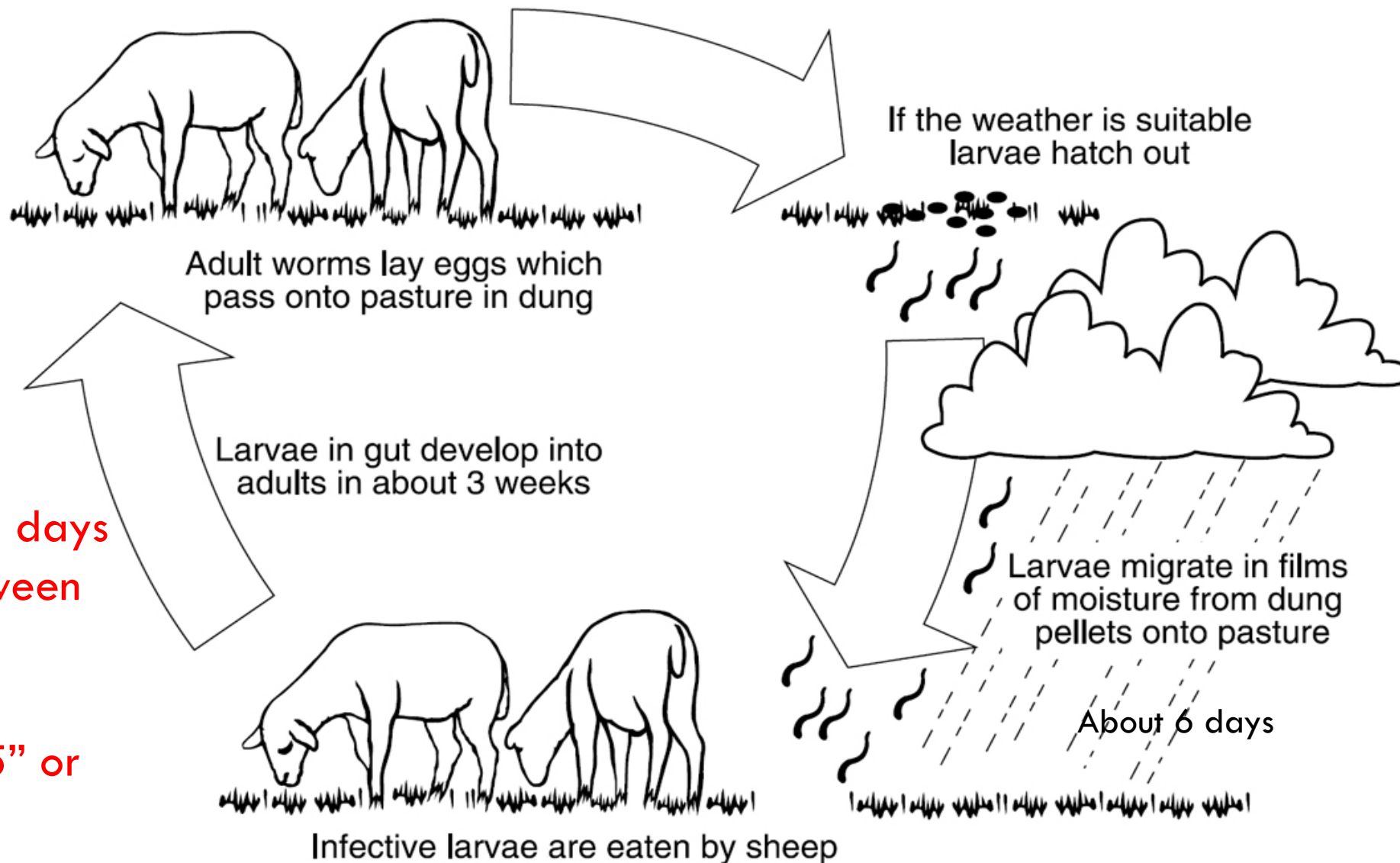
Efficient at protein utilization

Soft padded feet are easier on pasture than hooves

Note: Sheep, Goats and Camelids share parasites so best to only add one of these species to a “flerd”



# Life cycle of sheep worms



Target a rest period of 45 days or more between grazing

Keep grass 5" or taller

# Animal Unit Equivalents to One Animal Unit (AU)

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1,000 lb cow with a 300  
to 400 lb calf

13- 75 lb Alpacas with  
cria (5 Alpaca/Ac tops)

6- 120 lb ewes with 1.5  
lambs

7- 100 lb nannies with 1.5  
kids



# Water

(Maintain clean water troughs and avoid wet areas, snails/meningeal worm)

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## **Good Water Standards for Livestock Use**

Total Solids Less than 1000 ppm<sup>1</sup>

Hardness Less than 1000 ppm

Sulphates 500 ppm or less

Nitrates Less than 45 ppm

Iron Less than 5 ppm<sup>2</sup>

Sodium 500 ppm or less

Source unknown.

<sup>1</sup> ppm = parts per million = mg/liter

<sup>2</sup> Bauder, 1998



Agri-Gation  
Paris, TN  
731-234-6953

The T-L Difference

Agri-Gation

SHIPS SAVING UNITER

Mahiro

Ag Drainage Works LLC  
731-599-9555



NRCS Helping People Help the Land

# The Effect of Soil Temperature (F degrees) :

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140 Soil bacteria die, soil sterilization

130 100% of soil moisture is lost through evapo-transpiration

100 15% of moisture is used for growth 85% of moisture is lost

70 100% of soil moisture is used for growth

*Temperature at the soil surface can be 30 degrees higher without cover*

# PLANT

- **Diverse plant community**
  - **Grasses:**
    - Cool season: Tall fescue, Orchardgrass, Prairie Bromegrass, Annual ryegrass and Small grains
    - Warm season: Johnsongrass, Bermudagrass, Crabgrass, Sudangrass, Corn, Millets
  - **Legumes:**
    - Cool Season: White clover, Red clover, Hairy vetch
    - Warm Season: Annual lespedeza, Cow peas, Soybeans, Sun hemp
  - **Forbs:** Turnips and other brassicas, Chicory, Ragweeds and lambsquarter
- **Green Leaf:**
  - Begin Grazing: Seven to 11 layers of grass leaves
  - End Grazing Residual: 3+ layers of grass leaves
- **Residue:** covering the soil up to 3/8" thick

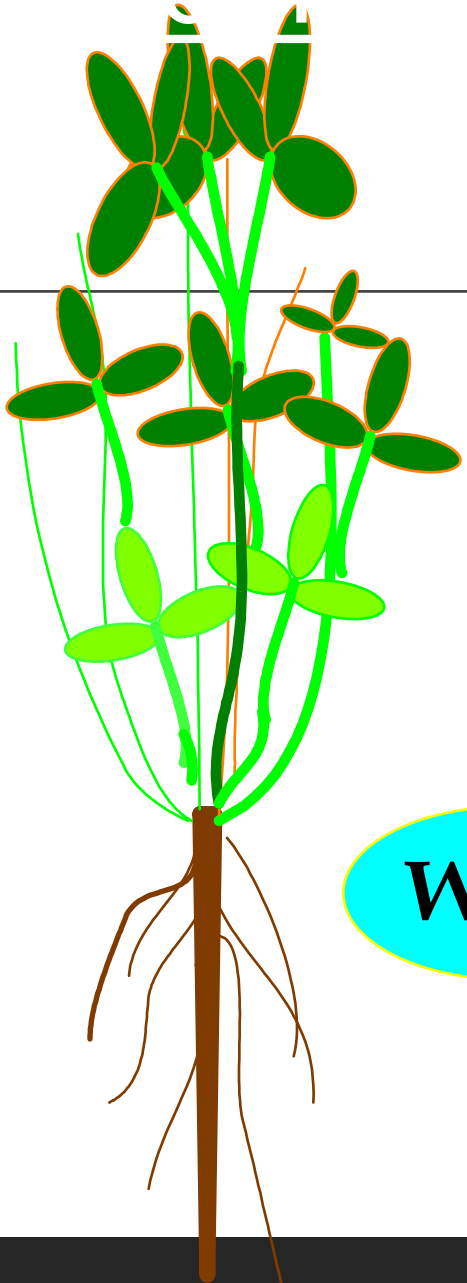




**Sun**

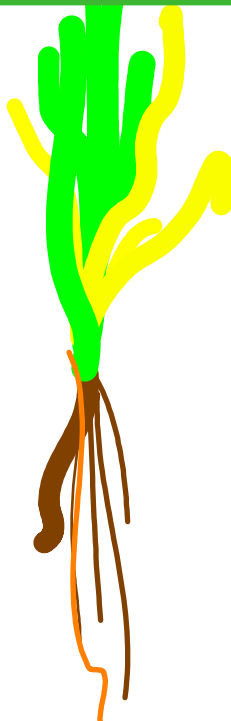
**95% raw material needed for growth comes from air**

