

Shepherd Ridge Farm

Integrating Hazelnuts and Cattle

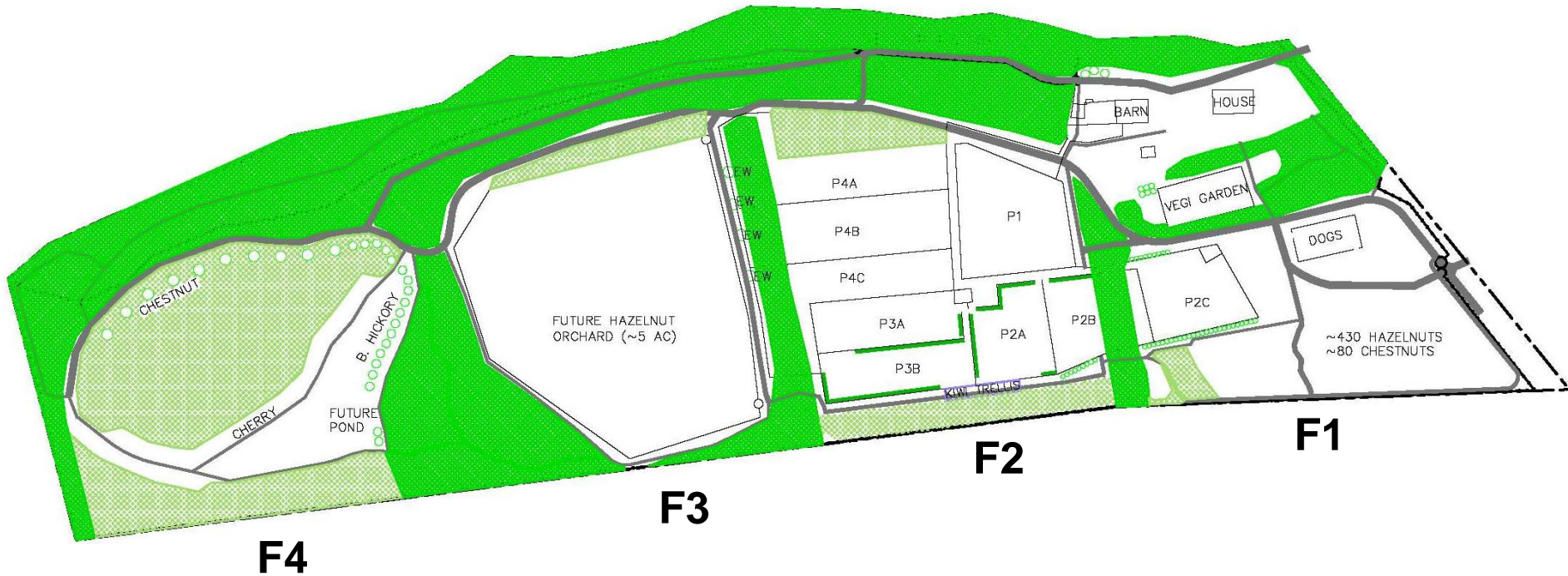


Presented By: Abigail Gilson

Why Nuts?



Farm Layout



~38 Acres:

F1 Propagation Orchard

F2 Rotational Grazing

F3 Future Commercial Hazelnut Orchard

F4 Reforesting/Pond for Orchard Irrigation

A person wearing a dark hoodie and pants is walking away from the camera across a large, open field of dry, yellowish-brown grass. Two small, white, fluffy dogs are running ahead of the person. In the background, there is a line of bare trees under a blue sky with scattered white clouds. A semi-transparent grey box is positioned in the upper center of the image, containing the text 'F1'. Another semi-transparent grey box is in the lower left corner, containing a list of plant types.

F1

First Plantings:
Apples, Hazelnuts,
Chestnuts, Raspberries,
Cherries, Peach, Paw Paw,
Shagbark Hickory

