25 Years of Learning
The Learning Continues…

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LODI FARMING, INC.
FEBRUARY 9, 2016

Lodi Farming

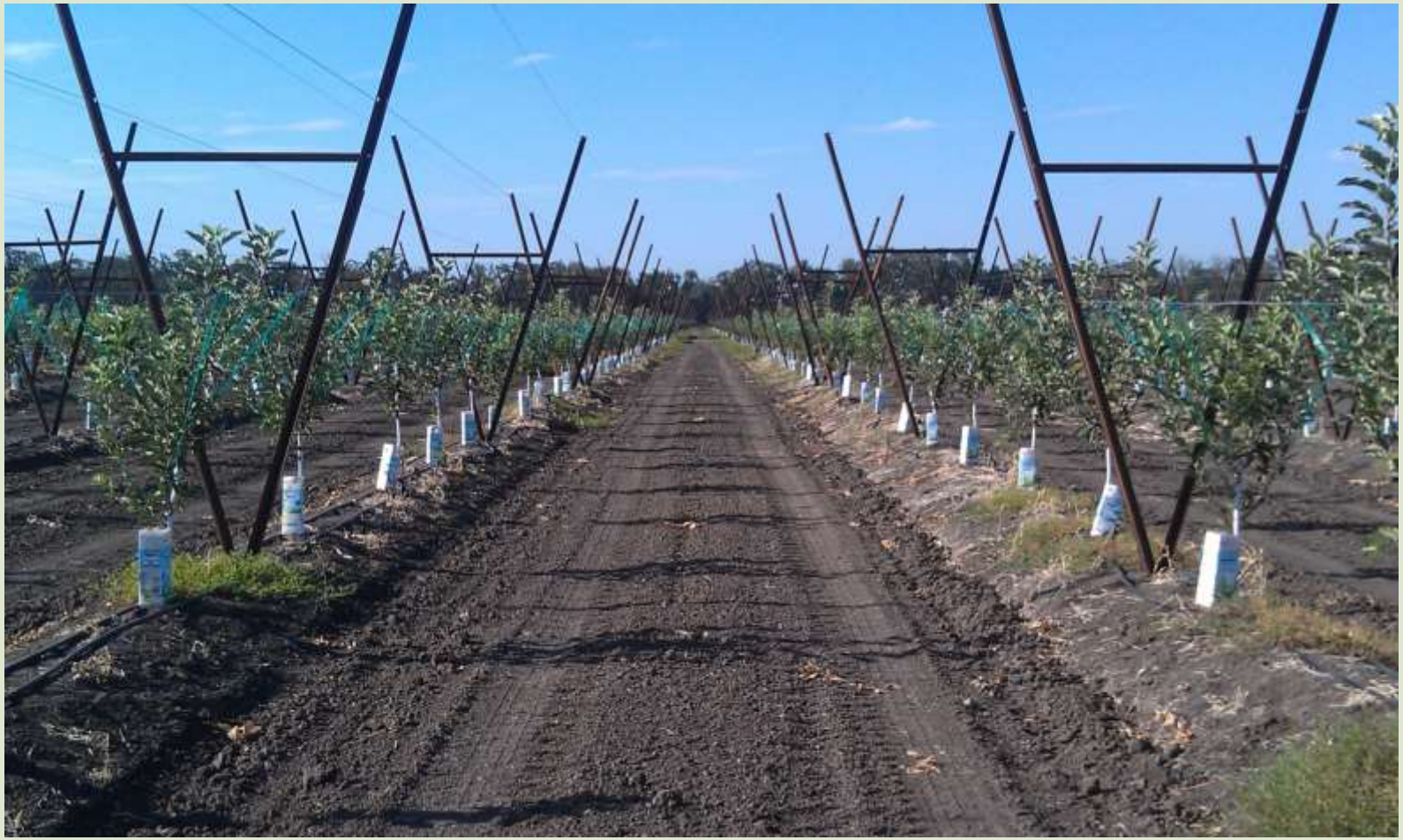
- 500 acres
- Gala. Fuji, Granny Smith, Pink Lady
- Located southeast of Lodi
- Started planting apples in the mid-1980's

Orchard Establishment

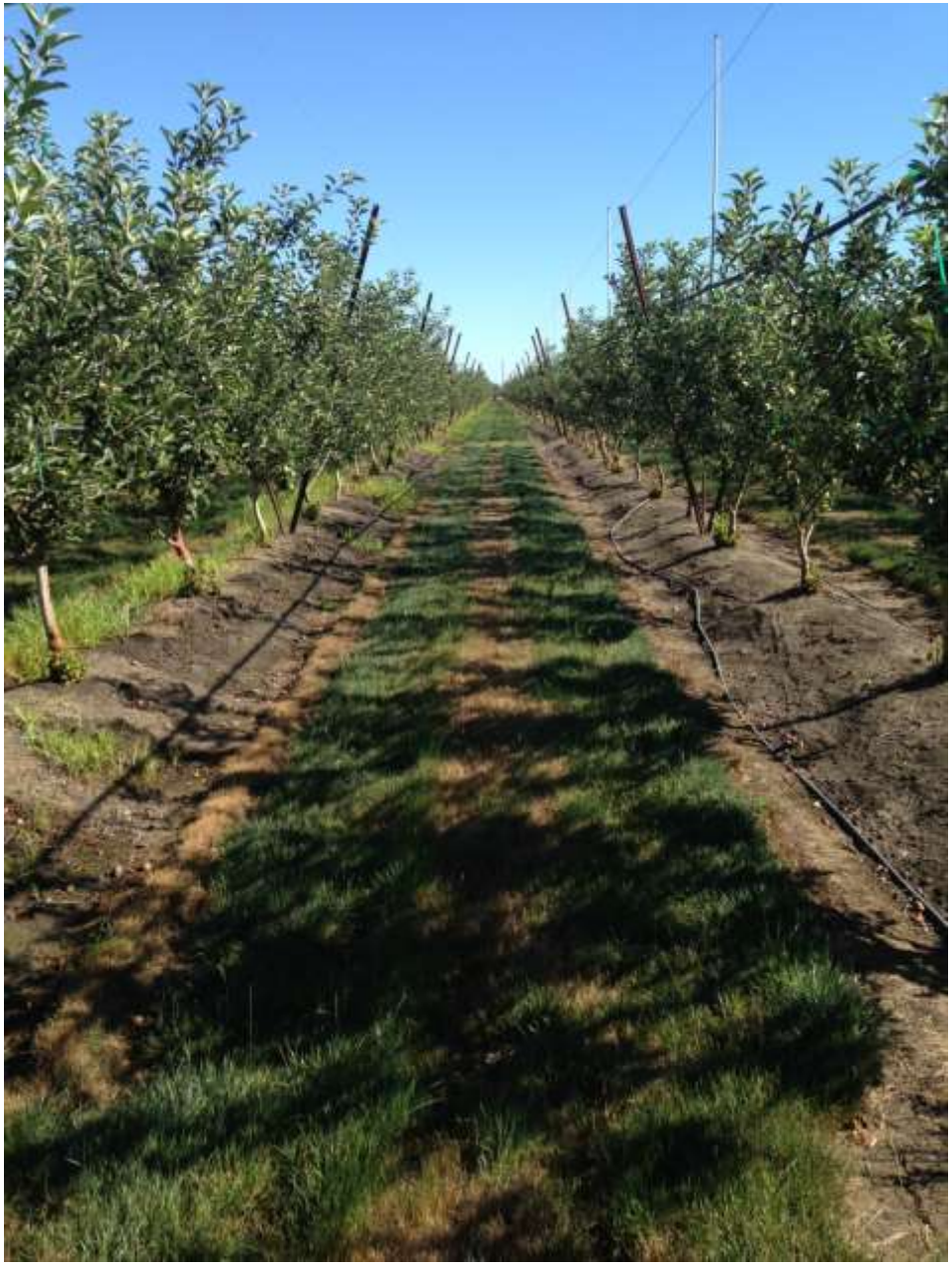
- Spacing 14 feet by 8 feet
- M7a Rootstock
- Hand planted
- V-Trellis
- Trees are allowed to grow 11 feet tall
- 8 to 10 leaders per tree depending on variety
- Micro sprinkler or drip irrigated
- Overhead cooling
- Permanent cover crop

