

Silvopasture in Wisconsin: Research observations

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Forest to silvopasture

Advantages:

- Speed
- Money??
- Tree form

Disadvantages:

- Less control of species & location
- Risk of logging damage
- Stumps



Sometimes converting woods to silvopasture is *not* appropriate

- If the woods are in MFL or have another legal restriction on grazing
- If the soils are too wet or the slopes are too steep
- If the woods have spring ephemerals or other sensitive flora you want to keep
- If the woods have young trees that you want to keep (<4" dbh)
- If the woods have high-quality timber, weigh the potential cost of damage
- If management capacity is limited



Step 1: consult a forester

What is the site's forestry and wildlife potential?

<https://dnr.wi.gov/topic/forestlandowners/locator/>

Step 2: what are your goals?

- Shade?
- Firewood?
- Control shrubs?
- Wildlife habitat?
- Savanna habitat?
- Timber?
- Emergency fodder?
- Other?

Silvopasture: Pasture into trees

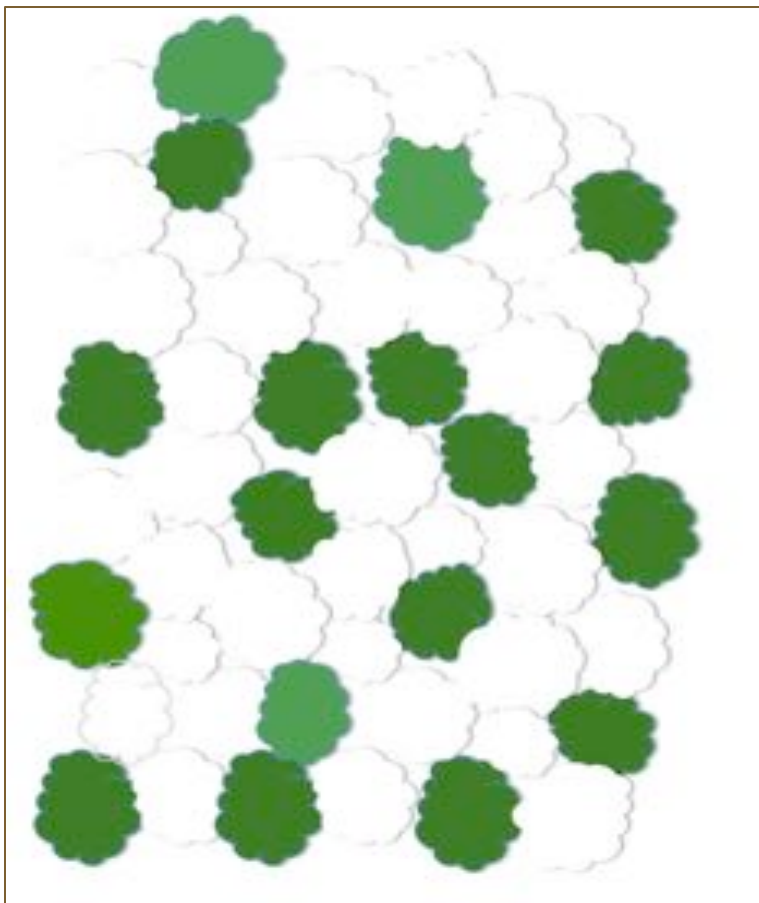
Plan

- Canopy management
- Forage establishment
- Rotational grazing

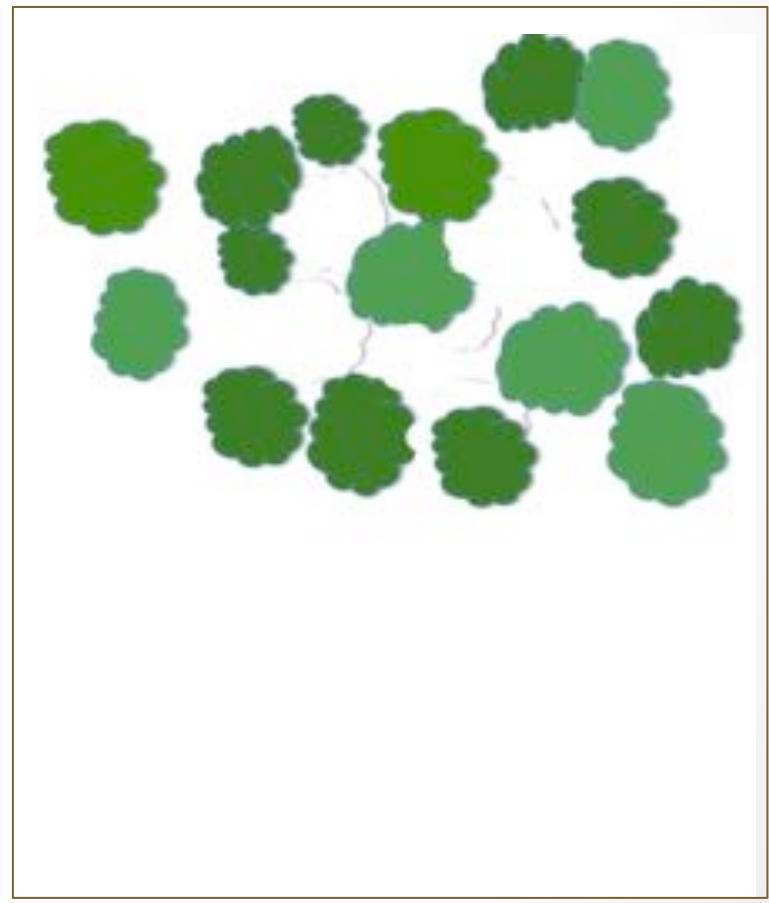


Design options

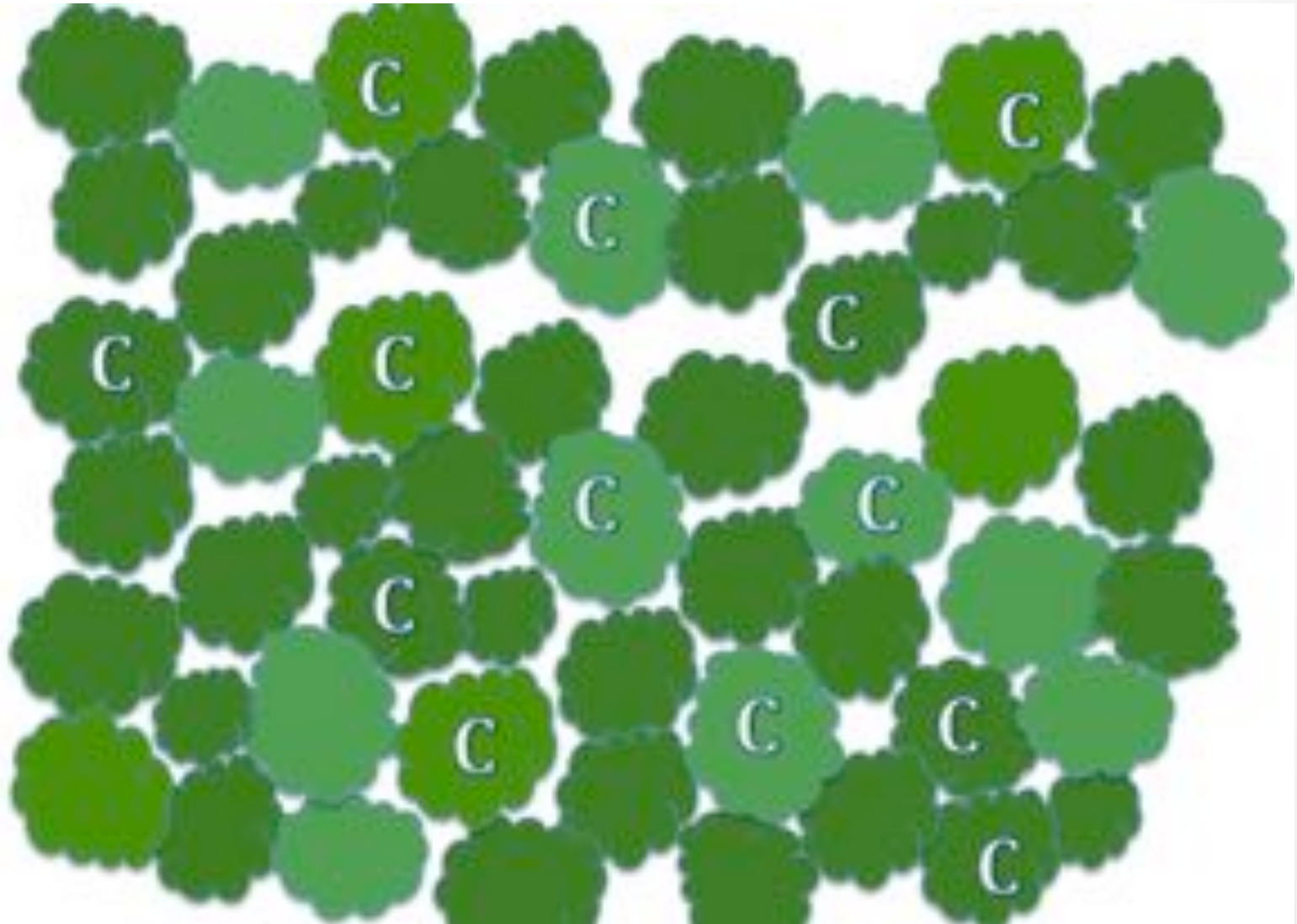
Silvopasture throughout



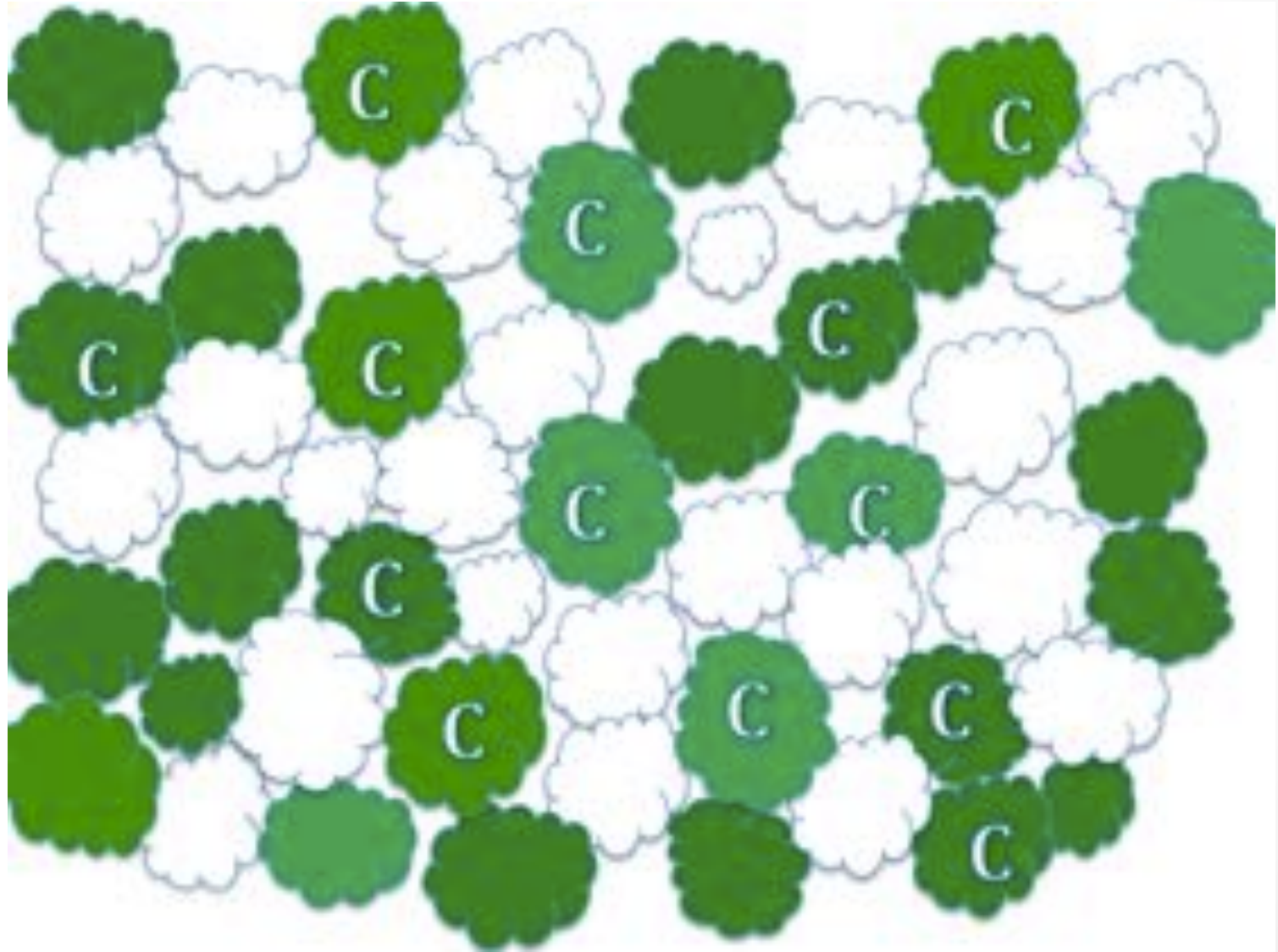
Silvopasture with open pasture



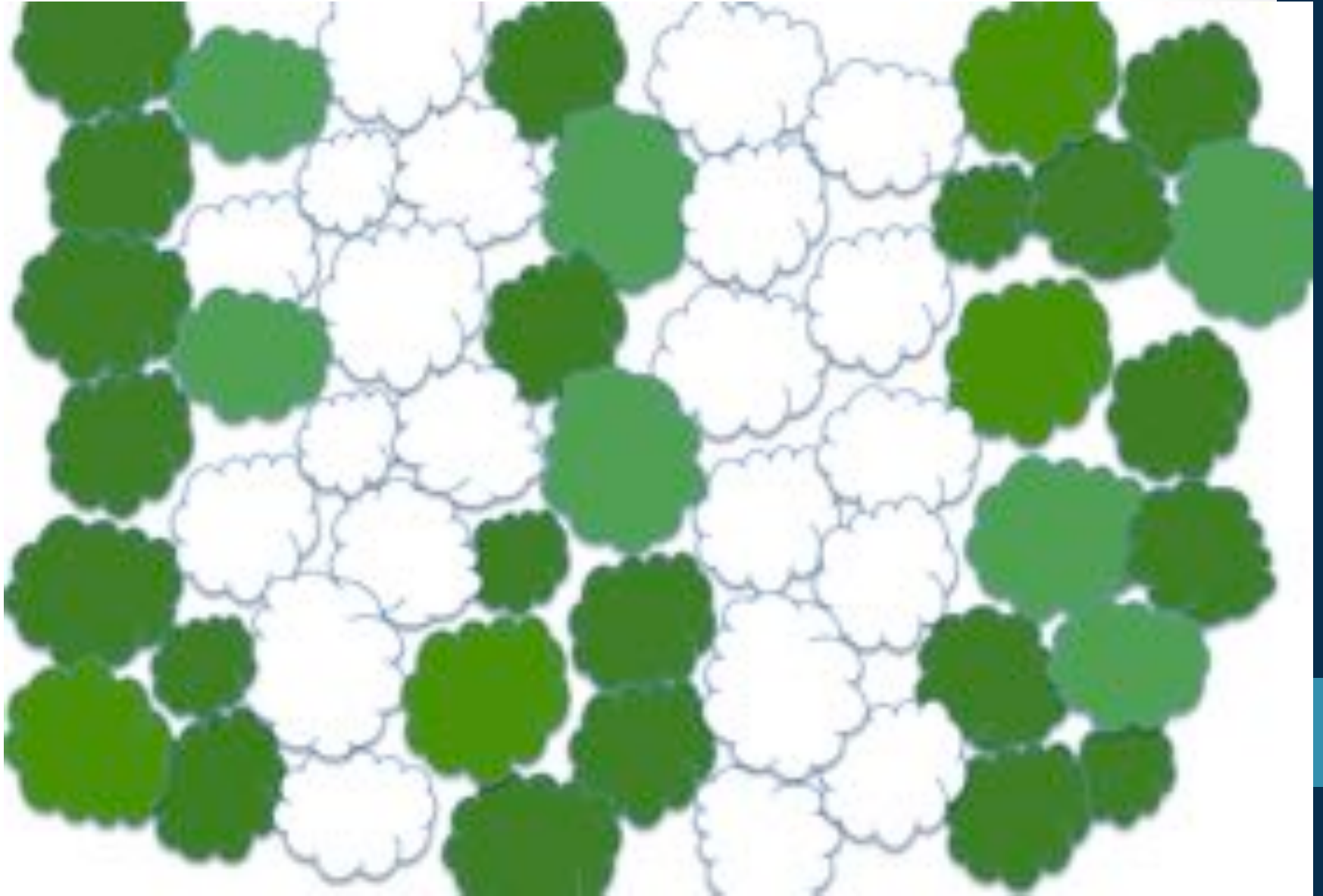
Crop tree selection

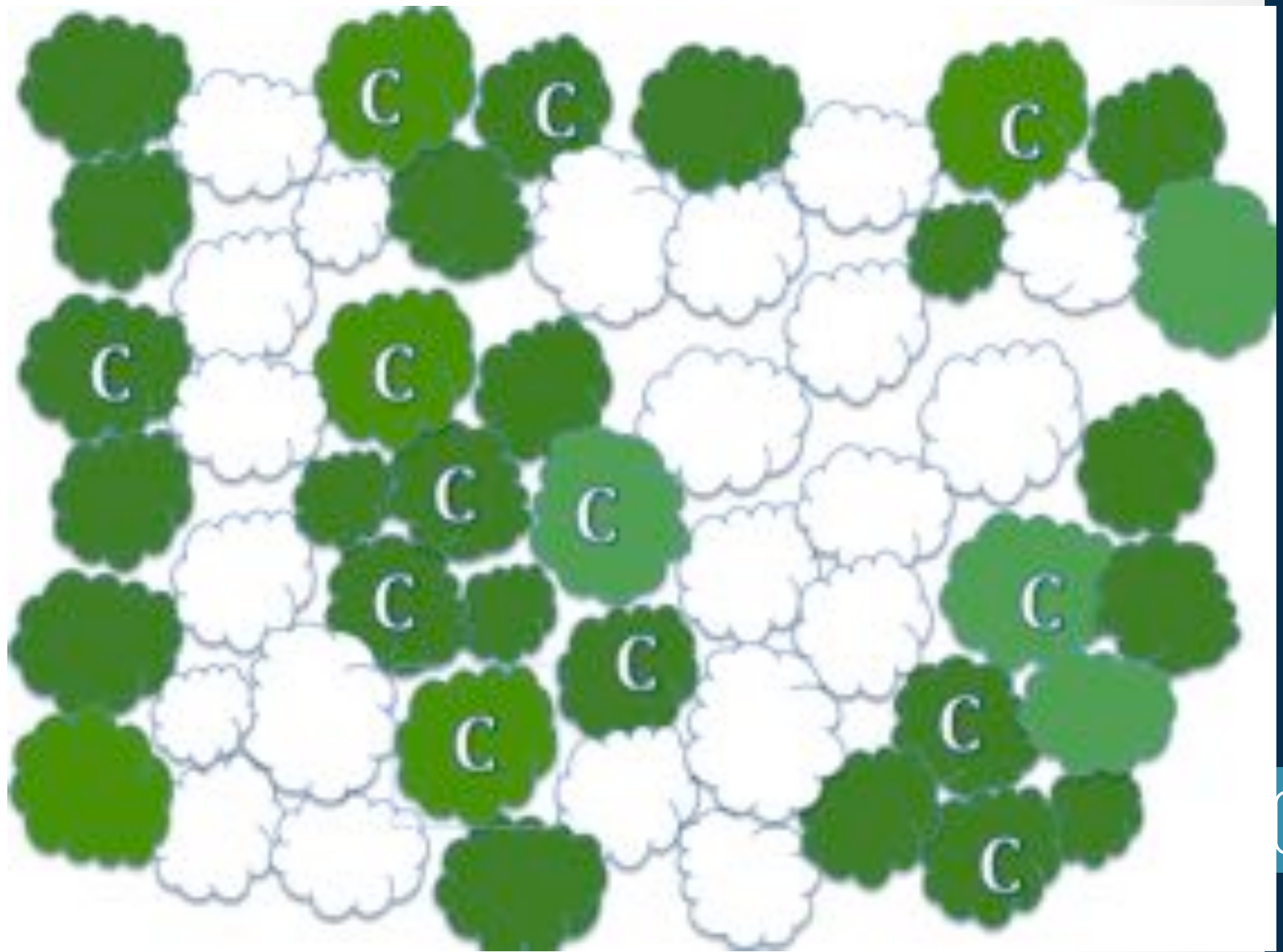


Crop Tree Thinning



Patch tree thinning





Other tips

- Aim for around 30-50% canopy coverage
 - risk of windthrow -- *but* -- tree canopies will fill out
- Mark trees before you thin
- If oaks are present avoid logging April 1 – July 15
- Conduct thinning when ground is frozen or dry



