Eastern Hardwood Silvopasturing

By adding trees to pasture, or pasture to trees

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Adding woods to pasture (*or*…)

…Pasture to woods


“plantation”


“reclamation”


“woodlot”


“orchard”

Hardwoods vs. Softwoods

generally speaking, hardwoods:

Pros:

- Have a higher average timber value
- Can provide fodder (browse & mast)
- Greater species options for mixed plantings
- Nitrogen-fixing options

Cons:

- Higher establishment cost
- More vulnerable to value loss
- More sensitive to site quality
- May require corrective pruning

Honey Locust Pasture
(Gleditsia triacanthos)

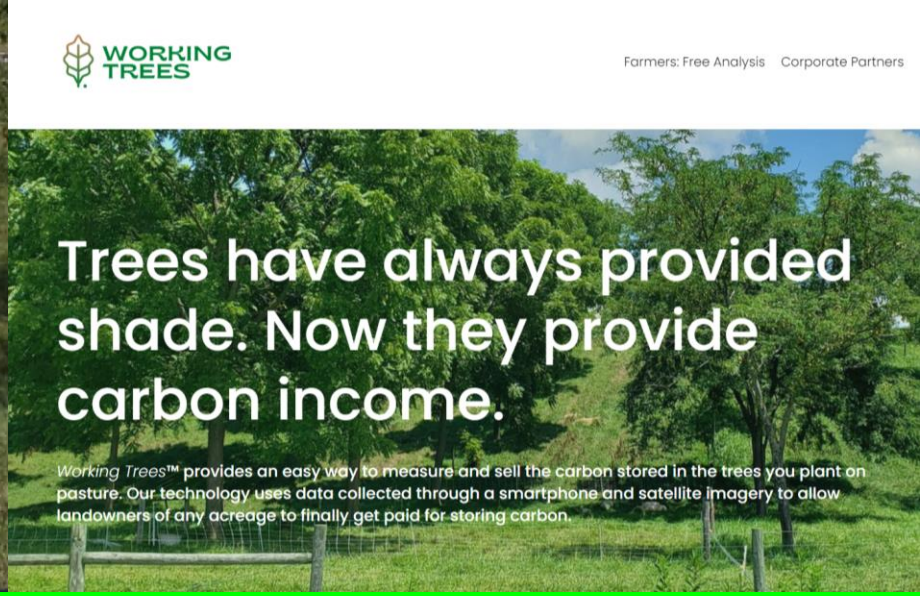
Alabama Ag Experiment Station

- 48 trees per acre @ 60 lbs pods/tree = 3,000 lbs pods/acre
  - Equivalent to 50 bu. Corn or 100 bu. Oats
  - Pod sugar content @ 29-39% (sugar beets)
  - Protein at 13%
- +2.5 tons of hay/acre as understory crop

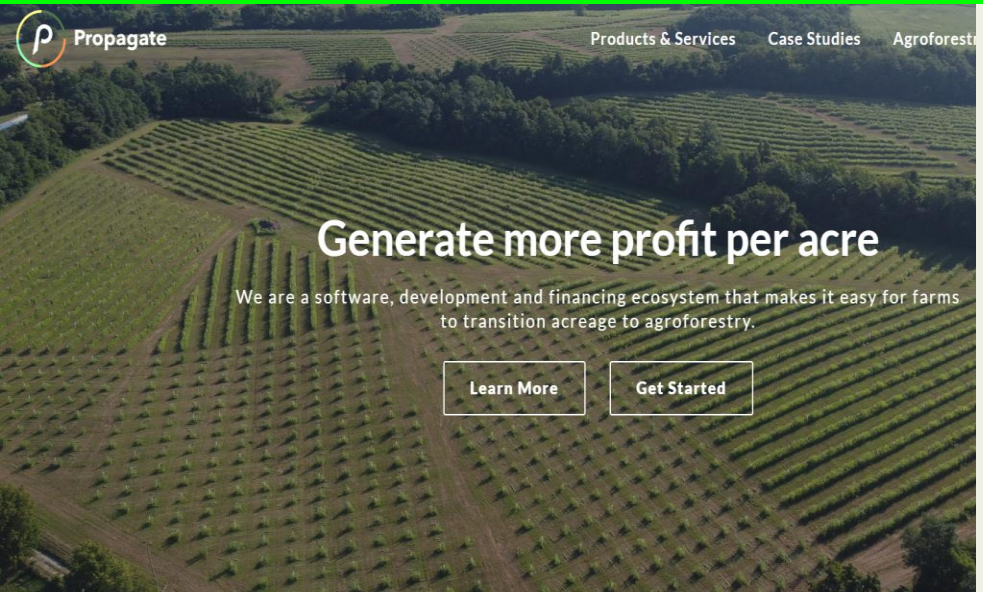
If Planting, Choose Tree That:

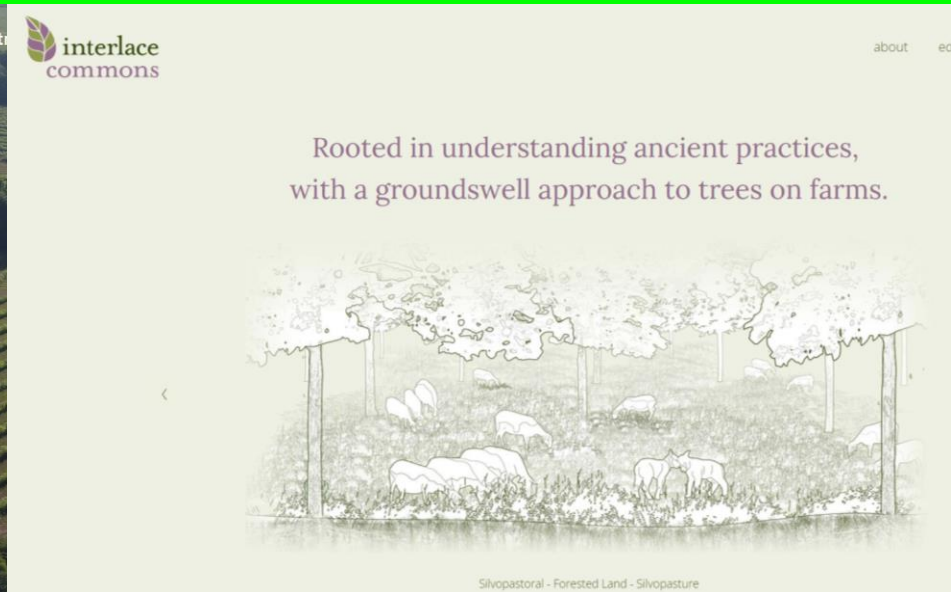
- Will achieve the objectives
- Have good genetics
- Are well-matched for the site
- Are free of (manageable) pests

and… are sufficiently hardy to establish under the planned level of care!



Help is out there!





Silvopasture Establishment in Existing Woods

Step 1: *Thinning*

Sunlight reallocation through tree density manipulation

Grow forages or firewood?

Goal: about 50% canopy closure

“Commercial” (make $)

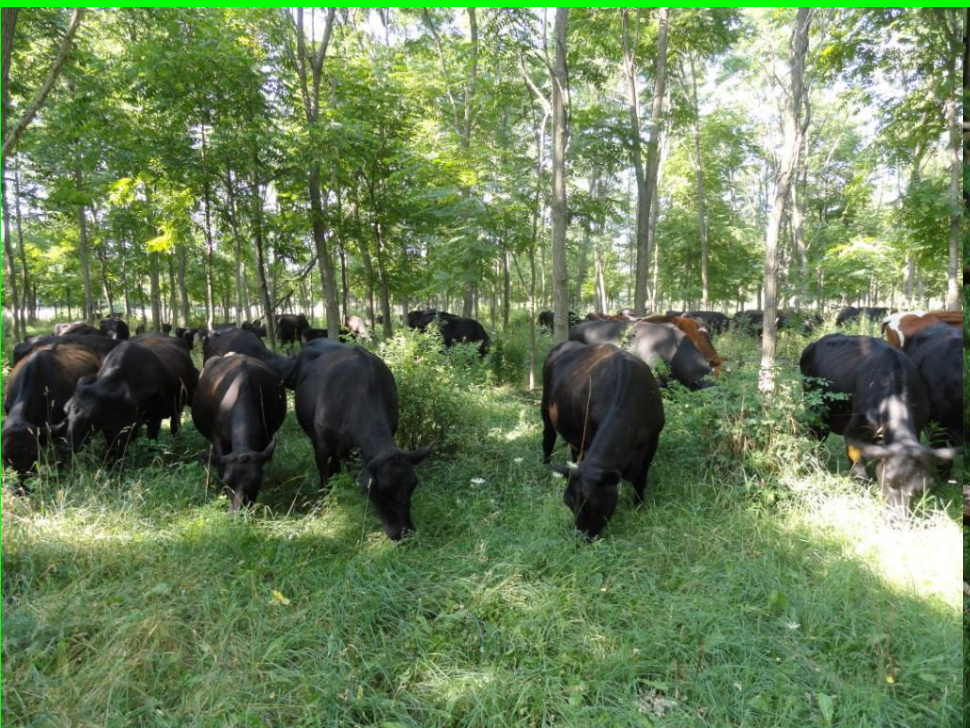
“Pre-commercial” (spend $)