**N**



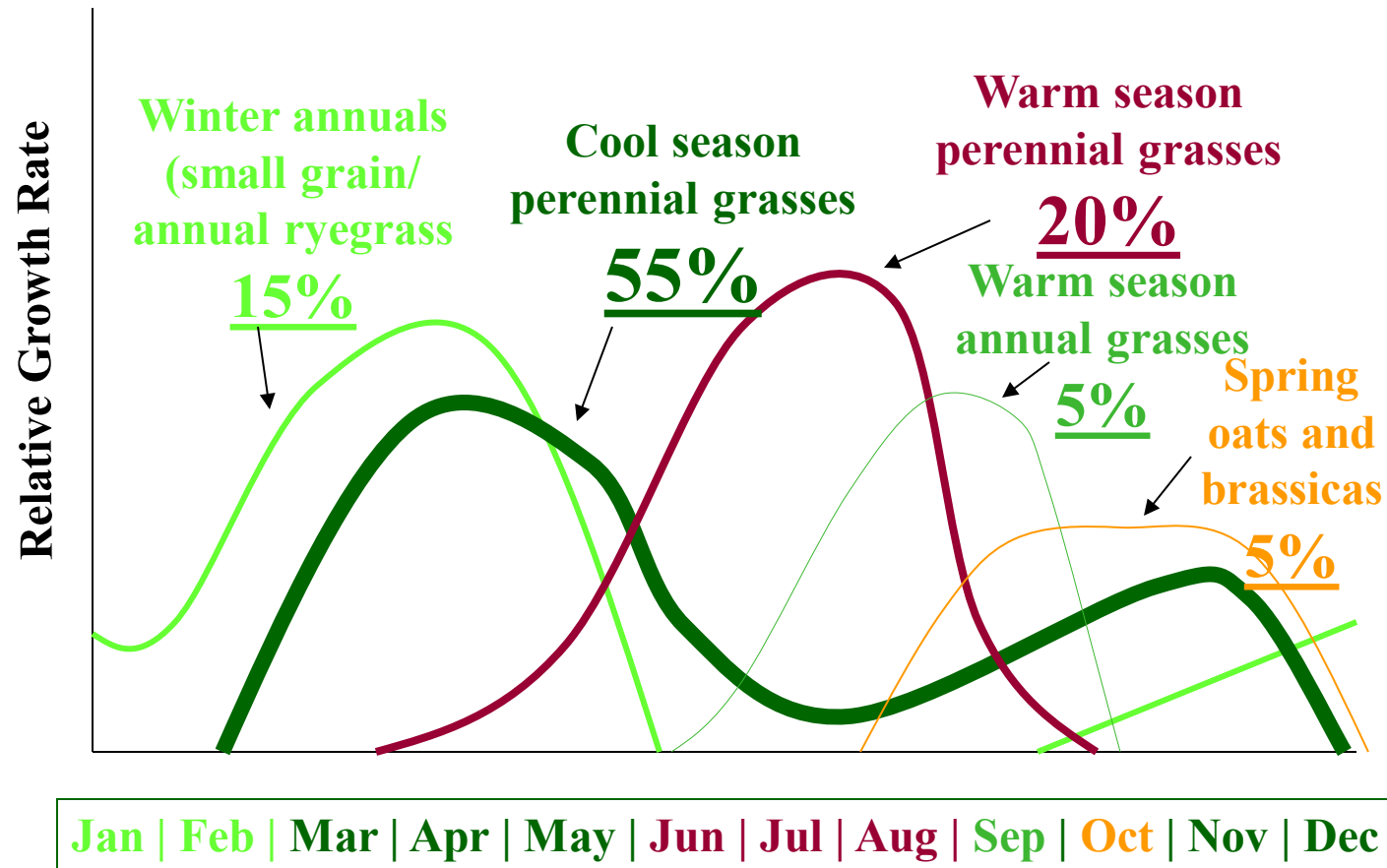
**CO<sub>2</sub>**

**Water**



# Approximate Percentages of Various Forages for Year Around Forage

Where is the void in you forage chain?



Percentage of each species will vary relative to yield

# Orchardgrass Cutting Height Study by the University of Kentucky Ray Smith and Associates

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4 year old field of Benchmark Plus

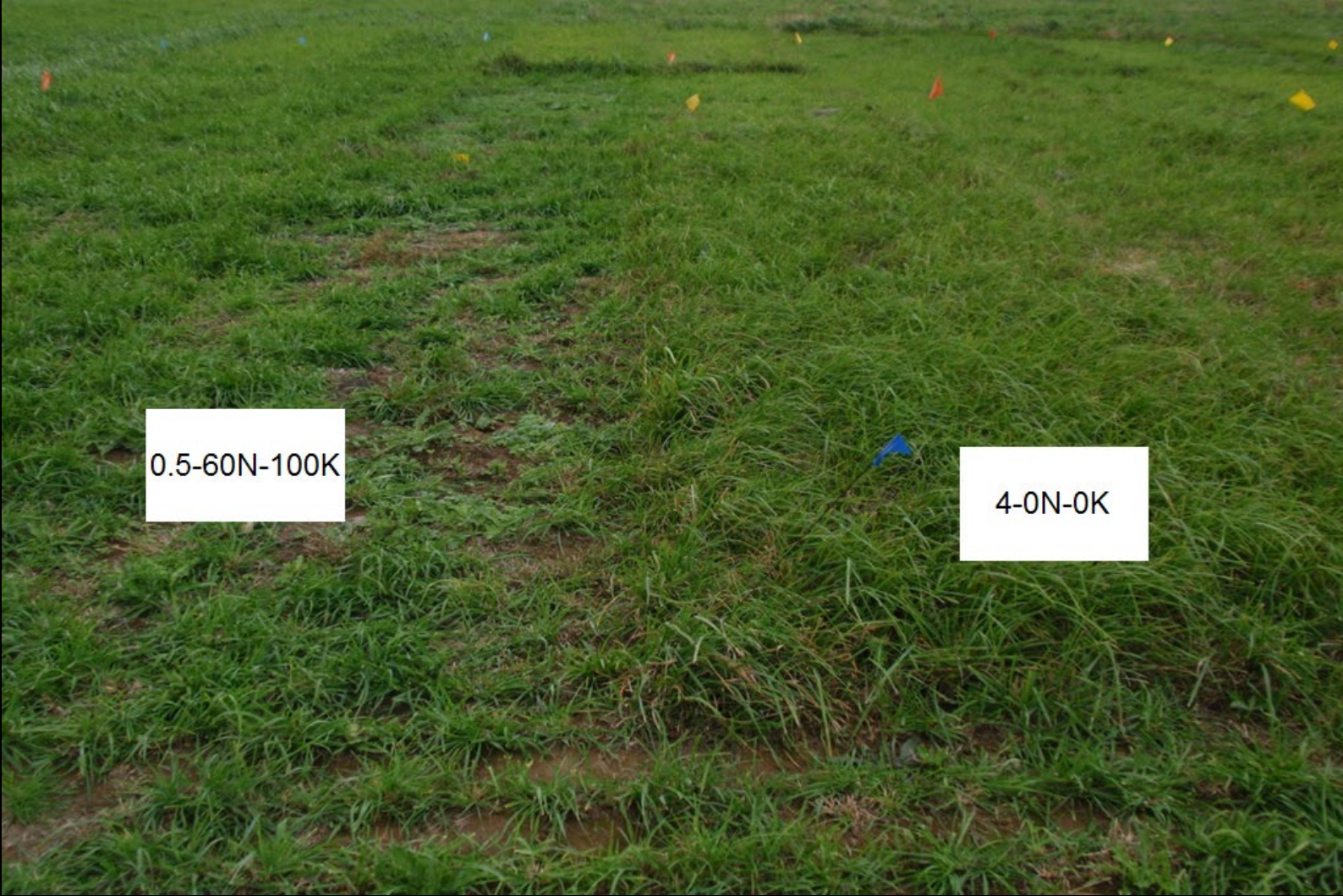
3 Cutting Heights

- 4 inches
- 2 inches
- 1/2 inches

4 Fertilizer Rates (3 applications)

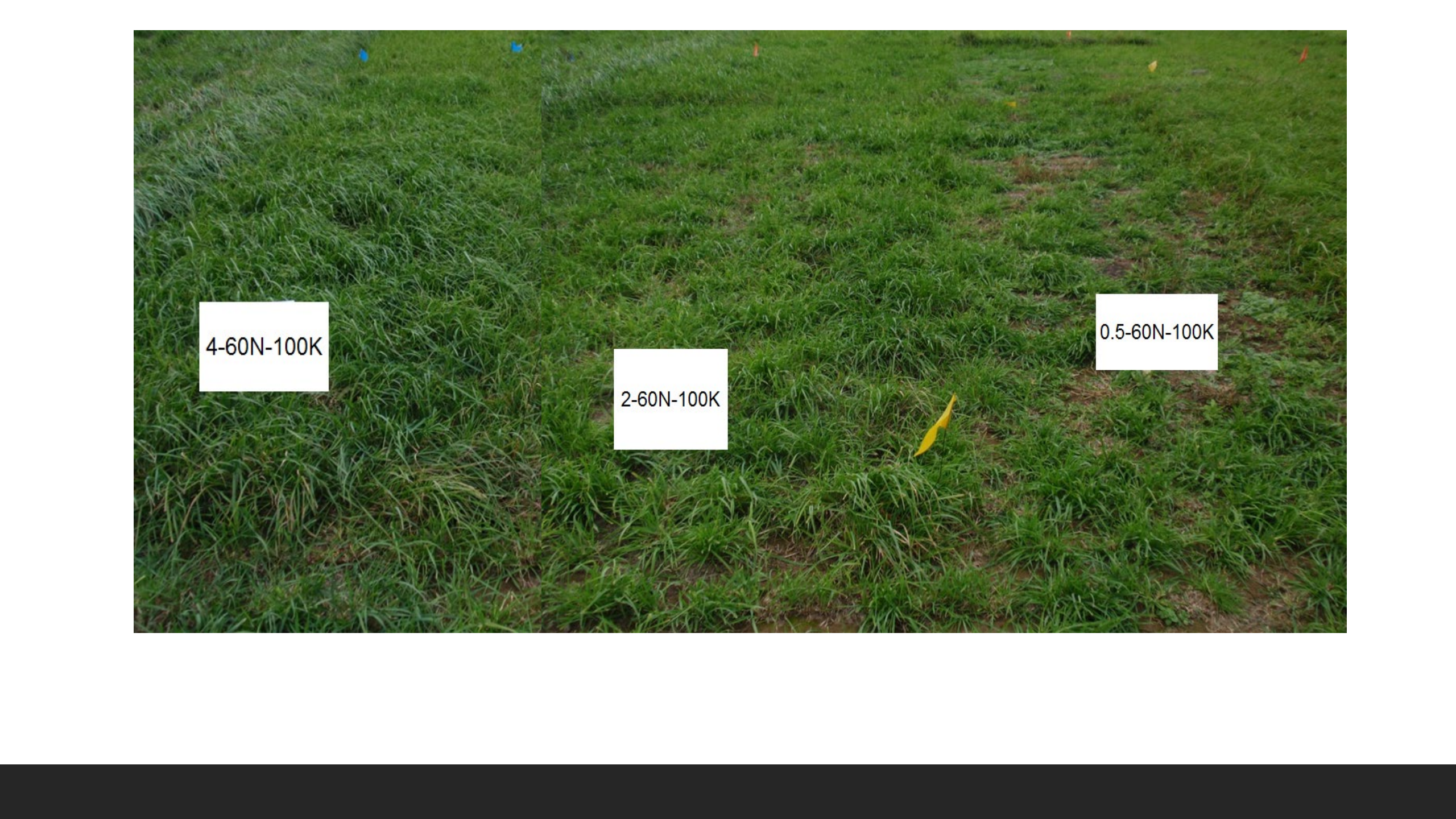
- 0 N and 0 K
- 60 N and 0 K
- 0 N and 100 K
- 60 N and 100 K