Have a plan for slash



After thinning:

- Grass seed can be broadcast by hand or from an ATV if site is not accessible for machinery
- Shade-tolerant grass mix? Orchardgrass, meadow fescue, smooth brome grass, Kentucky bluegrass, (reed canarygrass)
- Regular fence inspection



Lancaster silvopasture research



Research questions:

- What is the value of the shade?
- How does silvopasture affect vegetation and soils?

4 treatments:

- Open pasture
- Silvopasture
- Grazed woods
- Woodland control (ungrazed woods)



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Animal Welfare 5 Freedoms and grazing systems

- **FREEDOM FROM HUNGER AND THIRST** Ready access to fresh water and diet to maintain health and vigor.
- **FREEDOM FROM FEAR AND DISTRESS**
- **FREEDOM FROM PAIN, INJURY OR DISEASE**
- **FREEDOM TO EXPRESS NORMAL BEHAVIOR**
- **FREEDOM FROM DISCOMFORT** Provide an appropriate environment including shelter and a comfortable resting area.

Trees



Silvopasture is not 1 tree in the pasture



... or cows in the woods



Silvopasture welfare goal:

Provide shade and/or shelter for livestock while:

- Protecting soil and water quality
- Providing good forage
- Minimizing damage to trees
- Maintaining animal health

How? Good forage and grazing management

Supplementary welfare goals?

- Scratching or rubbing resources
- Medicinal or nutritional benefits of woodland plants?

Establishment

- Thinned woods to 72 ft² basal area
- Cleared slash
- Planted forage in Silvopasture understory



Silvopasture





Access to shade & welfare

- Did cows choose to access shade?
- Did access to shade reduce heat stress?





When do cows seek shade?

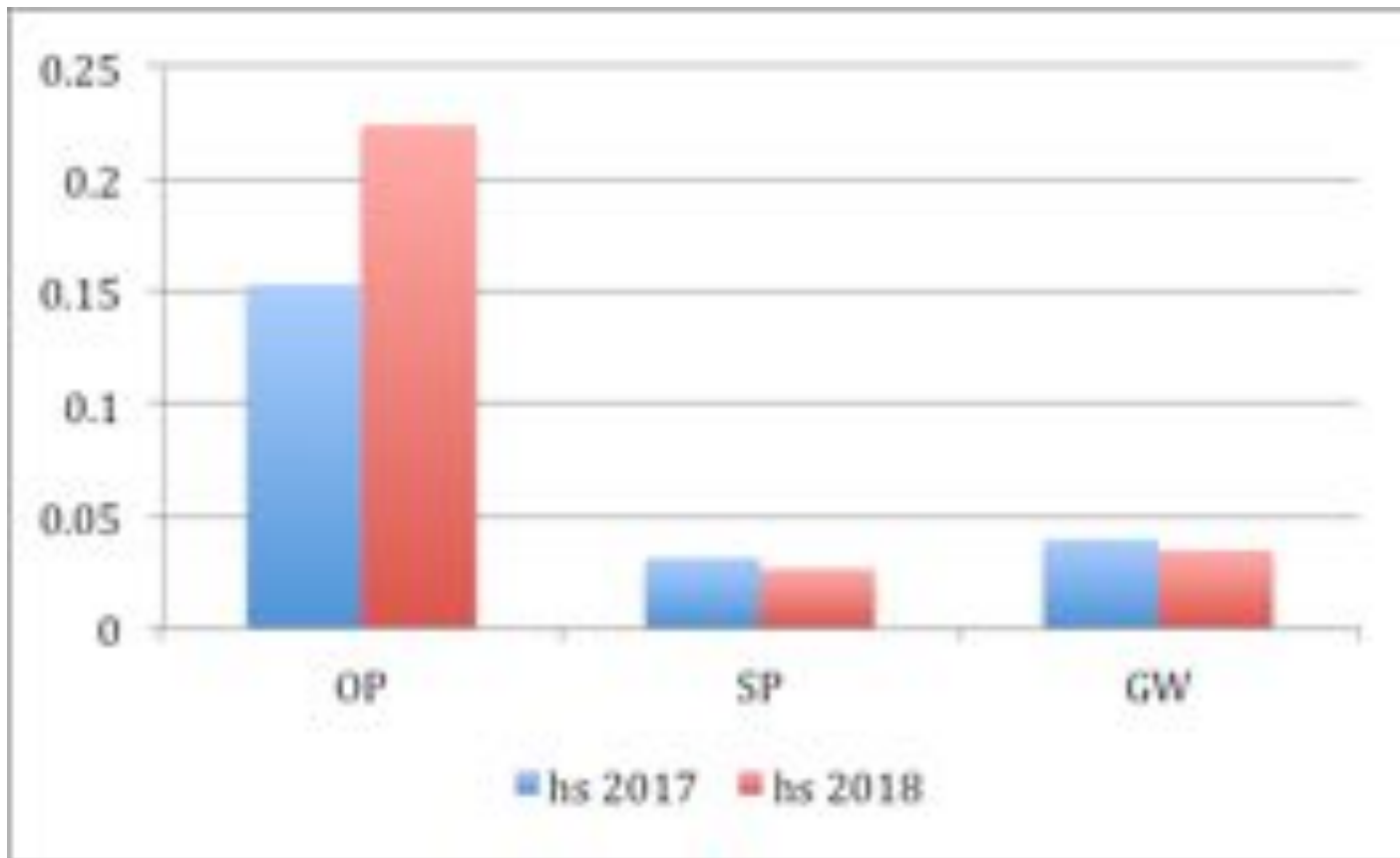
When it is cooler in the woods than in the open