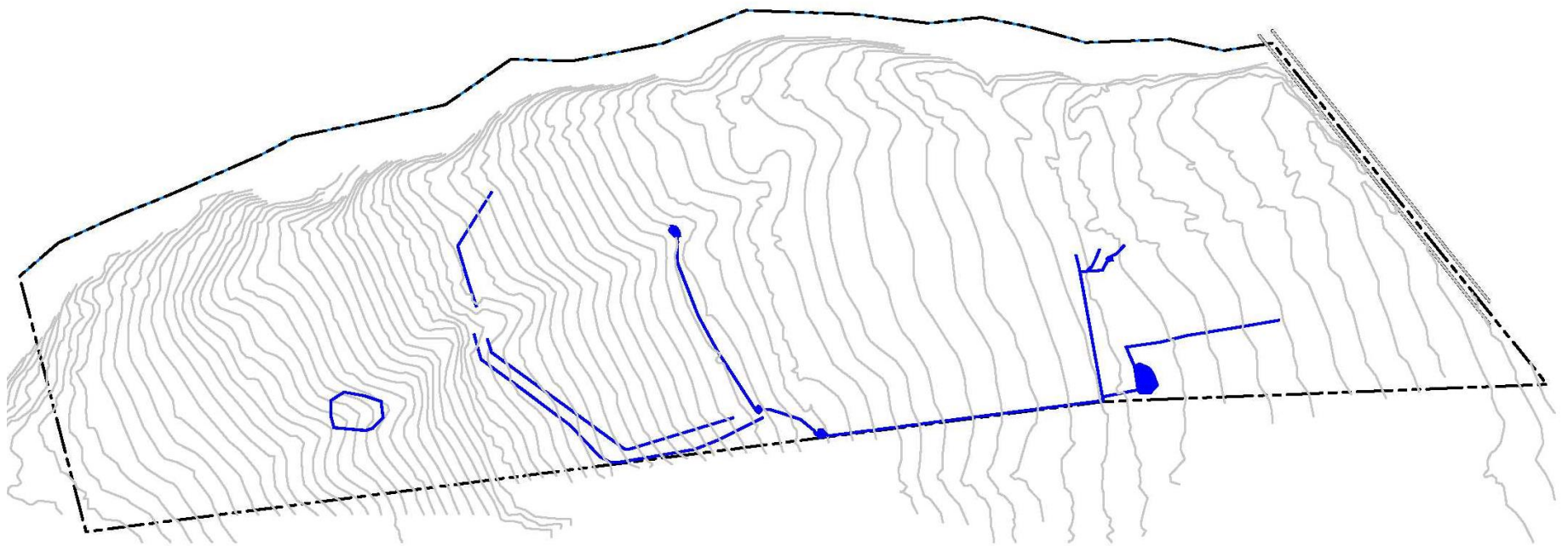
Soil/Drainage Issues



Drainage Plan



Drainage Plan



Microponds



The power of the shovel



Culverts



Tree Planting Prep



Silvopasture Challenges

- Cattle like to rub their heads on trees
- Cattle can step on/destroy young trees
- Overgrazing can compact soil
- Grazing can only take place around trees up to 120 days before harvest (food safety requirement)
- Hazelnut harvest Aug-Sept, so grazing must stop by end of April!

Solutions

- Electrified fencing around tree rows
- Bale grazing in orchard during winter
- Controlled manure application (separate grazing pasture)

Application of Manure as Fertilizer

- Nitrogen likely limiting nutrient so design for N
- Manure takes several years to release all N, so can safely apply over twice as much as needed for that year
- Bonus: worm action – loosens soil
- For pre-planting prep, place \geq 6 months ahead of planting for best results
- Nutrient bank stays around tree rather than washing away (cover with mulch)

Wood Chip and/or Straw Bedding



Winter Manure Pile





Manure as Fertilizer

single tree requirements		
Year	# N	# manure
1	0	0
2	0.25	62.5
3	0.33	82.5
4	0.39	97.5
5	0.45	112.5
6	0.51	127.5
7	0.57	142.5
8	0.63	157.5
9	0.69	172.5
10	0.75	187.5