0.5-60N-100K

4-0N-0K



4-60N-100K

2-60N-100K

0.5-60N-100K

# Day 1

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(24 hours after clipping)

1" Continuous    3.5" Rotational



# Day 2

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1" Continuous    3.5" Rotational



# Day 3

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1" Continuous    3.5" Rotational



# Day 4

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1" Continuous    3.5" Rotational



# Day 5

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1" Continuous    3.5" Rotational



# Day 6

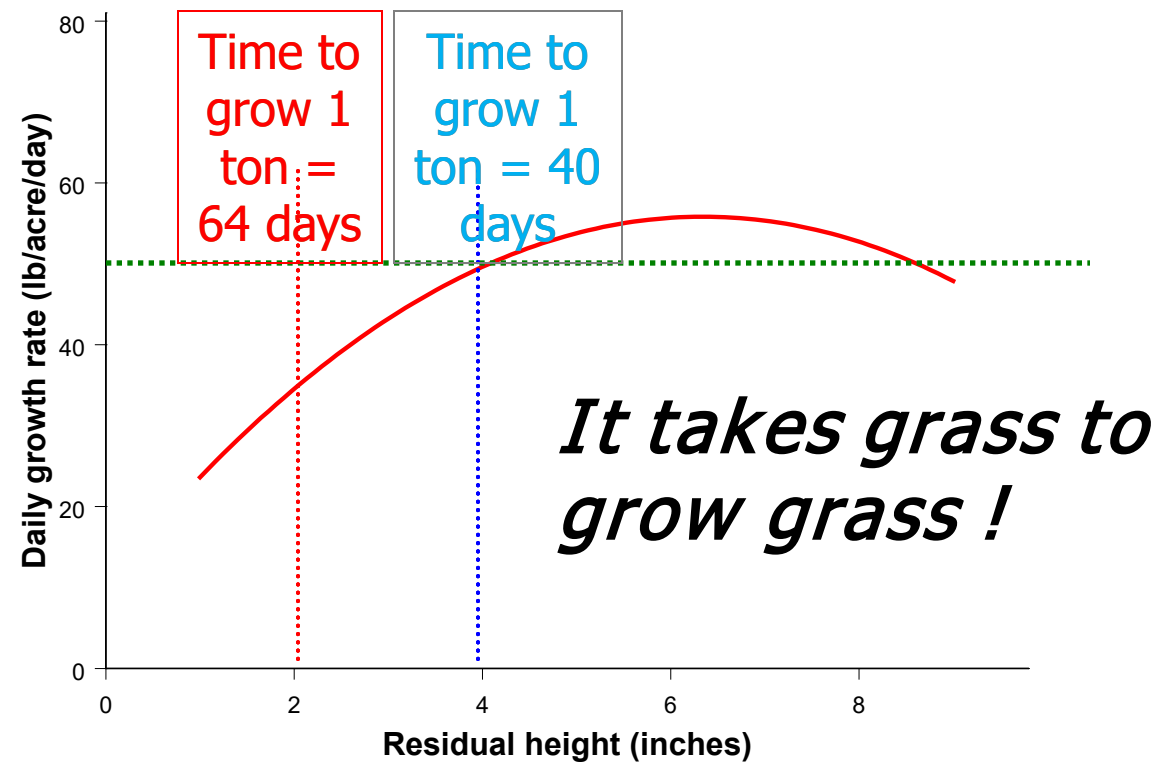
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1" Continuous    3.5" Rotational



## Effect of post-grazing residual on pasture daily growth rate (MU-FSRC)

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# Maintain Forages In Vegetative State



**Forage Species**

**Height to begin grazing**

**Height to terminate graz.**

Tall fescue  
orchardgrass  
an. Ryegrass  
sericea lesp.

5-8"

3"

Bermudagrass

5-8"

2"

Native warm  
season, sudan

18"

8-10"

For parasite control don't graze below 5".

# The challenge of maintaining Cover

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Stocking rate

Time on a paddock

Selective grazing

Drought

Winter

Sacrifice area



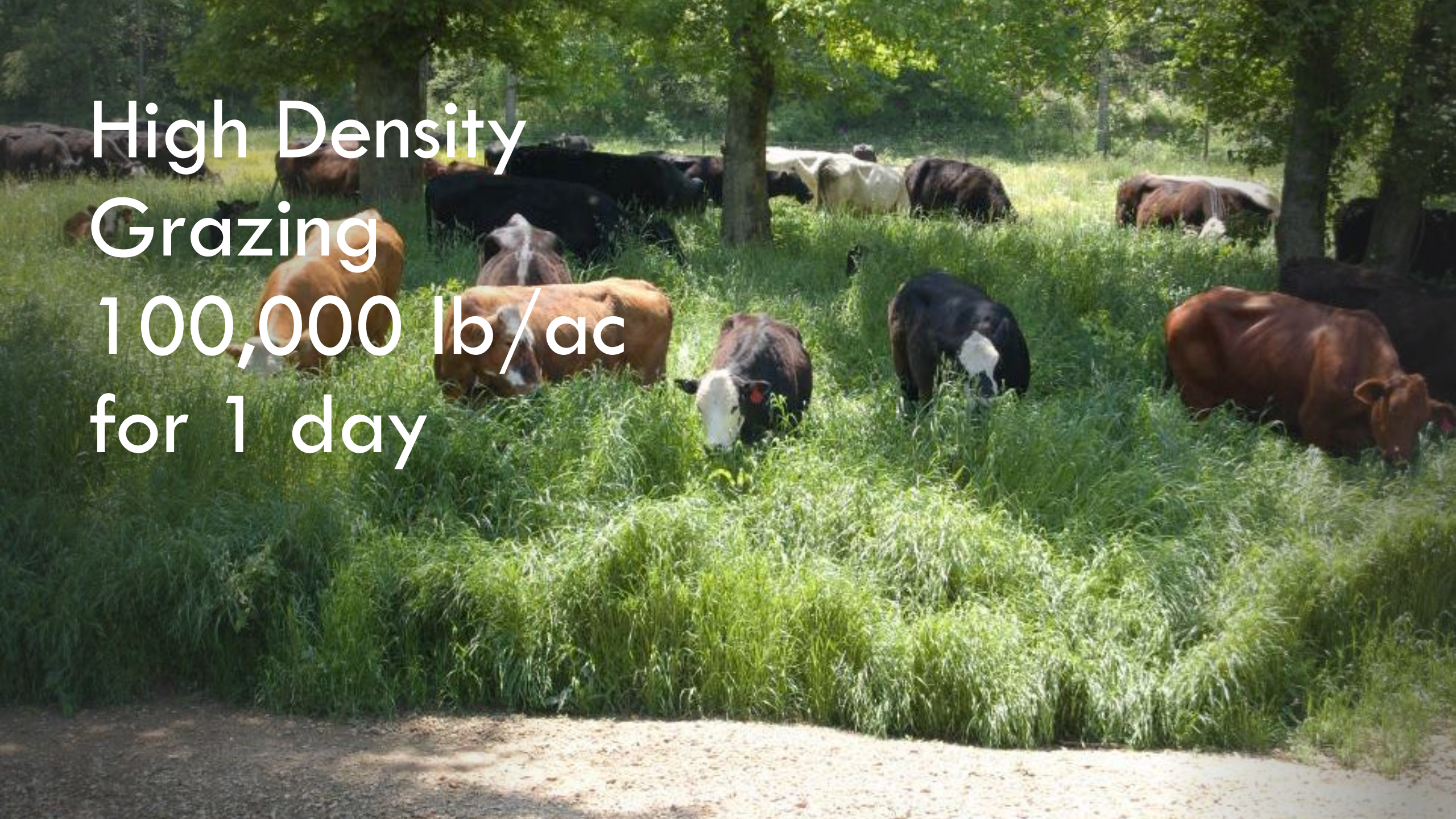
# The Best Weed Control?


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THINK ABOUT GROWING  
SOMETHING INSTEAD OF  
KILLING SOMETHING



High Density  
Grazing  
100,000 lb/ac  
for 1 day



A photograph of a rural landscape. In the foreground, there is a small, calm pond with a brown, mulchy bank. The middle ground is a wide, green field with several large, mature trees scattered across it. The background is a dense forest of green trees under a slightly overcast sky. The overall scene is peaceful and natural.

**High Density short  
duration grazing  
Warning do not  
overgraze**

# Blackberry briars and Tall fescue before grazing

Too  
mature

Electronet



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**Blackberry briars and Tall fescue  
after grazing**

**1700 lb/ac of goats for 1 wk**



Before Picture in  
August  
Pigs with Cattle,  
Goats, Dogs  
and Sheep

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A photograph of a grassy field with several bare trees in the foreground and a line of trees in the background under an overcast sky. The grass is green and appears to be a mix of species, including some brownish plants. The trees are mostly without leaves, suggesting late autumn or winter. The background shows a line of trees and a distant building.

After Picture  
November - Prairie  
Bromegrass  
adapted to shade  
and heavy manure  
areas

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# Adaptive Grazing

Forward Grazing

Rotational Grazing

Rotate prior to impacting most limiting resource

Rotate when next paddock is proper ht to graze

Rotate when the paddock is soiled

Don't limit yourself or your operation by locking into one form of management

Landscaping

Flash Grazing

Mob Grazing

Ultra high stock density grazing

Seasonal Grazing

Strip Grazing

Put and Take

Time Limit Grazing



# Stockpiling Grass-reserve paddock

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Standard recommendation:

- Set aside 1 ac/cow for stockpiling
- Graze or clip August 15-September 1
- After rainfall apply up to 60 lb of Nitrogen/ac (1% OM =25 lb of N)
- Strip graze after Thanksgiving



## Chemical composition of various plants browsed by goats (%)

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

**Table 2. Quality of alfalfa occurring in a newly established stand compared to seven annual weeds occurring in a weed nursery on July 16, 1971<sup>a</sup> <http://pubs.ext.vt.edu/418/418-150/418-150.html>**

Species	Invitro digestible dry matter (IVDDM)	Acid detergent fiber (ADF)	Crude protein (CP)
		% —————	
Alfalfa <sup>b</sup>	72	24	27
Redroot pigweed <sup>c</sup>	73	21	25
Common lambsquarters	68	22	25
Common ragweed	73	25	25
Pennsylvania smartweed	51	22	24
Yellow foxtail	69	30	20
Giant foxtail	62	33	18
Barnyardgrass	70	33	18

<sup>a</sup>Adapted from Marten, G. C., and R. N. Andersen. 1975. Forage nutritive value and palatability of 12 common annual weeds. *Crop Science* 15:821-827.