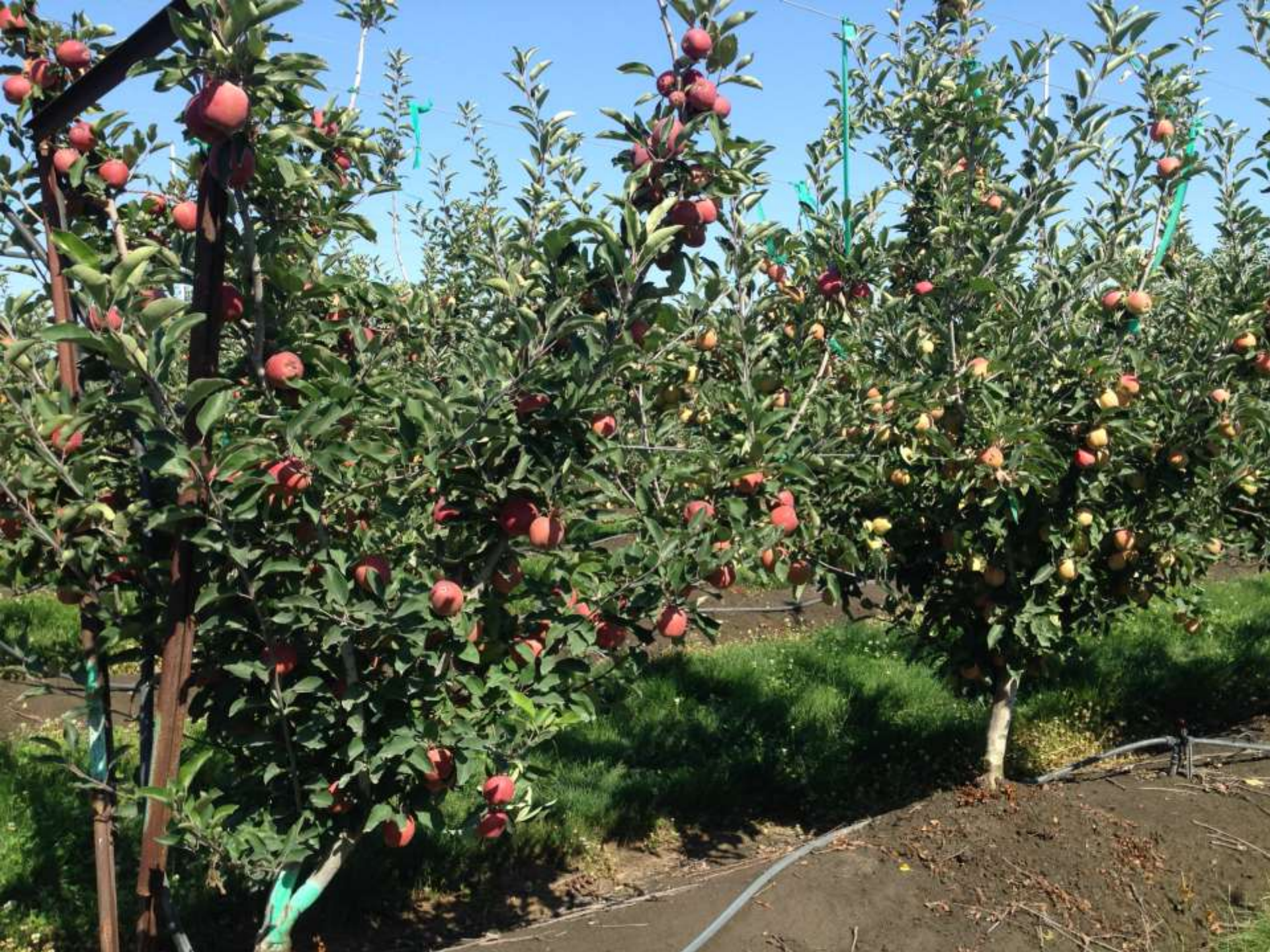
Orchard Establishment

V-Trellis

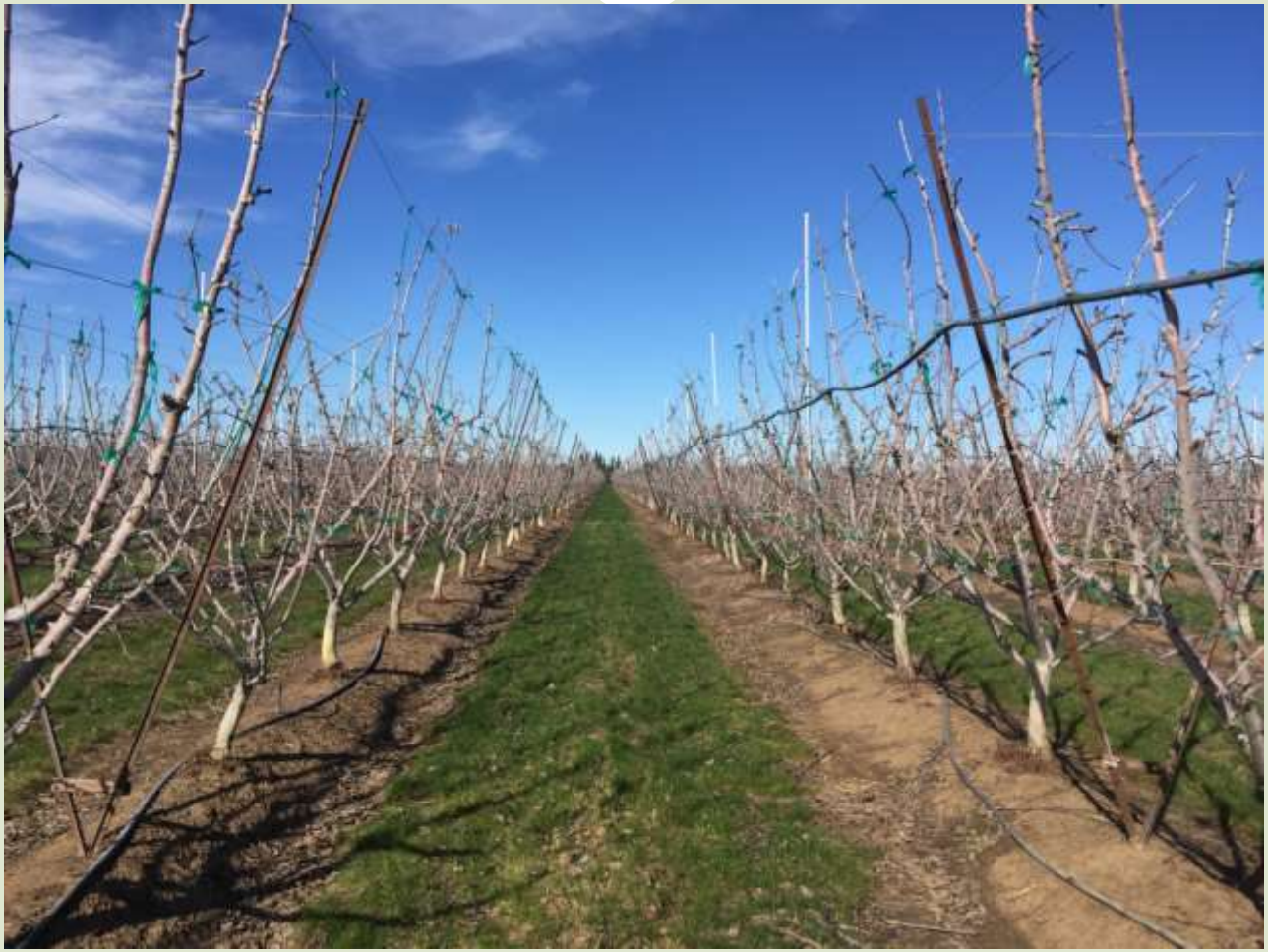


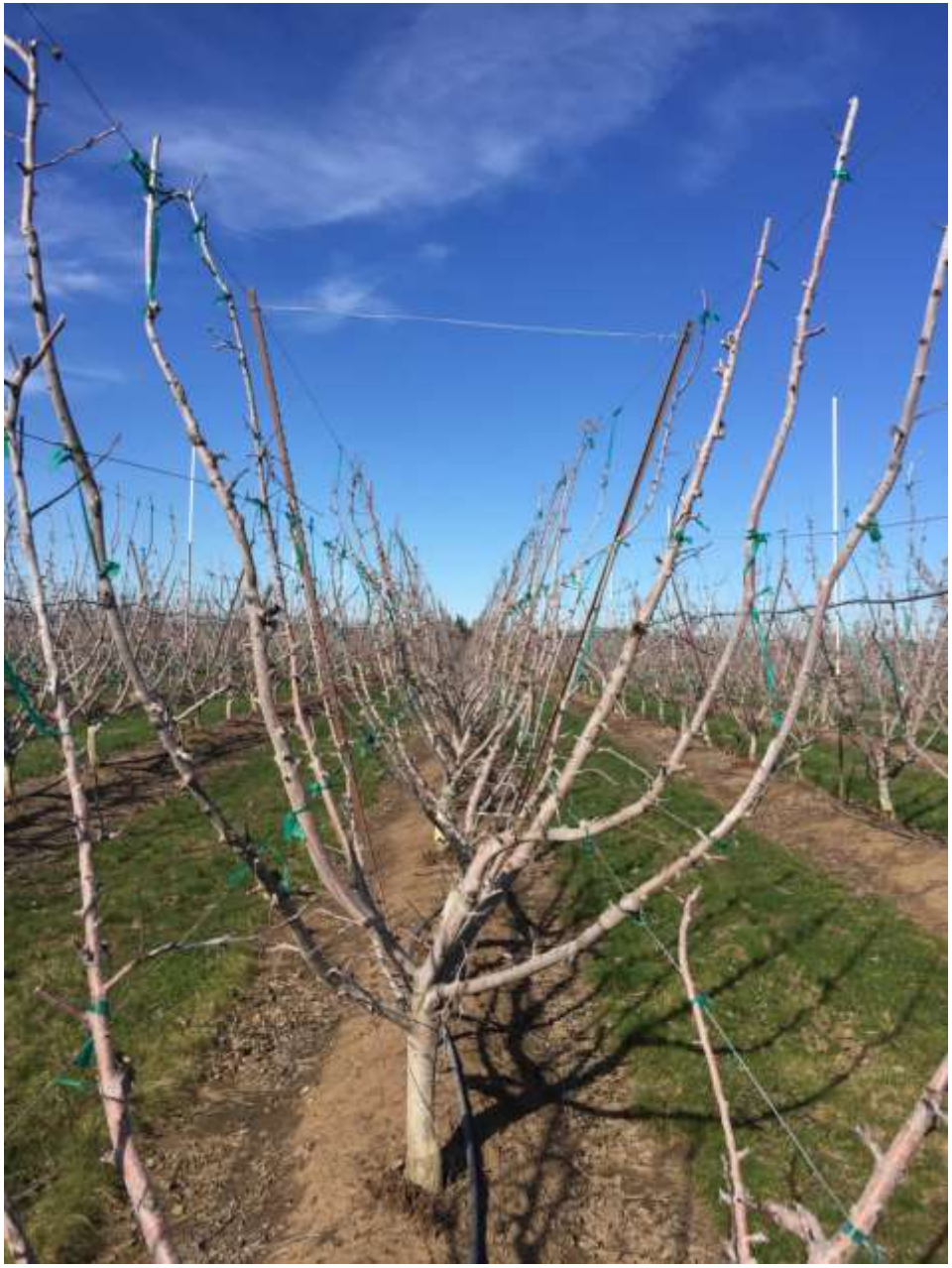
Tying limbs as trees grow

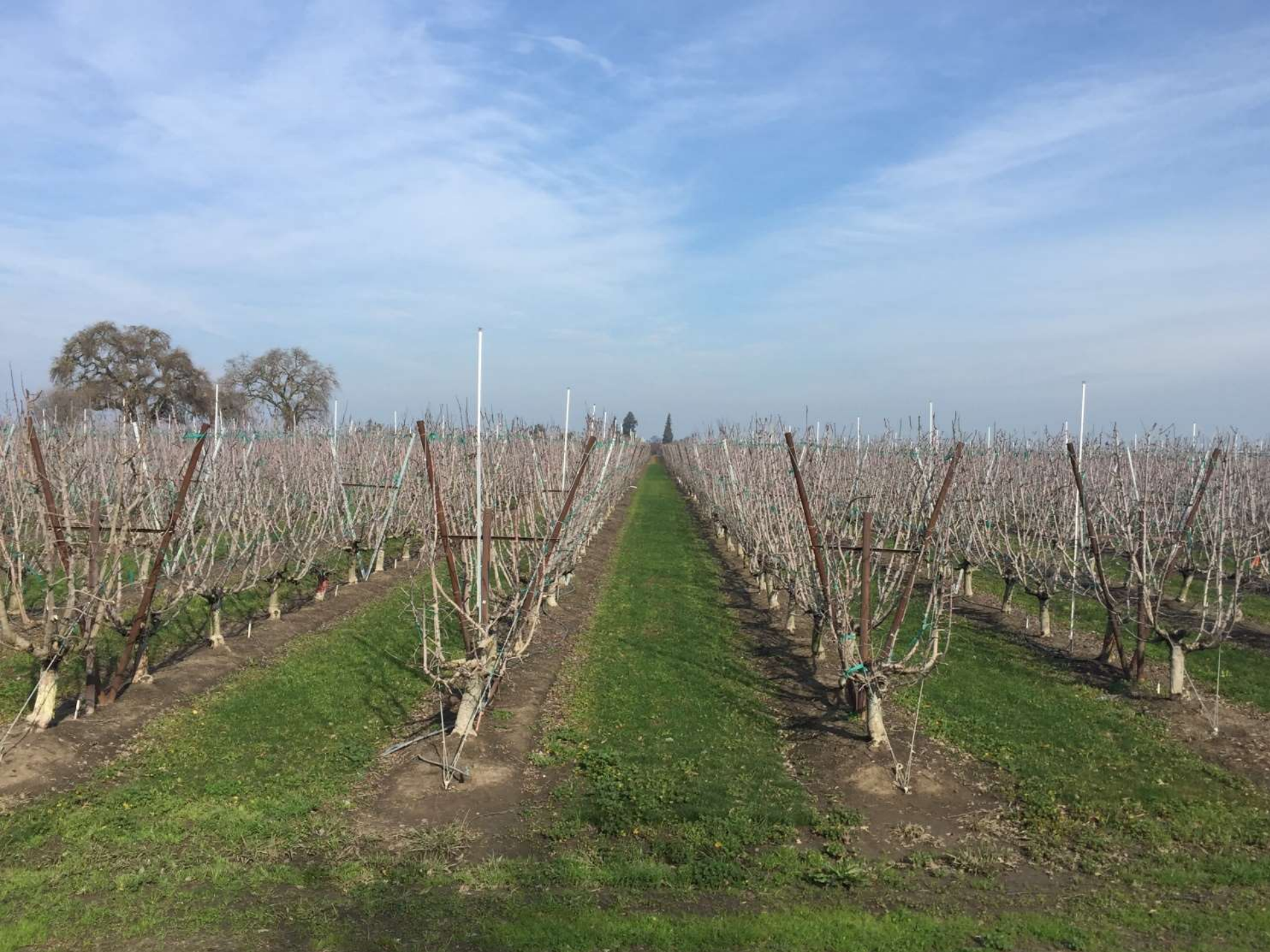




Trees should fill their allotted space in 4 to 5 years

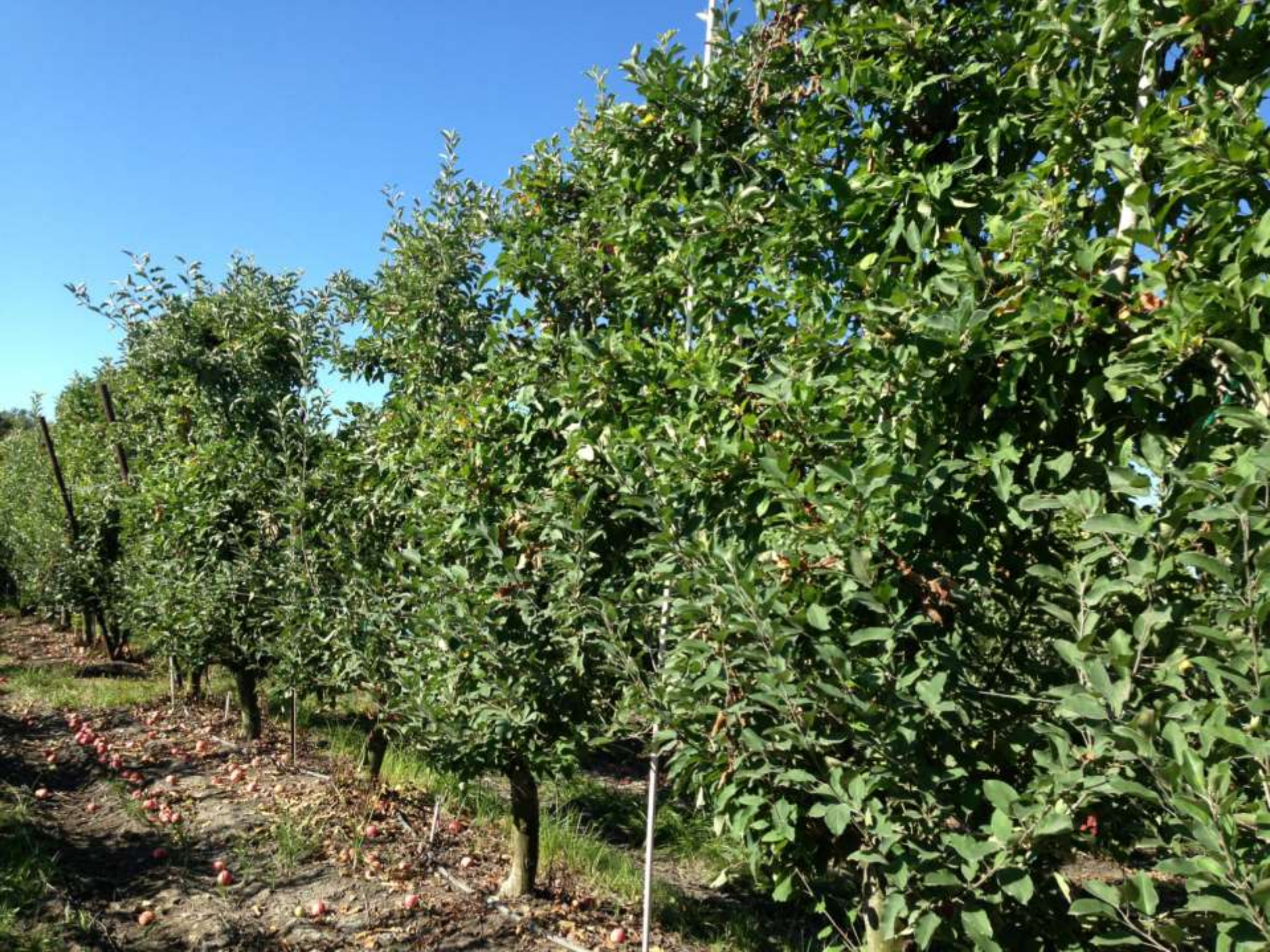