Silvopasture is only as good as

the quality and quantity of the food available!

Step 2: Forage Establishment

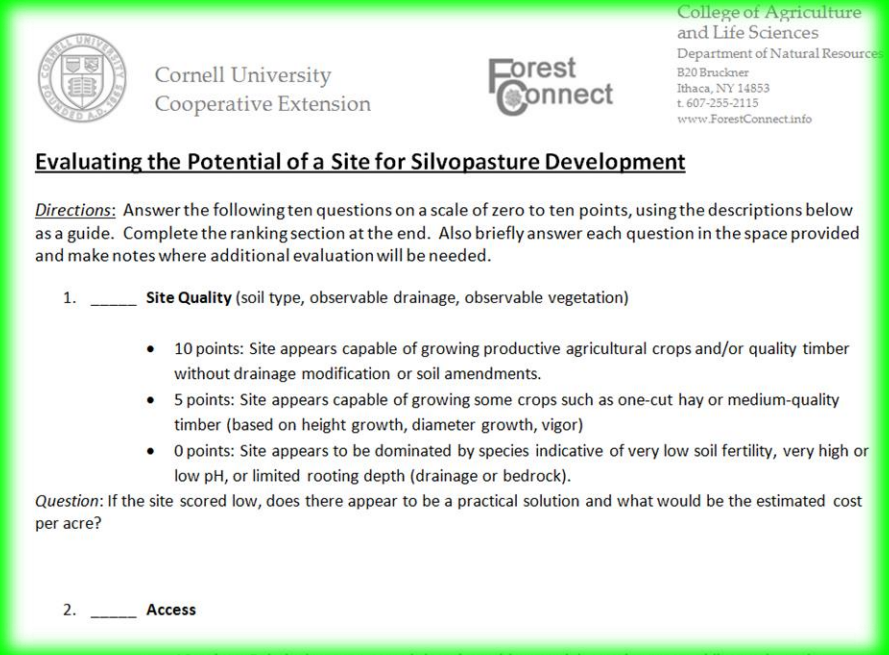
Step 3: vegetation mgmt. via the livestock workforce



Have a plan to periodically establish new trees, usually at the end of a silvopasture's life cycle

"Guide to Silvopasturing in the Northeast"

and other resources



Cornell University
Cooperative Extension

Forest Connect

College of Agriculture and Life Sciences
Department of Natural Resources
B20 Bruckner
Ithaca, NY 14853
t. 607-255-2115
www.ForestConnect.info

Evaluating the Potential of a Site for Silvopasture Development

Directions: Answer the following ten questions on a scale of zero to ten points, using the descriptions below as a guide. Complete the ranking section at the end. Also briefly answer each question in the space provided and make notes where additional evaluation will be needed.

1. _____ **Site Quality** (soil type, observable drainage, observable vegetation)

- 10 points: Site appears capable of growing productive agricultural crops and/or quality timber without drainage modification or soil amendments.
- 5 points: Site appears capable of growing some crops such as one-cut hay or medium-quality timber (based on height growth, diameter growth, vigor)
- 0 points: Site appears to be dominated by species indicative of very low soil fertility, very high or low pH, or limited rooting depth (drainage or bedrock).

Question: If the site scored low, does there appear to be a practical solution and what would be the estimated cost per acre?

