

COMPANION PLANTING OF SUNFLOWERS IN VINEYARDS FOR PEST BIRD MANAGEMENT

2021:2022







Measure the effectiveness of companion planting sunflowers in a vineyard

for minimizing damage from pest birds,

compared to labor-intensive netting of grapes



TEAM

Joe Hannan

Iowa State, Guide

Kristy Walker

*Walker Homestead
Farm and Winery*

Chris Larsen

Compass Hill Vineyard

John Barber

Ottawa Vineyards





PLANTING PLAN

Royal Hybrid Sunflower

- ❑ High-yielding, early sunflower, edible seeds
- ❑ Single stem/bloom height 7' flower diameter 8"
- ❑ **Space 8–12 in. in rows 18–36 in. apart, 1.5in. deep**
- ❑ Plant after soils warmed to **50 degrees F.**
- ❑ **Days to Bloom 68-71, Days to Seed 100-110**

PLANTING PLAN





Acres	.65	.45	.4
Seeds Needed	11,818	8,182	7,273
Pounds	3.9	2.7	2.4

1. Roundup/Herbicide 14 days prior to first tillage
2. Till just prior to planting after soils have warmed to **50 degrees F.**
3. Divide seeds evenly by 4 plantings every 2 wks (i.e., May 1, May 15, Jun 1, Jun 15)
4. Plant farthest patch first
5. After sunflowers appear then post emergent of Poast/Select product (csethoxymid or clethodim) when grasses are 2-4 inches or till

NCRS - SARE | Sunflower Project

Site Map of Proposed Planting Areas
Section 9 - T81N - R23W | Elkhart Township, Polk County, Iowa

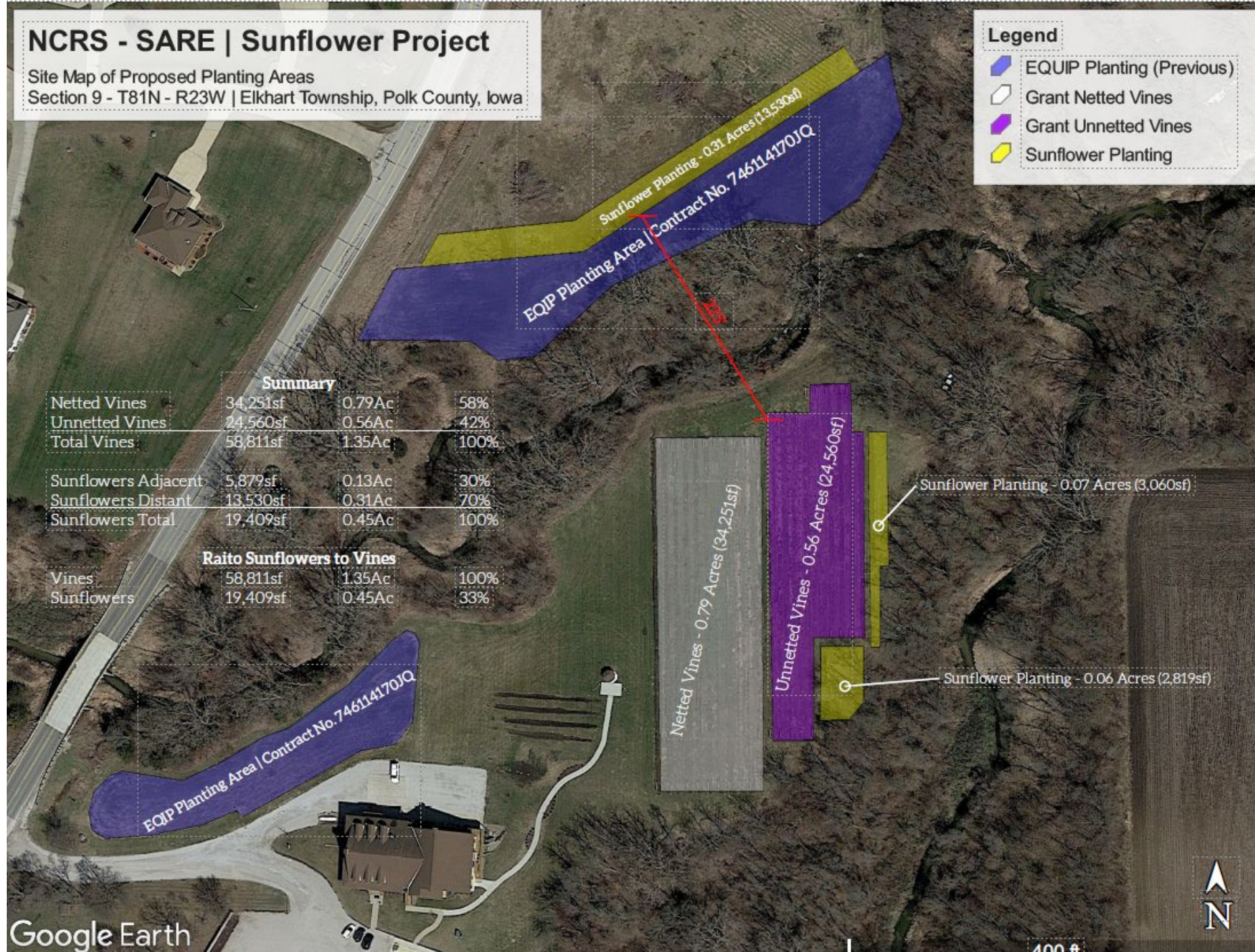
Legend

-  EQUIP Planting (Previous)
-  Grant Netted Vines
-  Grant Unnetted Vines
-  Sunflower Planting

Summary			
Netted Vines	34,251sf	0.79Ac	58%
Unnetted Vines	24,560sf	0.56Ac	42%
Total Vines	58,811sf	1.35Ac	100%

Sunflowers Adjacent	5,879sf	0.13Ac	30%
Sunflowers Distant	13,530sf	0.31Ac	70%
Sunflowers Total	19,409sf	0.45Ac	100%

Ratio Sunflowers to Vines			
Vines	58,811sf	1.35Ac	100%
Sunflowers	19,409sf	0.45Ac	33%



Ottawa Vineyards



Modified Two-Row Planters



Site Preparation

Burn Down



Tillage



April 15, 2021 – Burn Down

- Sprayed the site with a Glyphosate / Gluphosinate mix to kill the vegetation

May 5, 2021 – Till

- Rented a tiller and tried to prepare for planting
- Dry and hard ground > tiller was not adequate
- Tried to plant but couldn't get any penetration with the planter
- It rained and rained and rained...