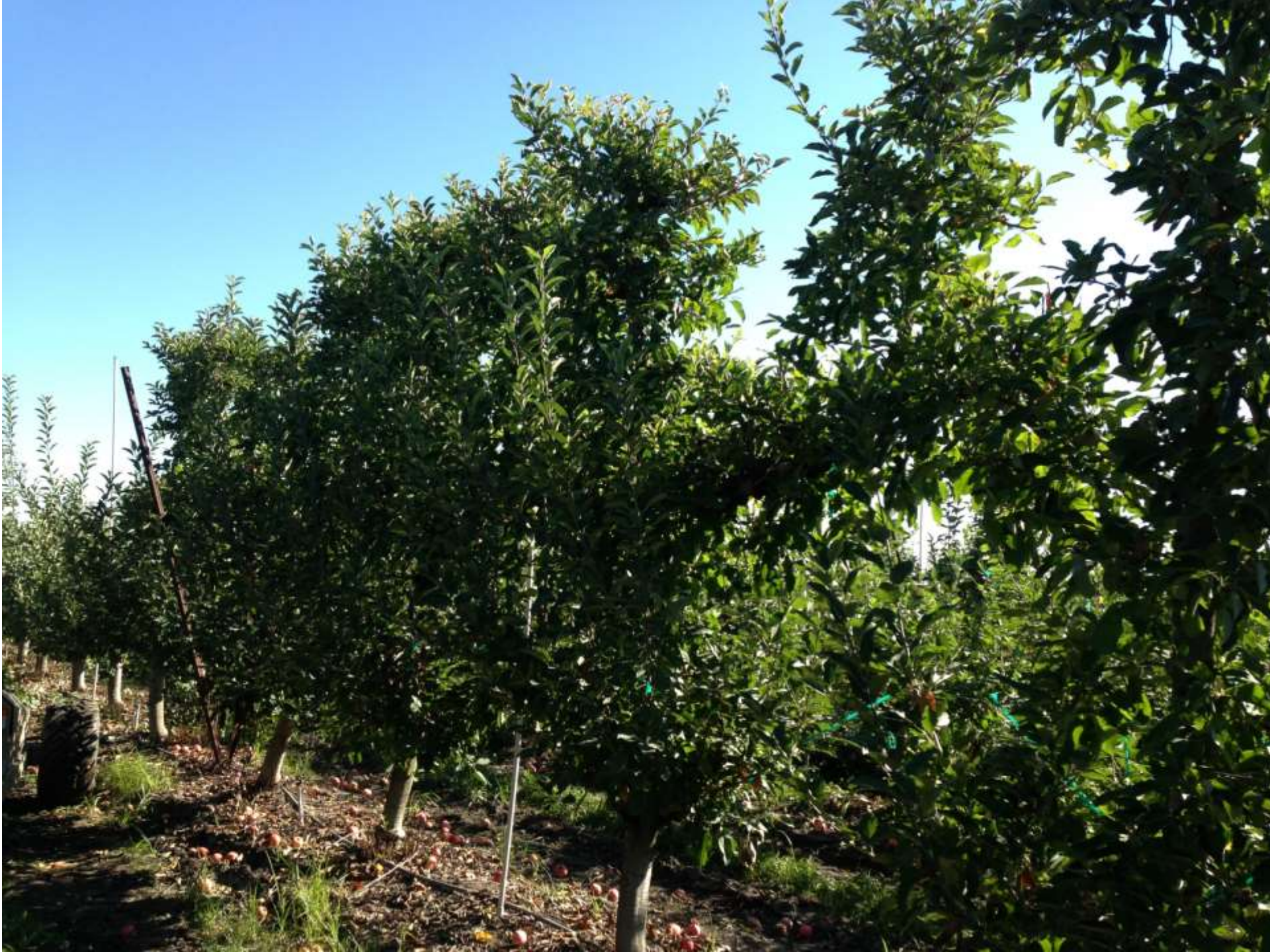


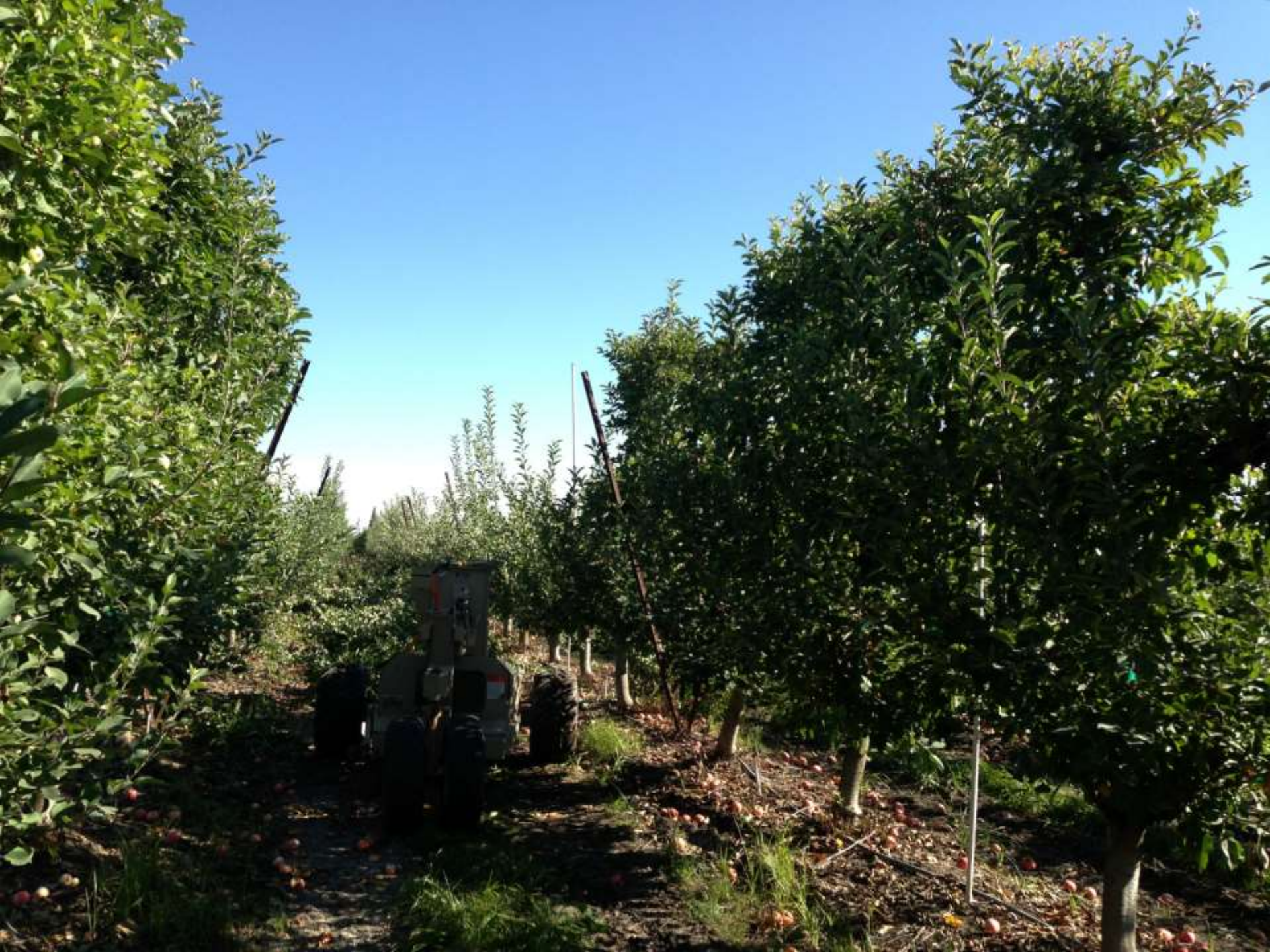


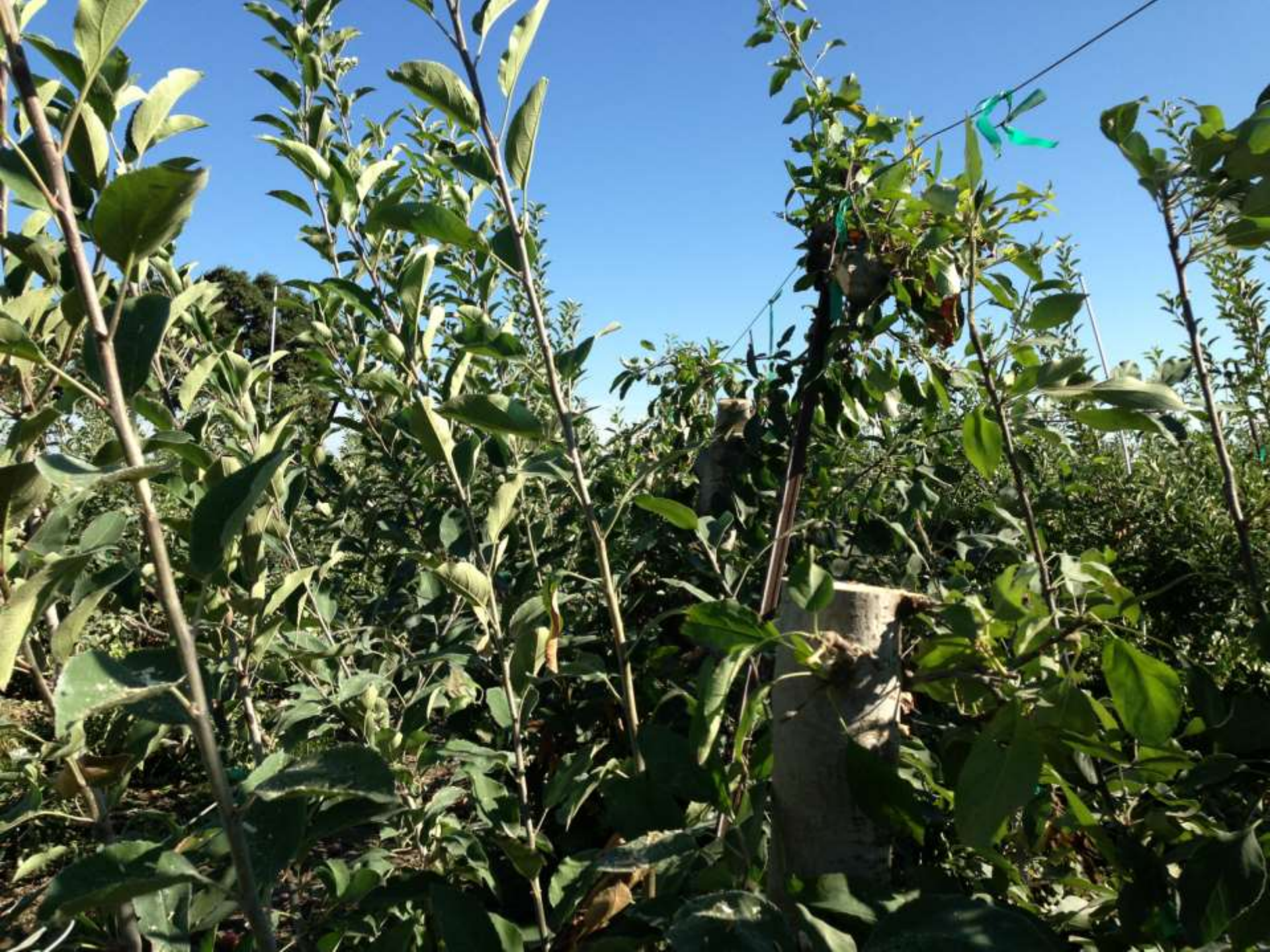
Grafting and Re-Training

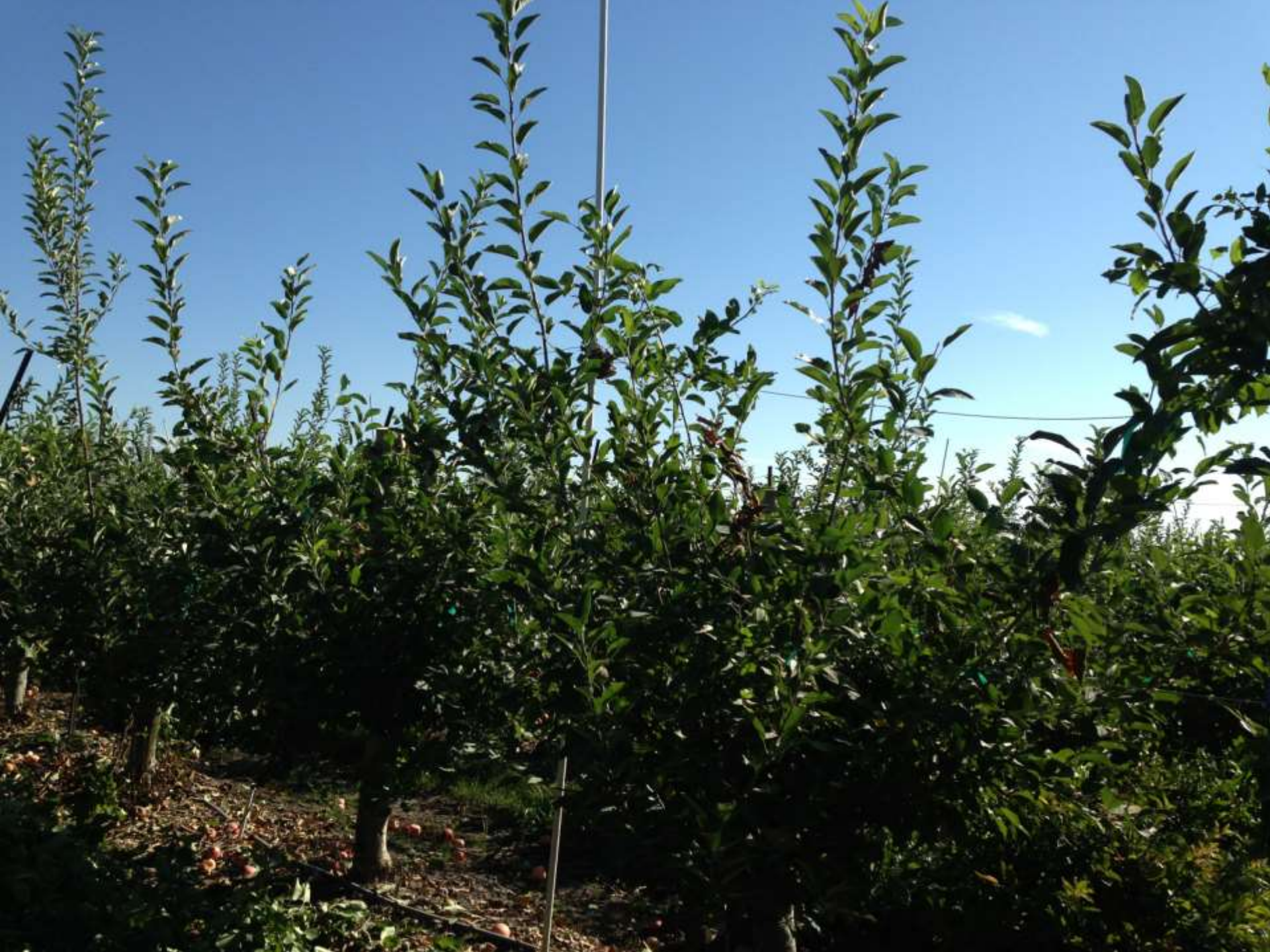
- Used to convert variety or strain
- Older orchards were originally trained to vertical wall
- When grafted, orchard is converted to V-trellis