<sup>b</sup>Alfalfa was seeded on May 14, 1971.

<sup>c</sup>Weed nursery was seeded naturally in late summer and autumn of 1970.

# Plants with Condensed Tannins (potent antioxidants)

“Medicinal Pasture” some are invasive just utilize if available

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anti-cancer properties, as well as a positive impact on heart disease, immune systems and urinary tract infections.

Sericea Lespedeza

Annual lespedeza

Birdsfoot trefoil

Arrowleaf clover

Berseem clover

Crown vetch

Multiflora-rose

Autumn olive

Chicory (volatile oils)

Mulberry

Mimosa





# Fencing

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Type of fence is dependent on pressure, cash flow, maintenance, and peace of mind.

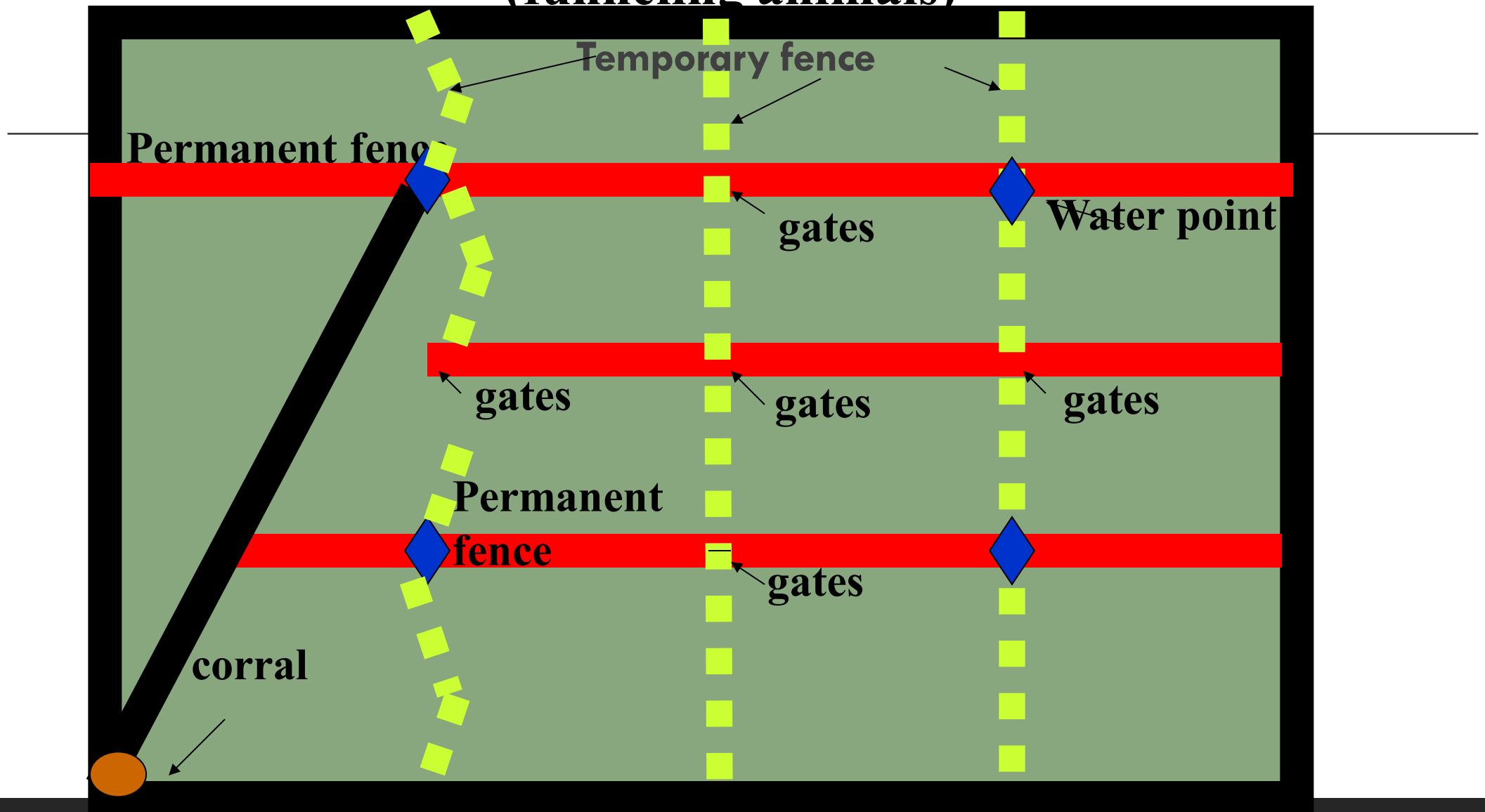
Hub definitely needs to be secure, woven wire

Electrified High tensile wire can work but you must keep it hot.

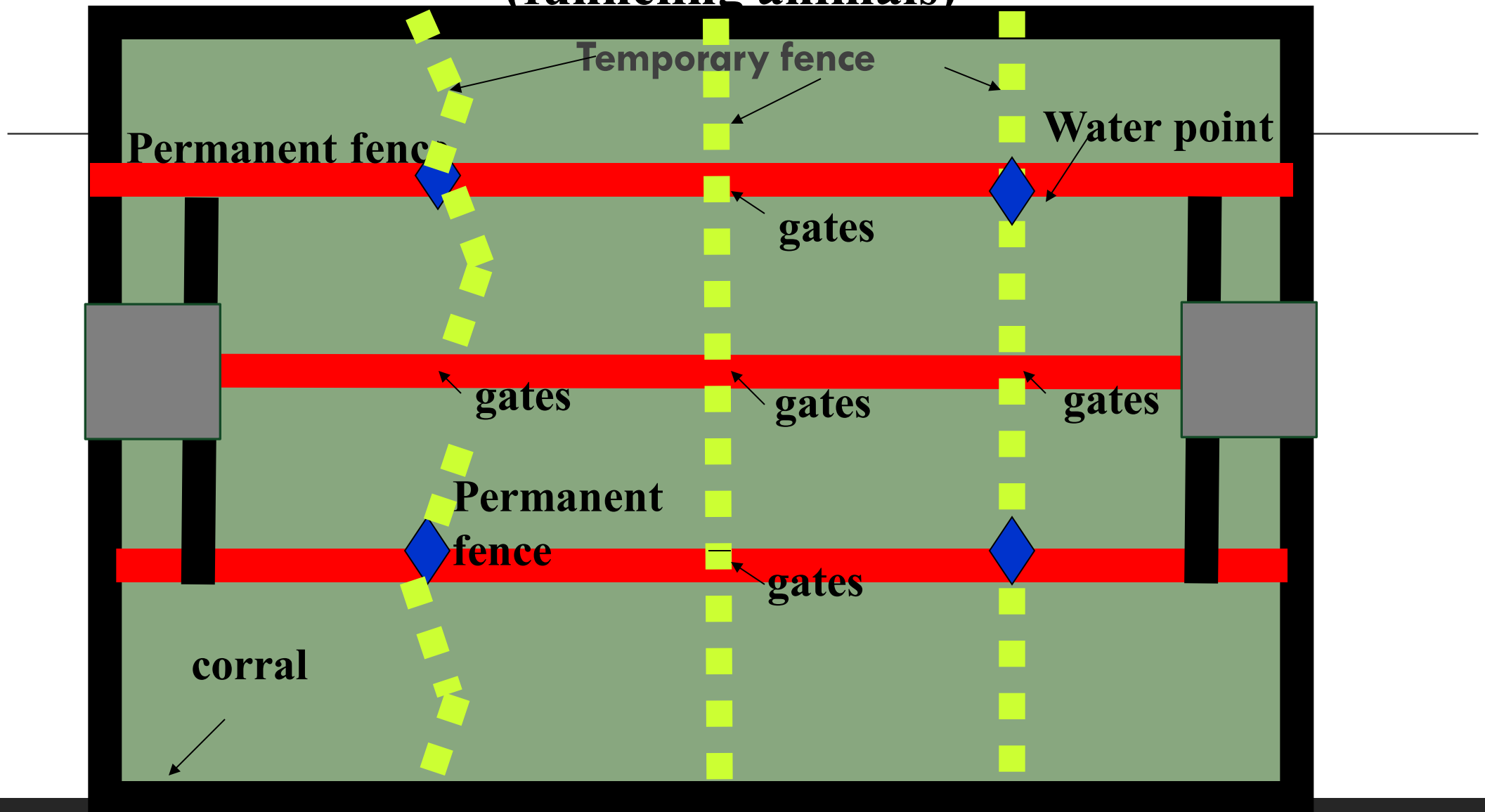
Breaking animals to hot wire, best is offset wire from woven wire