May 27, 2021 - Planted

- Hired a guy with a big disk to tear it up.
- Harrowed the ground as best we could and planted.
- Time was running away from us

Challenges

- Depth of one side too deep- seeds never appeared
- Weeds emerged - failed to use a post emergent
- Deer took all put 3 plants
- Turkey (new to region, attracted to sunflower plot, then to vineyard)
(Turkeys ❤️ Japanese Beetles)



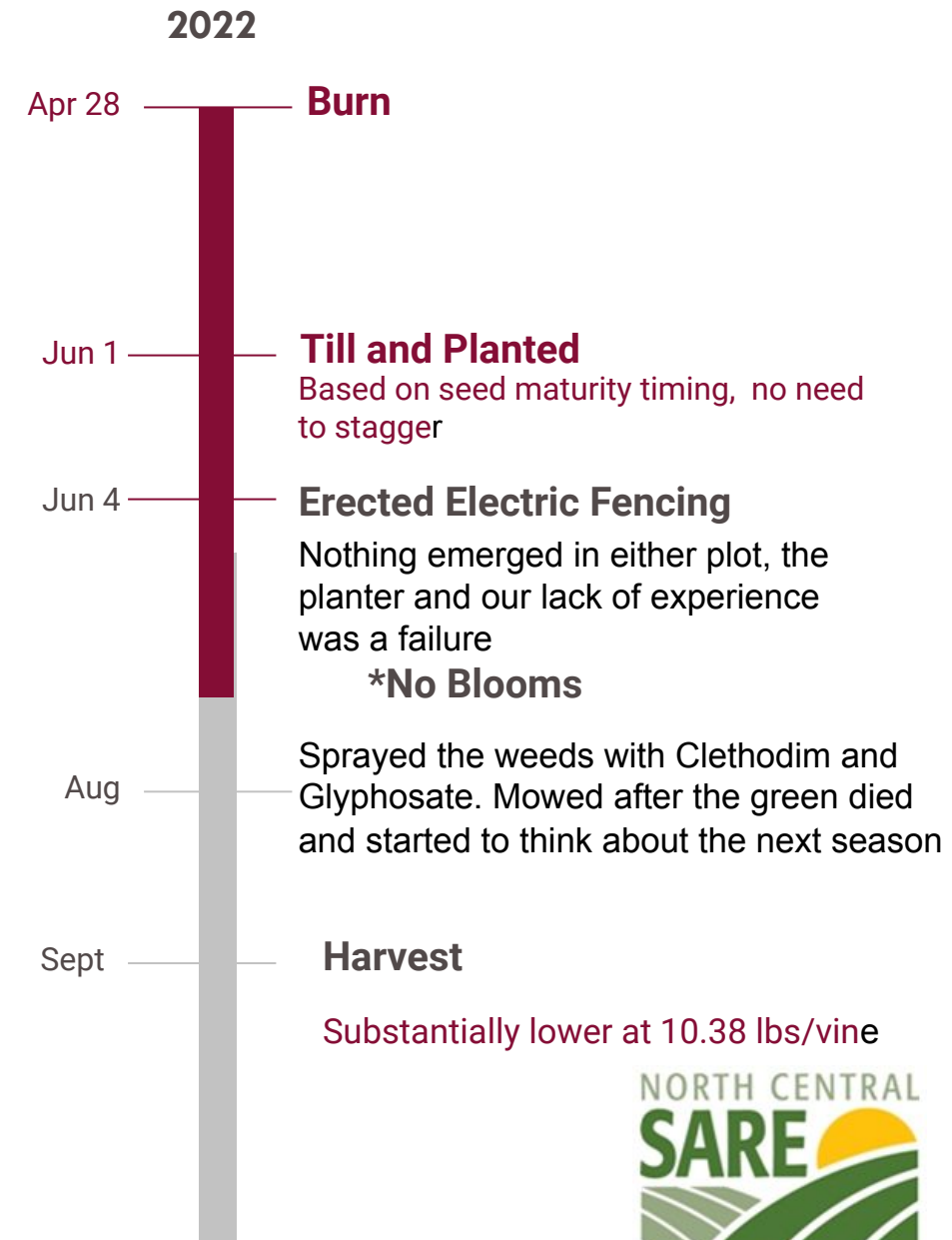
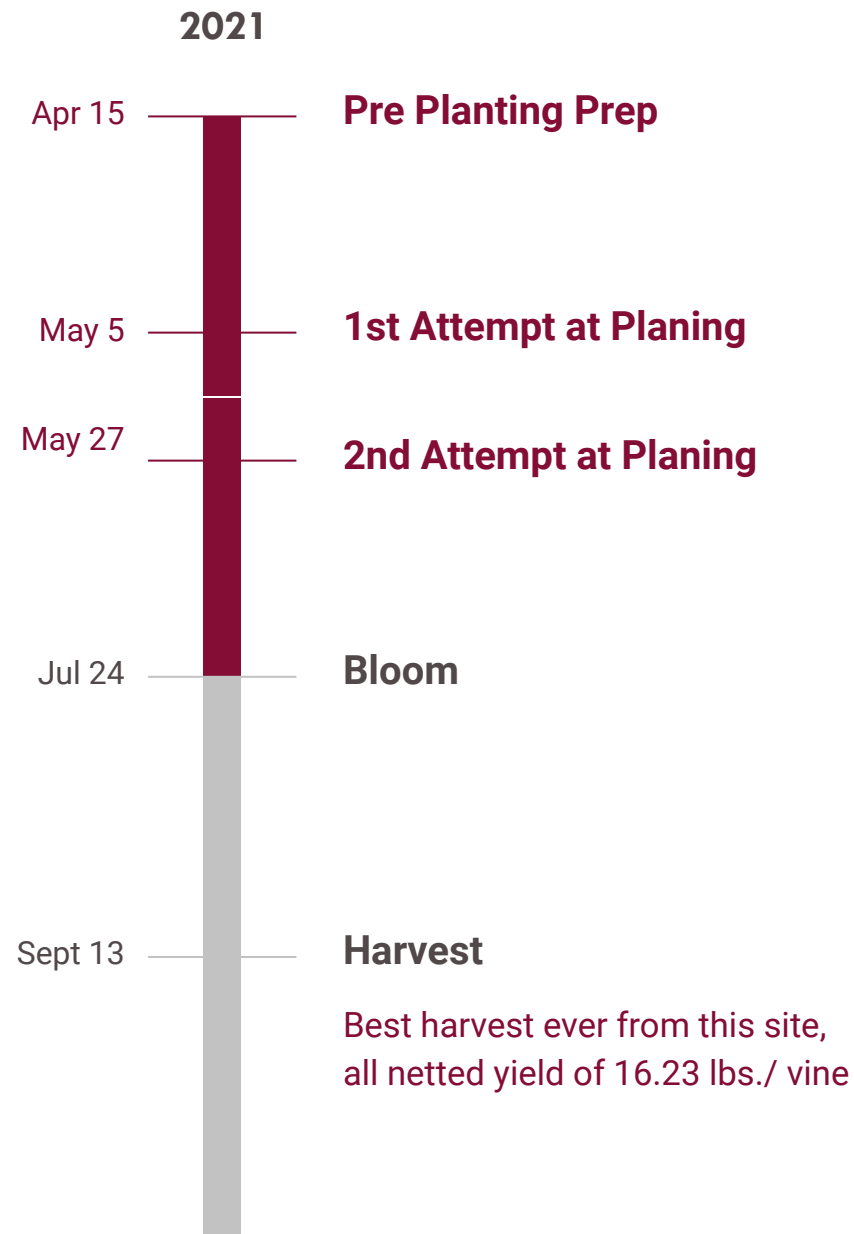