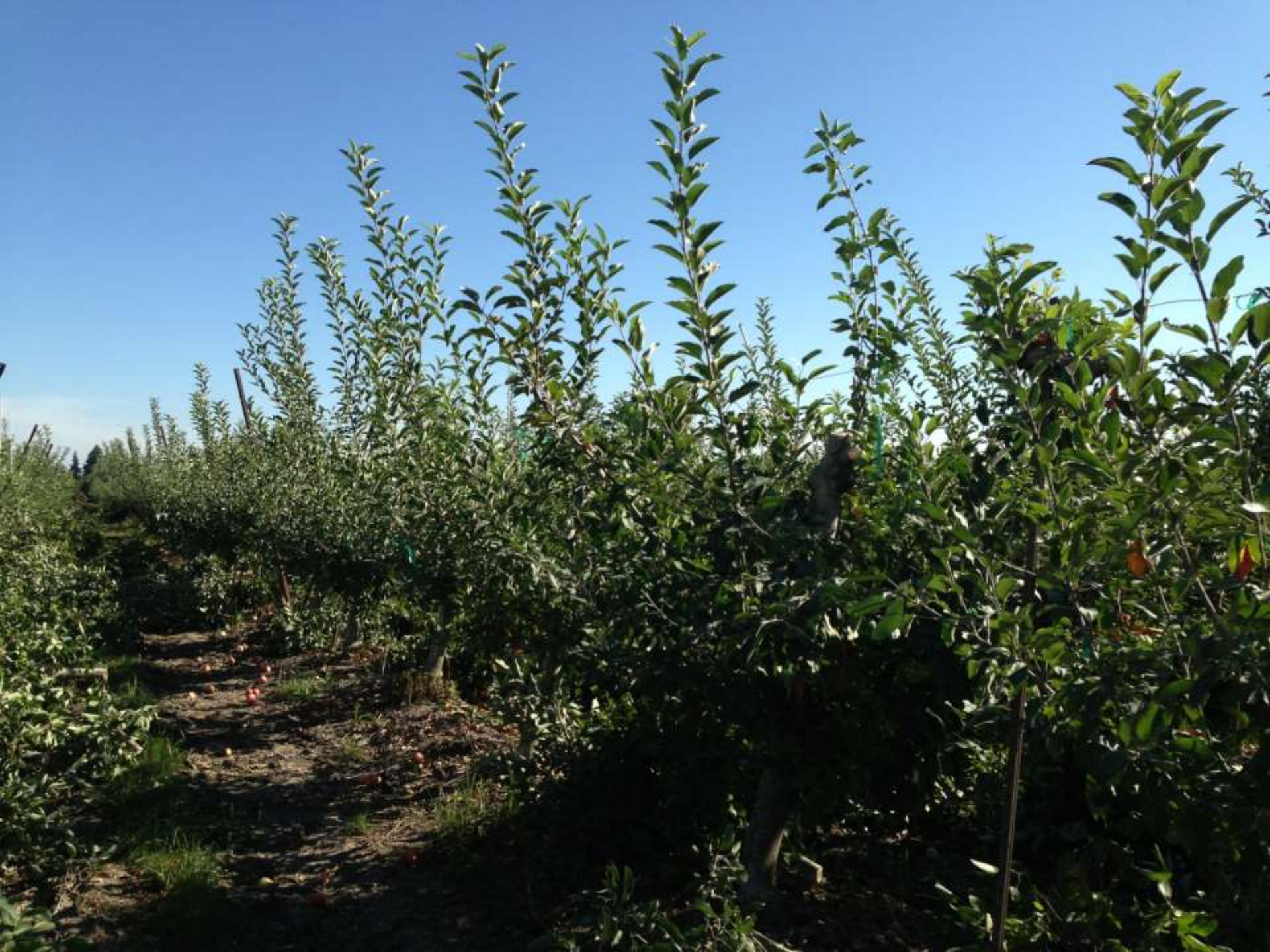


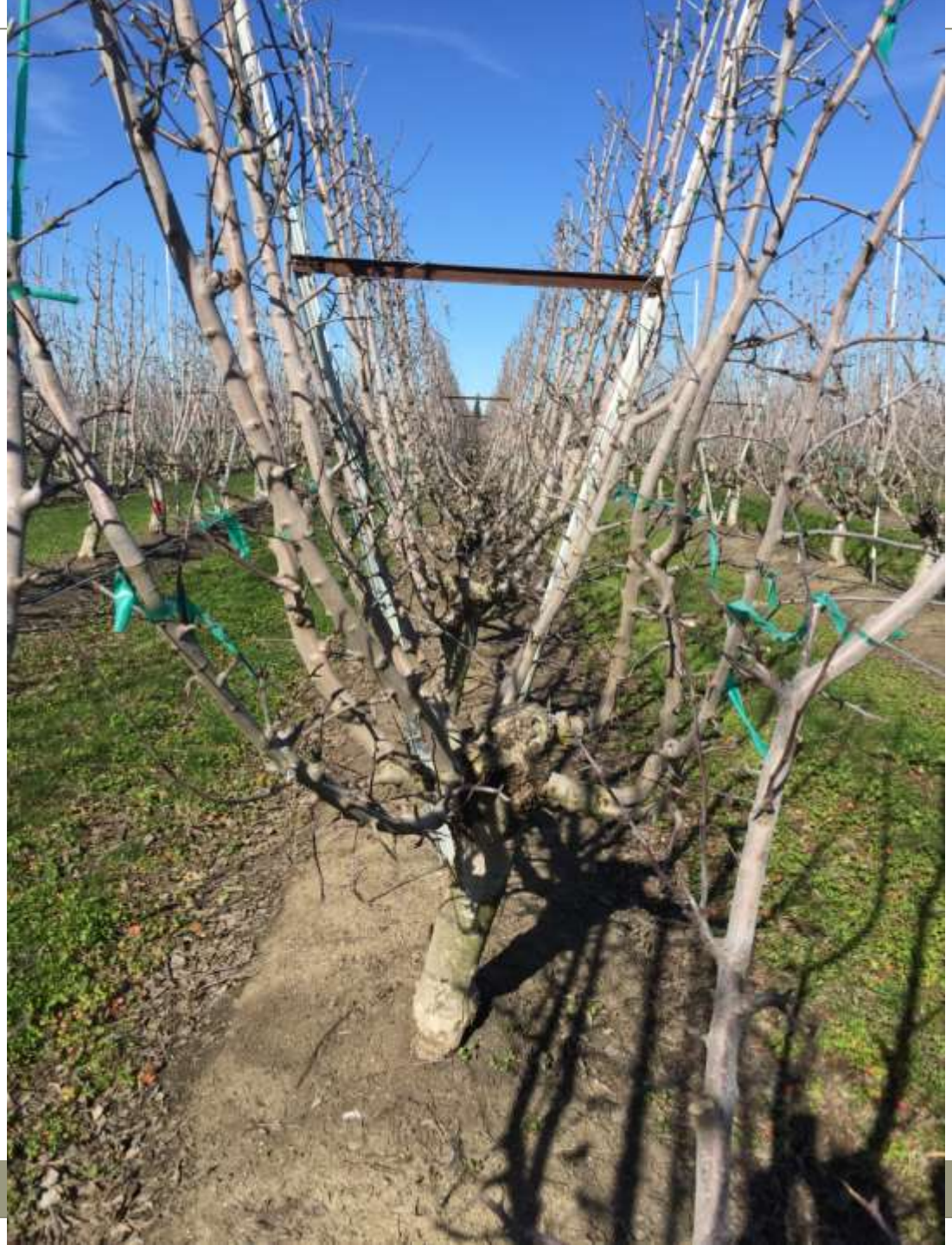


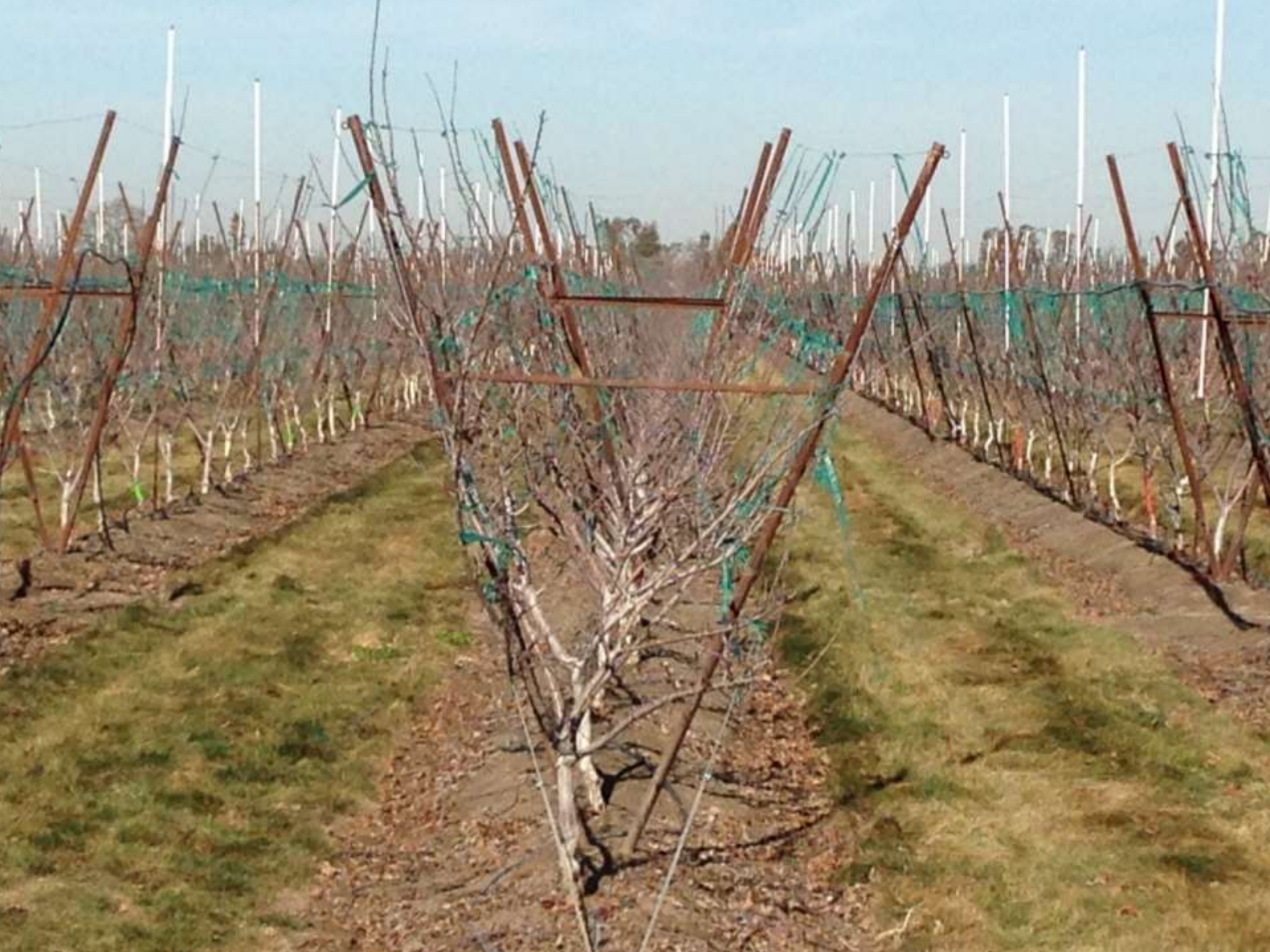


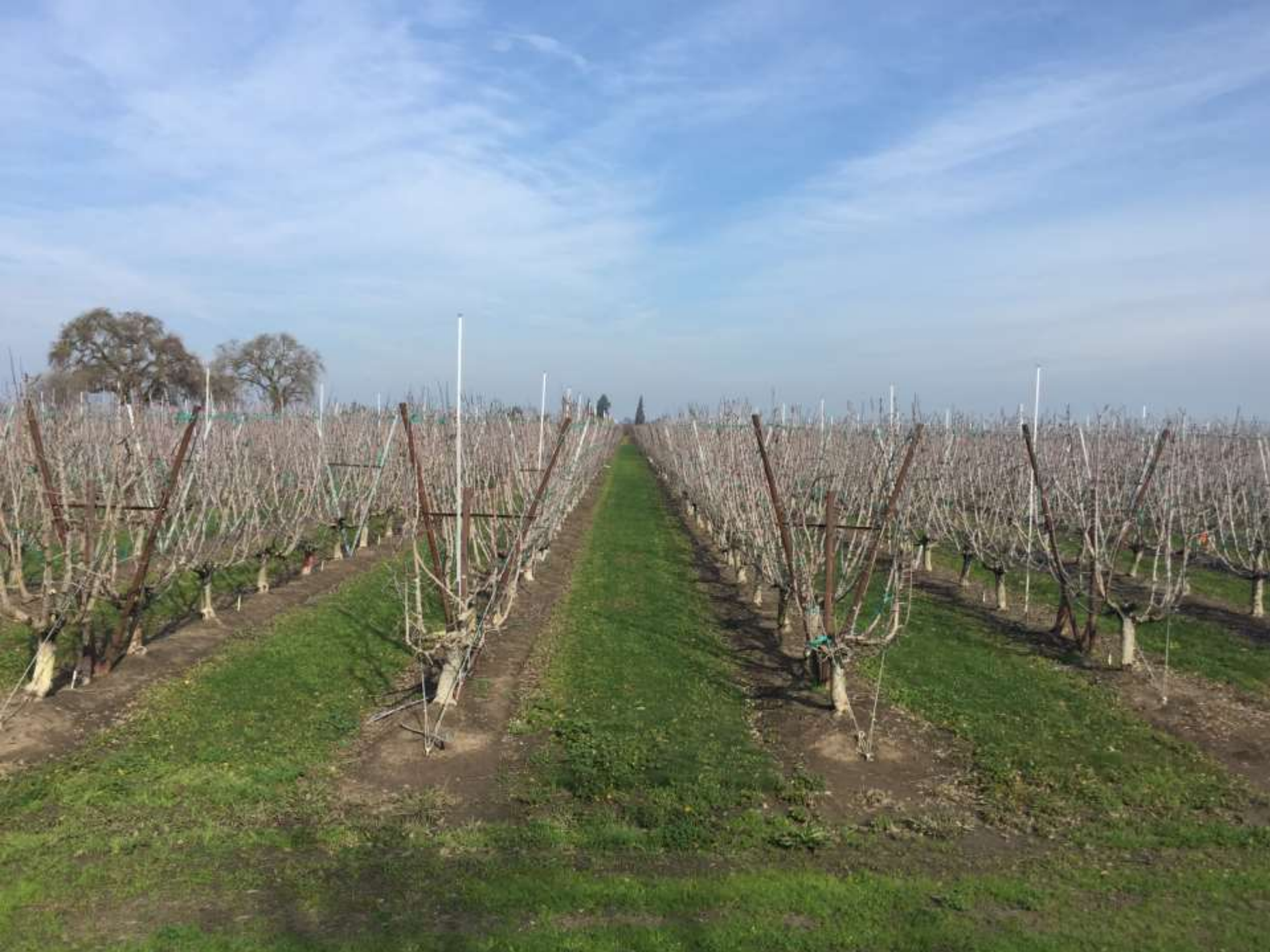


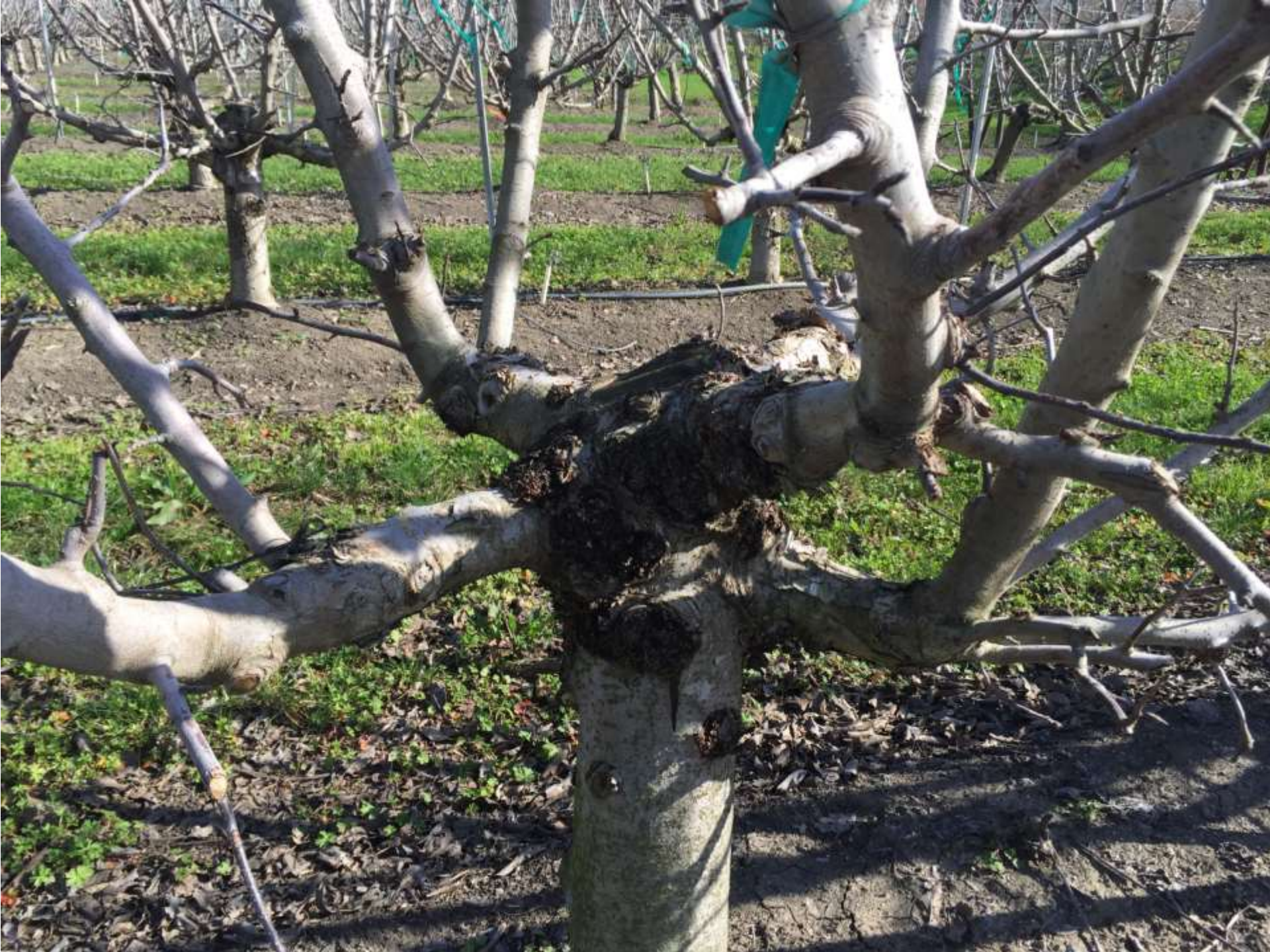




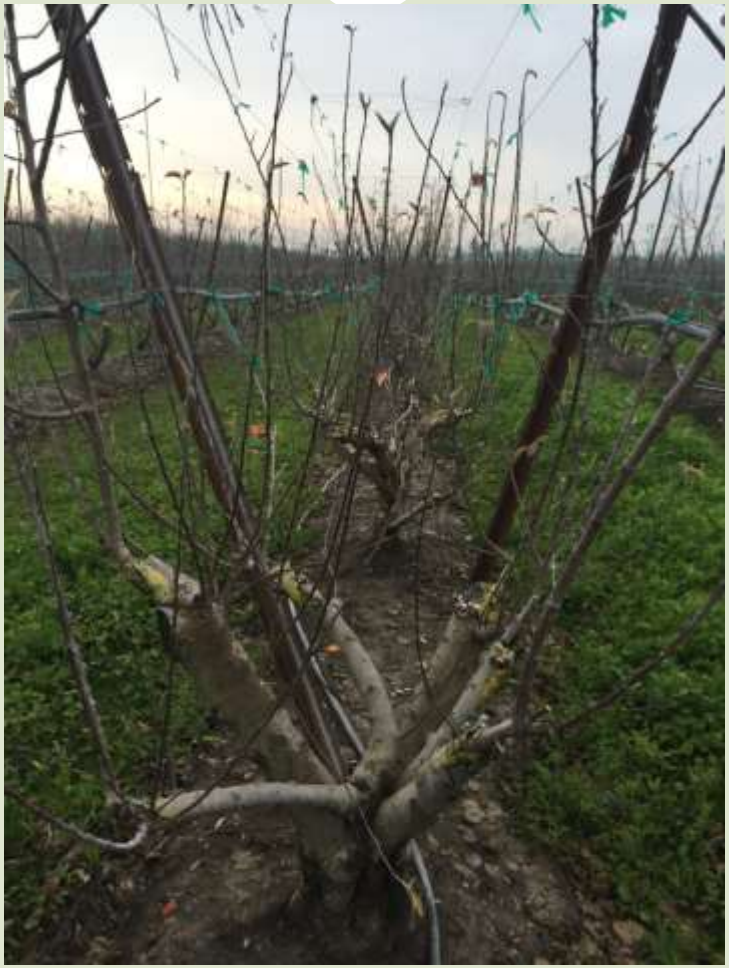








Grafting an Existing V-Trellis



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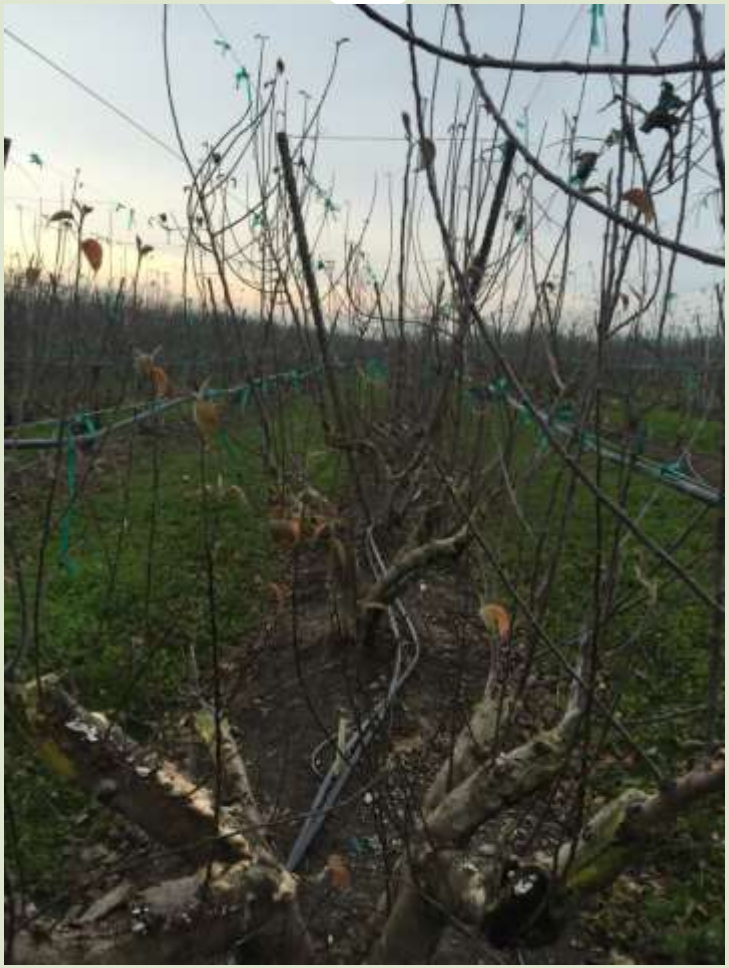

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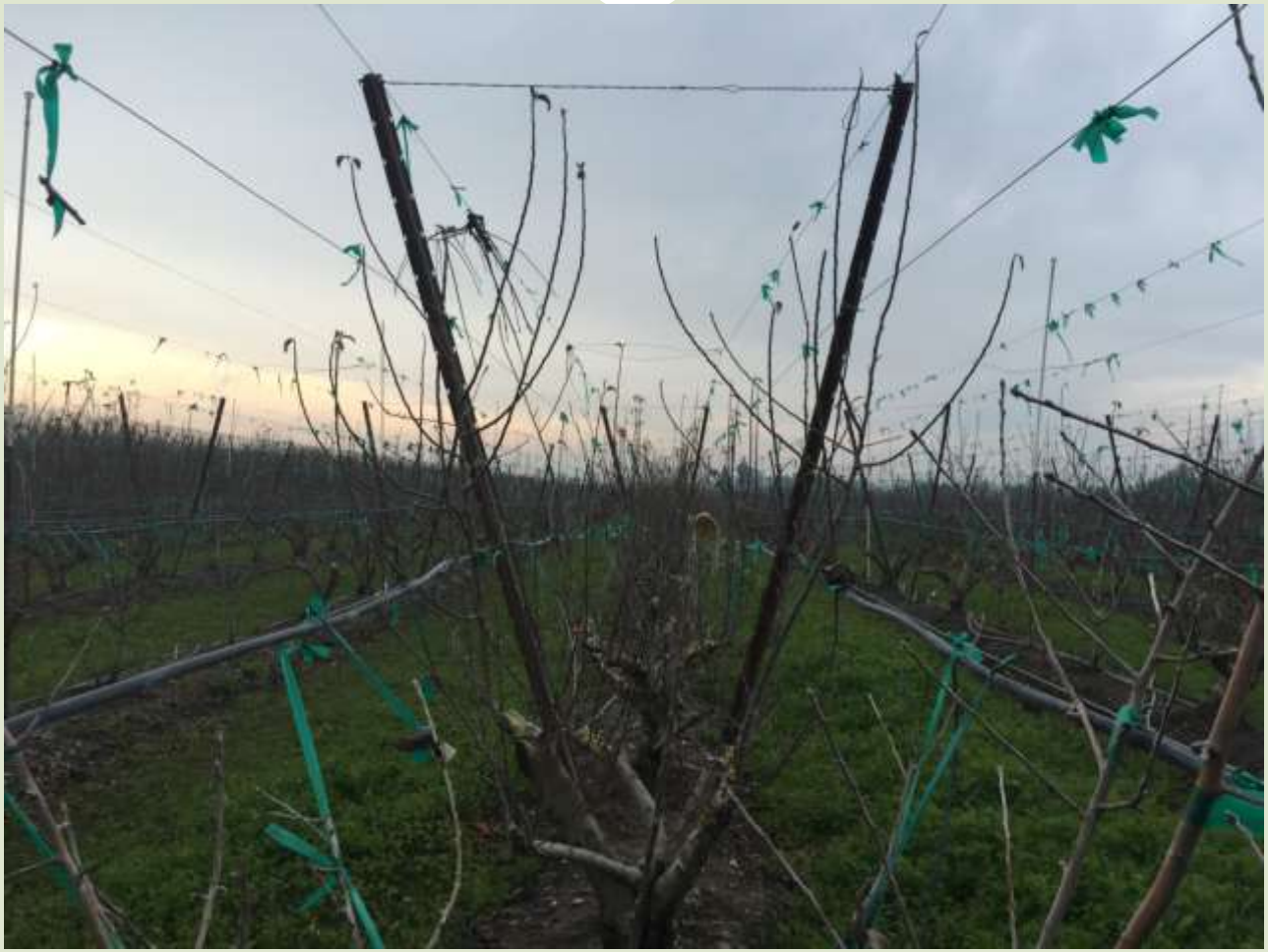

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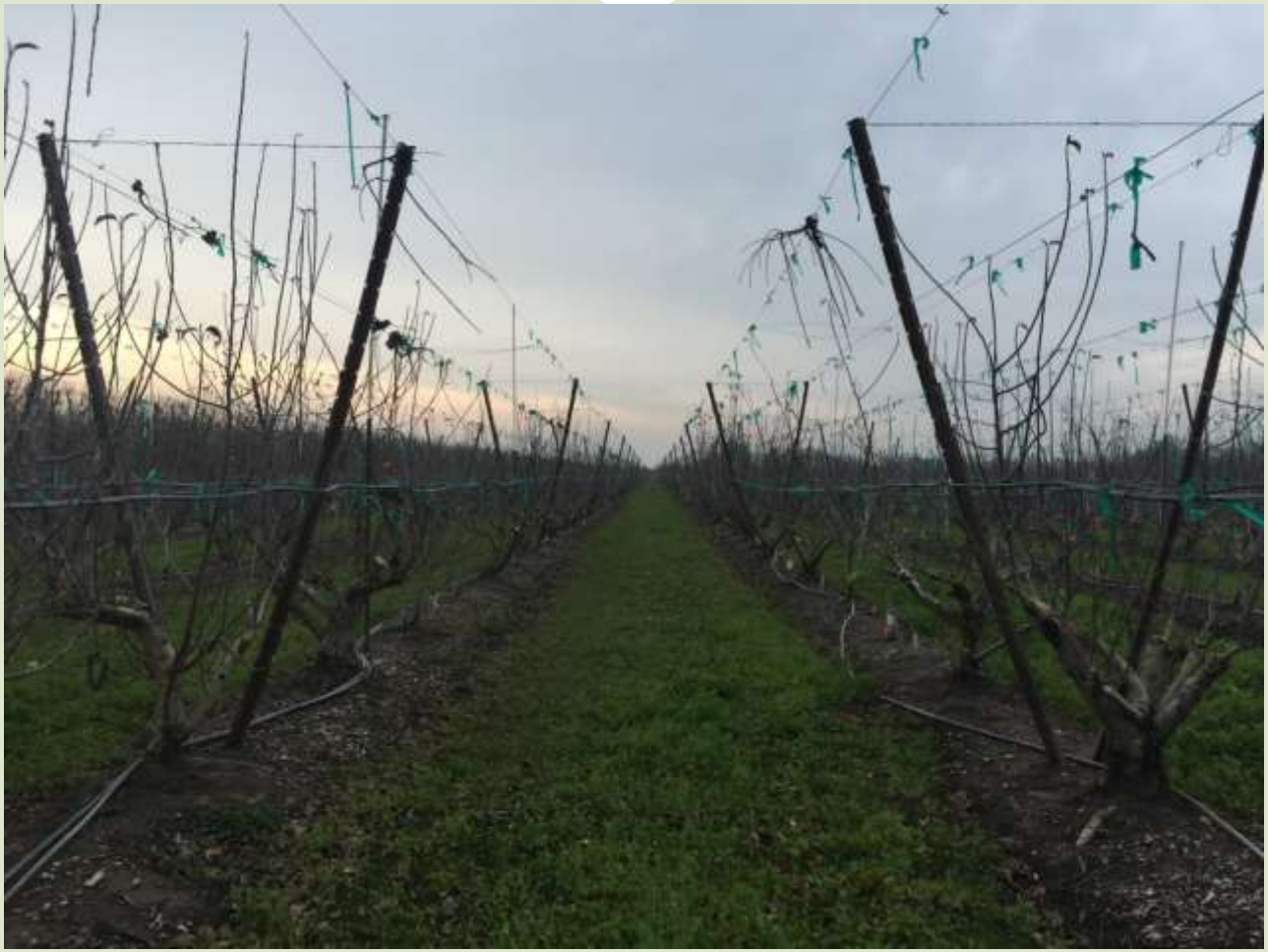


Why Overhead Cool?

