

# 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%
<b>Total Vines</b>	<b>58,811sf</b>	<b>1.35Ac</b>	<b>100%</b>

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

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

Sunflower Planting - 0.31 Acres (13,530sf)  
EQUIP Planting Area | Contract No. 746114170JQ

Netted Vines - 0.79 Acres (34,251sf)

Unnetted Vines - 0.56 Acres (24,560sf)

Sunflower Planting - 0.07 Acres (3,060sf)

Sunflower Planting - 0.06 Acres (2,819sf)

# 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)



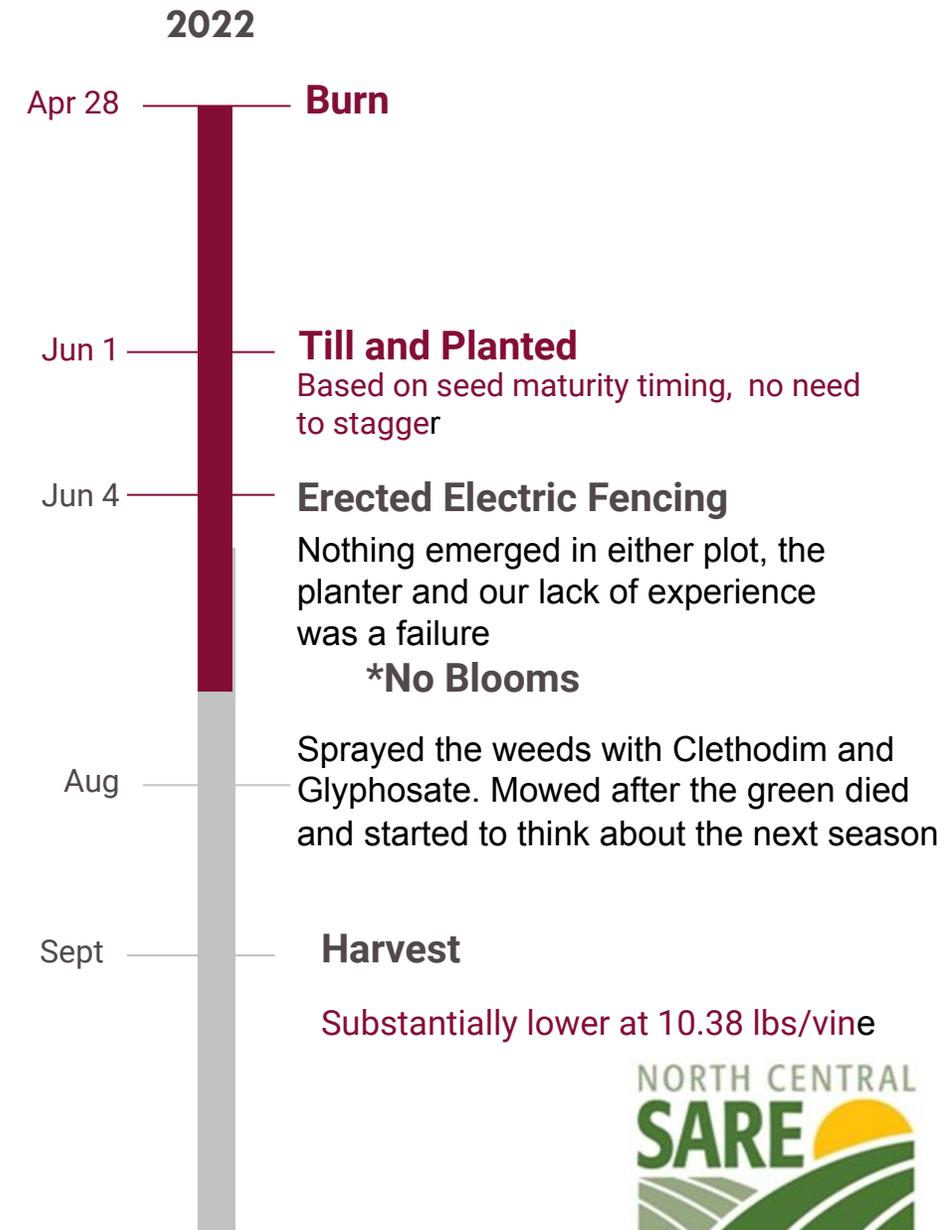
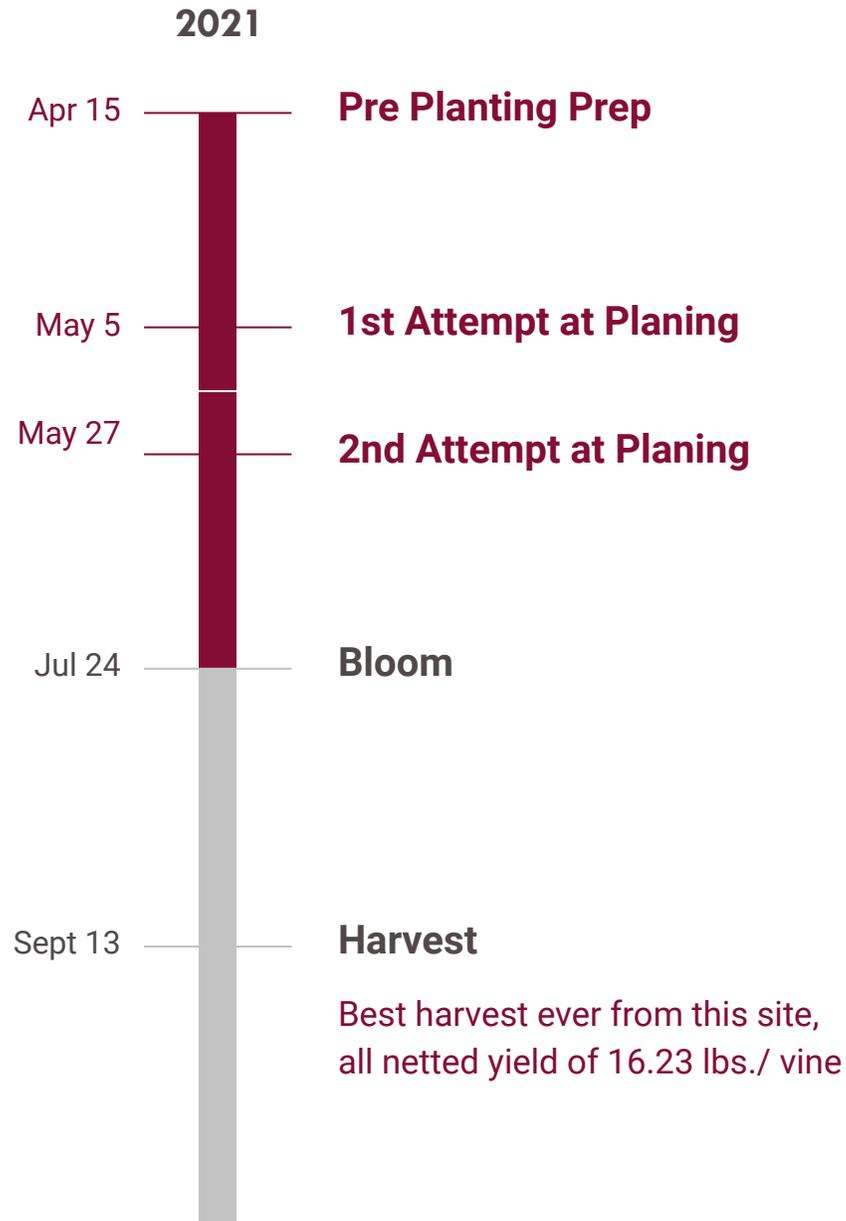