Fixed knot High tensile woven wire saves money due to post spacing

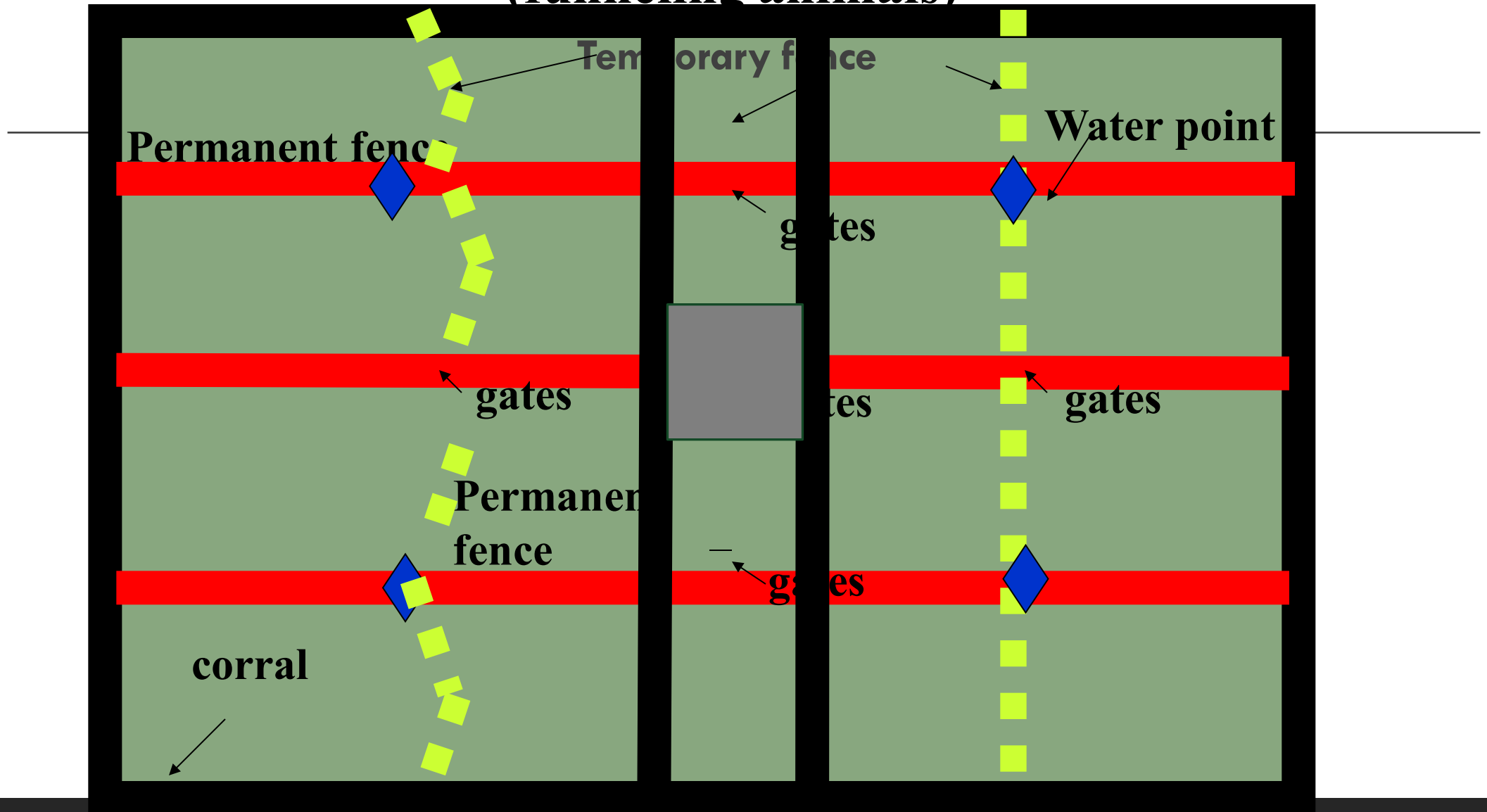
# 16 Paddock with 4 Watering Points (funneling animals)