- Evaporating water cools the tree and fruit, not the temperature of the water
- Fruit burns when the fruit surface temperature of the apple reaches 114 F (Variety dependent).
- Fruit surface temperature is, on average, 20 degrees warmer than ambient air temperature. Temperature difference can vary with cloud cover, humidity, wind, etc.
- Therefore, you can't let the ambient air temperature of the orchard exceed 94 F or you will get sunburn
- Trees completely shut down at 95F (STRESS).

Why Overhead Cool?

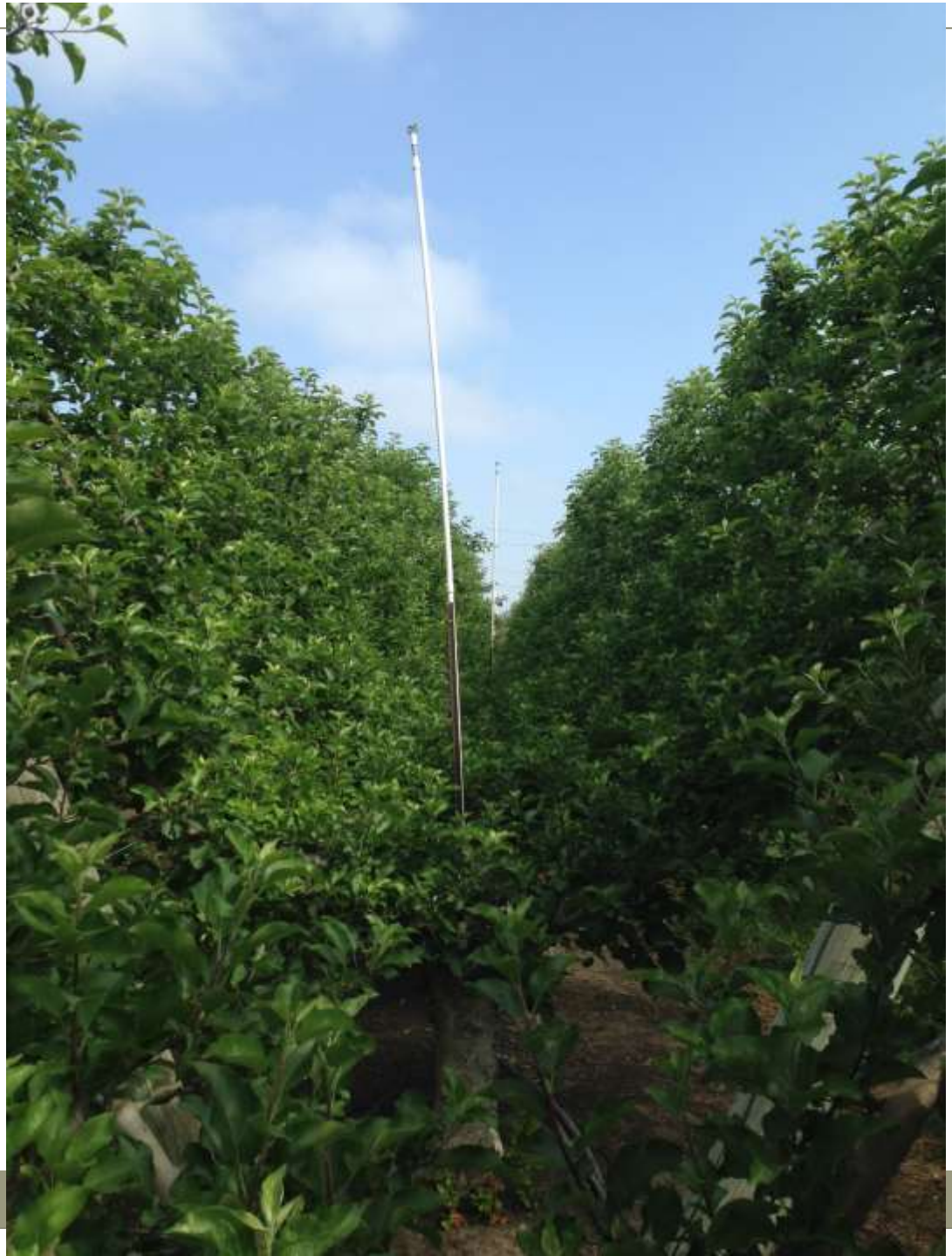
- If the tree has shut down, fruit growth has stopped!
- Worse yet, the tree uses the fruit as a water reservoir when evapotranspiration exceeds the capacity of the roots to take in water, further inhibiting growth of the apple.
- Bitter pit incidence increased with tree stress

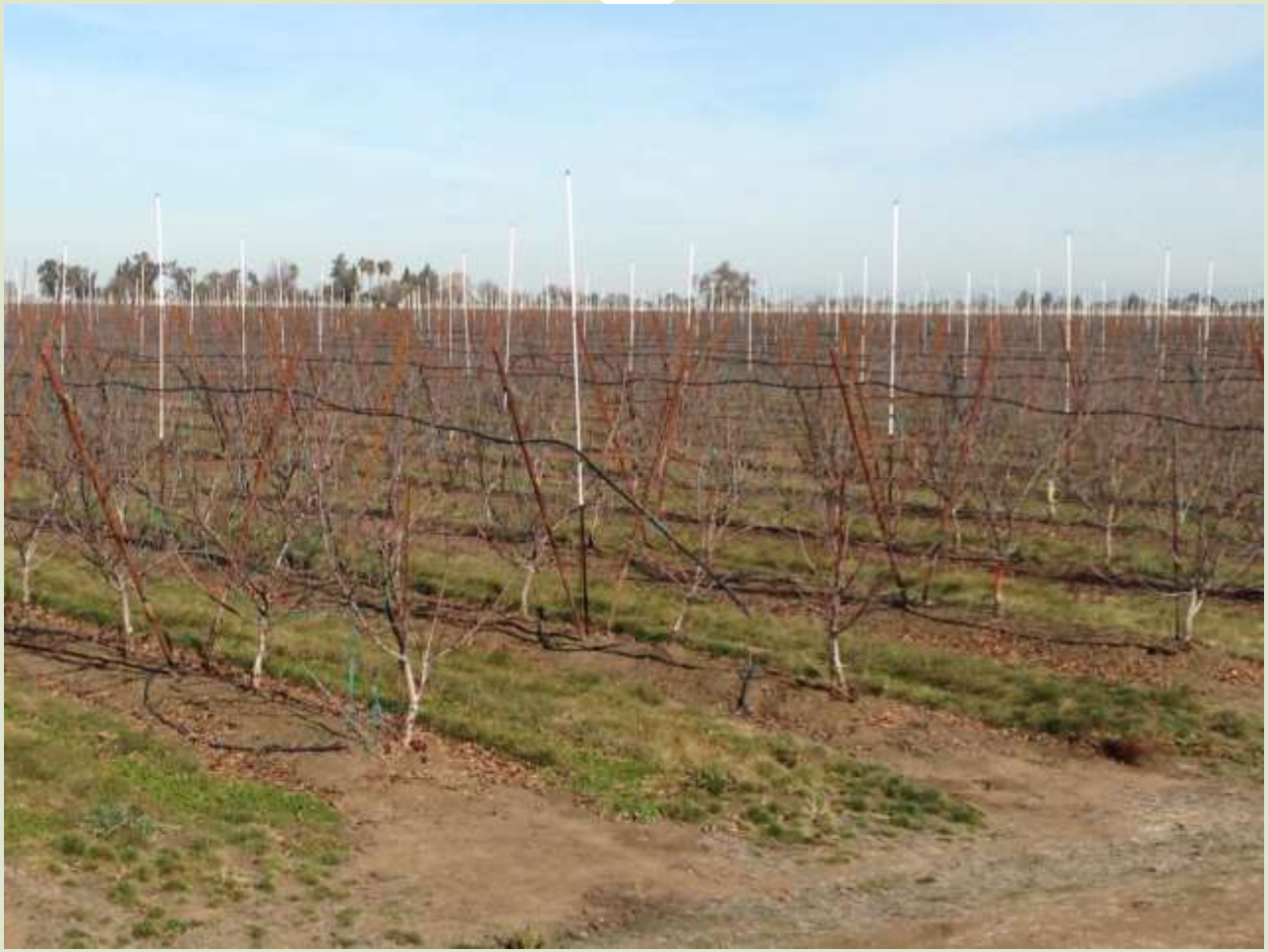
Overhead Cooling Apple Trees

- To avoid the fruit surface temperature from reaching 114F (ambient air temp at 94F), I turn on the overhead cooling sprinklers at 91F.
- The system runs for 10 minutes on, and is off for 10 minutes.
- The process repeats itself until the ambient air temperature drops to 80F +/-
- The system is manually turned off at 6PM even if ambient air temperature has not reached 80F.

Overhead Cooling Apple Trees

- Evaporation is cooling the apples/trees!
- With overhead cooling, ambient air temperature in the orchard can be 10 to 15 degrees cooler.
- Humidity is 100%
- Harvest activity stops!
- If water is high in bicarbonates, it will need to be treated (sulfuric acid).