0.004 lbs N/lb manure

60 lb manure/ young tree / year

0.24 lbs Nitrogen

65 lbs per day manure production / cow

23,725 lbs/year per cow

135 trees/acre in mature orchard

5 months of year for manure gathering

25,313 lbs manure/acre mature orchard

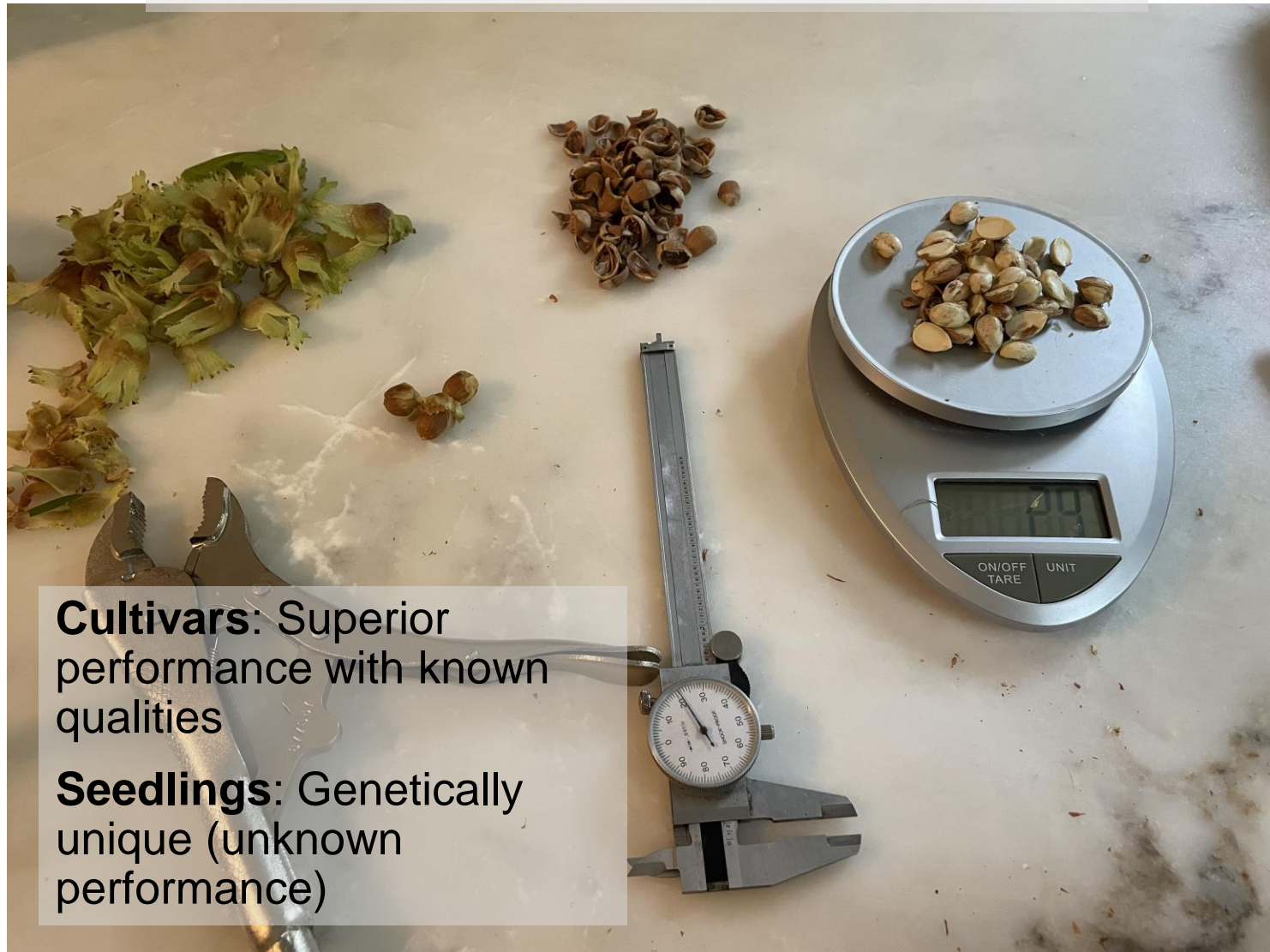
2.6 cows/acre to support mature hazel orchard

- 1 cow/acre with 100% manure capture

Wood Chip Manure Cover



Hazelnut Genetics



Cultivars: Superior performance with known qualities

Seedlings: Genetically unique (unknown performance)

Hazelnut Processing at Nut Hub (New York Tree Crops Alliance)