# Feeling Beat by Mother Nature

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



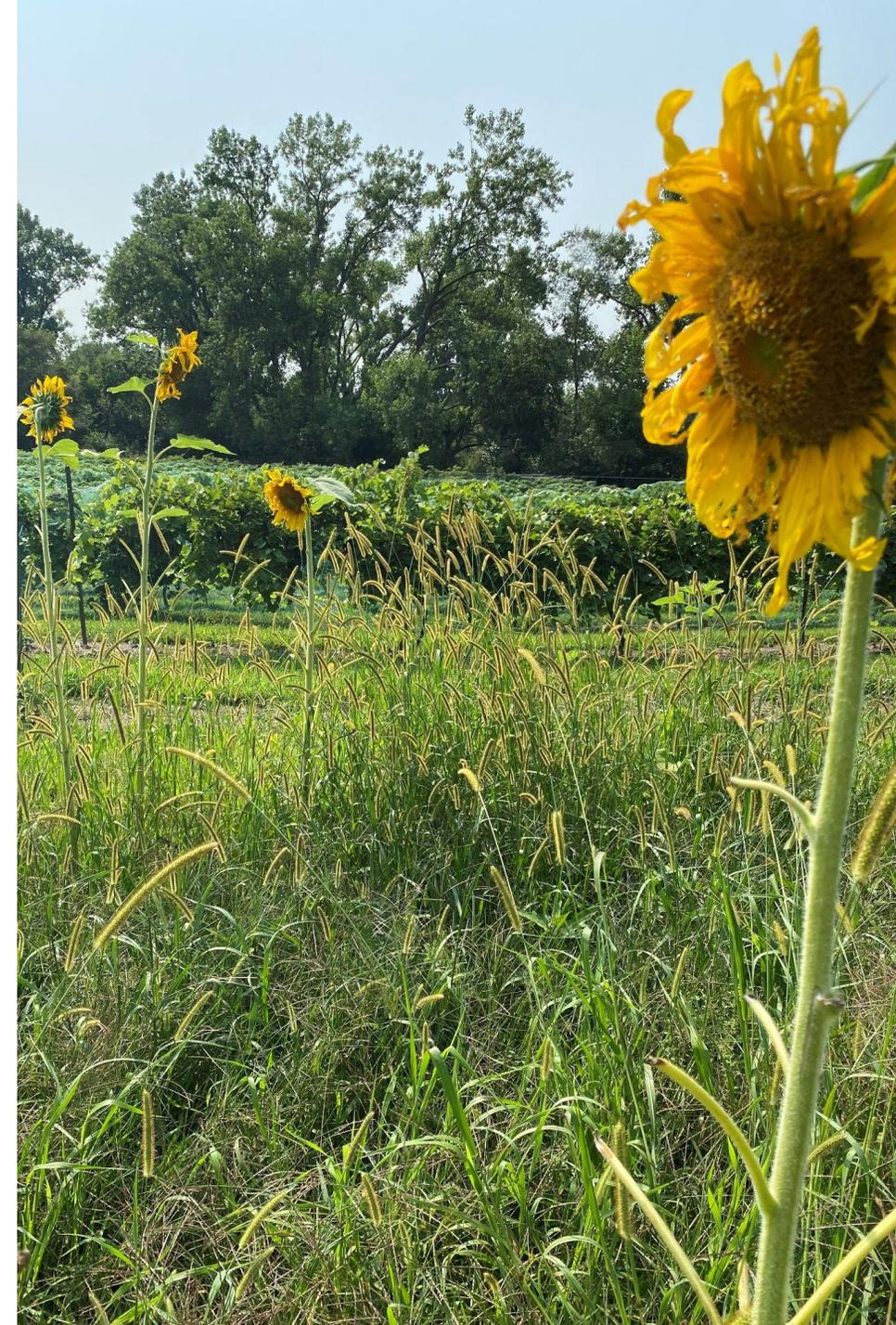
# Year 1 Comments

*(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)
<b>Frontenac</b> 16.23 lb/vine (sunflowers)	<b>Frontenac</b> 10.38 lb/vine (no sunflower blooms)





Proposed Sunflower Block  
Area: 0.65 acres

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

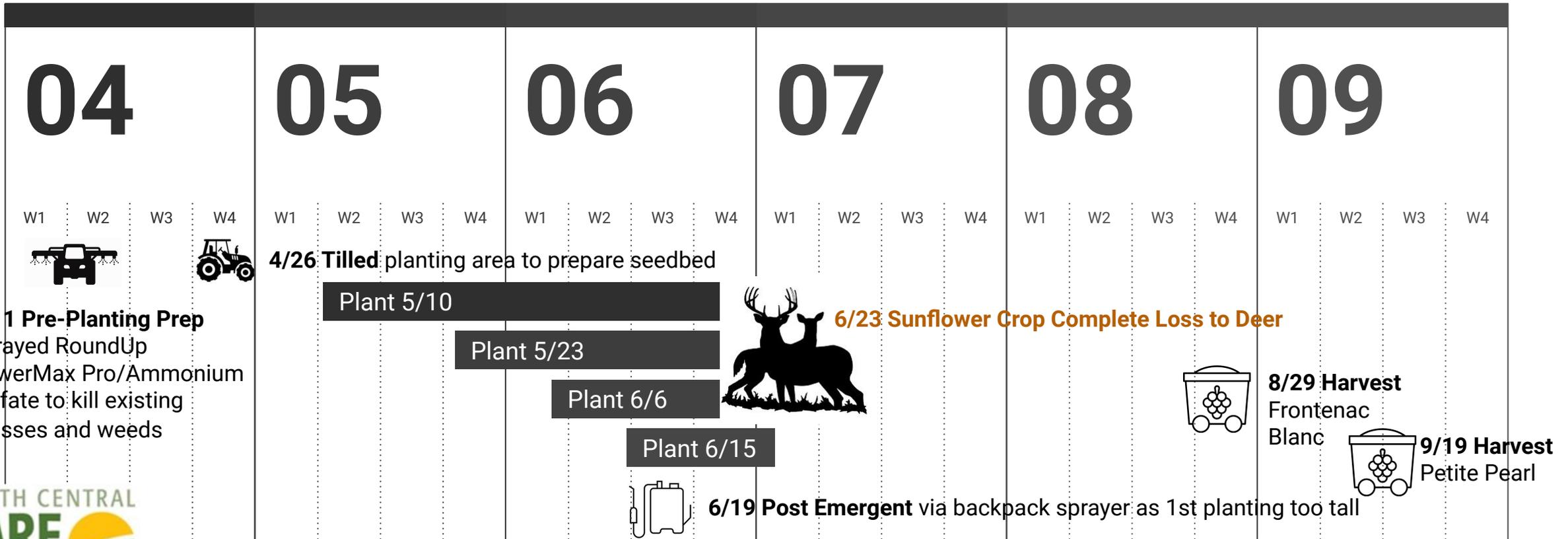
Petite Pearl Block  
Area: 1.14 acres (612 vines)