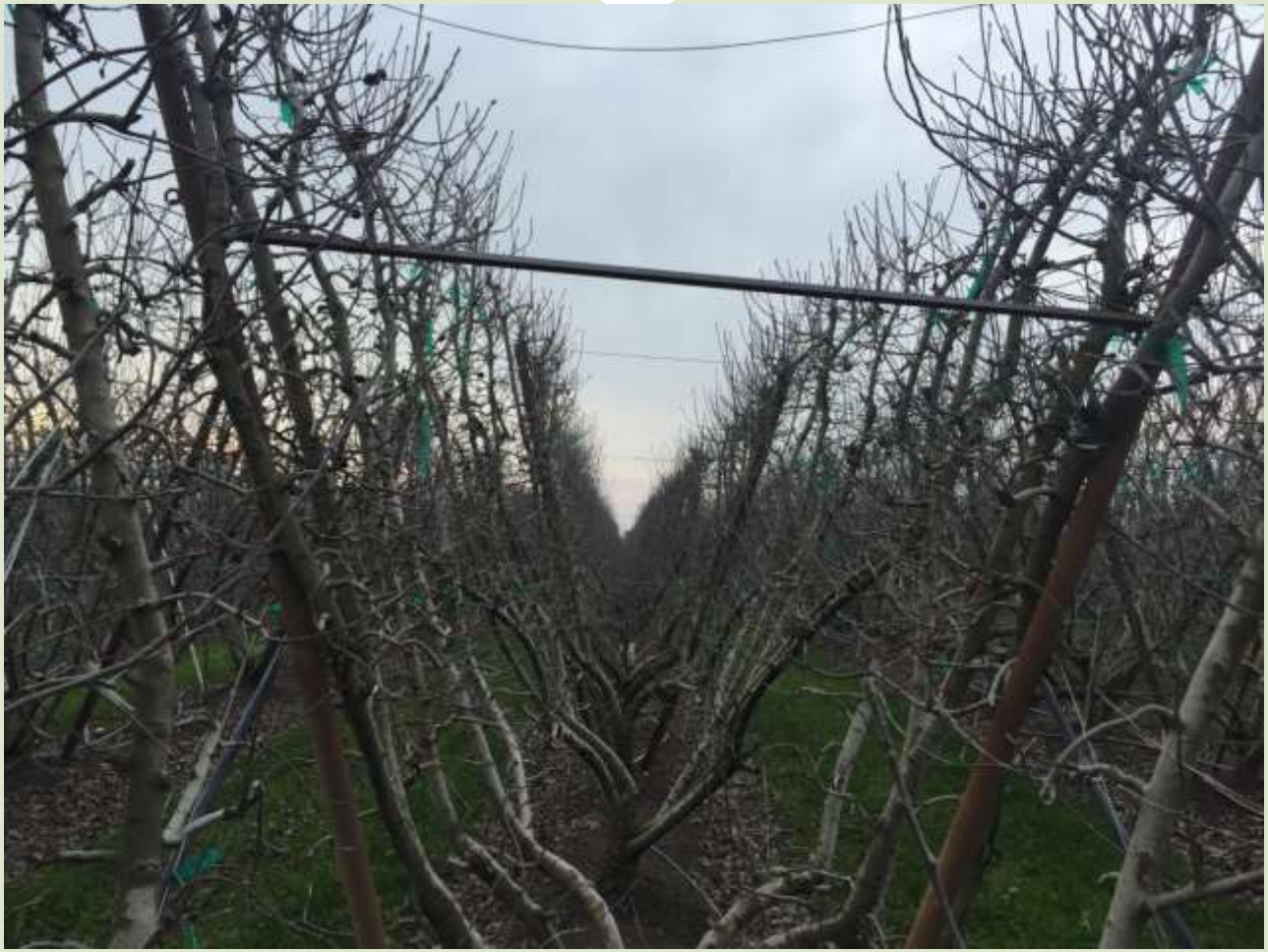


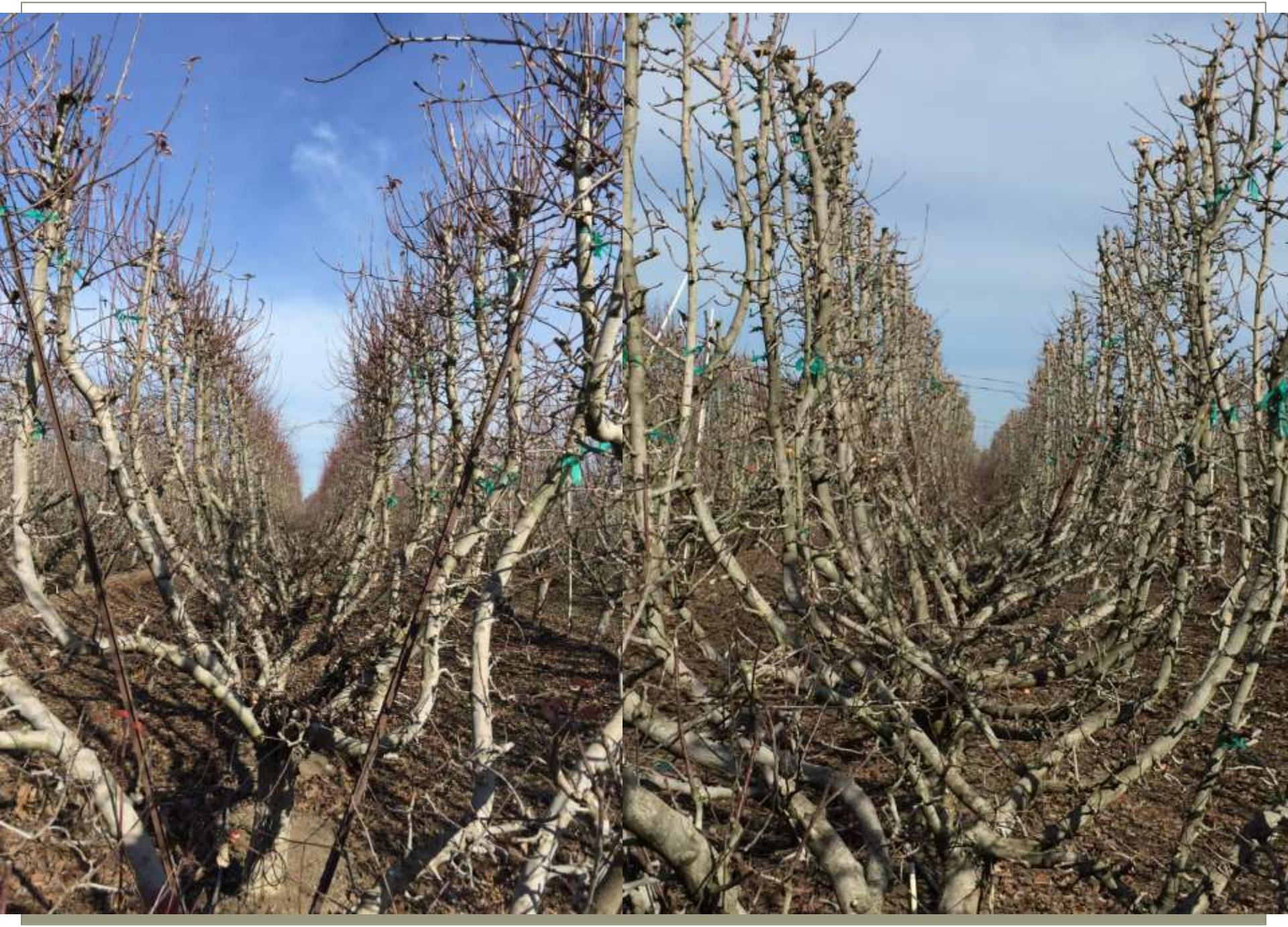


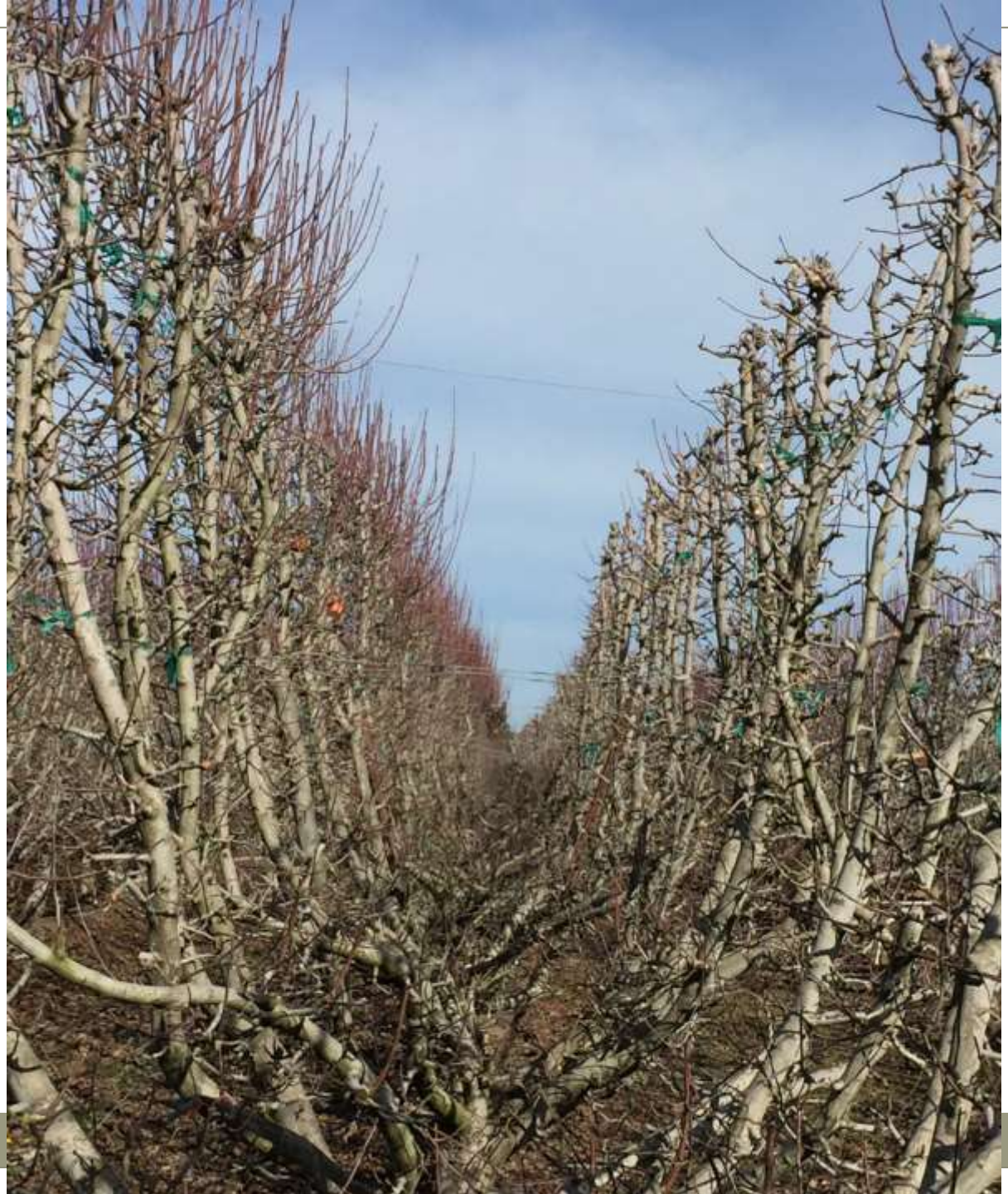
Dormant Pruning

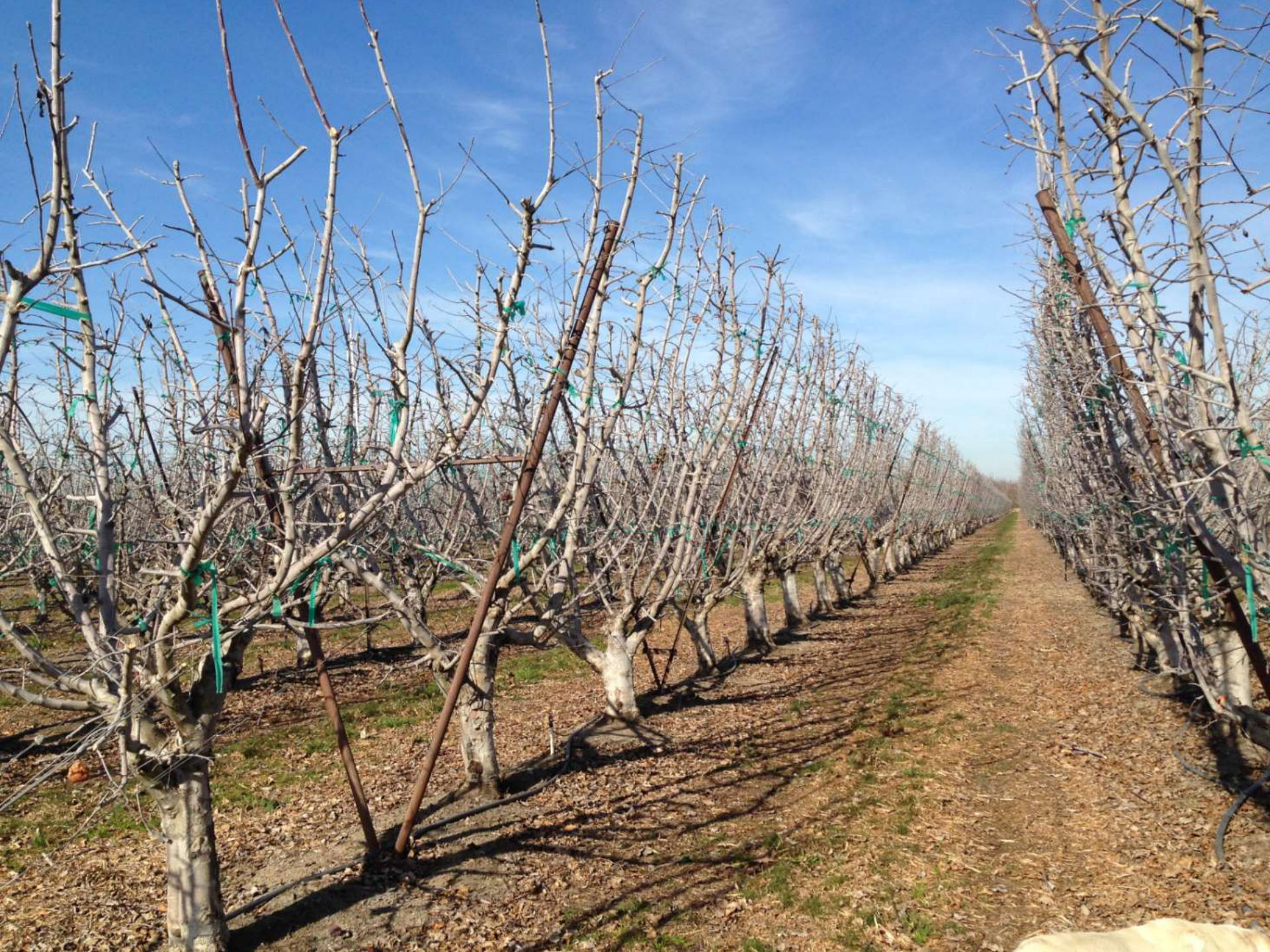
- Upright suckers are removed
- Horizontal wood larger that ¾” in diameter is pruned back to 1 to 2 inches in length (stub cut)
- Old/weak horizontal fruiting wood is cut to half of its length (rejuvenating cut)
- One year old fruitwood is either left entirely or removed entirely.