Feeling Beat by Mother Nature

Netted 100% due to poor cropping

- North plot extremely weedy but produced sunflowers
- Birds definitely enjoyed the fruit of our labor
- Foxtail biggest challenge
- Cut and sold some flowers at farmers markets

Ottawa Timeline



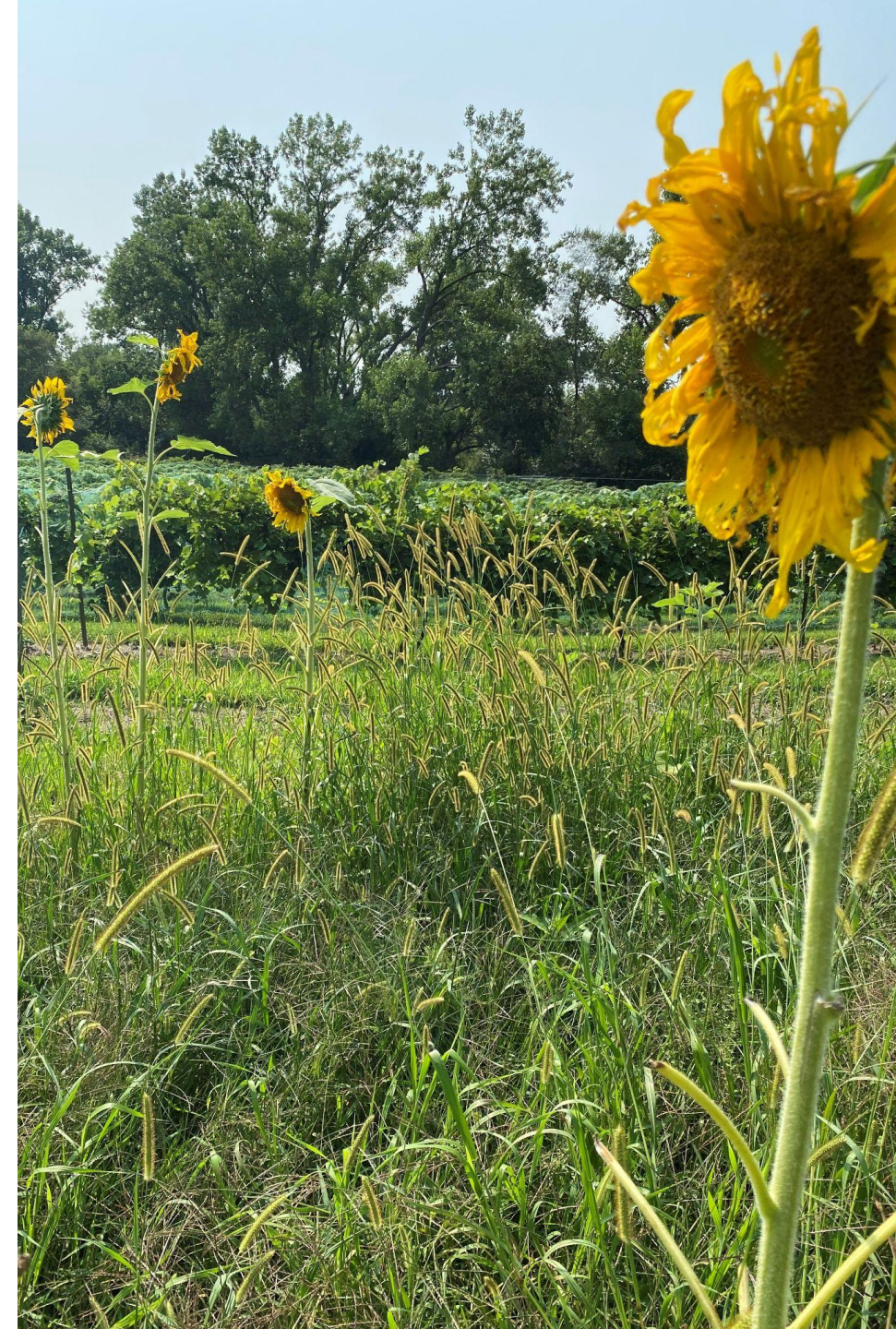
Year 1 Comments

(Ottawa Vineyards)

Timing issues but thinks project should run for several years to determine its impact. We (Ottawa) need to **learn how to do better planting and weed control**.

Tillage equipment would be nice versus relying on others during their busy time and especially when weather does not cooperate. Plan to upgrade equipment so to manage multiple sunflower plantings'.

For a **winery there are more benefits than just controlling birds.** The agritourism industry provides a better tie and understanding for the population that live in the non-rural areas. It seems to be a **draw for people and is a nice backdrop for wedding pictures and such**, but people, like the birds need to know about it through marketing and one year does not make a good measurement.





Year 2 Comments

Ottawa Vineyards

May have planted too deep.

In year 3 will work on killing the competing grass first and then broadcasting and harrow seeds for planting.