Location of Cows in Relation to Temperature Changes

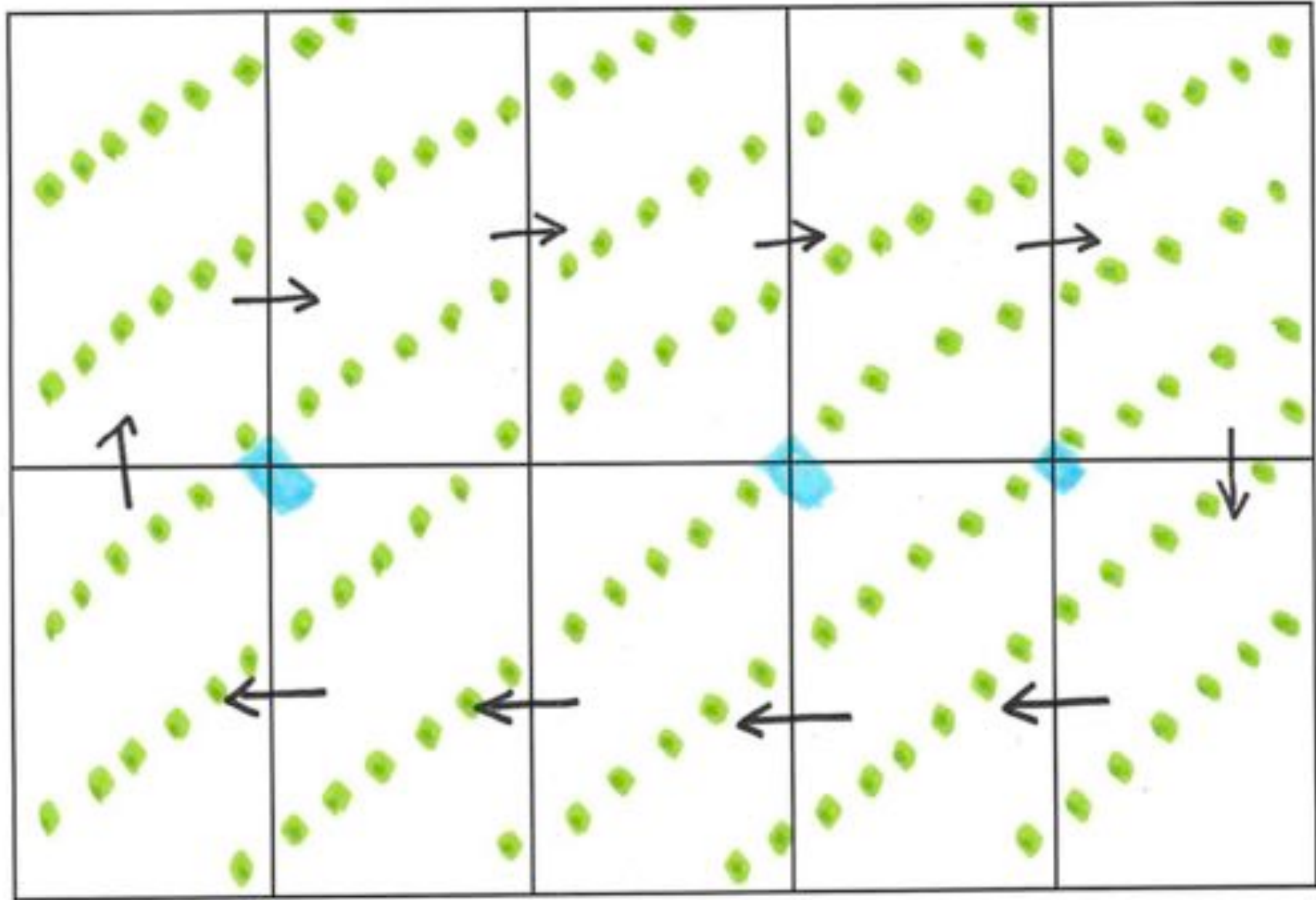


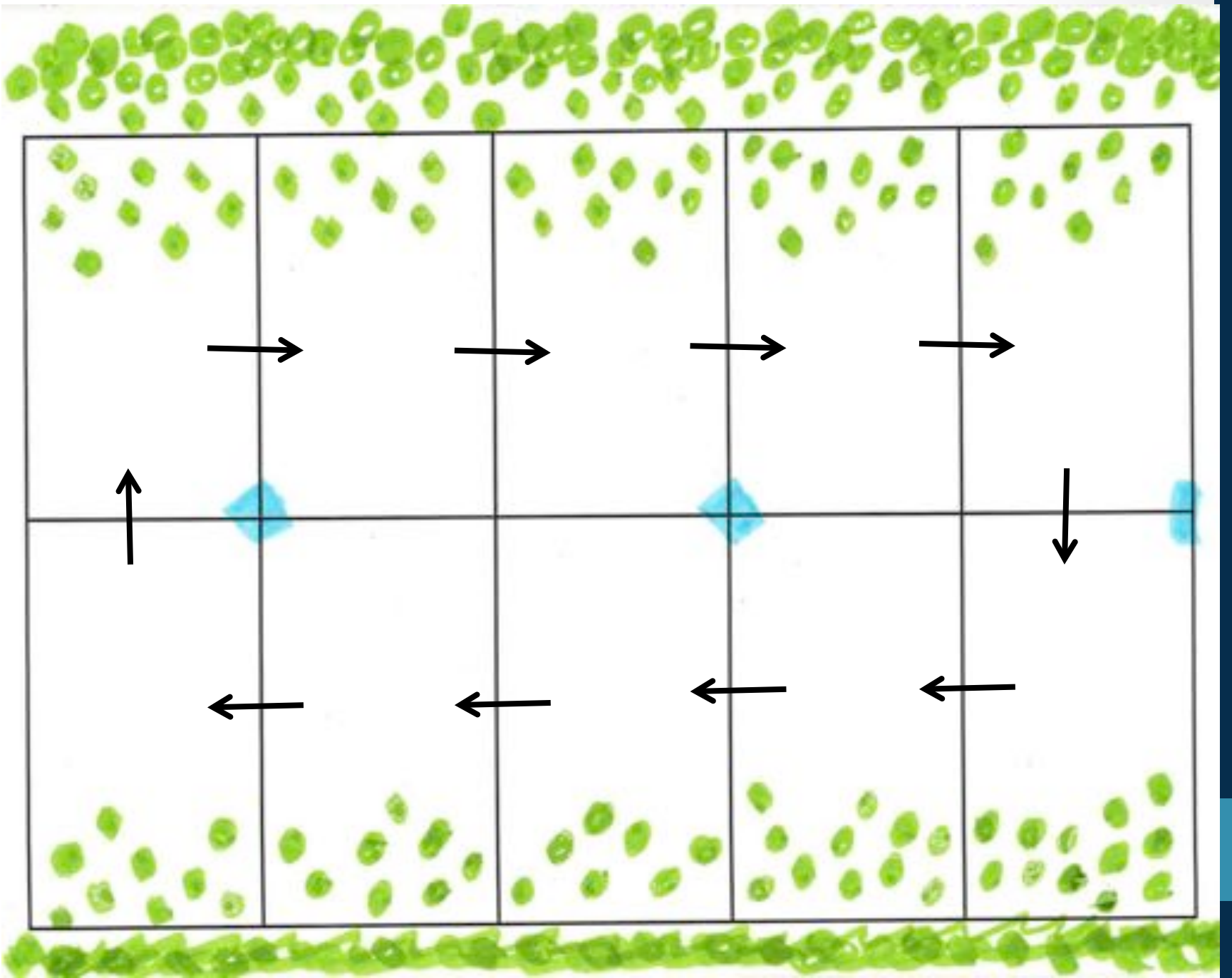