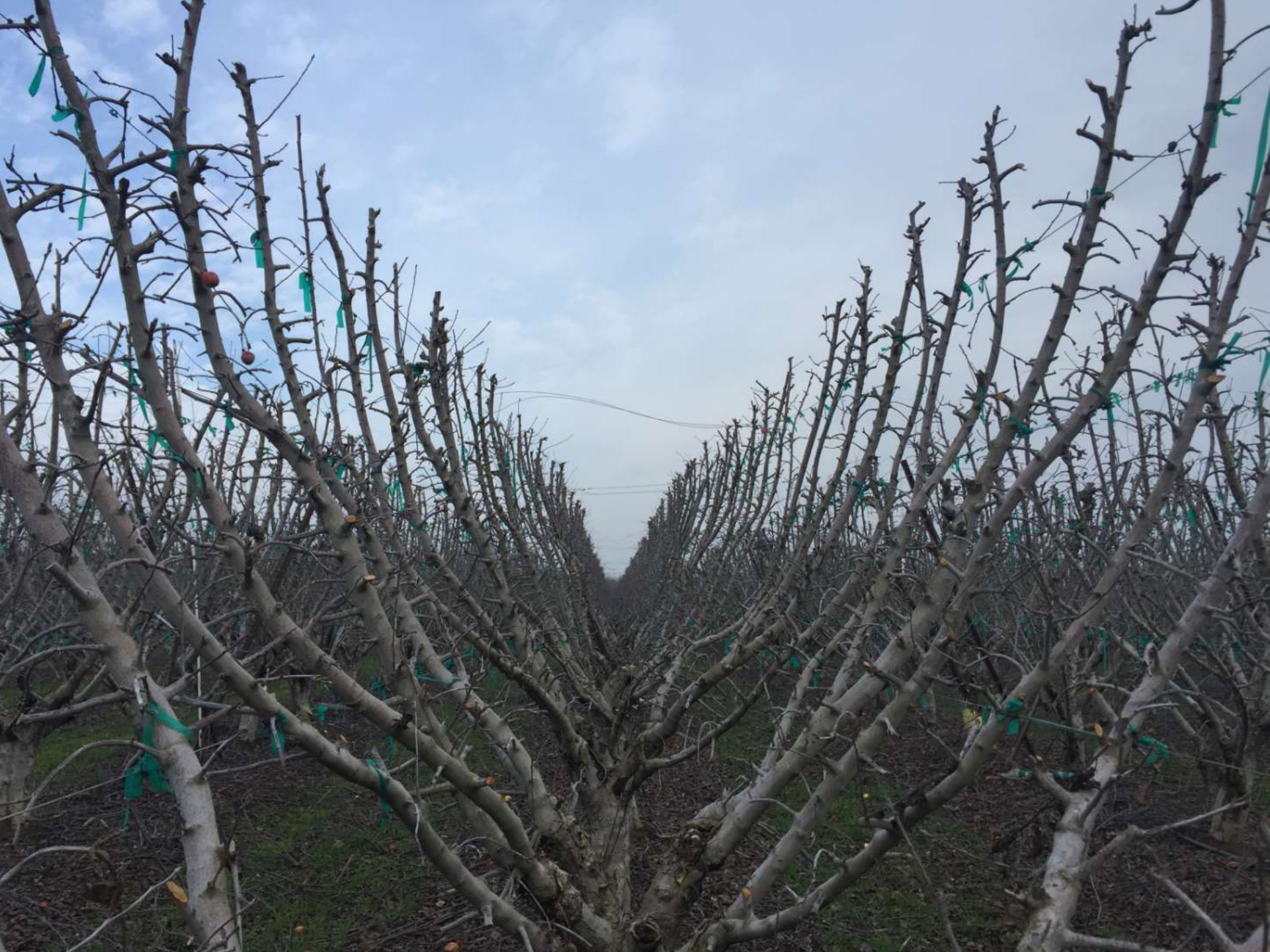
Unpruned

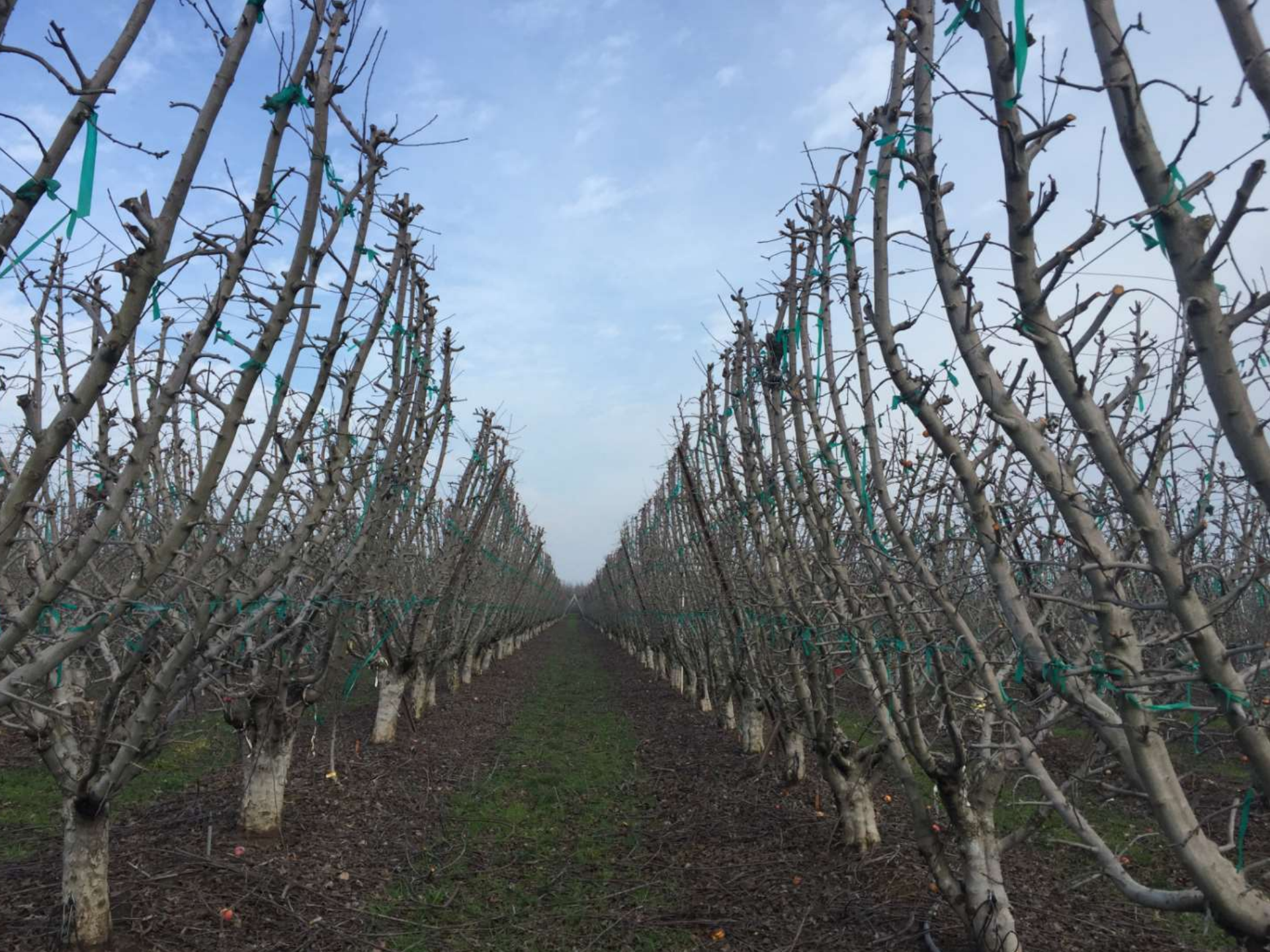




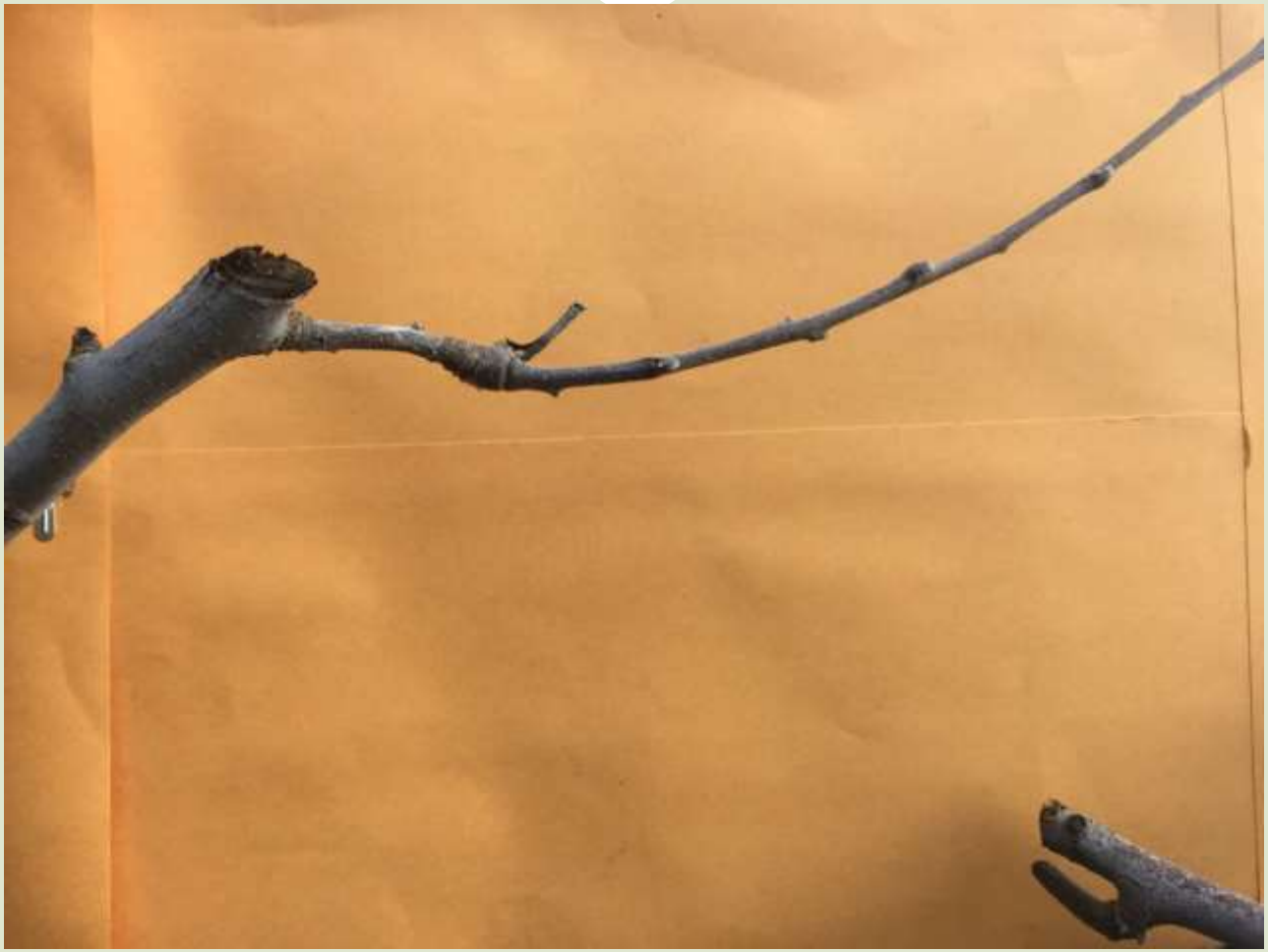


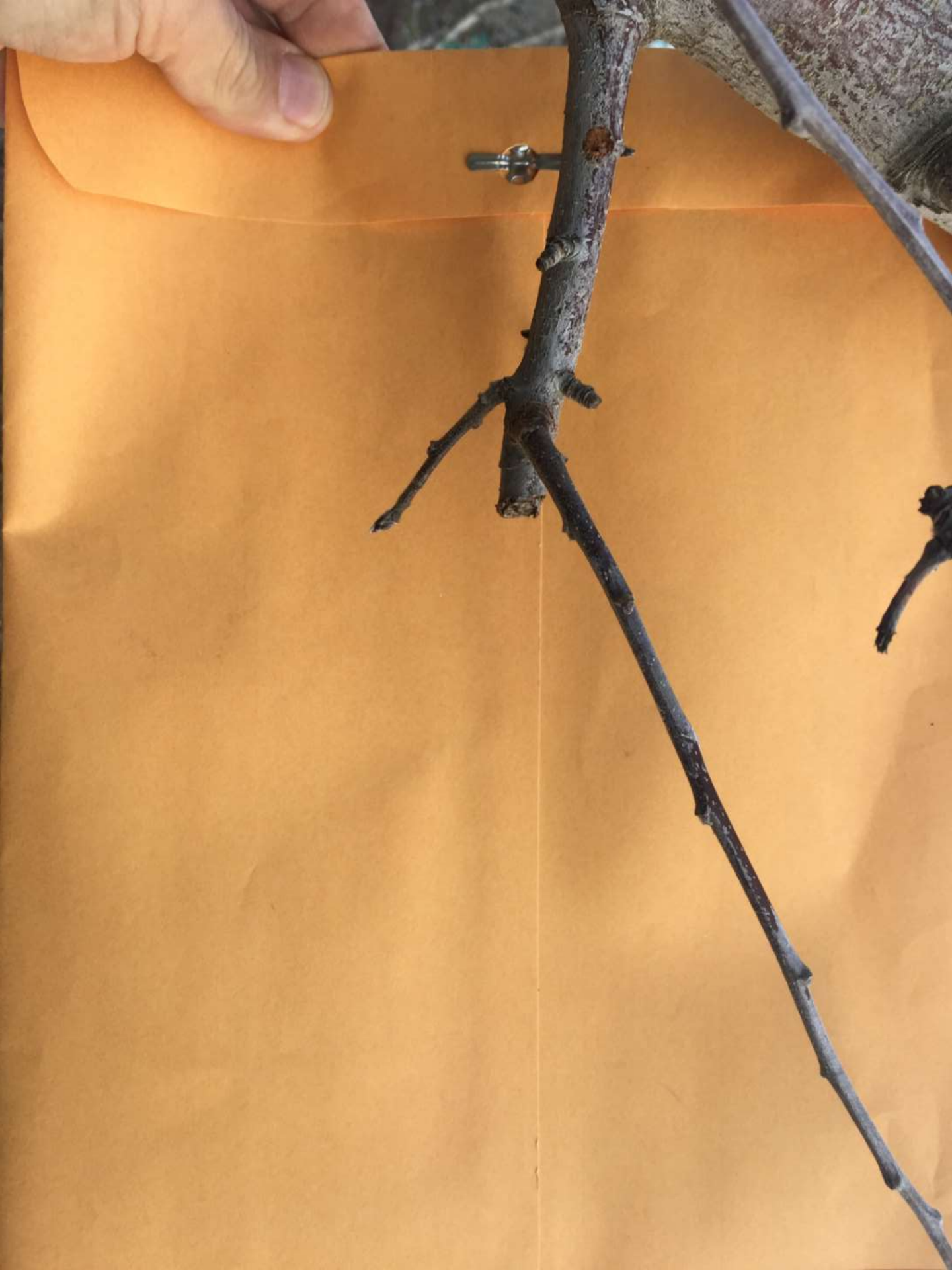




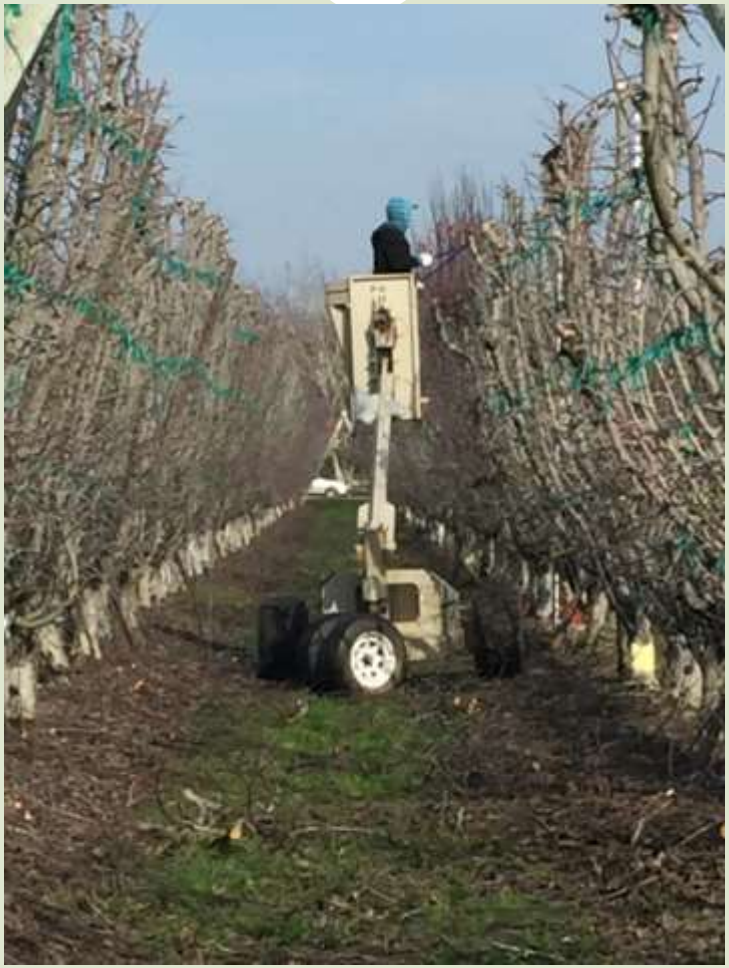


Result from stub cut made last year

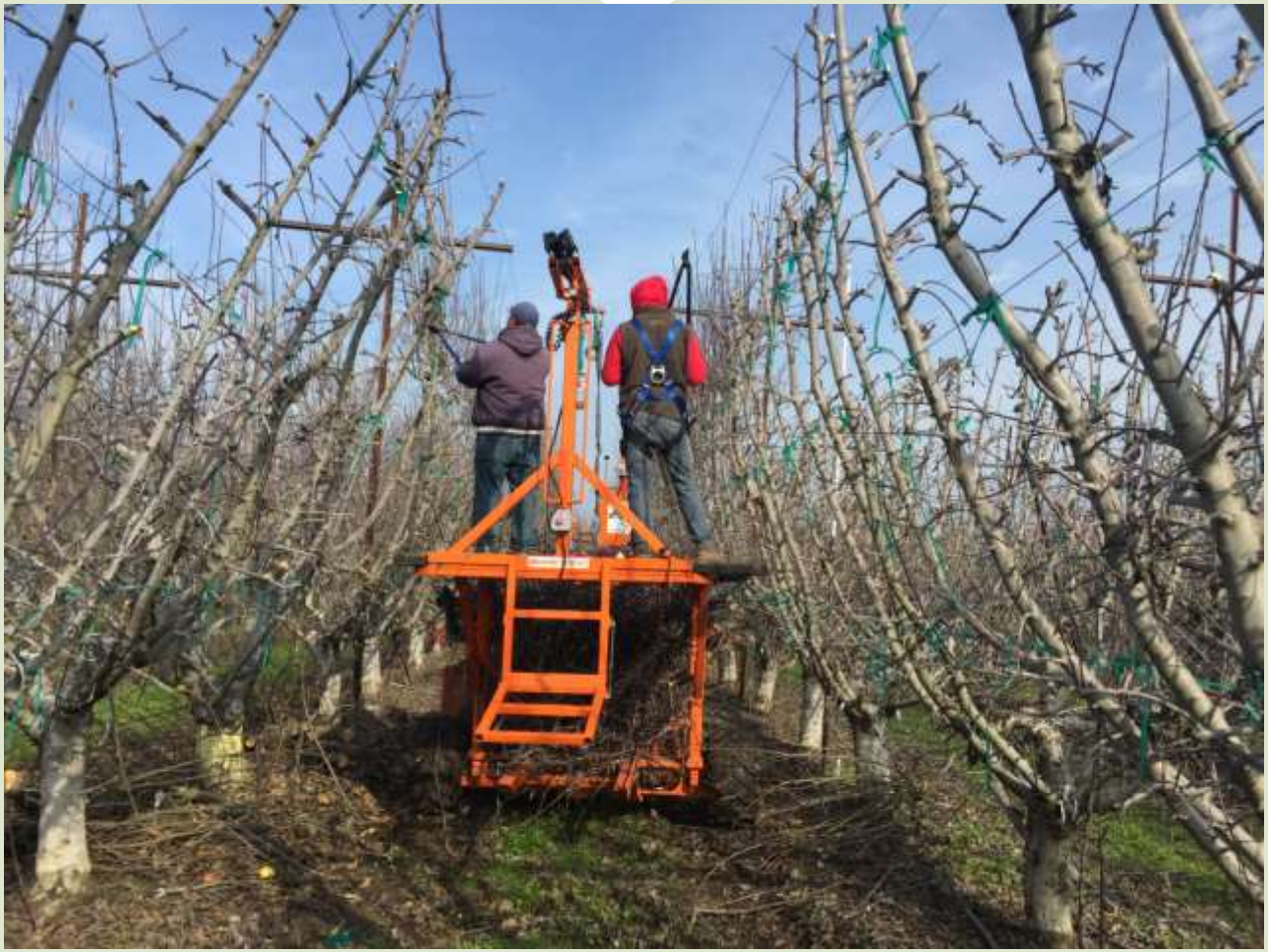




Pruning Tower

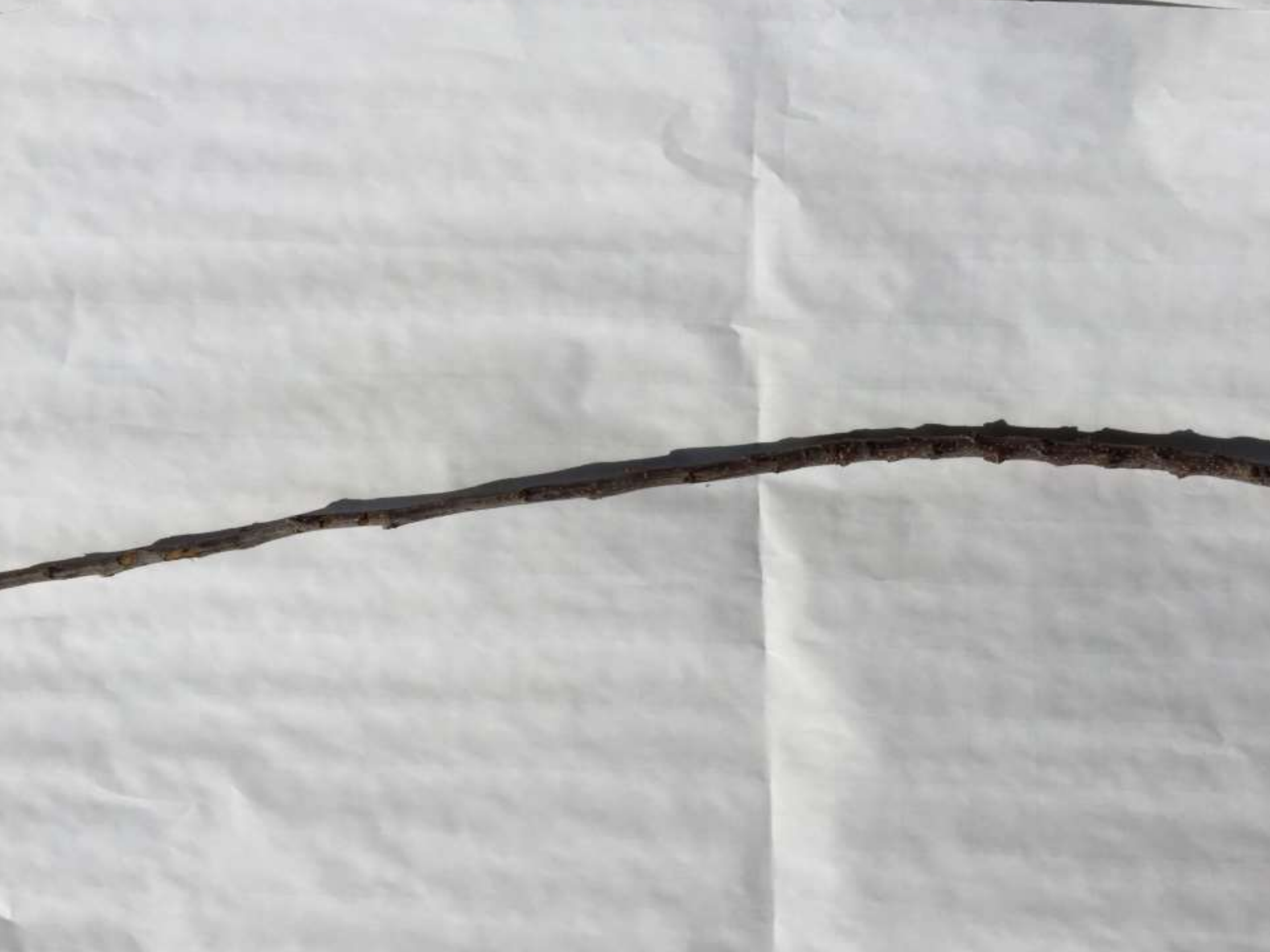


Picking Platform Used for Pruning



Apogee

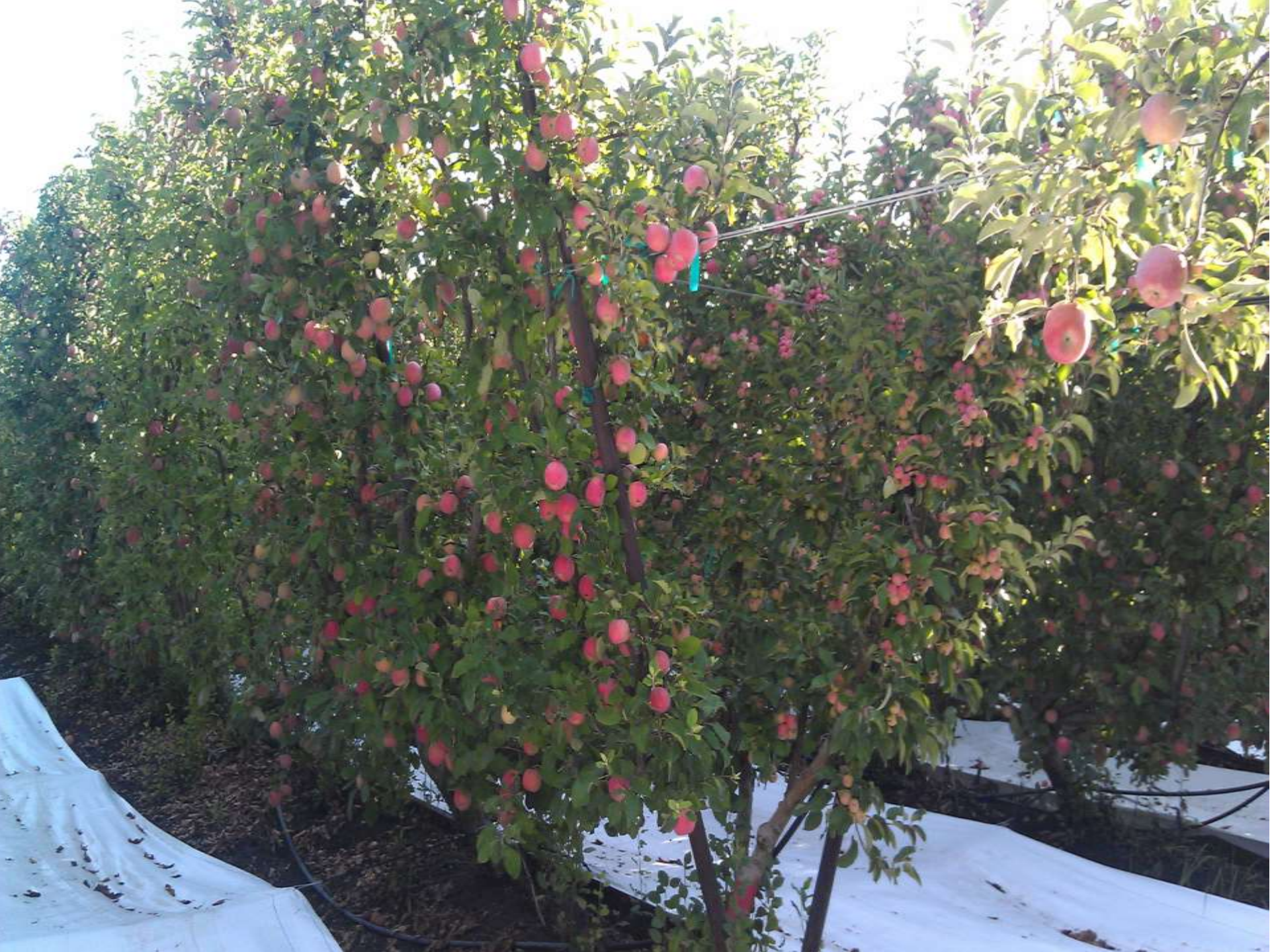
- Apogee is a plant growth regulator that shortens the internode length as the tree grows, resulting in shorter shoots
- Applications begin shortly after bloom and continue every 3 to 4 weeks
- Consult your PCA for exact rate and timing recommendations
- Pre-harvest interval on the current label is 45 days before harvest