Ottawa Vineyards Harvest

2021 (netted)	2022 (netted)
Frontenac 16.23 lb/vine (sunflowers)	Frontenac 10.38 lb/vine (no sunflower blooms)





Proposed Sunflower Block
Area: 0.65 acres

Unnetted Petite Pearl
% Unnetted: 25% (153 vines)

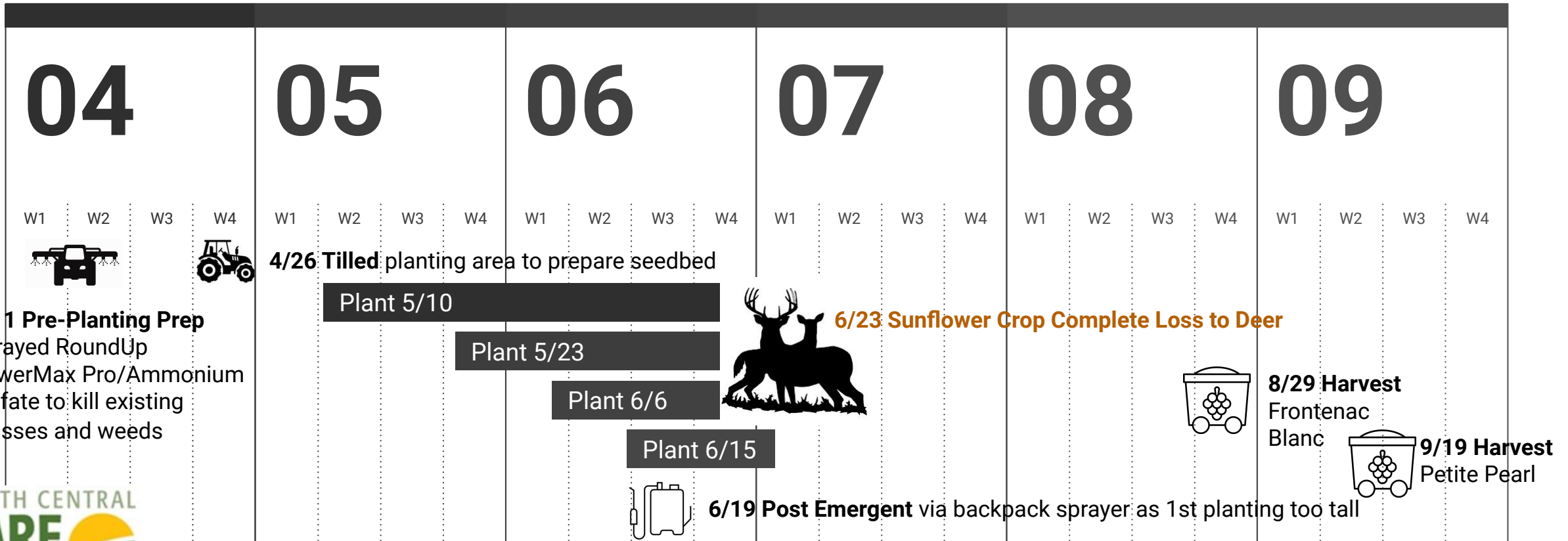
Petite Pearl Block
Area: 1.14 acres (612 vines)

Frontenac Blanc Block
Area: 0.71 acres (390 vines)

Unnetted Frontenac Blanc
% Unnetted: 46% (180 vines)

Compass Hill Vineyard

Year 2021 Compass Hill Vineyard Timeline



▲ LOREM



2021 Deer Love Sunflowers



20,000 seeds planted... 1
made it.



2022 Sunflower Crop Protection

If you have a deer problem in your vineyard, then you will have a deer problem with your sunflowers

6ft high deer fence around the perimeter of sunflowers

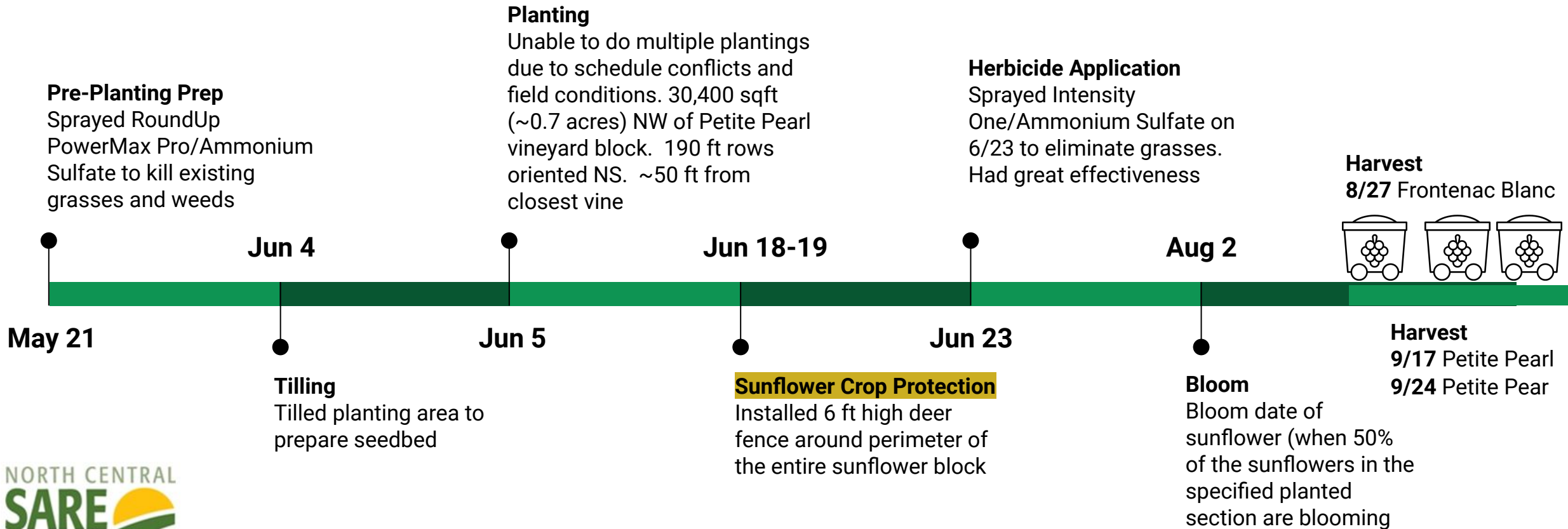
- ☐ low-wire 6" above the ground
- ☐ mid-wire 3 ft above the ground
- ☐ high-wire 6 ft above the ground

14 gauge electric fence wire with T-posts spaced every ~20ft. Installed cheap plastic deer netting on outside of the wires



❖ Did not leave enough buffer area between planting area and fence to easily turn. Need to increase the turning area next year

Year 2022 Compass Hill Vineyard Timeline





Compass Hill Vineyard Harvest

2021 (100% Netted)

Frontenac Blanc:
7.39lb/vine

Petite Pearl:
9.69lb/vine

*Planted in 2015 and 2017

2022

Frontenac Blanc: 0.77lb/vine

Due to terrible raccoon problems, did not get a commercially viable crop. Damage equal across all rows and could not distinguish between raccoon and bird damage

Petite Pearl:

-Unnetted vines: 1.75lb/vine

-Netted vines: 10.58lb/vine

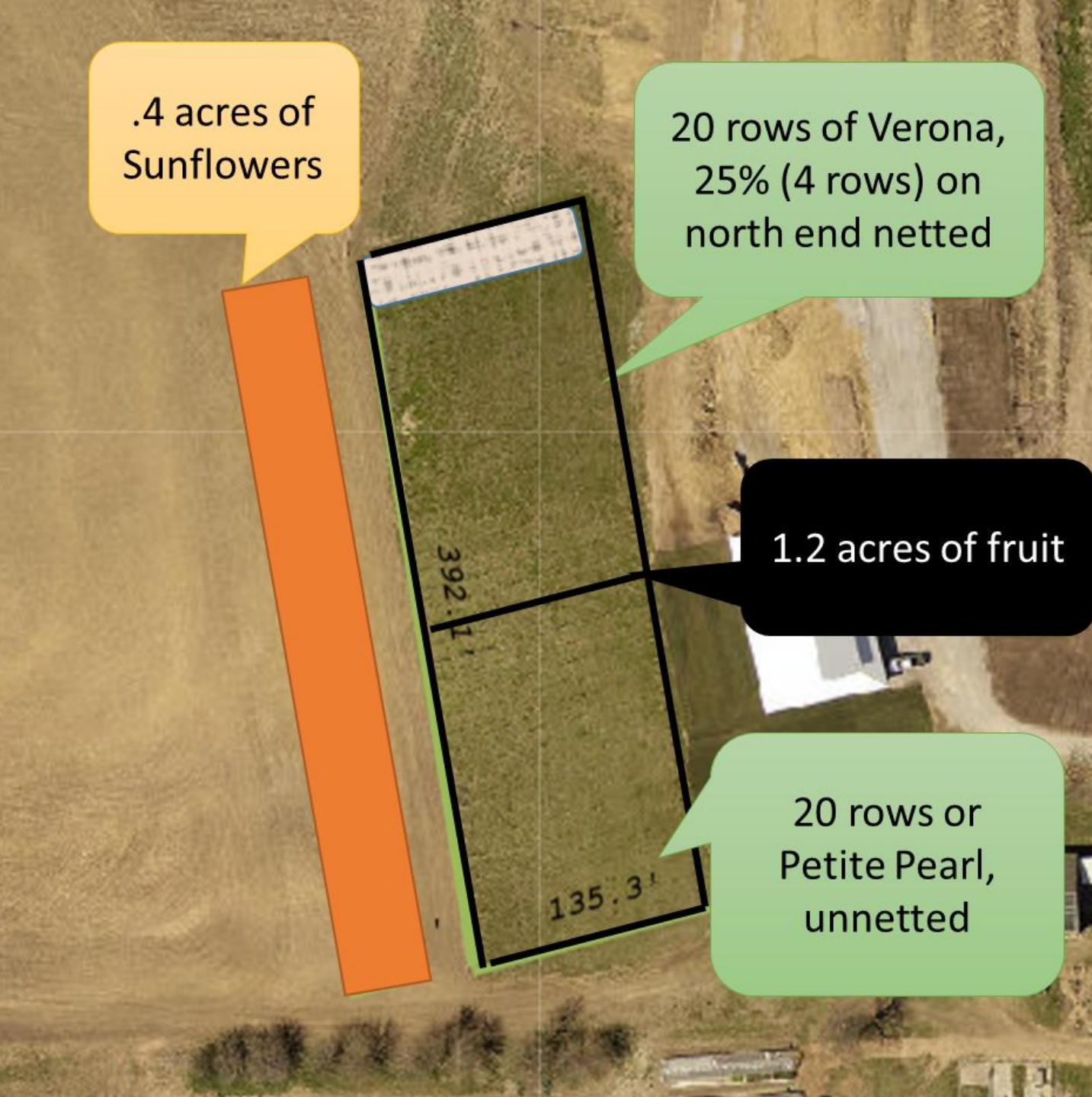
Managed to keep the raccoon out of the Petite Pearl for the most part, but a significant difference between the netted vs. unnetted vines (Note: Sunflower had not yet reached seed-readiness prior to grapes being ready for harvest)

Compass Hill Vineyard Year 2 Observation

- ❖ Nice amount of rainfall the day after planting
- ❖ Great germination
- ❖ Season got extremely dry but sunflowers did great
- ❖ Did not see many birds in sunflowers during the growing season
- ❖ Really happy with sunflower growth - they were beautiful
- ❖ Surprised how many seeds are produced per flower head and how heavy they got
- ❖ Did not see many birds in general in either vineyard or sunflowers during the month of August

Based on harvest data and observations, it does not appear that the sunflowers helped this year, however, I don't think the sunflower seeds had gotten to the proper stage to fully test the hypothesis. If I had been able to stage the plantings as planned and planted earlier I think we would have seen better results