Shade

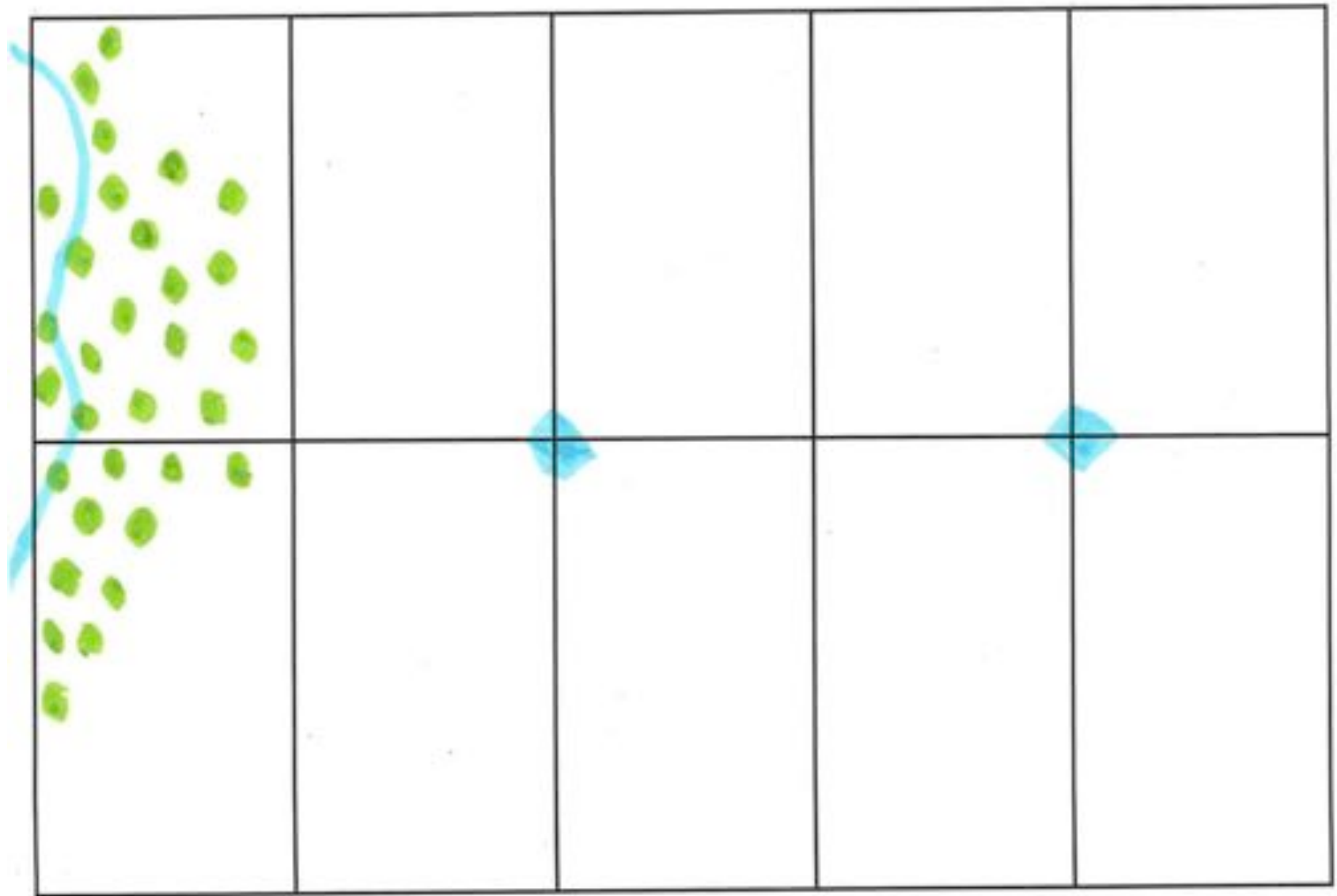
- Cows in the open pasture more likely to show signs of heat stress