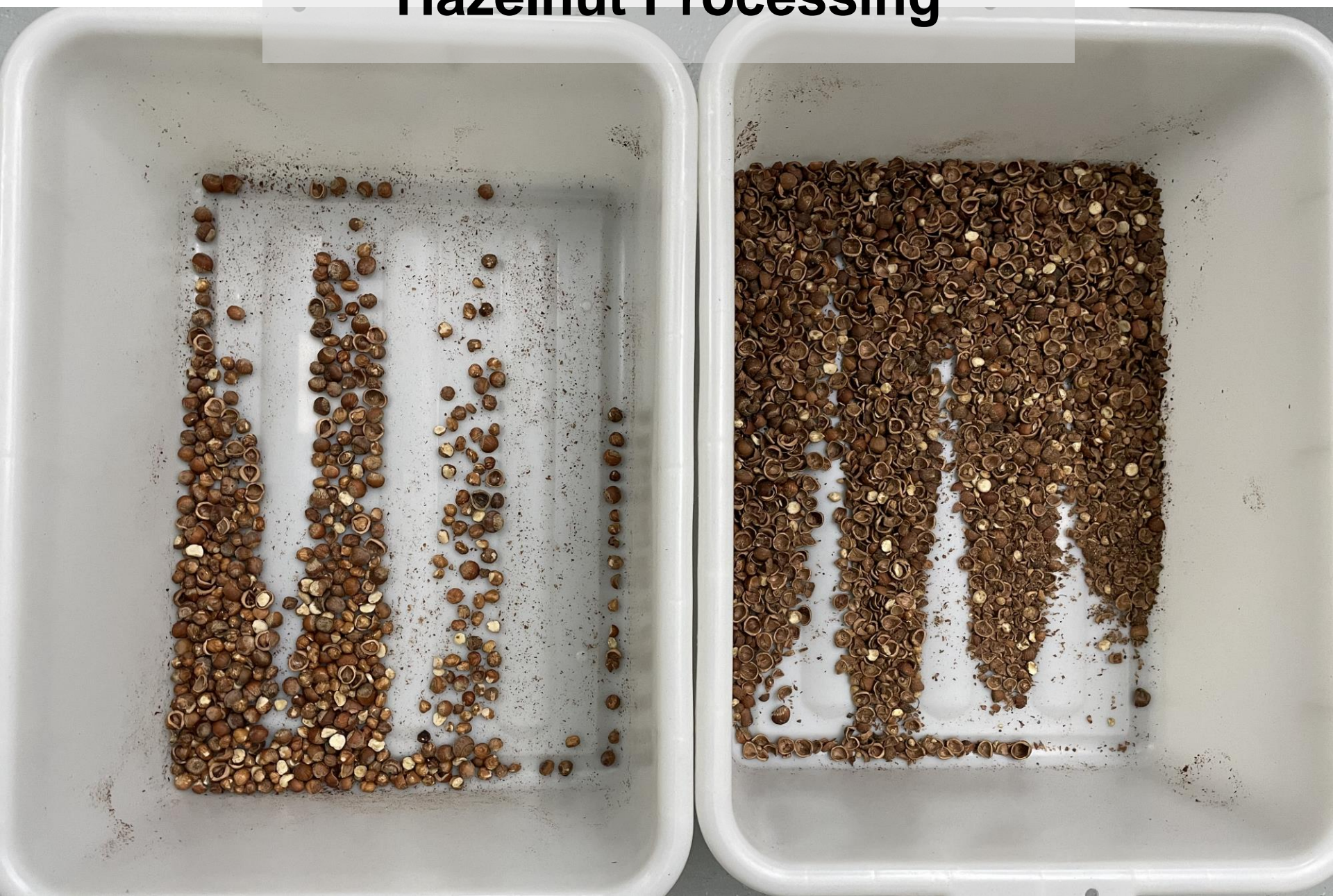


Contact Info: outreach@nytca.org

Hazelnut Processing



Hazelnut Processing



Commercially Viable Nuts



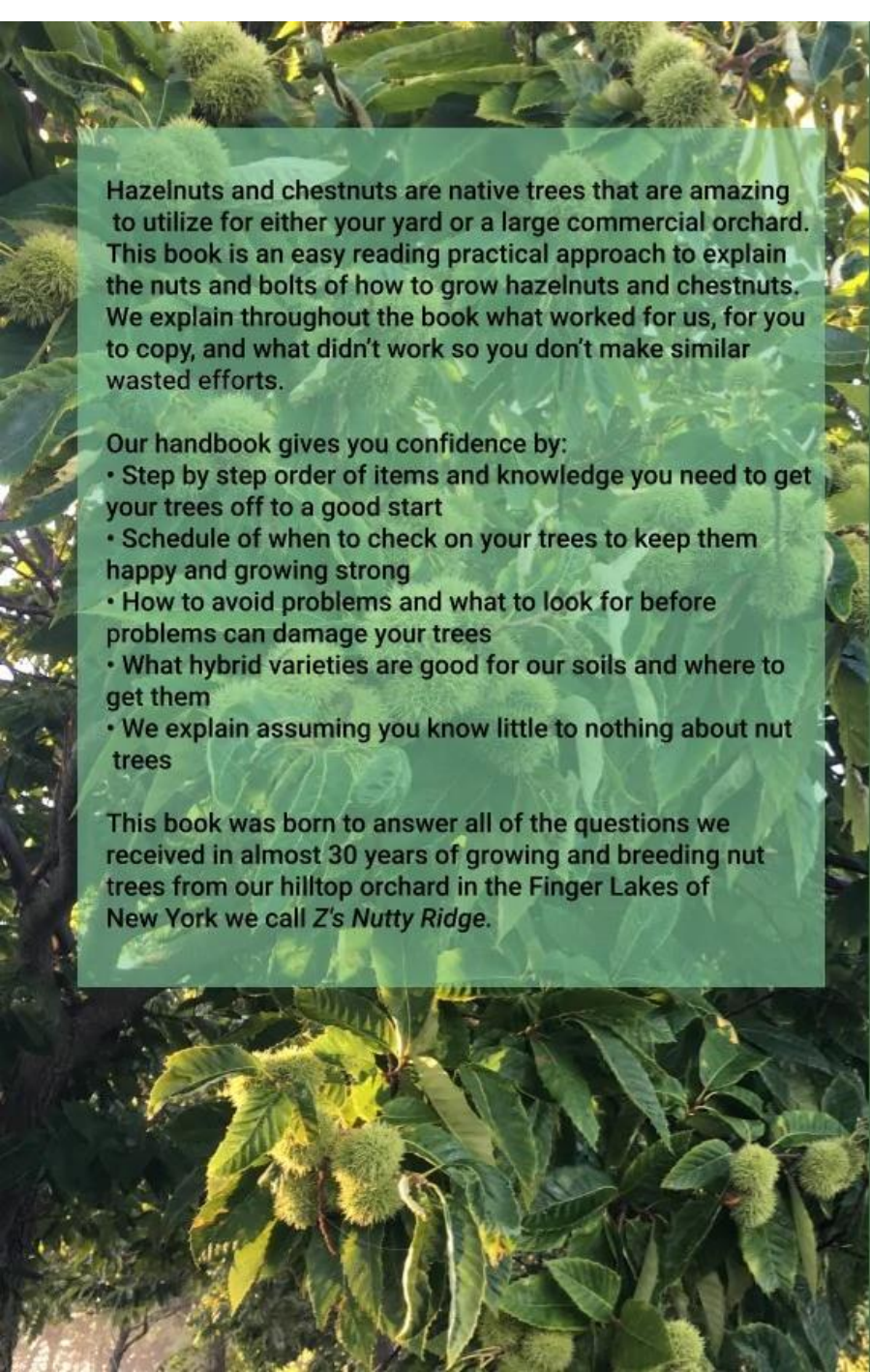
- Size and Shape
- Shell thickness
- Blight resistant
- Cold hardy
- Known yields

NITKA cultivar

Rutgers (zone 6 and up)

4 UMHDI cultivars (2-3 years for launch)





Hazelnuts and chestnuts are native trees that are amazing to utilize for either your yard or a large commercial orchard. This book is an easy reading practical approach to explain the nuts and bolts of how to grow hazelnuts and chestnuts. We explain throughout the book what worked for us, for you to copy, and what didn't work so you don't make similar wasted efforts.

Our handbook gives you confidence by:

- Step by step order of items and knowledge you need to get your trees off to a good start
- Schedule of when to check on your trees to keep them happy and growing strong
- How to avoid problems and what to look for before problems can damage your trees
- What hybrid varieties are good for our soils and where to get them
- We explain assuming you know little to nothing about nut trees

This book was born to answer all of the questions we received in almost 30 years of growing and breeding nut trees from our hilltop orchard in the Finger Lakes of New York we call Z's Nutty Ridge.

ZARNOWSKI

The Hazelnut and Chestnut Handbook



The Hazelnut and Chestnut Handbook

ALL YOU NEED TO KNOW TO GROW HAZELNUTS AND CHESTNUTS FROM 2 TO 20,000 TREES



Jeff and Dawn Zarnowski of Z's Nutty Ridge LLC

F3 Commercial Hazelnut Orchard Layout



4-5 Rows of Cultivars

- Double Density
- 18' row spacing
- 10' spacing cultivars
- 5' spacing pollinators