2. _____ **Access**

Silvopasture Management Plan Template

Introduction

1. **Property Information**
   - a. Ownership profile
   - b. Biophysical profile
   - c. Farm management history
   - d. Mission and goals
     - i. Farm
     - ii. Silvopasture
2. **Maps**
3. **Management by Silvopasture Type**
   - a. Trees
     - i. Current condition
     - ii. Desired condition
     - iii. Actions
   - b. Forage
     - i. Current condition
     - ii. Desired condition
     - iii. Actions
   - c. Livestock
     - i. Current condition
     - ii. Desired condition
     - iii. Actions
   - d. Special features, threats and considerations
   - e. Evaluating the system
4. **Farm Infrastructure**
   - a. Current
   - b. Needed
   - c. Actions
5. **Silvopasture Viability**
   - a. Current condition
   - b. Desired condition
   - c. Actions
6. **Plan of Work**
   - a. Forest-to-silvopasture
   - b. Planting trees in pastures (Pasture-to-silvopasture)

available at: www.forestconnect.info

and www.silvopasture.ning.com

Farm Context

Lick Skillet Farm
25 miles East of Knoxville, TN

1k acres century farm
with state-of the art grazing mgmt;
all operations are pasture-based

Sell Grass-finished beef and lamb, pastured pork, chicken and eggs (gmo-, soy- and corn-free)

Direct Market nearly all meat locally via online sales (some wholesale)

Environmental Context: 9-month growing season, hot summers, ~50” annual rainfall, rich soils, rolling topography with ~15% of land steep and wooded, lots of wildlife,biodiverse pastures

Why Silvopasture?

From weight gain to calving/lambing weights, we know shade is critical to our animals' performance

We have lots of trees, but because of the legacy of haymaking, they aren't dispersed across the fields, so effectively we lack adequate shade

Trees ARE a critical part of a sophisticated grazing management system; but don’t be oversold. Your pasture management and infrastructure (fencing and water) must come first if you care about your productivity and profitability. Don’t overlook your soil or herdsman.

We made a lot of mistakes trying to grow trees in pasture, at first.

How We Successfully Grow Trees in Pasture

1st Carbon Credits for Silvopasture in US!

Our Solution

<u>Wrapped Tubes with Energized Polywire</u>

- Increased survival 4-5x
  - (from ~20% to >90%)
- Halfed cost
  - (from >$50/tree to <$25/tree*)

**Cost is per living tree at 2 years, includes all labor and materials costs*

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Walkthrough

- More details on Youtube…

  Search for:

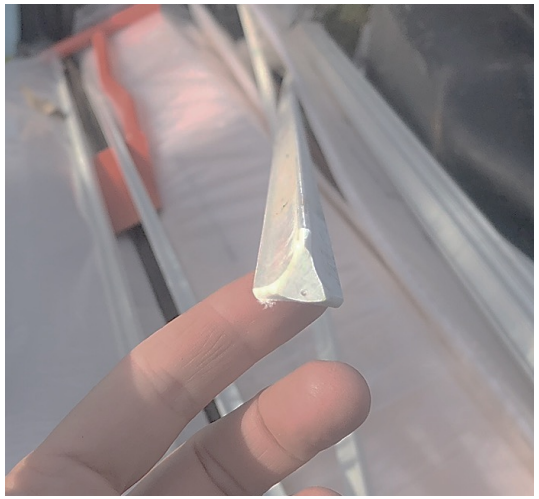
  “Wyn Miller Appalachian Sustainable Development”

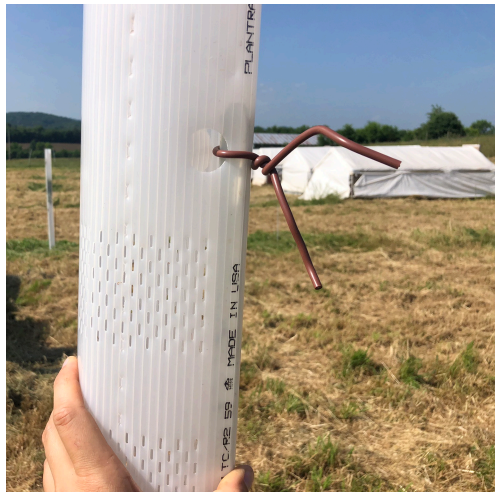
  https://www.youtube.com/watch?v=KxJN-YUjJOk

- *Please watch that video before contacting me directly for details on installing this system – thanks!*

The 6’ Plantra System

- 6’ long x 4” dia plastic tube with ~¼” vertical vent slits
- 7’ fiberglass stake, triangular in section
- Insulated twist-ties
- “Hair net” or plastic mesh sock
- Retail ~$10, wholesale ~$6.50
- Lifespan supposedly ~6yrs