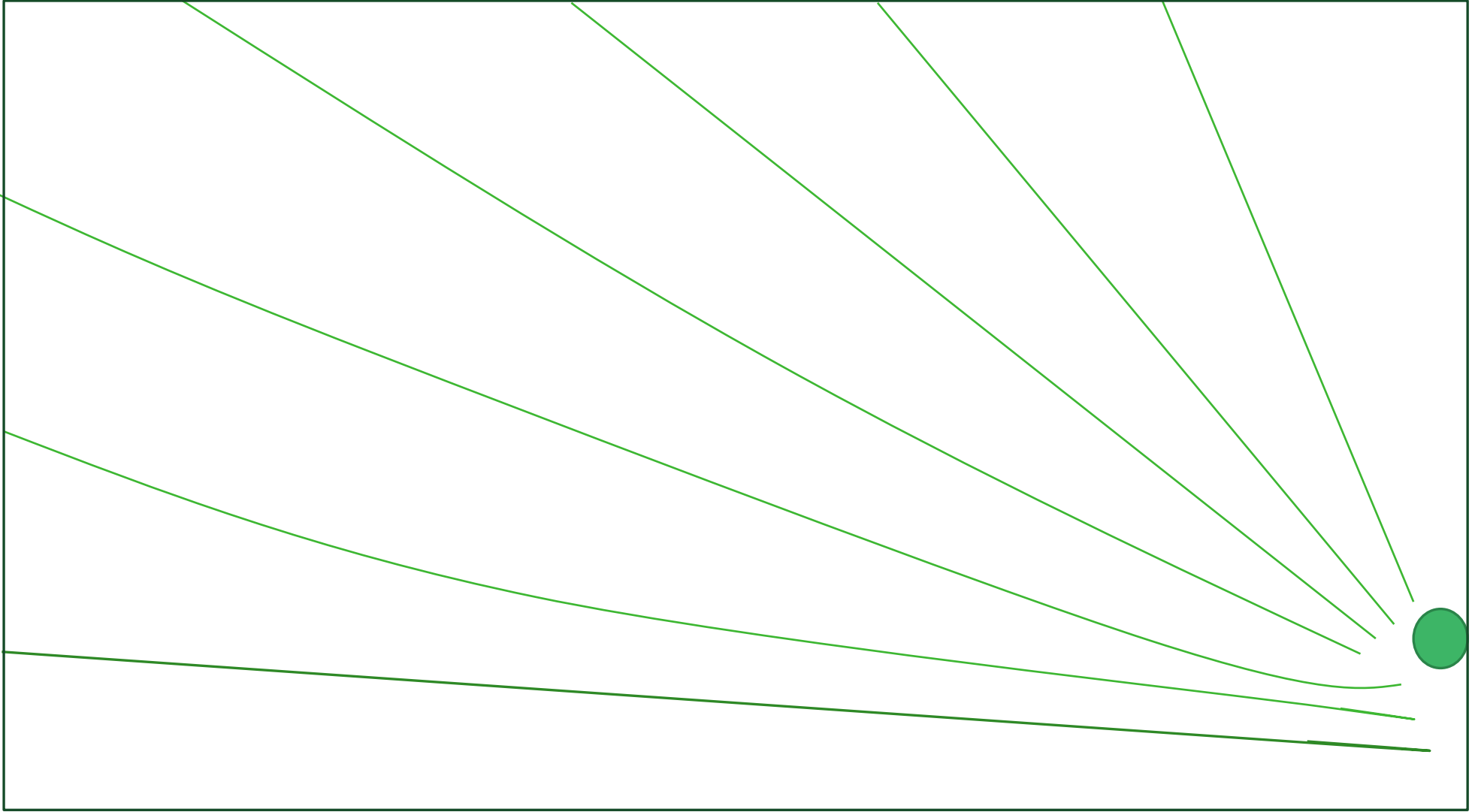


# 16 Paddock with 4 Watering Points (funneling animals)



# 16 Paddock with 4 WATERING POINTS (funneling animals)



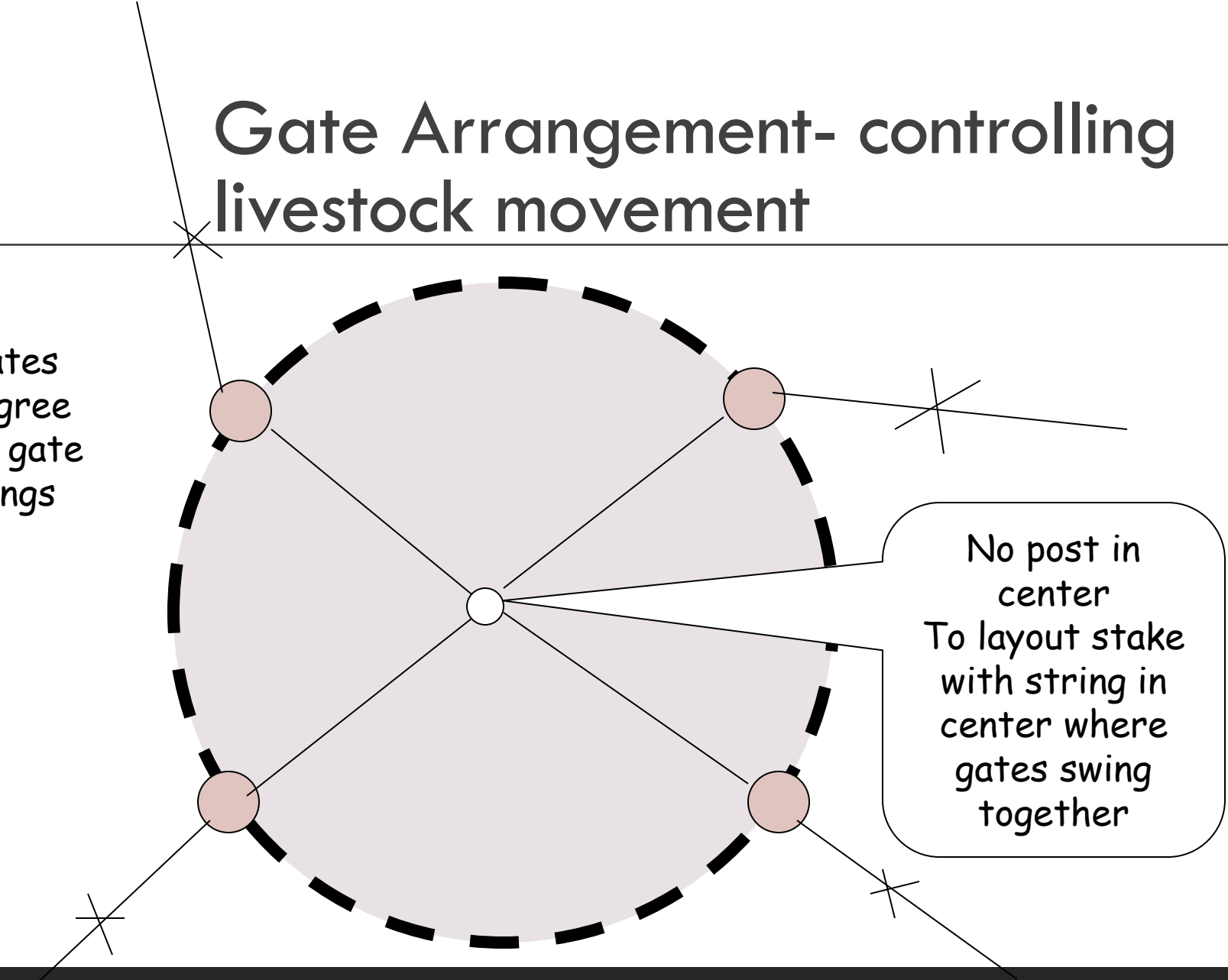




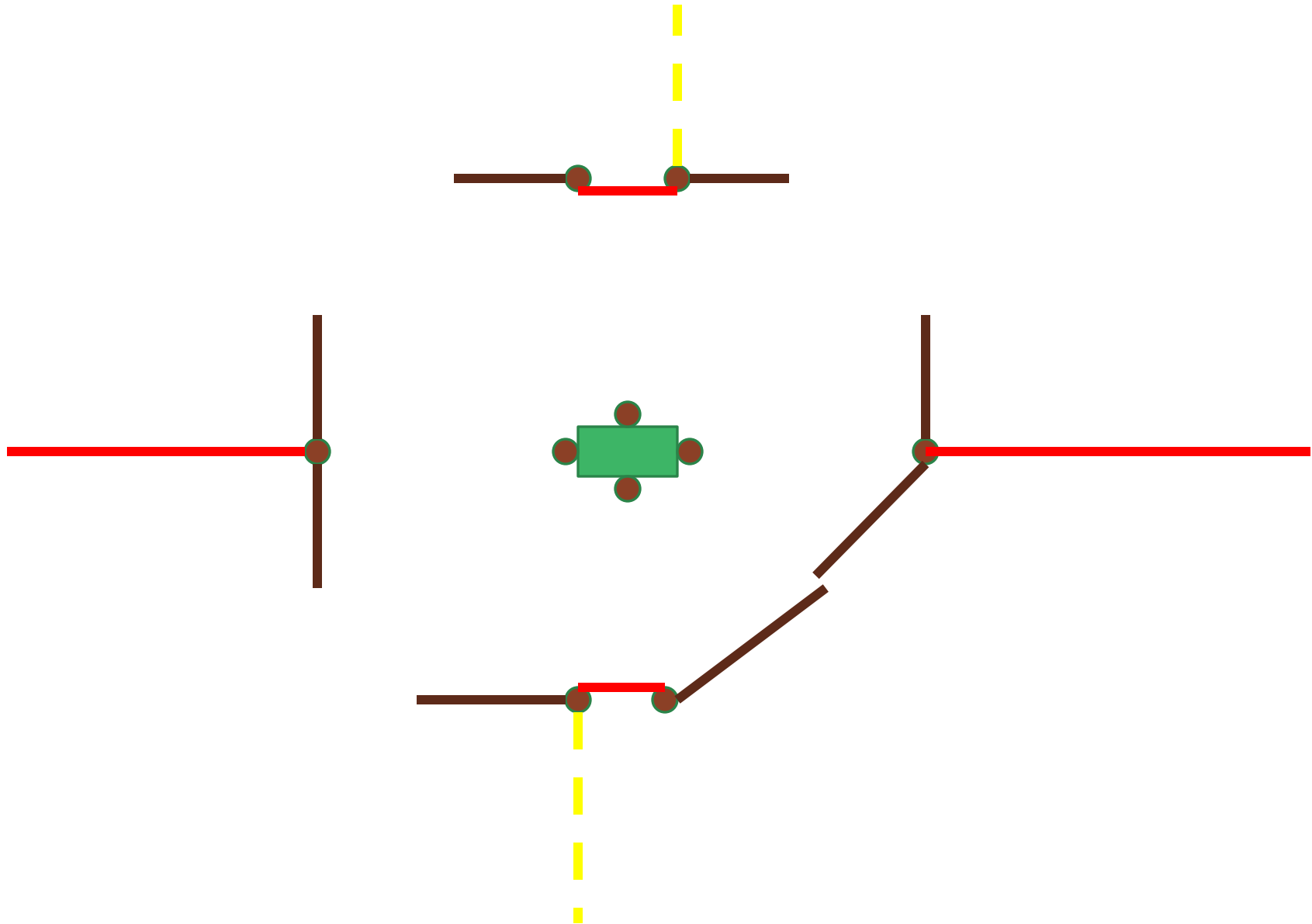



# Gate Arrangement- controlling livestock movement

16' gates  
90 degree  
= 22.5' gate  
openings



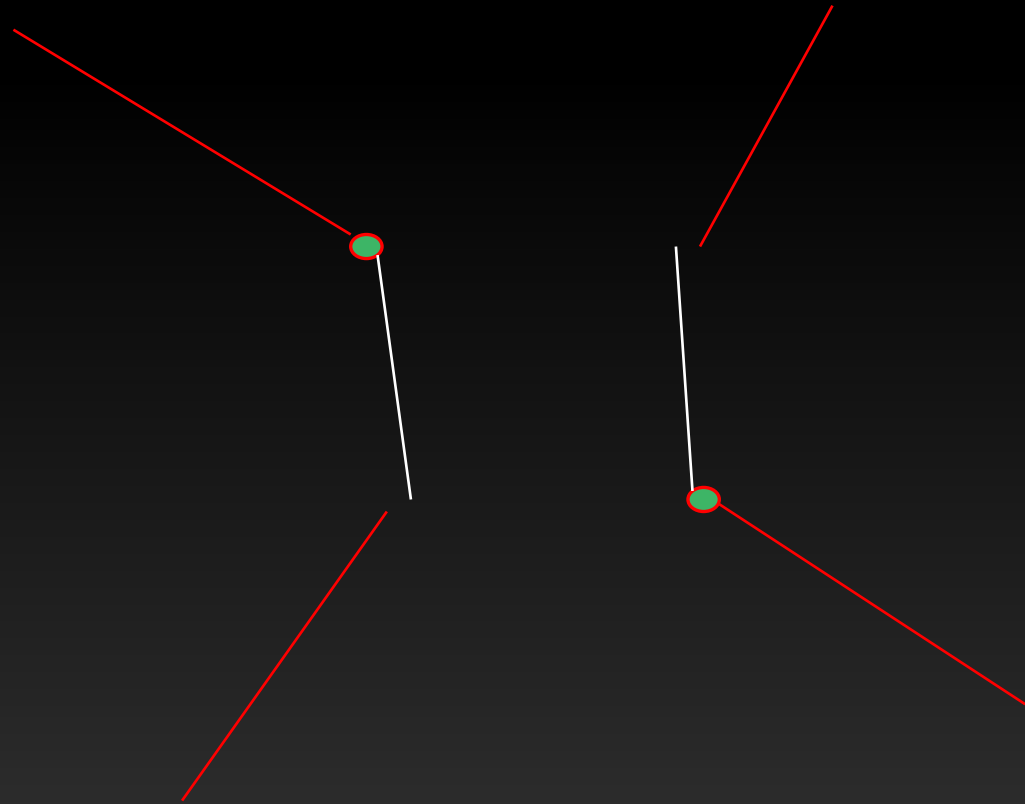
No post in center  
To layout stake with string in center where gates swing together