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





# 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

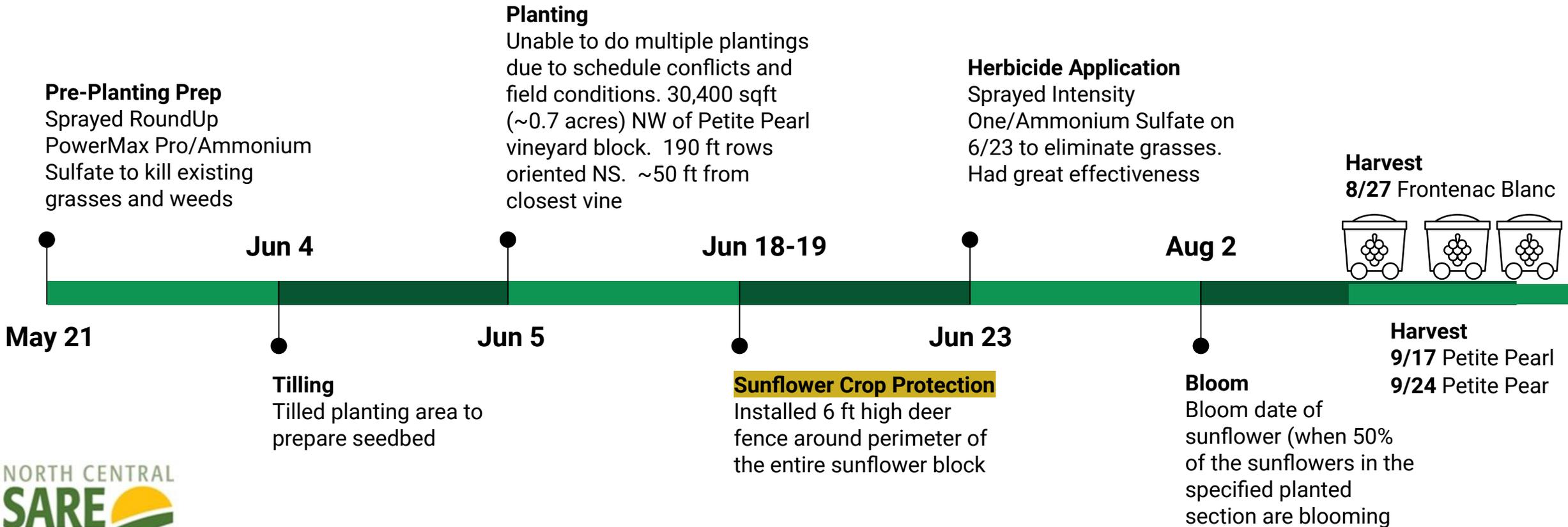
- ☐ low-wire 6" above the ground
- ☐ mid-wire 3 ft above the ground
- ☐ high-wire 6 ft above the ground

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

**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

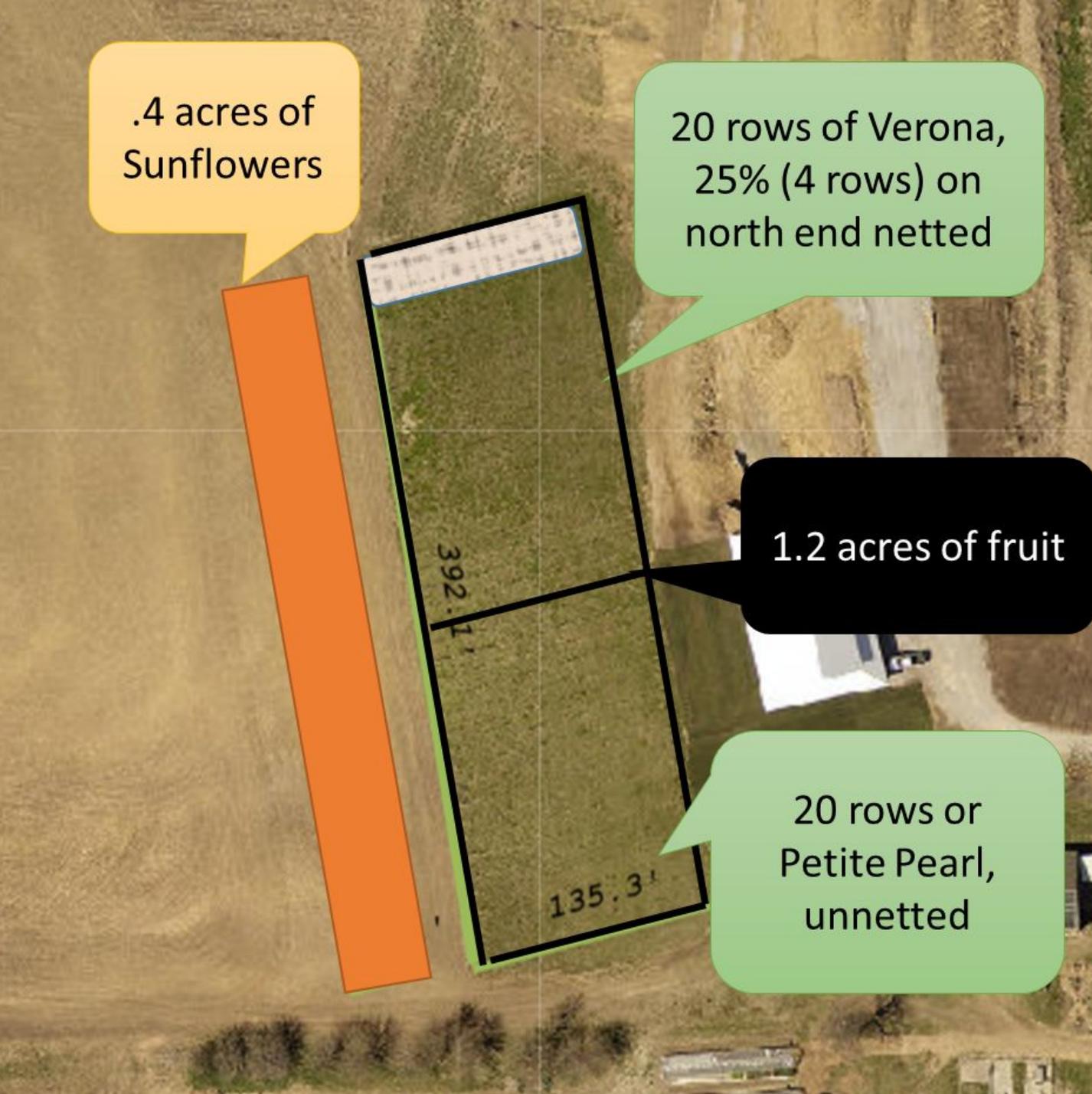
Managed to keep the raccoon out of the Petite Pearl for the most part, but a significant difference between the netted vs. unnetted vines (Note: Sunflower had not yet reached seed-readiness prior to grapes being ready for harvest)