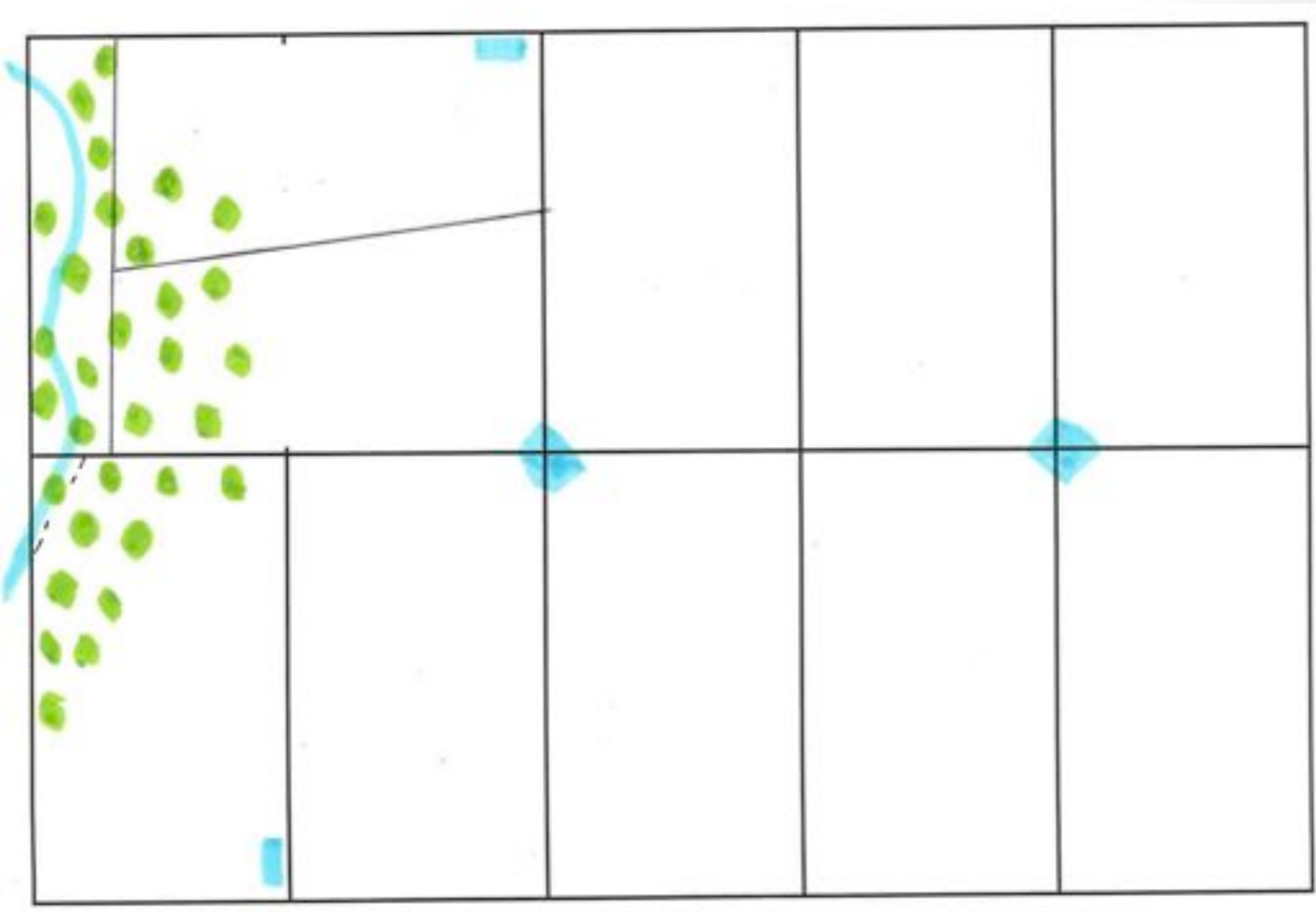












Heat Stress Factors

- Temperature
- Radiation (shade)
- Humidity
- Wind

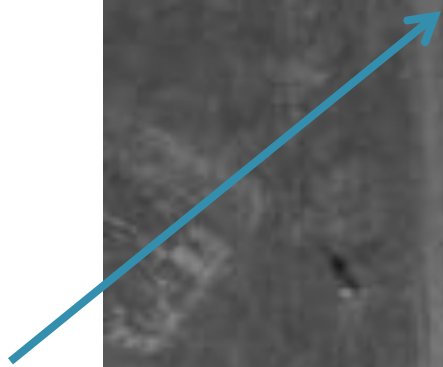


Edges

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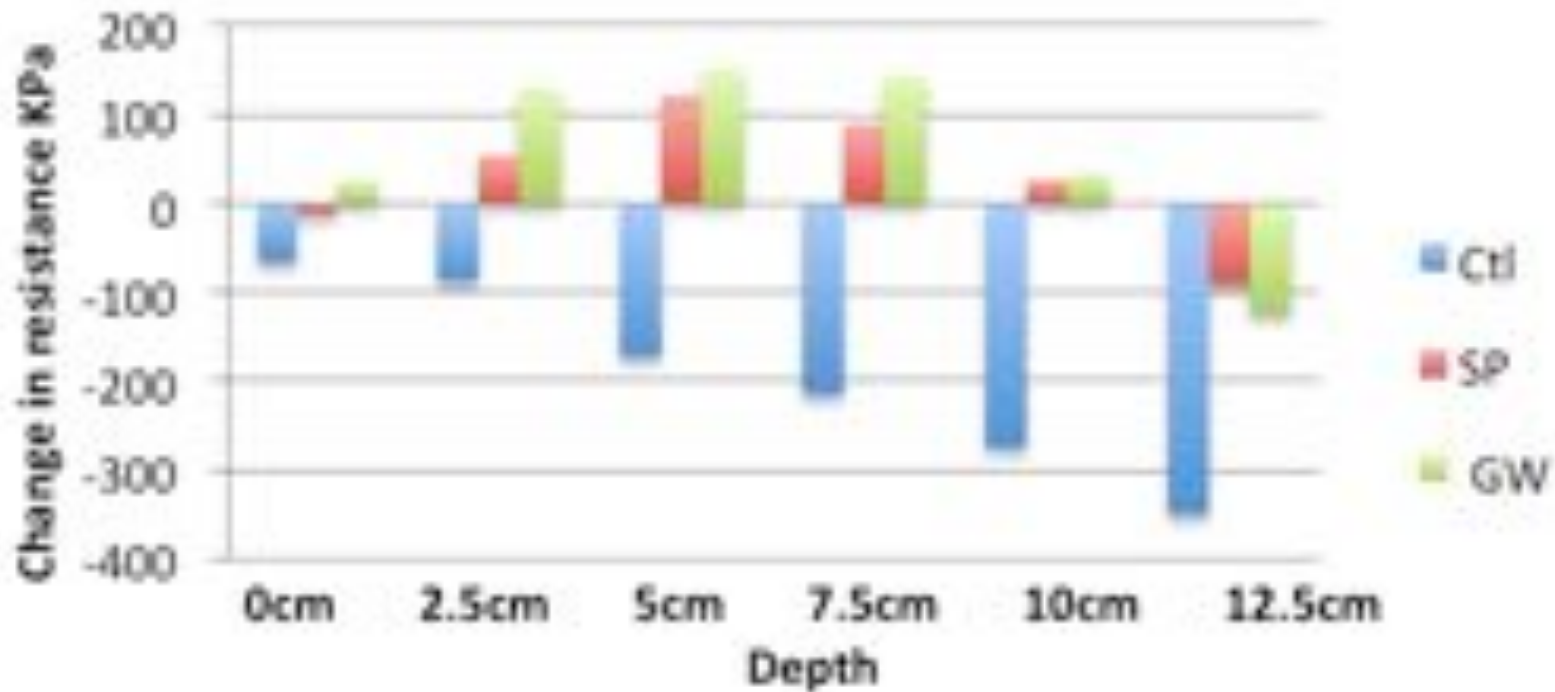