826 cultivars

525 pollinators

Pollinators every 4th or 5th row and also on ends

F3 Revenue Estimate

*Yield is in-shell

*Assume every other tree is cut down at year 8

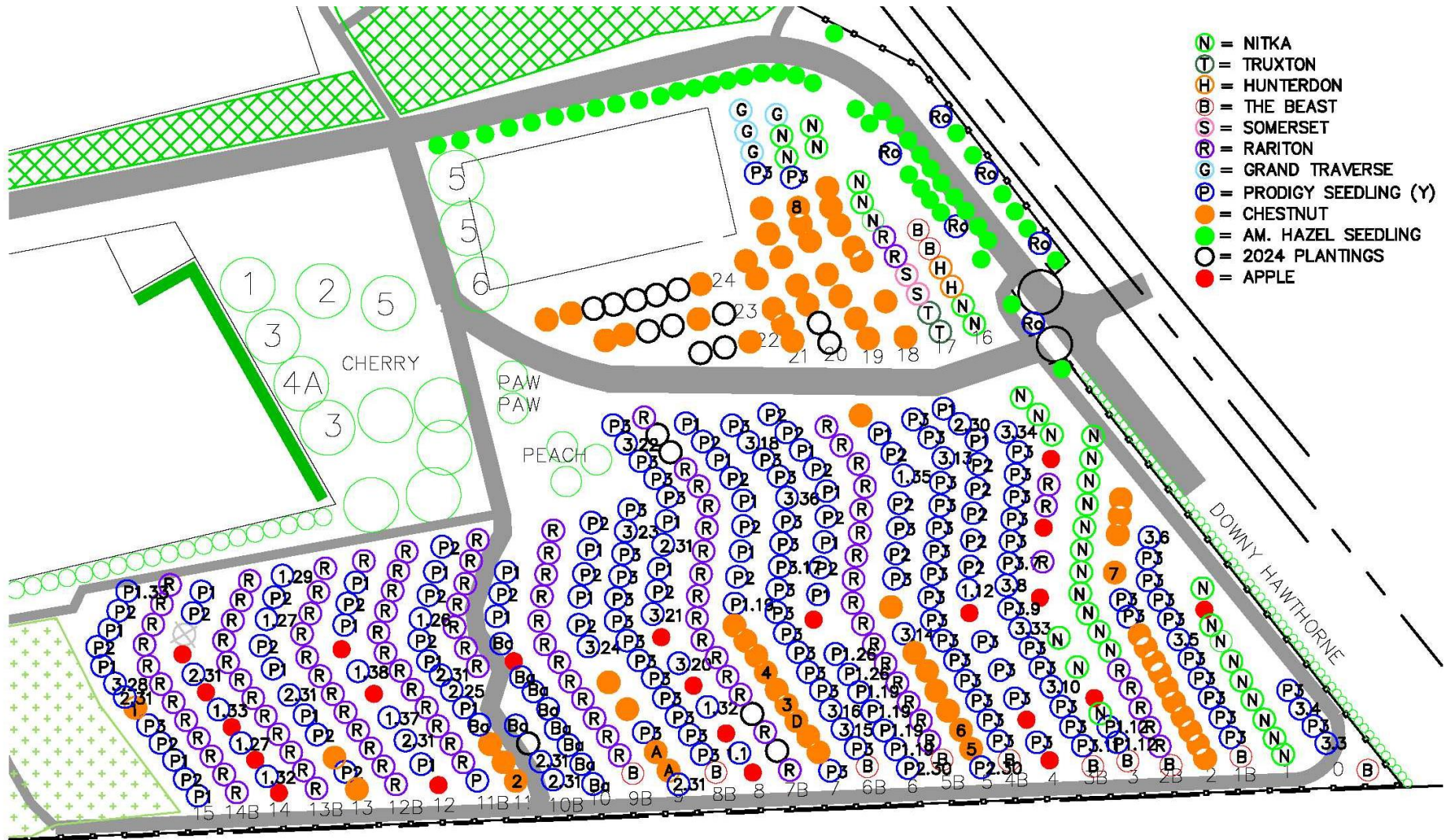
*Assume yield is only from cultivars, not seedlings, and beasts count as cultivars

Sales price per pound **\$2.00**

	Year	Number of trees	Yield/Tree (lbs)	Total Yield (lbs)	Revenue
1	2029	390	0	0	\$0
2	2030	934	0	0	\$0
3	2031	934	0.688073394	642.6605505	\$1,285
4	2032	934	2.614678899	2442.110092	\$4,884
5	2033	934	4.036697248	3770.275229	\$7,541
6	2034	934	5.504587156	5141.284404	\$10,283
7	2035	934	10.09174312	9425.688073	\$18,851
8	2036	467	11.00917431	5141.284404	\$10,283
9	2037	467	14.67889908	6855.045872	\$13,710
10	2038	467	18.34862385	8568.807339	\$17,138
11	2039	467	21.10091743	9854.12844	\$19,708
Maturity	2040	467	25.68807339	11996.33028	\$23,993

- Note: ~17 lbs/hr Handpicking. (705 hrs/17 weeks at 40 hrs/week)

F1 Orchard Layout



F1 Hazelnut Genetics and F3 Planting

- Remove inferior seedlings (improve quality of pollen)
- Harvest seeds from **cultivars** in F1
- Grow out seedlings as pollinators in air-prune beds
- Grow out cultivars in F1 and propagate via layering to plant in F3
- 2026: plant first half of seedlings
- 2027: plant second half of seedlings
- 2028: plant first half of cultivars
- 2029: plant second half of cultivars

*Key: **Don't plant more than you can take care of**

Prodigy Seedlings



Seedling Propagation



Cultivar Propagation



Orchard Management: Irrigation

A white, cylindrical irrigation tank is mounted on the back of a tractor. The tank has a red stripe around its middle. A black hose is coiled around the front of the tank. The tractor is parked on a wooden deck in an orchard with trees in the background.