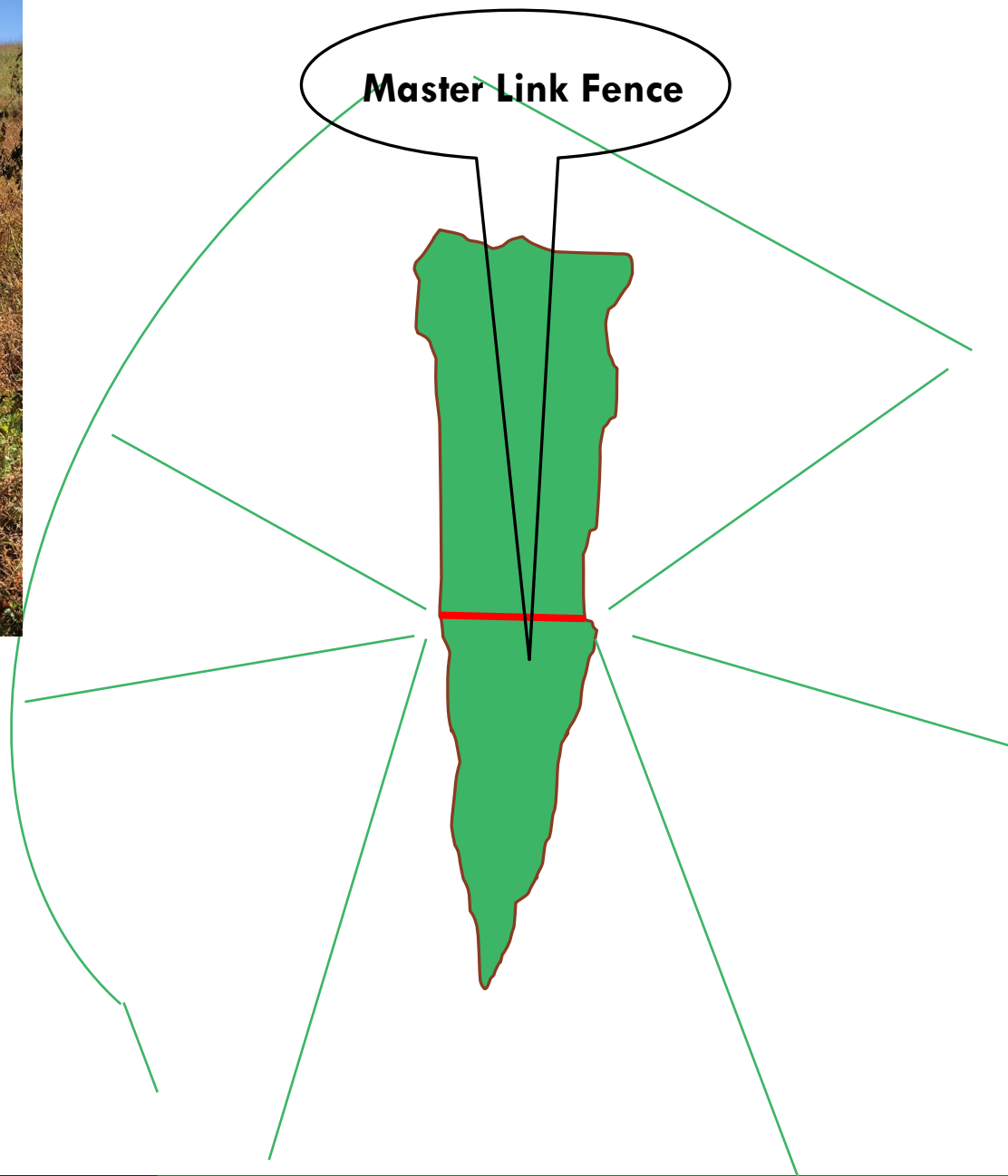


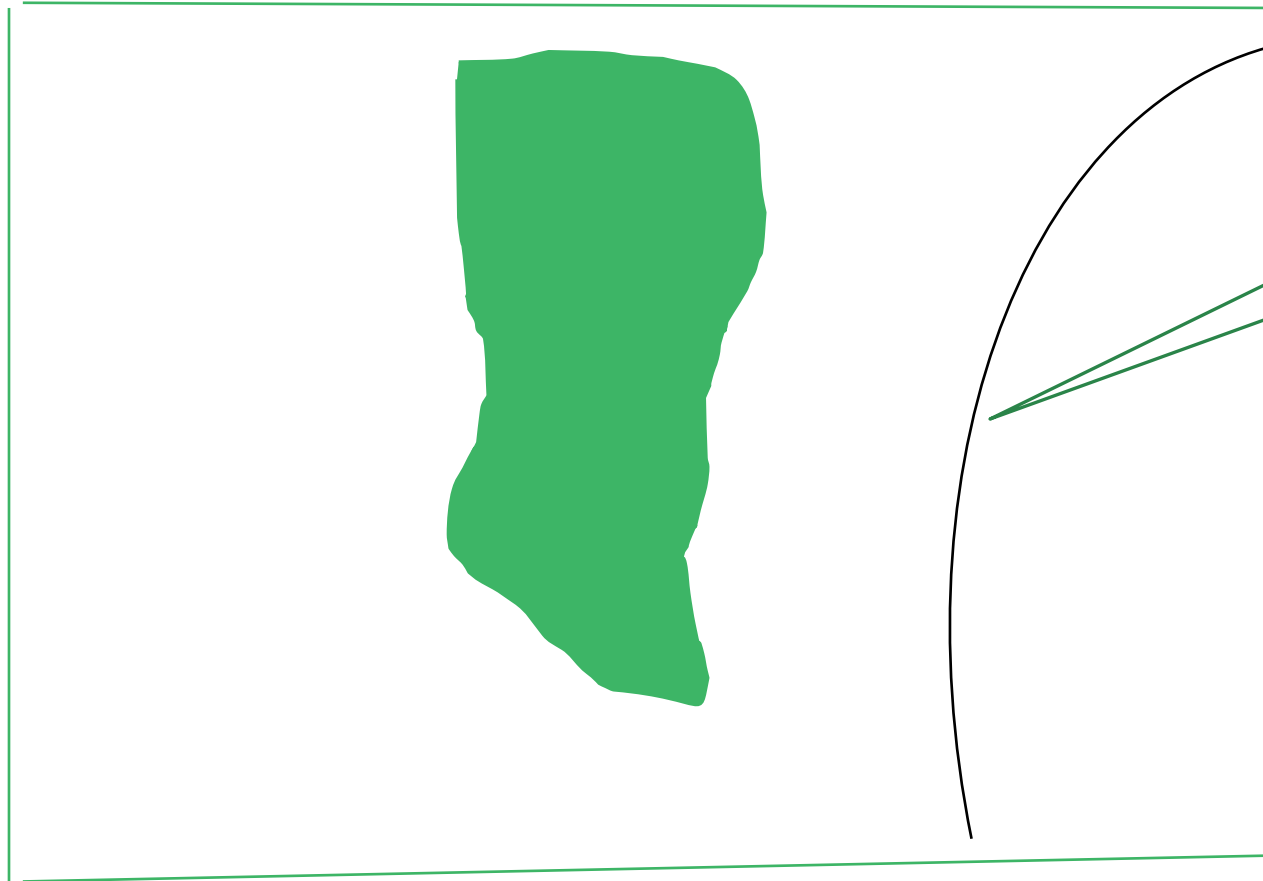


2 Gates Four fields if rotational grazed,  
bungy gates can be different widths

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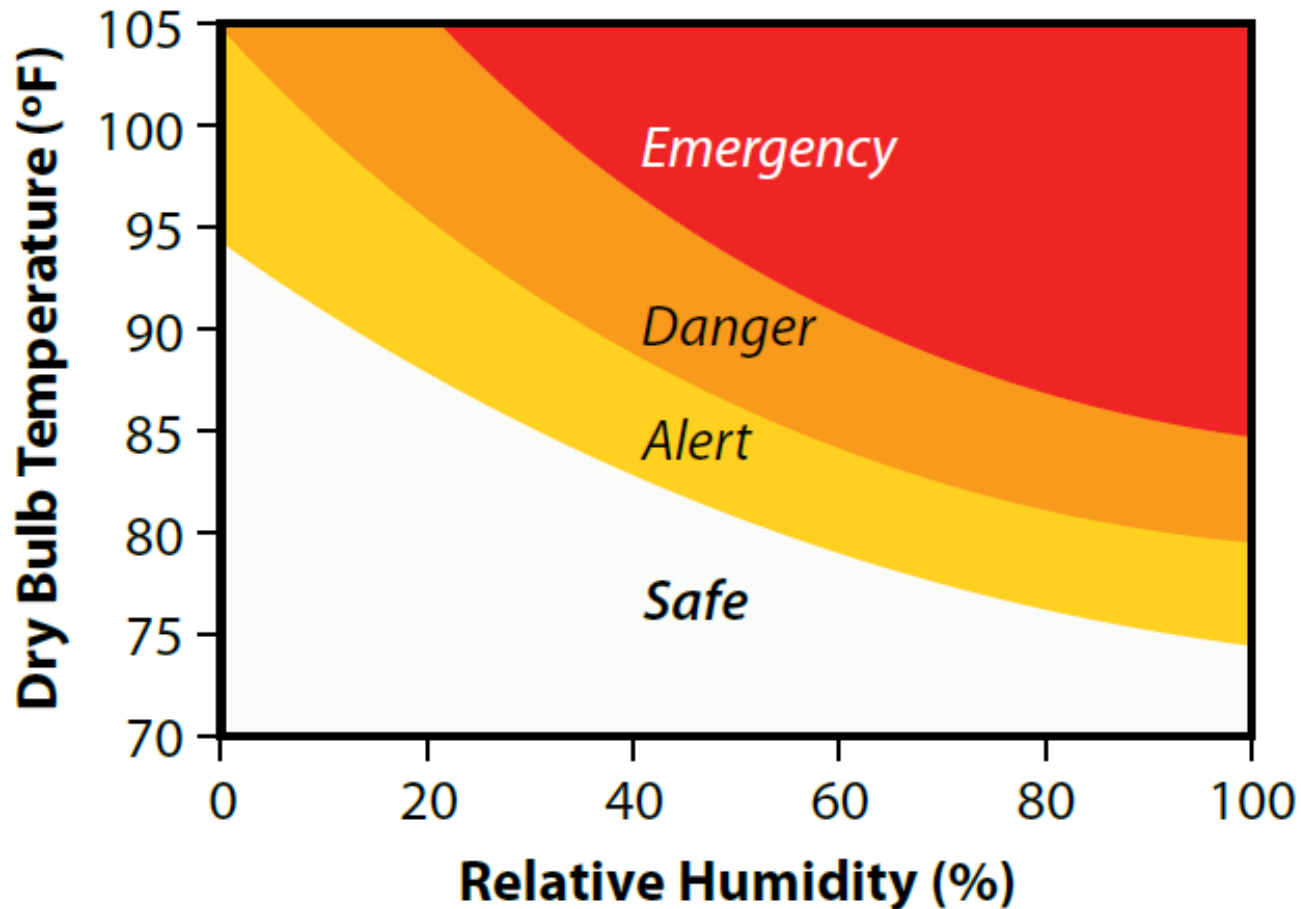
Temporary  
Fencing on  
the contour

# The Value of Shade

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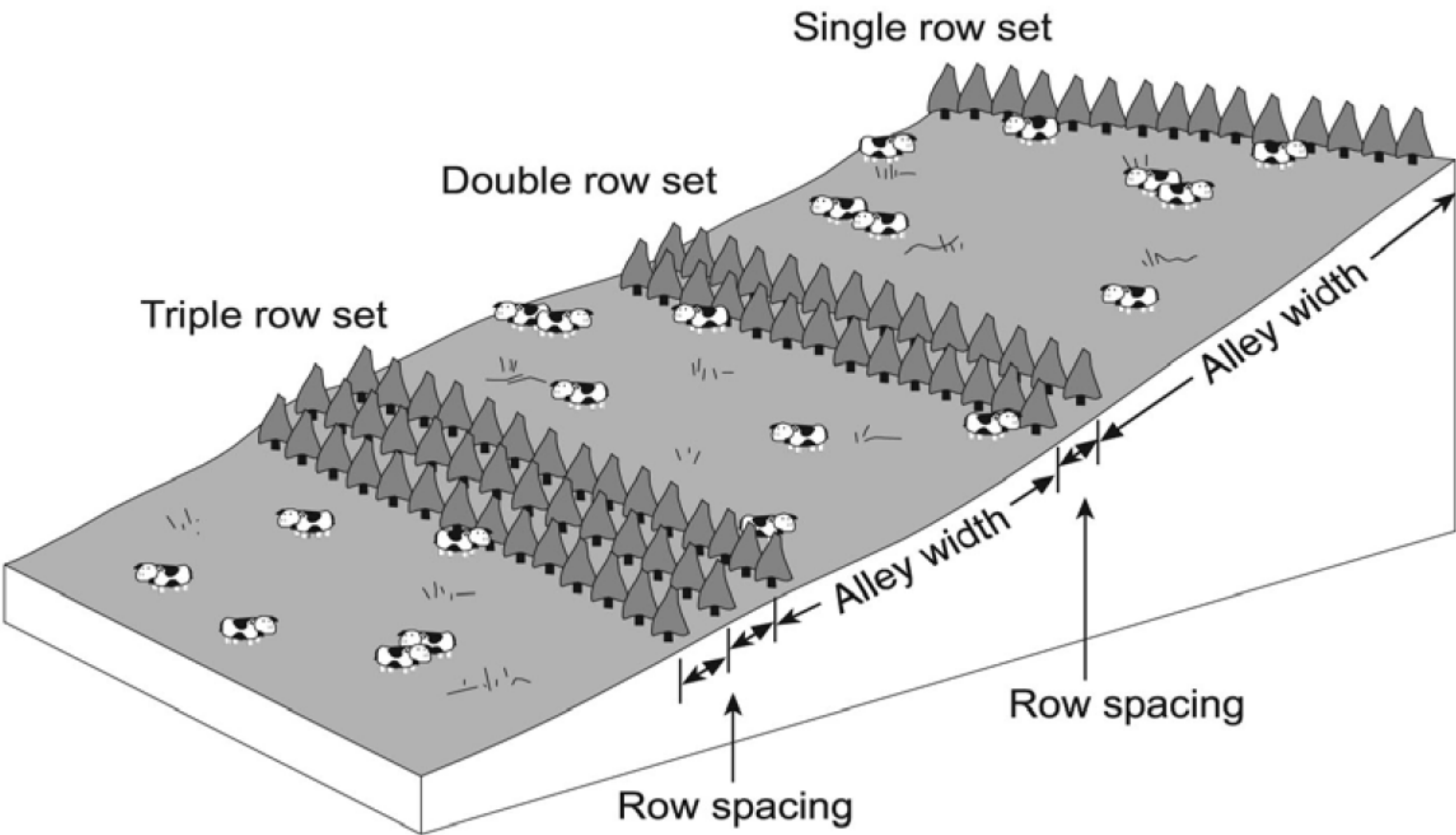