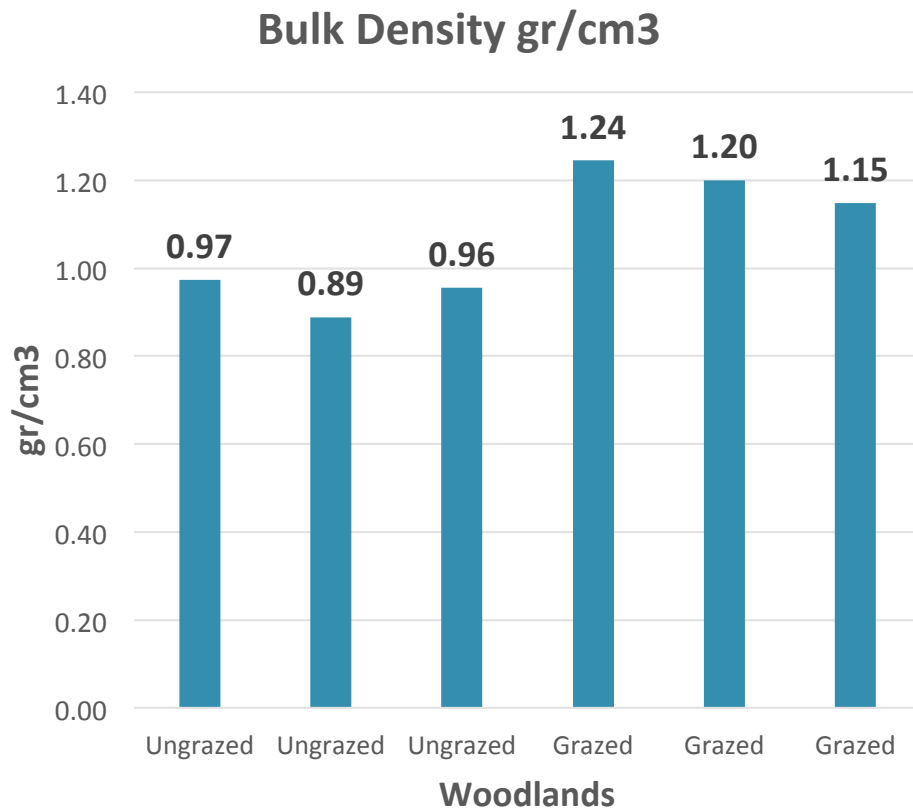


Soil compaction?

Change in soil resistance spring to fall 2017

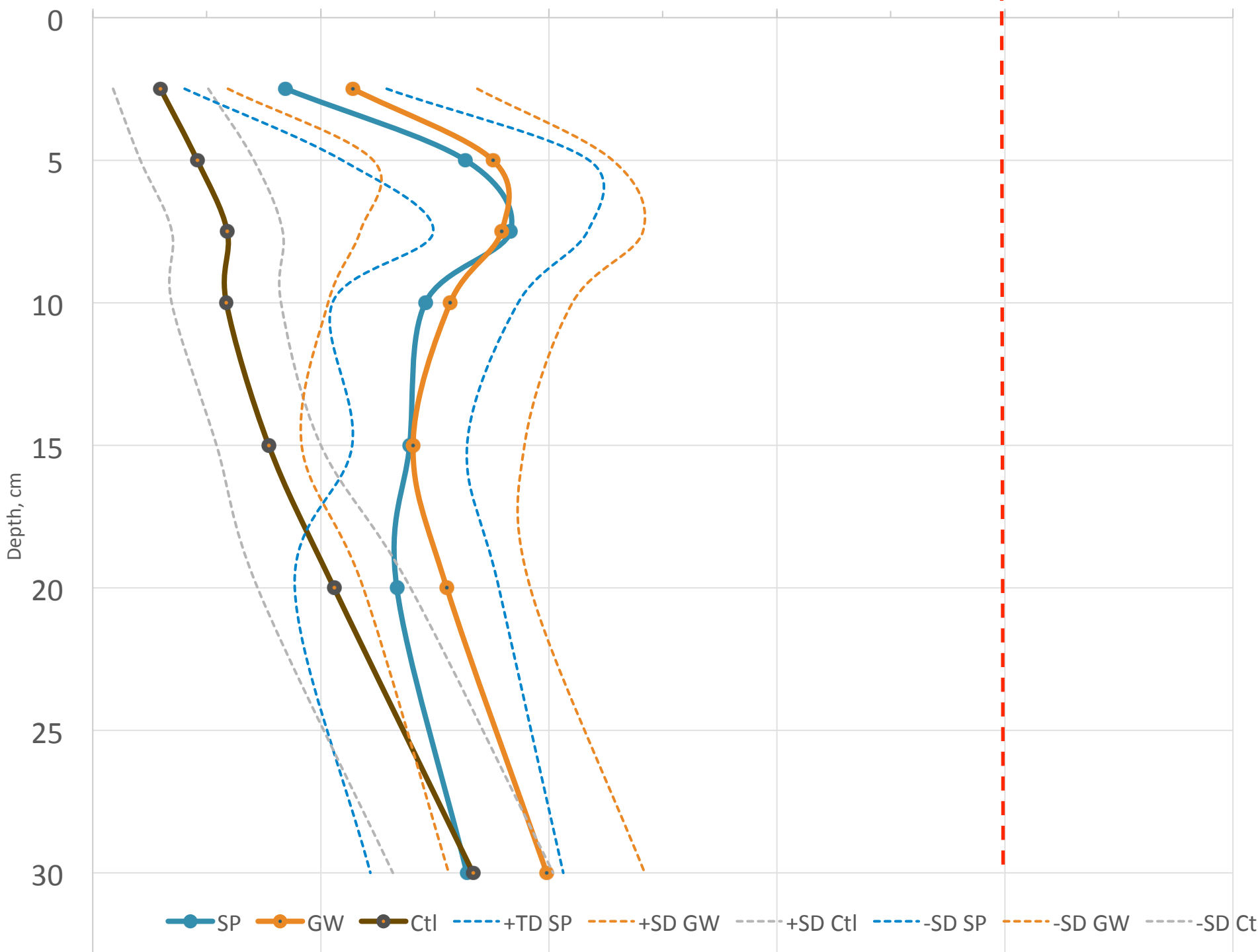


Grazed woodland is not silvopasture



Woodland Characteristics *Soil, Bulk Density*

- Un-grazed average 0.94 ± 0.044 gr/cm³
- Grazed woodlots average 1.2 ± 0.045 gr/cm³
- (p-value: 0.002)



Silvopasture vs Grazed Woods



- Grass in the silvopasture slows the spread of species such as thistles, white snakeroot, and pokeweed.
- Grass in silvopasture holds up better to cattle impact than the species in grazed woods, but not as well as the open pasture.

Silvopasture

Can improve animal welfare (esp. thermal comfort), but requires thoughtful management of grazing to prevent environmental damage:

- Manage grazing timing to maintain good forage layer
- Re-seed high traffic areas
- Manage shade to maintain good forage layer
- Ensure animals always have access to good forage

We will post silvopasture resources at

<https://fyi.extension.wisc.edu/sustag/resources/in-service-training/>

Thank you to:

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Questions?