.4 acres of Sunflowers

20 rows of Verona, 25% (4 rows) on north end netted

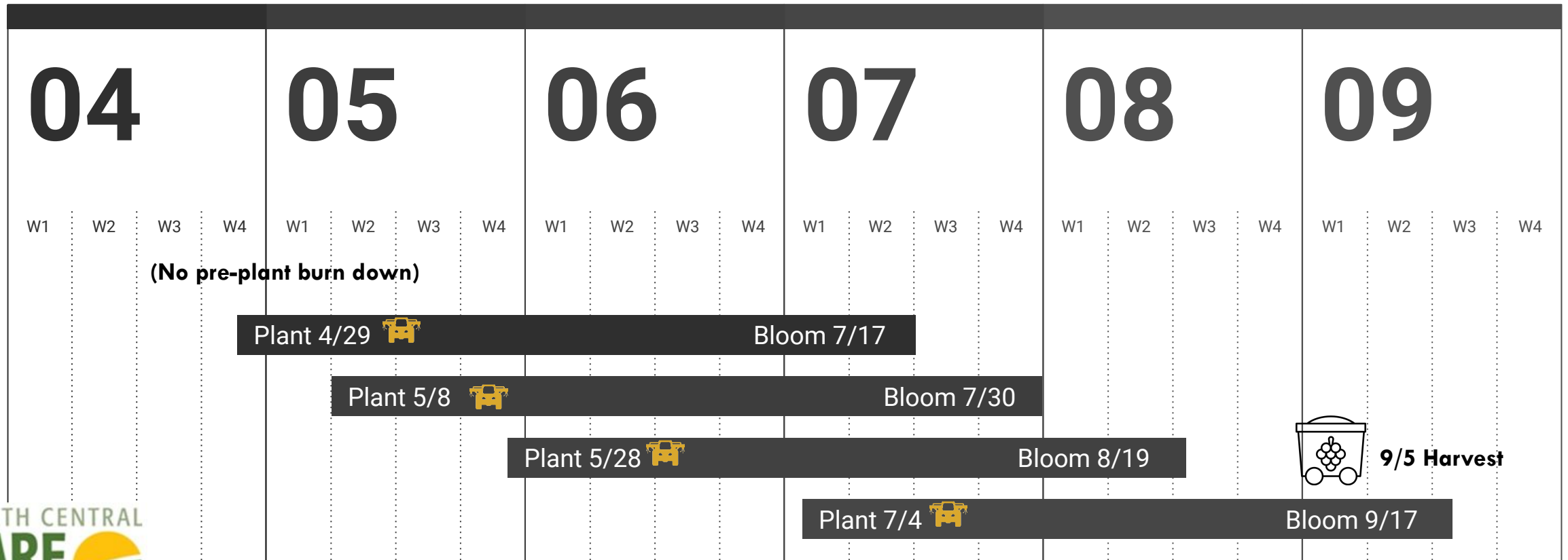
1.2 acres of fruit

20 rows of Petite Pearl, unnetted

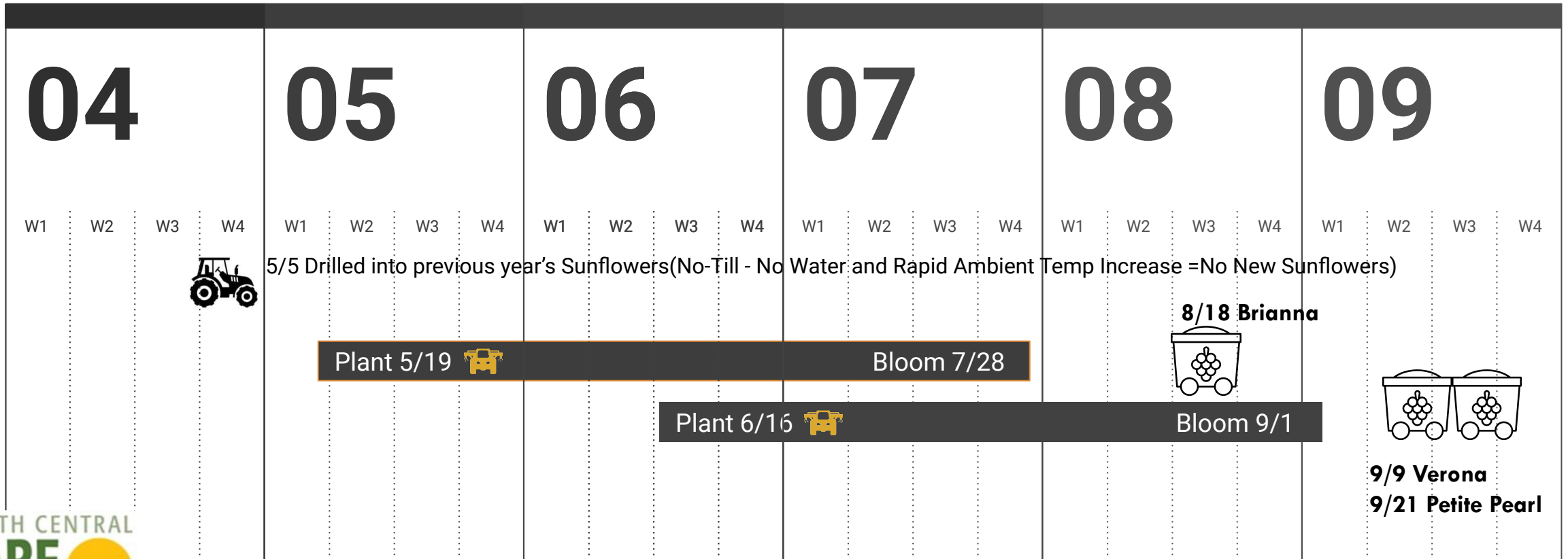
Walker Homestead



Year 2021 Walker Homestead Timeline



Year 2022 Walker Homestead Timeline

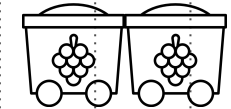


Plant 5/19  Bloom 7/28

Plant 6/16  Bloom 9/1



8/18 Brianna

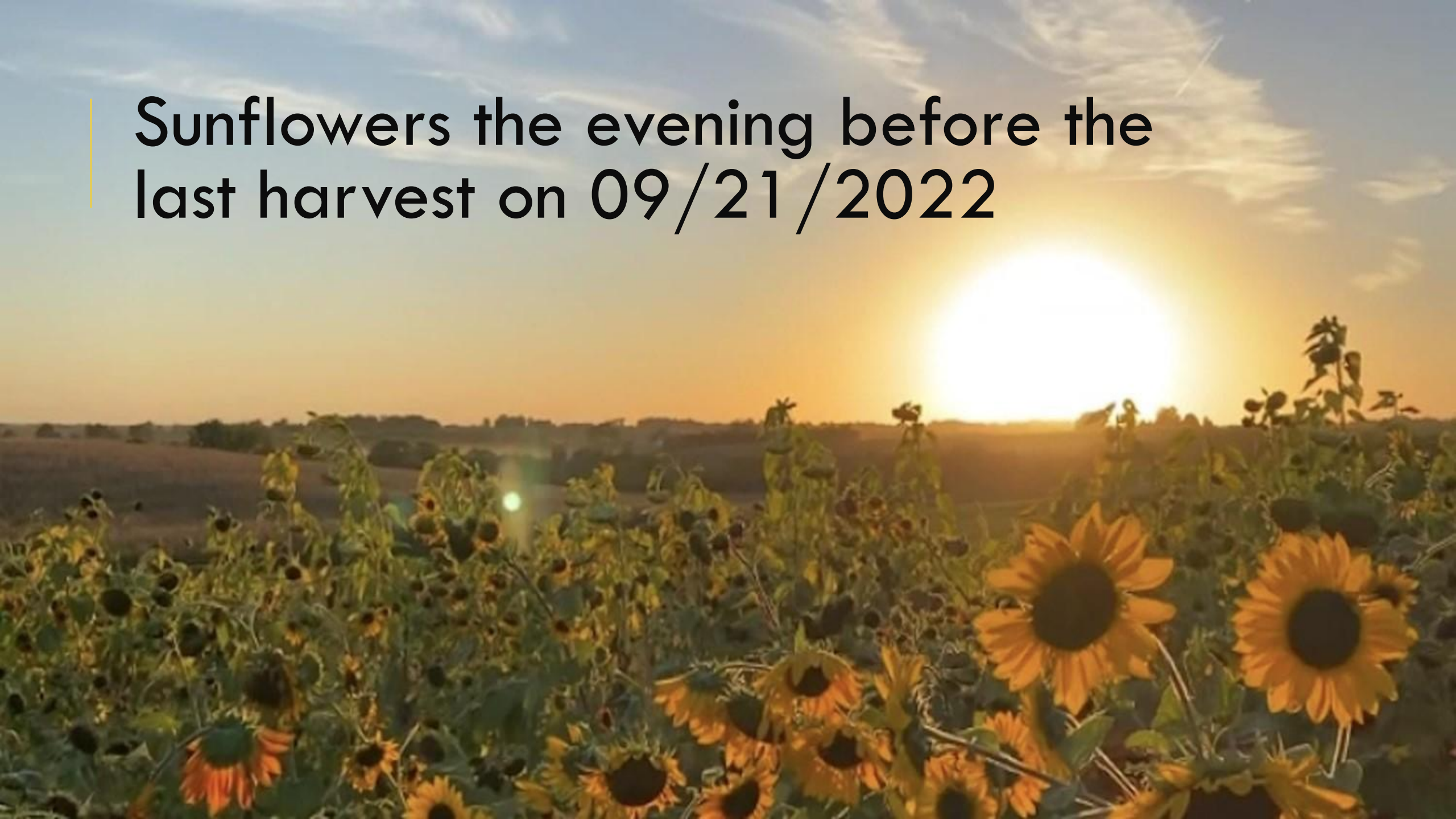


9/9 Verona
9/21 Petite Pearl

 Post-Emergent Application

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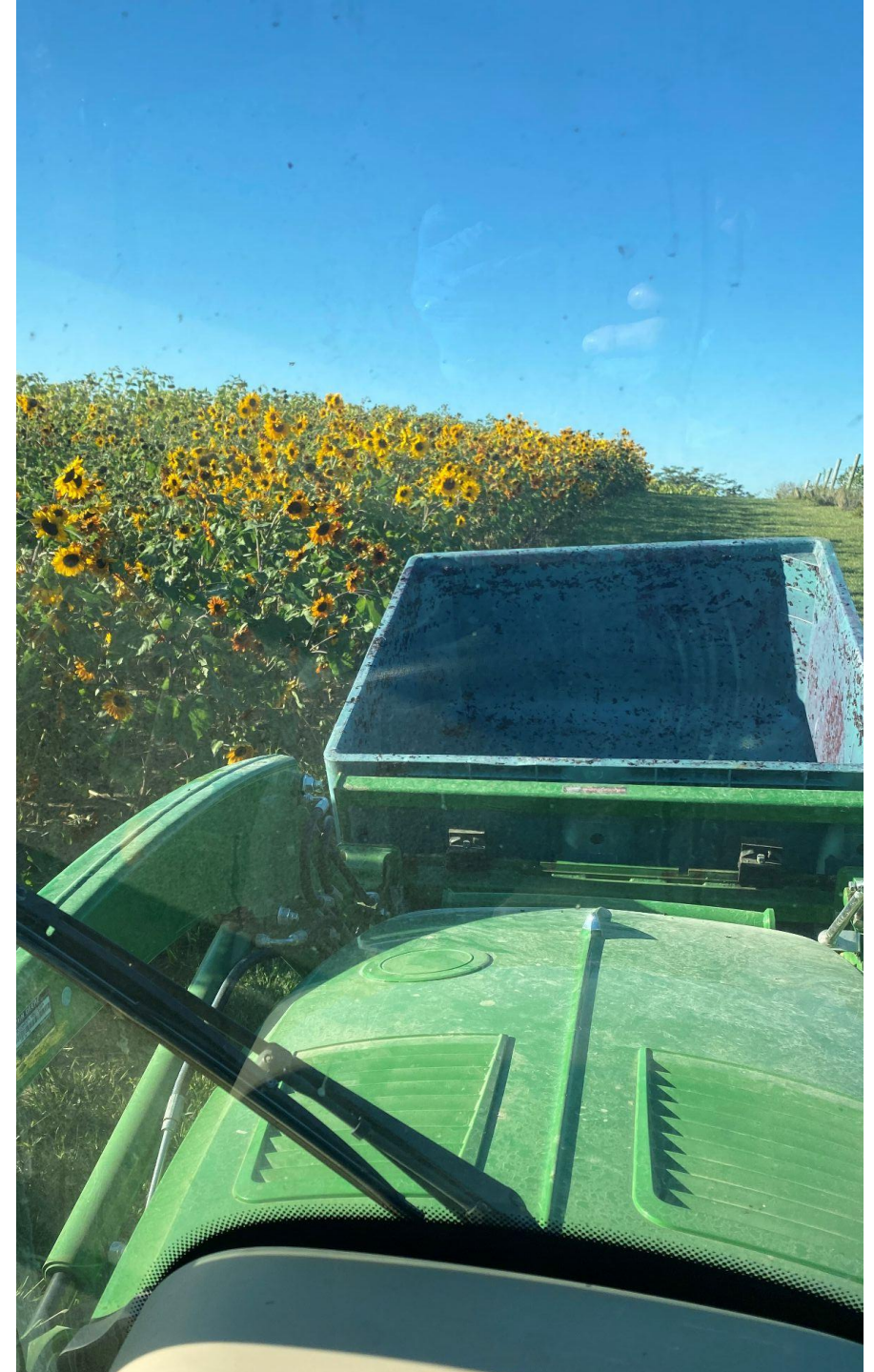
Sunflowers the evening before the
last harvest on 09/21/2022



Walker Homestead Harvest

2021	2022 (Unnetted)
Netted: 6.2 lb/vine Unnetted: 6 lb/vine	Verona: 5.74 lb/vine Petite Peal: 7.5 lb/vine

* Young Vines Planted in 2017





Walker Homestead Thoughts

- ❖ Sunflowers are a draw for a wedding backdrop (huge revenue stream for us)
- ❖ Sales from U-Pick
- ❖ Hand harvest a small portion of our seeds
 - Microgreens (Nutty flavor)
 - Mix seeds with corn for livestock feed
 - Save enough seeds to replant the following season

- ❖ Have not invested in nets
- ❖ Not interest in the labor or the look of nets
- ❖ Pest management also aided by two hawks and one cat that patrol the vineyard



Regardless of having fancy tools, data capture still hard

- Making time to capture data as collected
- Managing Volunteers
- Farming/Harvest Exhaustion
- Variation in grapes, age, soil, weather
- Small sample with wide range of variability

Profitability Comparison

(not including planting equipment)