- Cows on the abundant shade treatment spent the most time grazing
- Improved gains in yearling steers on rangeland
- More uniform, or less spot grazing by cattle; McIlvan and Shoop (1971)
- Soil life active longer when temperature and moisture are not erratic (glb)
- High temperatures can increase water consumption 78%, water consumption in an average summer is 40% more than winter. (NSW-AU)



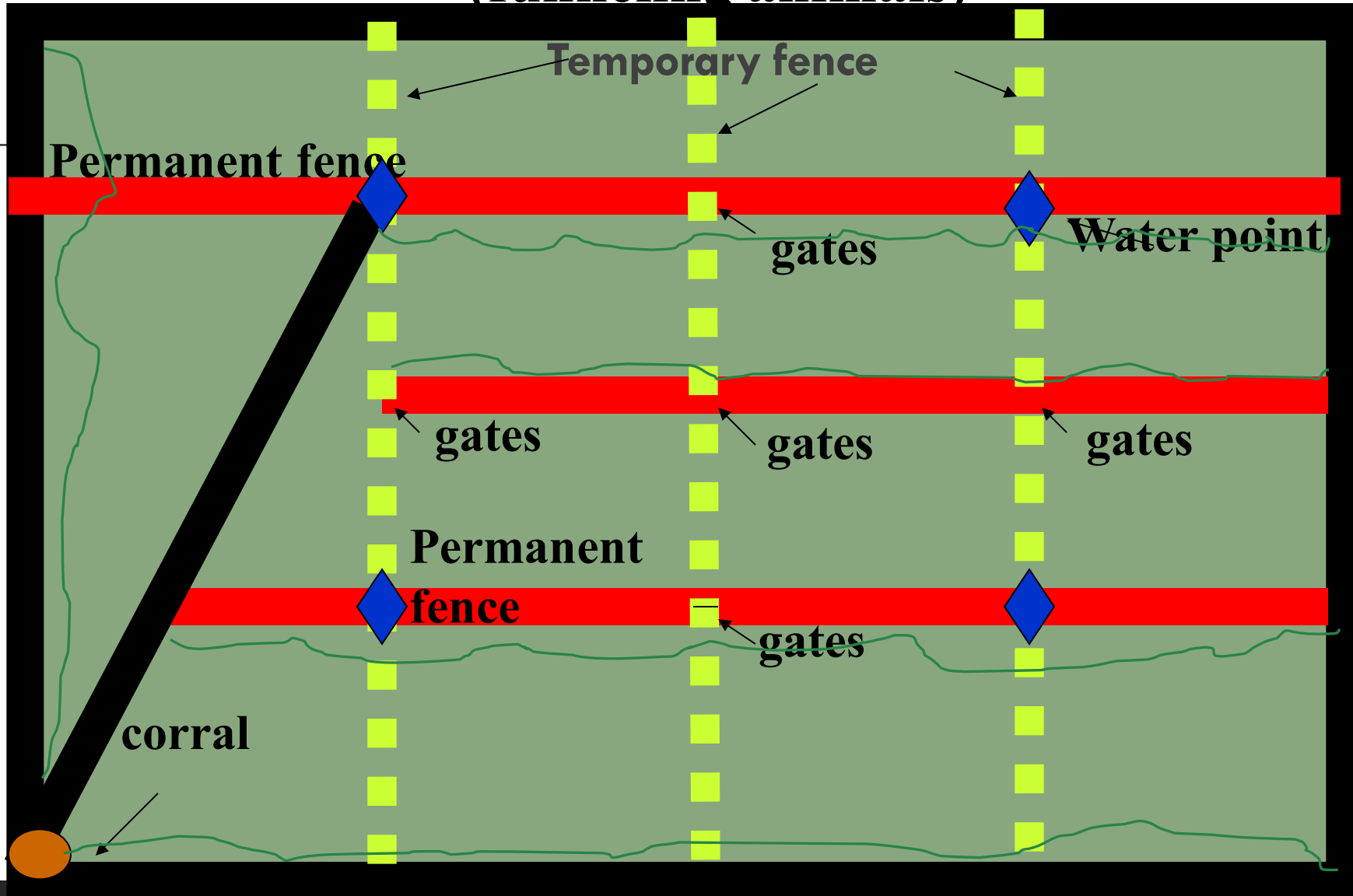
**Figure 1.** Livestock Heat Stress Guide. Adapted from the Livestock Weather Hazard Guide, Samuel Roberts Noble Foundation, Inc.

- Missouri study found providing shade had the biggest effect on cattle grazing endophyte-infected pastures gaining 0.72 lb per day more than cattle without shade
- University of Arkansas, researchers found that providing artificial shade resulted in an average daily gain of more than 20% compared to cattle with no shade, and cattle with tree shade showed nearly a 60% increase compared to those with no shade.



# 16 Paddock with 4 WATERING POINTS (funneling animals)

*Shade in  
all  
paddocks*











# Silvopasture Forage Growth Differences

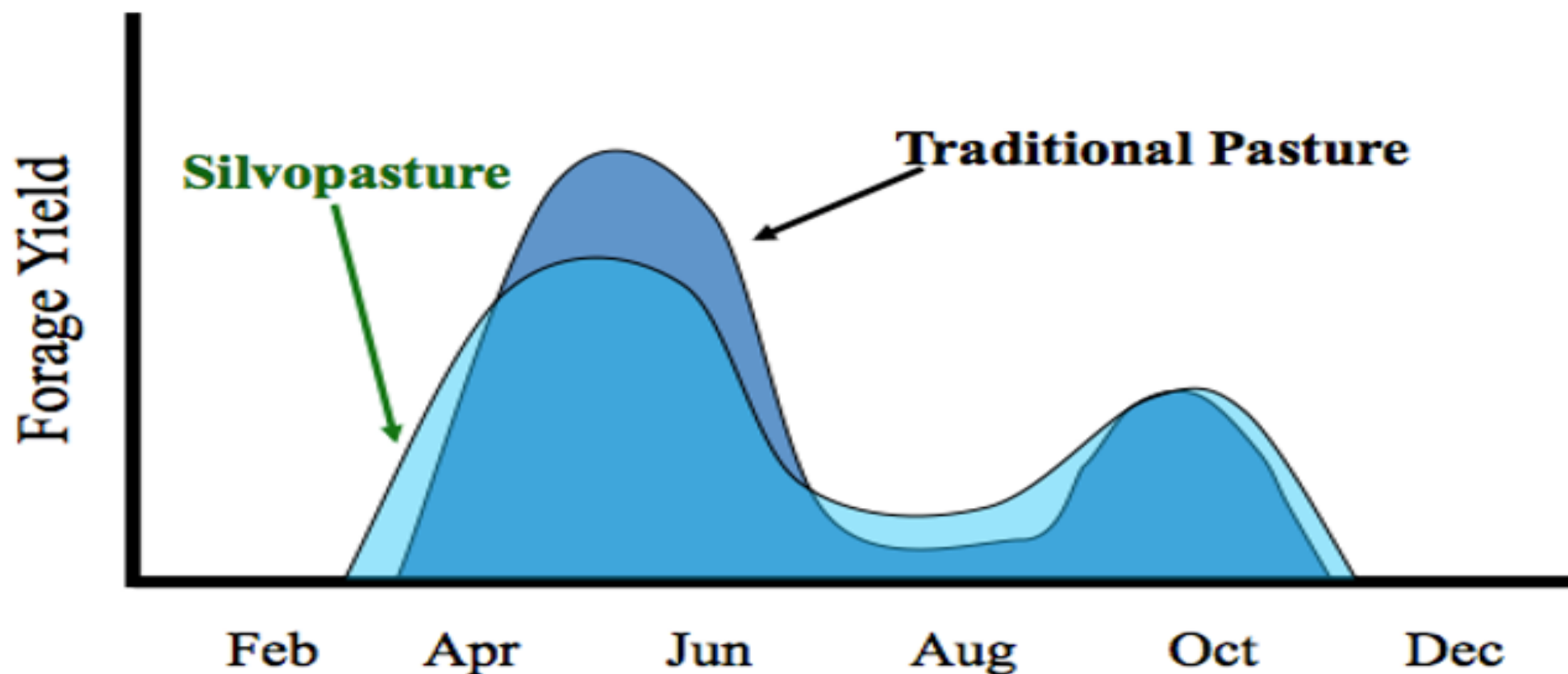


Figure 5: Silvopasture Forage Peak growth differences, adapted from **Walters, 2011**

# **MINIMUM CANOPY GAP 0.1 ACRE (66' X 66') AND GAP BEYOND 1.0 ACRE (209' X 209') LITTLE BENEFIT**

The role of gap size has also been quantified in that gaps have little effect on available light when openings are smaller than 0.04 ha (0.10 acres) and larger than 0.4 ha (1 ac) in size (Dey and MacDonald 2001).





## Summary- Be Observant

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*In regenerative agriculture everything is connected so managing soil, plants and animals will benefit the whole. Resiliency results and assures production even in hard times.*

Comments- Questions  
Ruminations?  
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gregbrann.com

*Pasture Walk*  
*October 17, 2024*