# 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

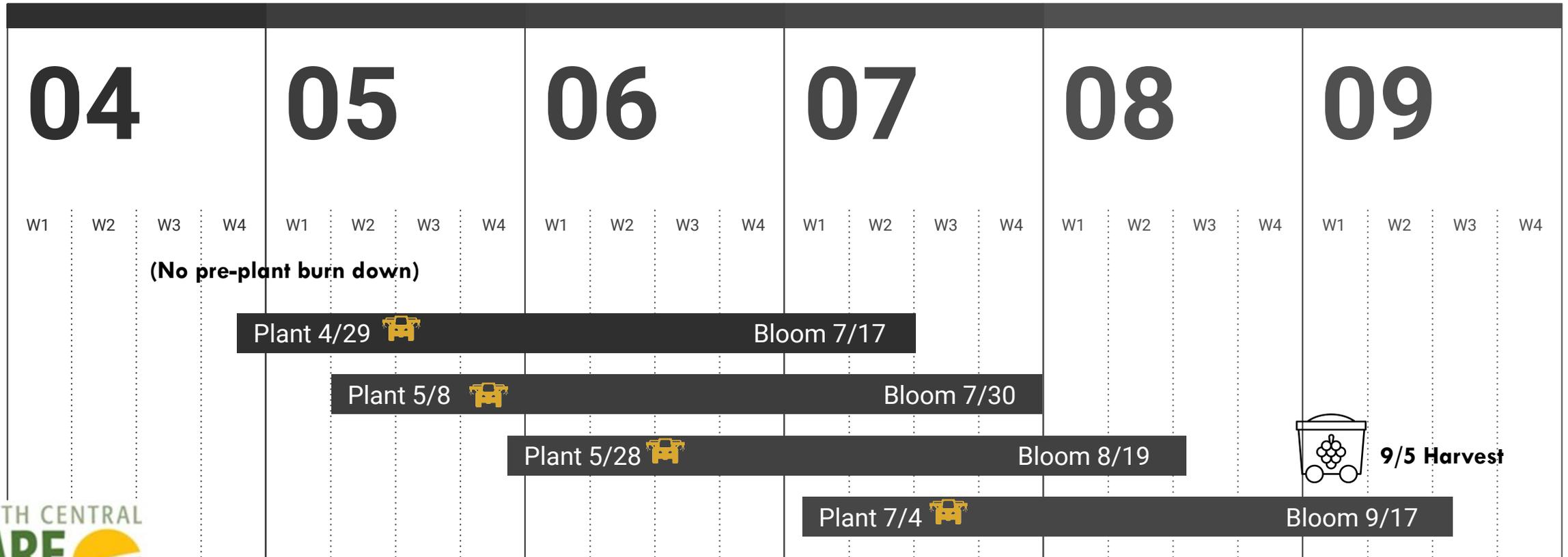
1.2 acres of fruit

20 rows or Petite Pearl, unnetted

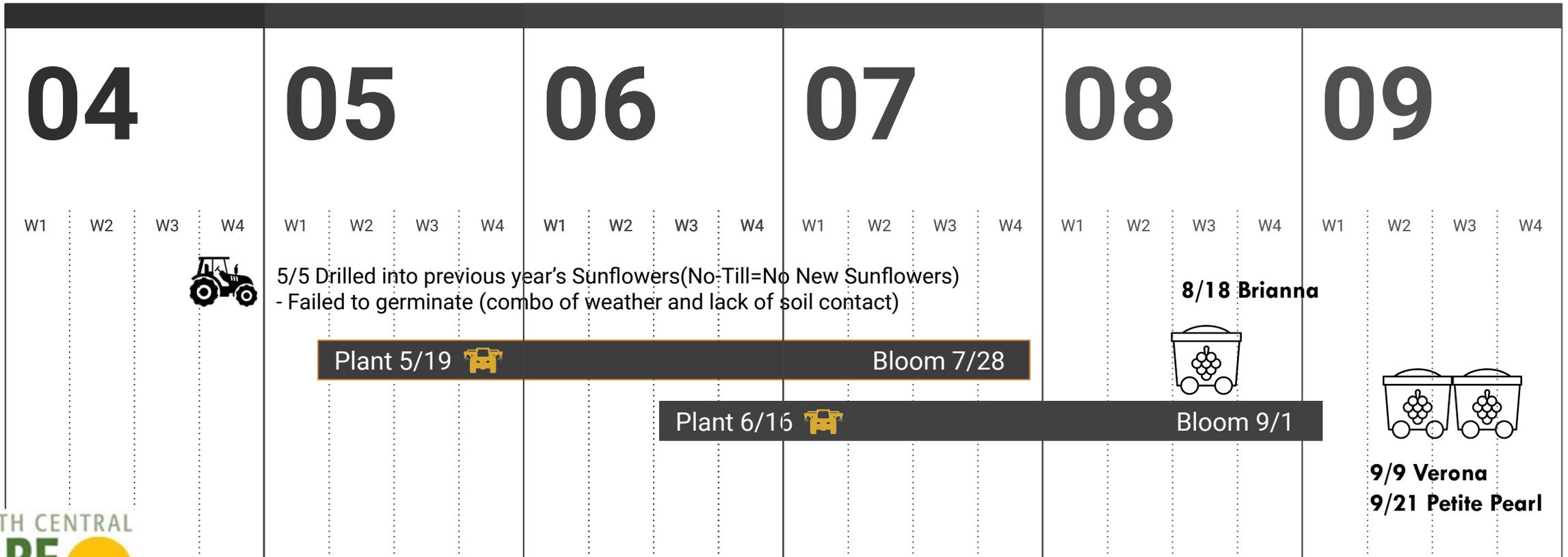