Hazelnuts may need
irrigation during first 1-3
years

Orchard Management: Deer

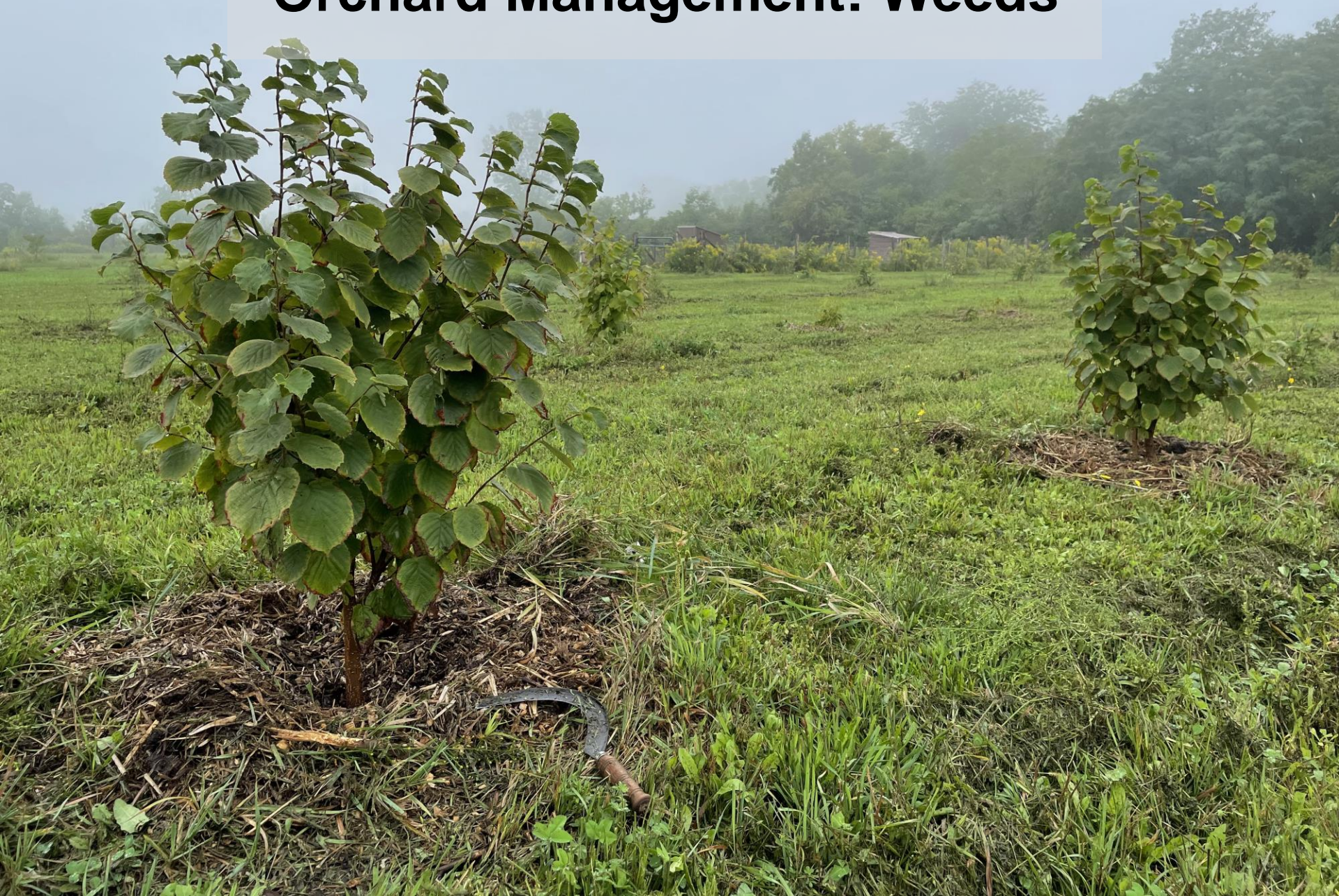


Orchard Management: Voles



Best defense against voles is mowing!