Costs

- Seeds in Year One
- Herbicide (or Labor Tilling)
- Initial Equipment
- Planting Labor

Revenue

- ★ Saving on Labor of Nets On/Off
- ★ Savings on the Cost of Nets
- ★ Gain of Protein for Animal Feed
- ★ Microgreens
- ★ Agritourism Draw
- ★ U-Pick Flowers
- ★ Soil Health
- ★ Supports Regenerative Ag

Sunflower Seed Cost

Compass Hill Vineyard (1.85 acres)	Ottawa Vineyards (1.35 acres)	Walker Homestead (1.2 acres)
4.3 lb of Sunflower Seeds (.65 acres)	3 lb of Sunflower Seeds (.45 acres)	2.6 lb of Sunflower Seeds (.4 acres)
\$117	\$81	\$72

Weed Control *(if select to do so)*

Dual + Spartan

pre-emergent grass and
broadleaf weed control
(2 week prior to planting)

Poast or Select

postemergence grass control
*(Once grass is 2-4 inches tall- does
not hurt sunflowers)*

Last for two growing seasons

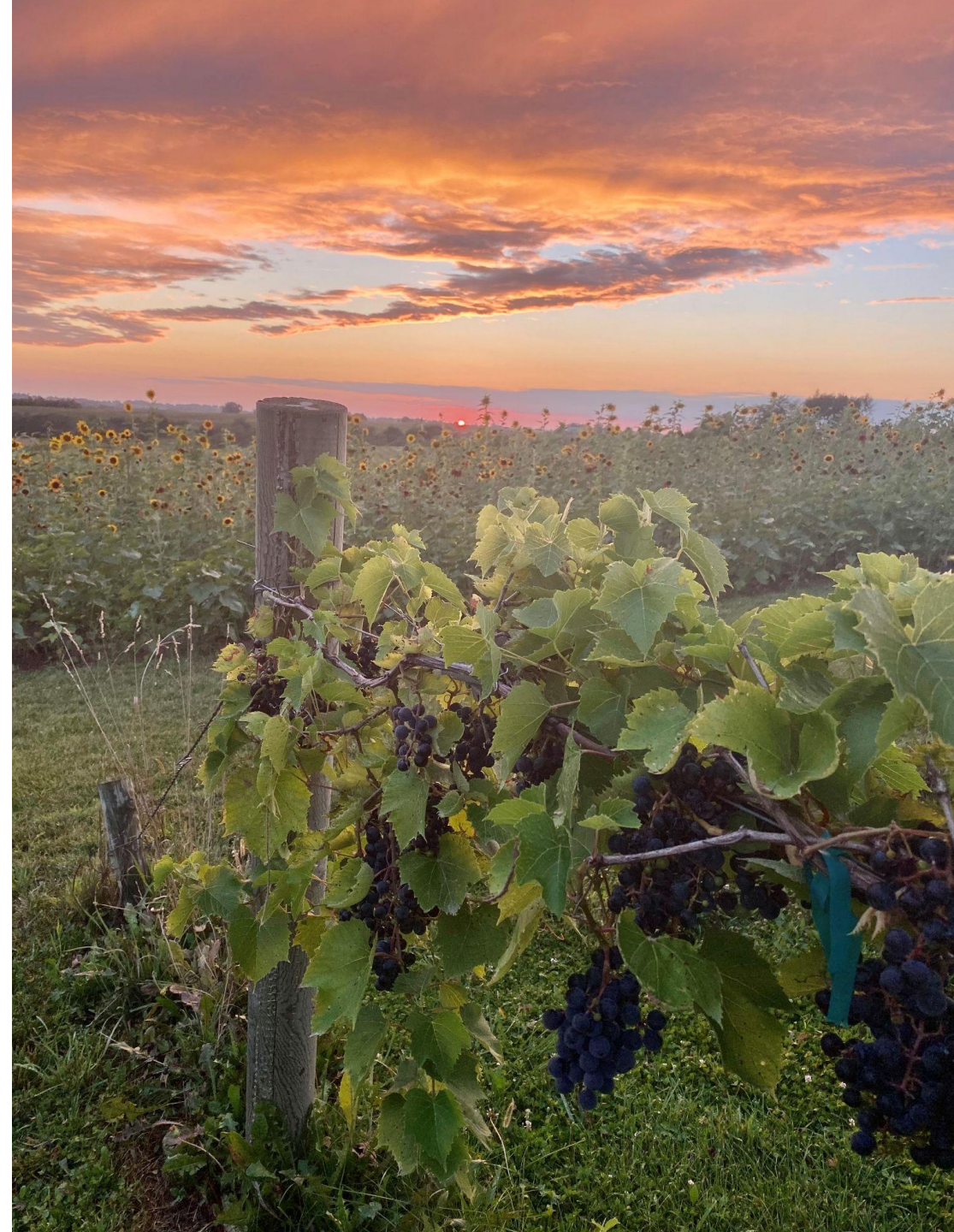
Poast = \$275/2.5 gallon jug

Spartan = \$90/quart

Dual cost of \$230 for a 2.5 gal

~\$300/growing season

Overall Lessons Learned





If issues with
deers in
vineyard, must
proactively
protect sunflower
crop as well



Need the right tools
to manage multiple
plantings

Weed Control

1. Start with a clean field
2. Must maintain weed control for a productive crop
 - Chemical or
 - Tilling or
 - Mowing rows :(



Ottawa Vineyards Conclusions

Grape Farming and Row-Crop Farming are Completely Different

- Equipment issues both years, maybe broadcast and harrow is better to overcome this challenge
- Timing is key. You can wait in a vineyard but NOT w/ row crops You must do the work when the work is required, the window is smaller
- This research needs to carry on for some time to know if it helps. Birds are creatures of habit, may take awhile to discover your sunflowers
- It's one part of protecting grapes and maybe combo of nets, drones, cannons, predator bird sounds, tinsel, dogs, decoys, and sprays
- As an agritourism business, this is an attraction regardless of effectiveness. Photo opportunity, selling flowers etc. worth the effort
- Moving our winery and would like to continue the practice at new facility and maybe a third time's a charm





Ottawa Vineyards Conclusions

Some sunflowers finally popped up late, the picture is our bountiful harvest. As I said there are side benefits to doing sunflowers

We won't give up and we will learn, maybe try cover crops for weed control, fertilizers and soil test to make perfect conditions

Compass Hill Vineyard



All three plan to
continue to
companion plant
sunflowers with our
vineyards

For questions on the project...

Kristy Walker kristy@walker-homestead.com

John Barber john@ottawavineyards.com

Chris Larsen larsen.cc@gmail.com

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