# Walker Homestead



# Year 2021 Walker Homestead Timeline



# Year 2022 Walker Homestead Timeline



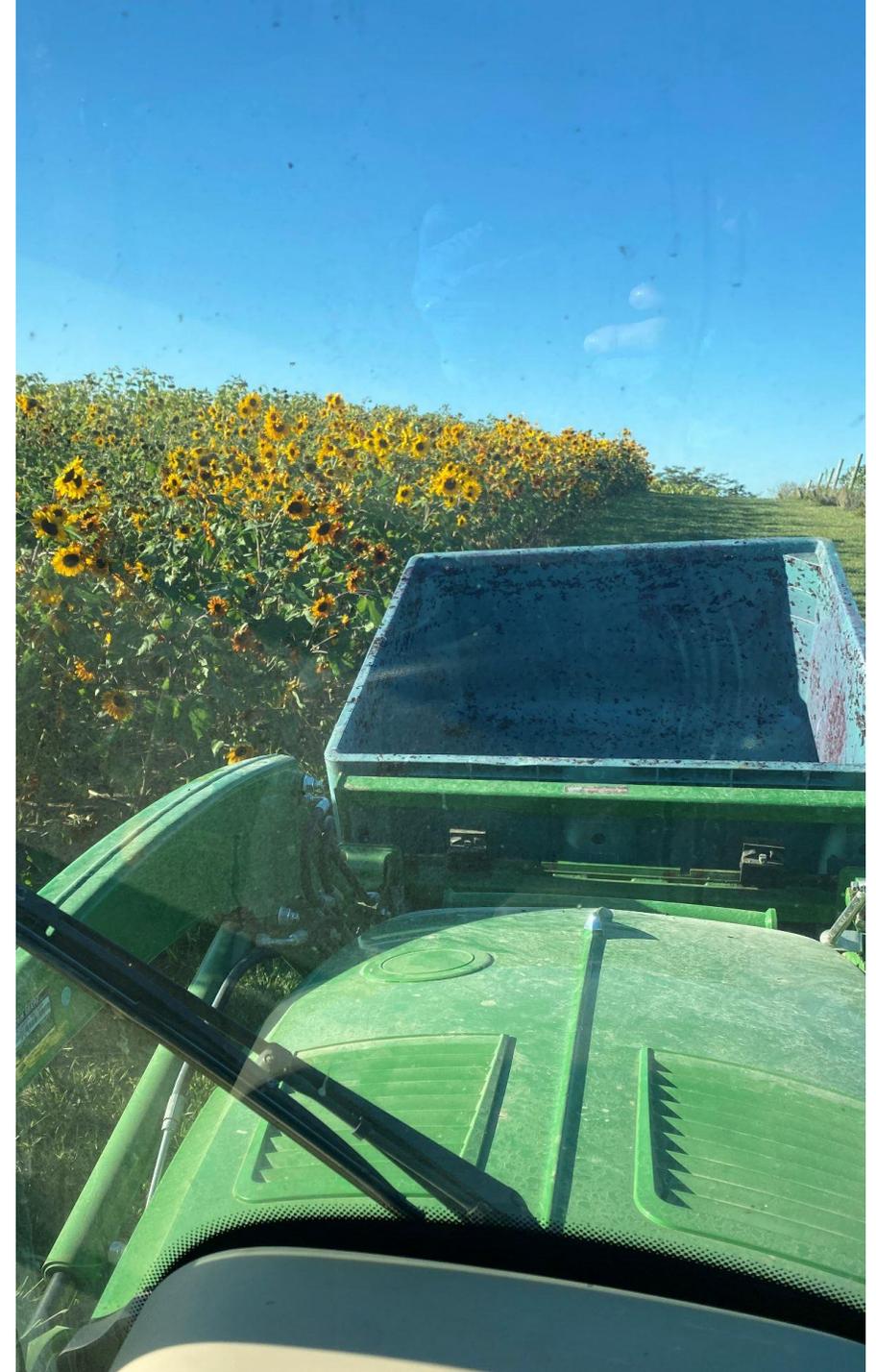
Sunflowers the evening before the  
last harvest on 09/21/2022