Orchard Management: Weeds



Orchard Management: Pests



- Biodiversity and predator habitat
- Pheromone traps if necessary
- Tree of Heaven control
- Spongy moth – Bt Spray

Expanding Manure Application



- Skid Steer Rental

- Manure Spreader



EFFORTLESS
MANURE
MANAGEMENT



ROBUST
CONSTRUCTION

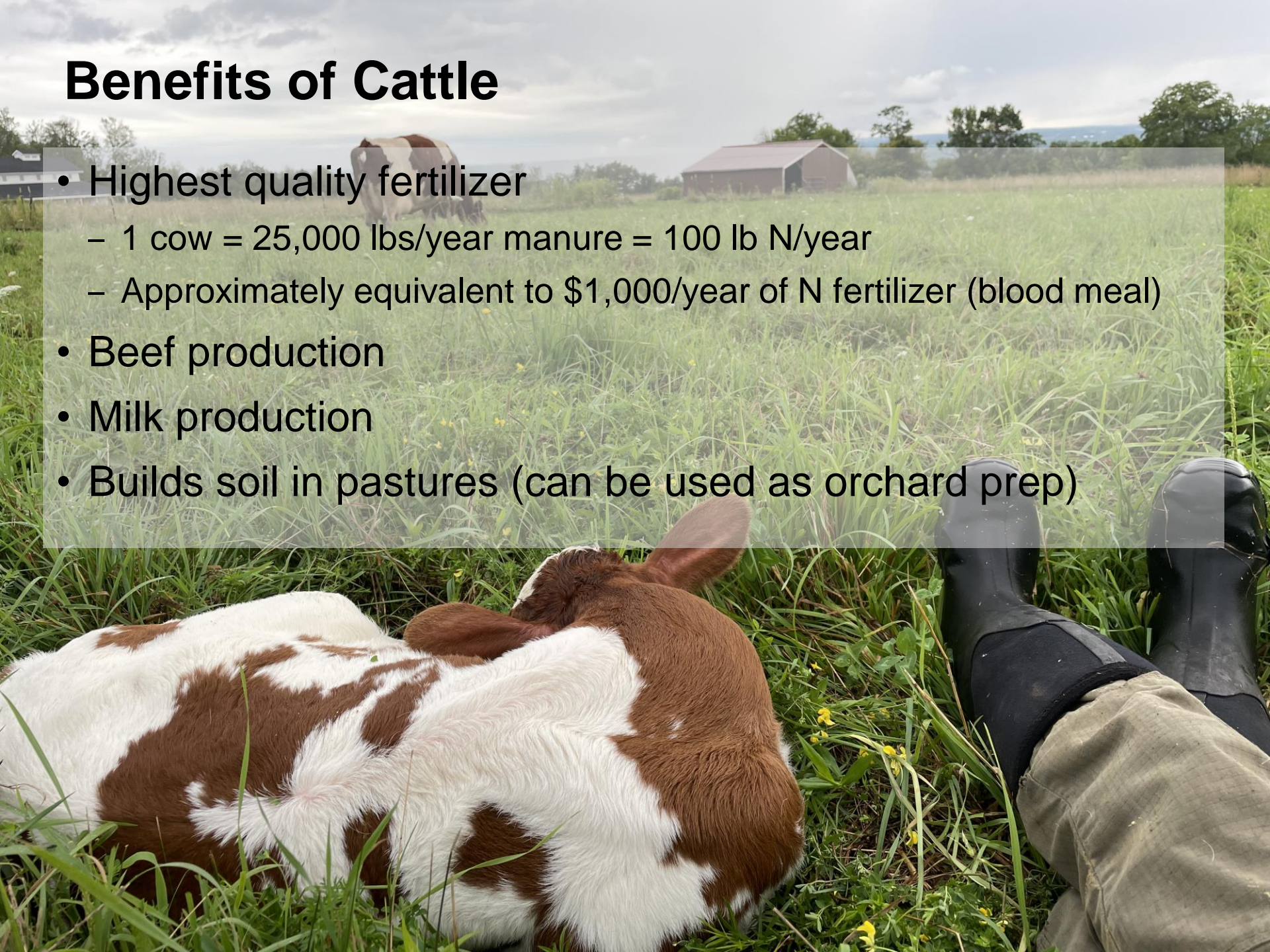


CONVENIENT
OPERATION



Benefits of Cattle

- Highest quality fertilizer
 - 1 cow = 25,000 lbs/year manure = 100 lb N/year
 - Approximately equivalent to \$1,000/year of N fertilizer (blood meal)
- Beef production
- Milk production
- Builds soil in pastures (can be used as orchard prep)



Composting Cow Manure





QUESTIONS?

For farm tour, park at Dutch
Harvest Farm:
1487 Ridge Road, Lansing

Contact: info@shepherdridgefarm.com