Polywire

- Made specifically for rotational grazing
- Lighter weight and better visibility than traditional wire
- Plastic provides better tensile strength, less stretching
- 2.5 mm = ~7 cents/LF
- 2mm = ~3 cents/LF
- (metal electric fence wire ~2-3 cents)
- Lifespan many years if treated well
- Not made to be cut; made to be rolled and unrolled

Installation Walkthrough

1. **Set end posts**
2. Stretch “row wire” between 2 end posts and attach with insulated connection
3. Plant and prune trees
4. Drive stake
5. Slip on tube
6. Label if desired
7. Add insulated wire fasteners
8. Wrap with polywire and fasten
9. Top off with hairnet
10. Connect to “row wire”
11. Energize and test

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Solar

Permanent

Installation Walkthrough

Solar

- Good for <1 mile
- $150
- I like the ones with built-in ground

Permanent

- Good for >1 mile
- $700
- Look for high joules if weeds are an issue (5 +)
- Put in multiple sturdy grounding rods and connect securely

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Recommend 6-7k volts for training period, 2-3k volts for maintenance thereafter

Pros and Cons

Pros

- Plantra tubes improve growth
  - Growth rate
  - Upright linear form
  - “Mini-greenhouse” extends growing season
- Fits livestock farmers
  - Materials we are comfortable with
  - Forgiving, lightweight
  - Great visibility from afar
  - Walk away and leave it
  - Cattle manage weed competition

Pros and Cons

Cons

- Labor intensive
  - Fiberglass bad if damaged
  - Tubes *may* slow maintenance
  - Polywire not meant to be cut
  - Cutting and finishing ends of polywire takes time and dulls tools
  - Tip: Wrap tubes ahead of time for less time in the field
- Hanging row wire impedes vehicles (couplers may help)
- Hoping Plantra will come up with a manufacturing solution to reduce labor

"So, how do you address…?"

Observation	Context	Interpretation
We do not have voles or mice	Ecological? Lots of weasels and small mammal predators	We **do not** protect from voles
We do not have deer	Ecological We have other ruminants present in all pasture.	We **do not** protect from deer
Any time the trees are not heavily grazed around, they are overtaken by weeds	Climate	We **do not** fence animals away from trees
We do have strong winds, but our trees are not injured by tubes, just "callused"	Climate	We **do not** modify tubes for wind
We have birds regularly remove hairnets (socks)	Ecological	We **do** modify the top of tubes for securing hairnets

Securing “Hairnets”

Callus

"What species do you plant?"

Observation	Context	Interpretation
We do not have a market in place for any timber or non-timber products	Farm Goals/ Operations Shade is the primary goal, any other income is ancillary	We do not plant any species that require special care
We have no disease problems	Farm Goals/ Operations We plant a wide variety of native ecotypes, with very few domestic fruit or nut spp	We do not sterilize pruners, or provide any disease treatment
We need shade, yesterday!	Farm Goals/ Operations Shade limits heat performance NOW, but trees grow slowly	We use "fast filler" spp on close centers that will be cut, such as redbud, silver maple, lombardy, mulberry, and loblolly pine
We need and want pines	Farm Goals/ Operations Critical habitat plus screening	I developed a "plucking" maintenance for pines
Hanging wires create an obstacle for vehicles	Farm Goals/ Operations We need to bushhog between rows, and drive under hanging wires	We are using couplers to extend the high of cross-row connections

“Plucking” Pines

"Why spend so much time on the energized tubes?"

Observation	Context	Interpretation
Our employees are very busy, and the only value-added work is directly oriented towards producing high-quality meat	Farm Goals/ Operations	We "front-load" our establishment, building systems that will require minimal maintenance after establishment
Mowing is not feasible	Farm Mowing costs a lot of time and money, and our business model is feeding animals	We do not mow around trees
We cannot remove tubes/ polywire until trees are very large in diameter	Farm Goals/ Operations	We employ a "phase 2" period wherein the stakes are removed, and tubes cut horizontally, to allow further increase in diameter while still providing protection

“Phase 2”

“Phase 1”

Thank You

Email:

wmlandsolutions@gmail.com

- Youtube Walkthrough…

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- *Please watch that video before contacting me directly for details on installing this system – thanks!*

- Also, we’re hiring! Send folks interested in grazing and agroforestry our way…specifically looking for a sheep enterprise manager