# Walker Homestead Harvest

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

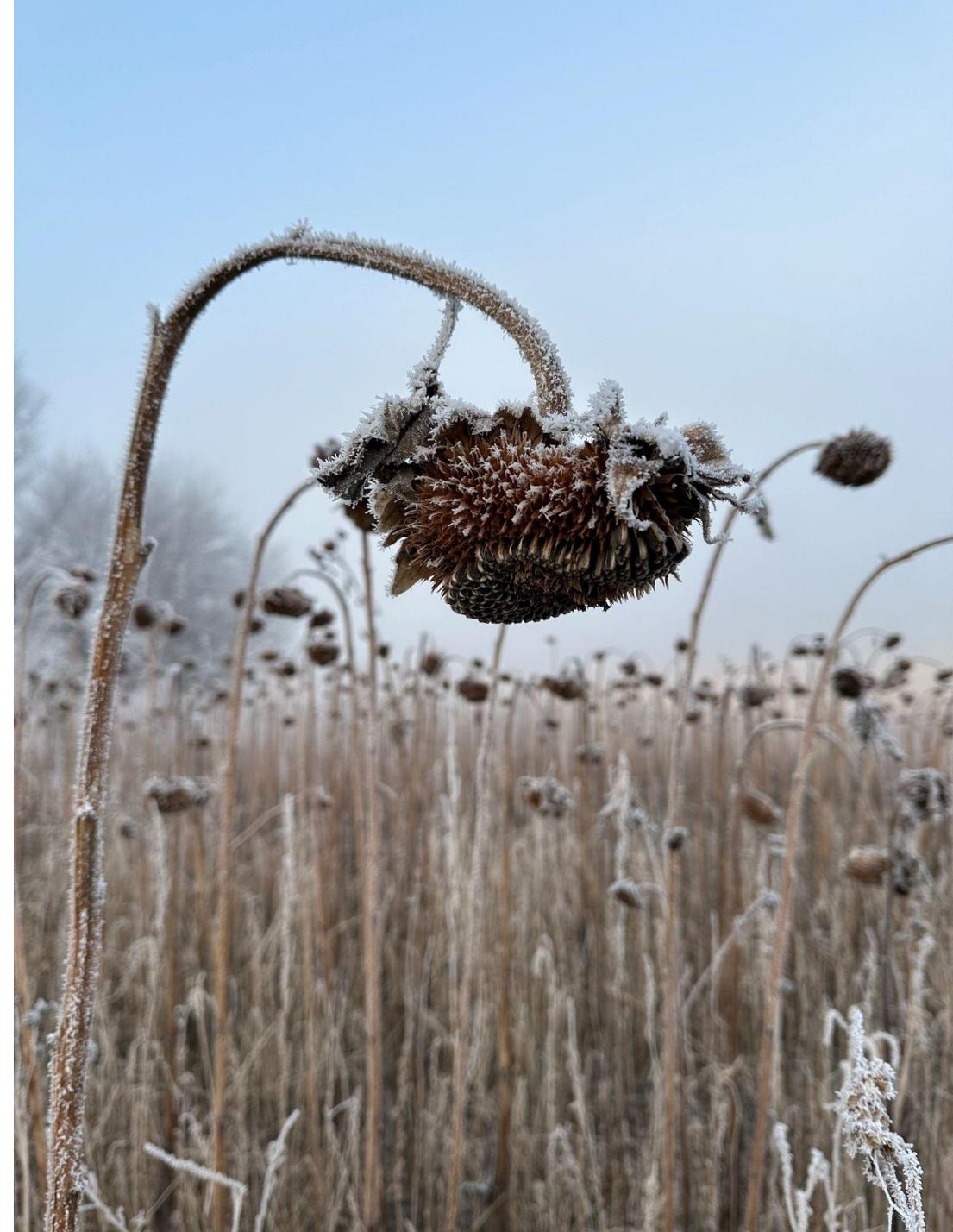
\* Young Vines Planted in 2017





# 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
- Farm/Harvest Exhaustion
- Variation in grapes, age, soil, weather

# 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**

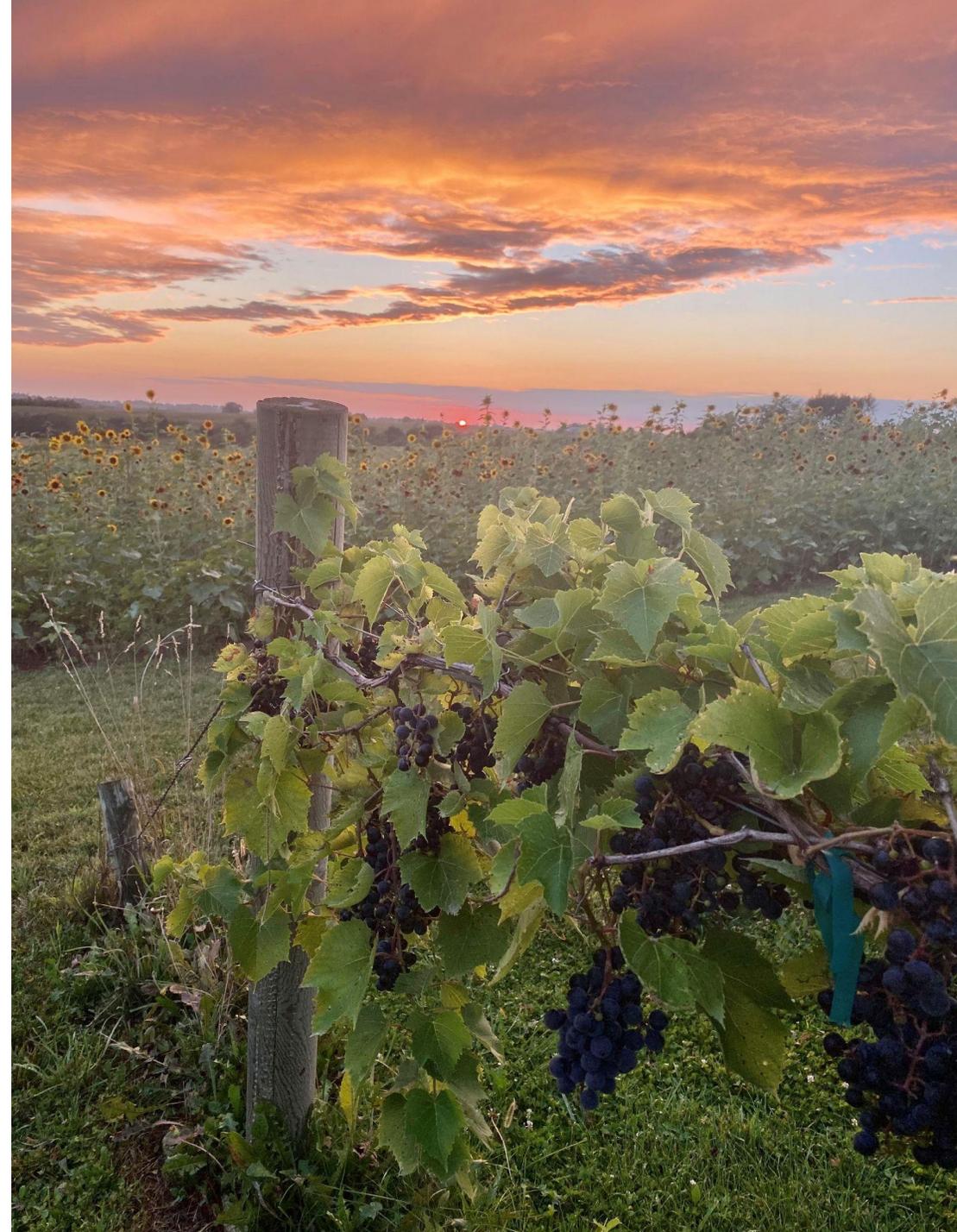
Poast = \$275/2.5 gallon jug

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...

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Study made possible by a 2021 **NCR-SARE Farmer Rancher Grant**  
FNC21-1314 “Companion Planting of Sunflowers in Vineyards for Pest Bird Management”