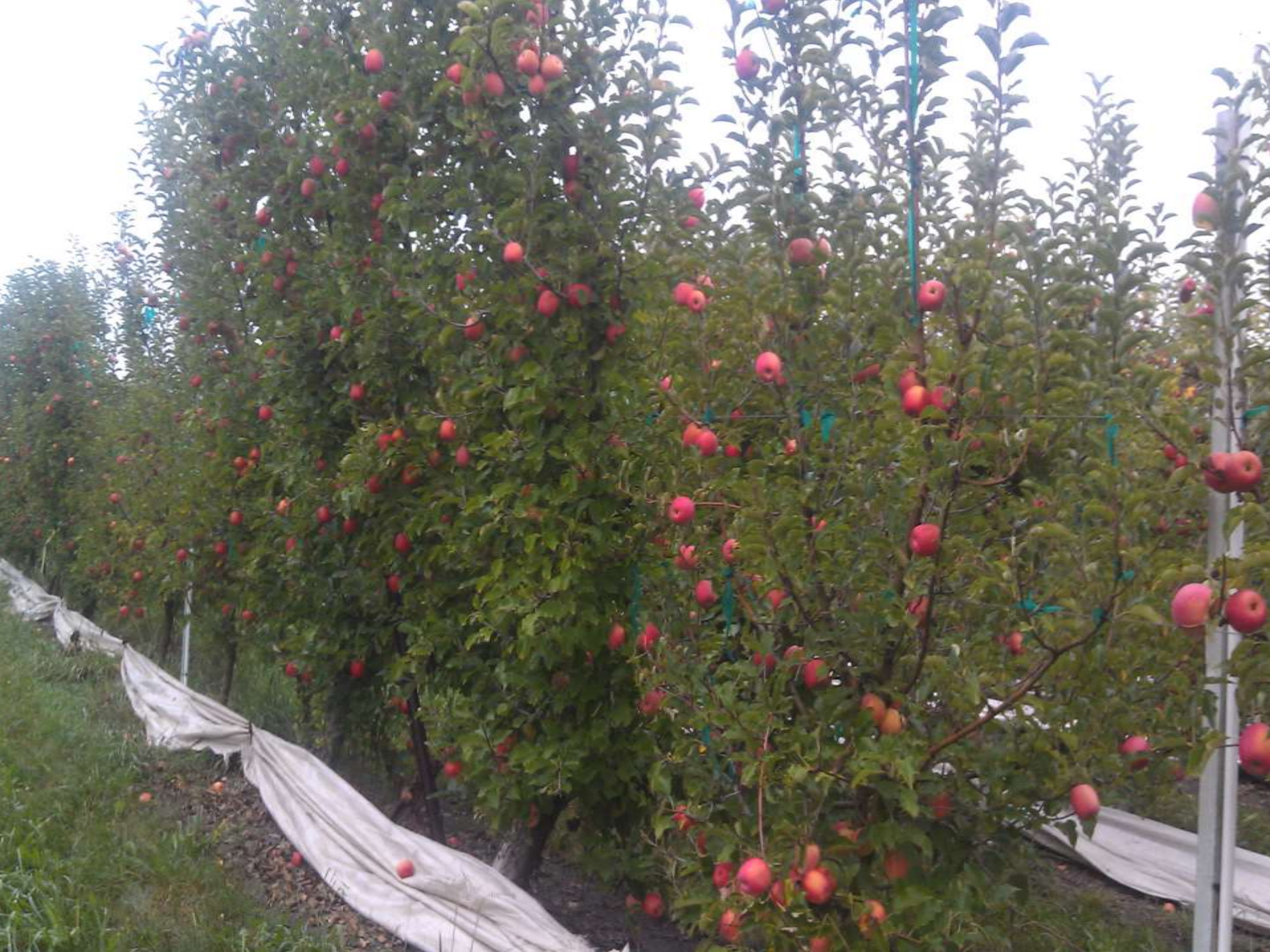


Summer Pruning

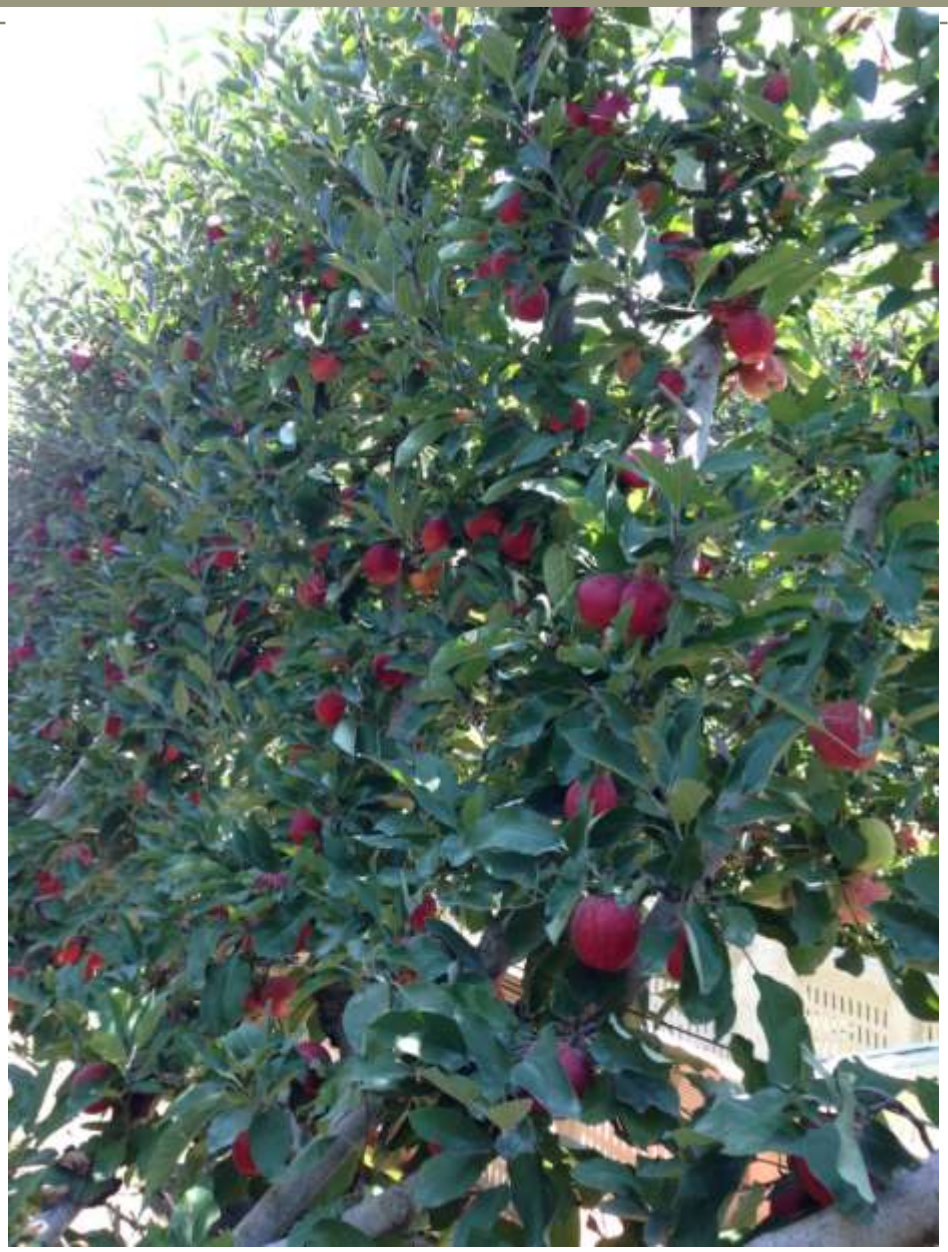
- Summer pruning is necessary to provide adequate light interception for maximum color development on apples.
- Summer pruning will create more sunburn (overhead cooling can minimize).
- There's a constant struggle between developing adequate color and minimizing sunburn.
- If apogee is used properly, summer pruning is mainly mechanical topping and hedging.

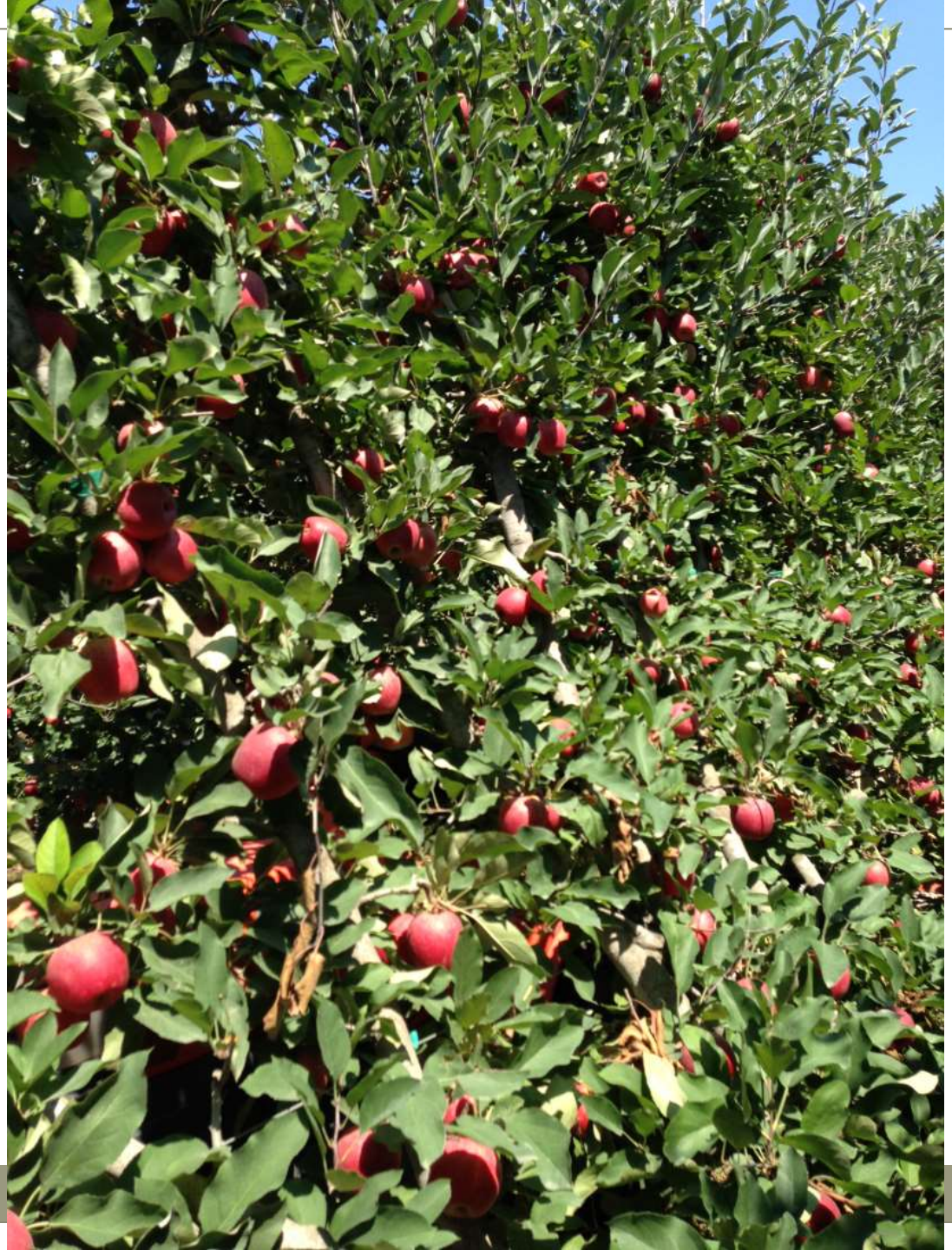
Reflective Fabric





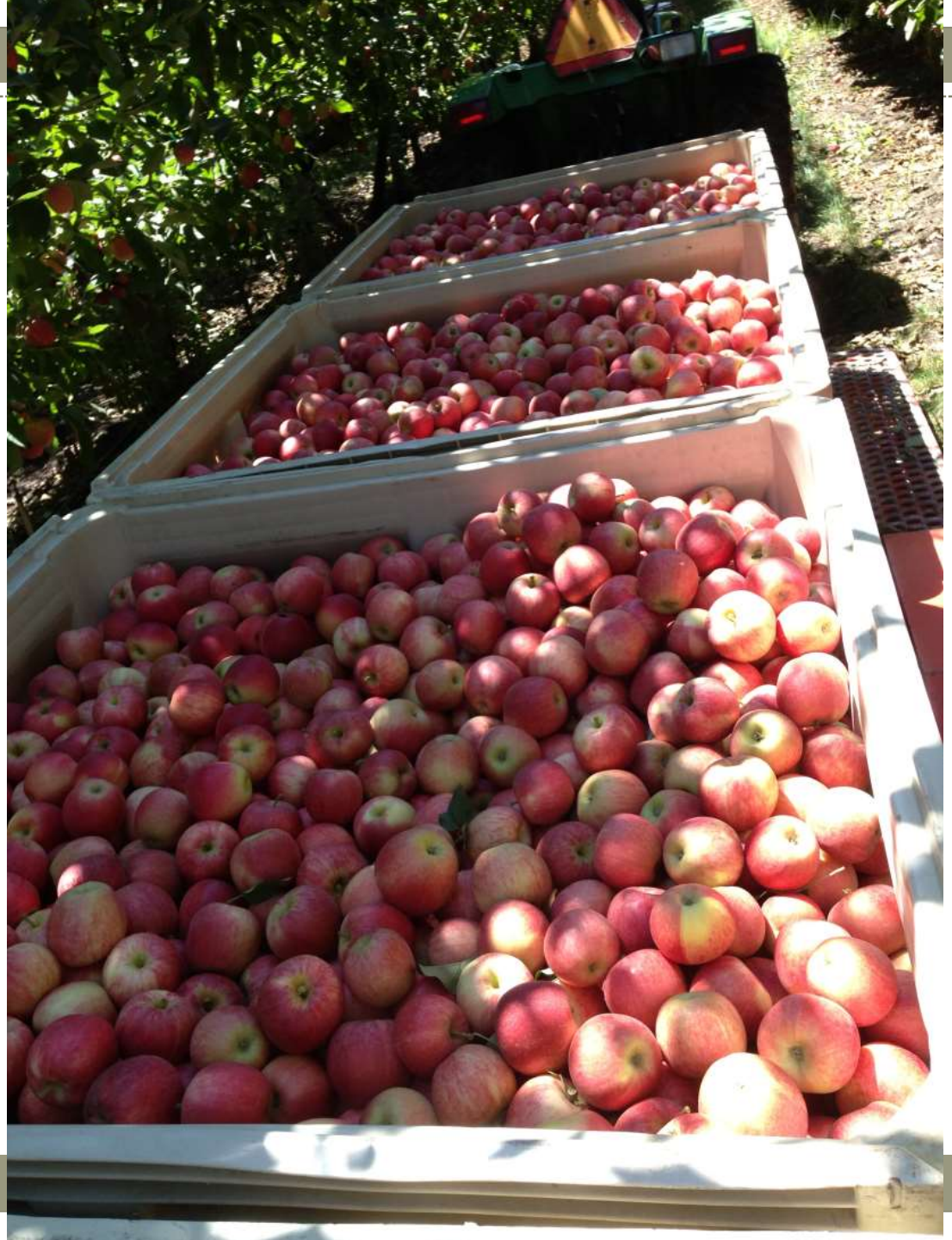
Gala Trees at Harvest

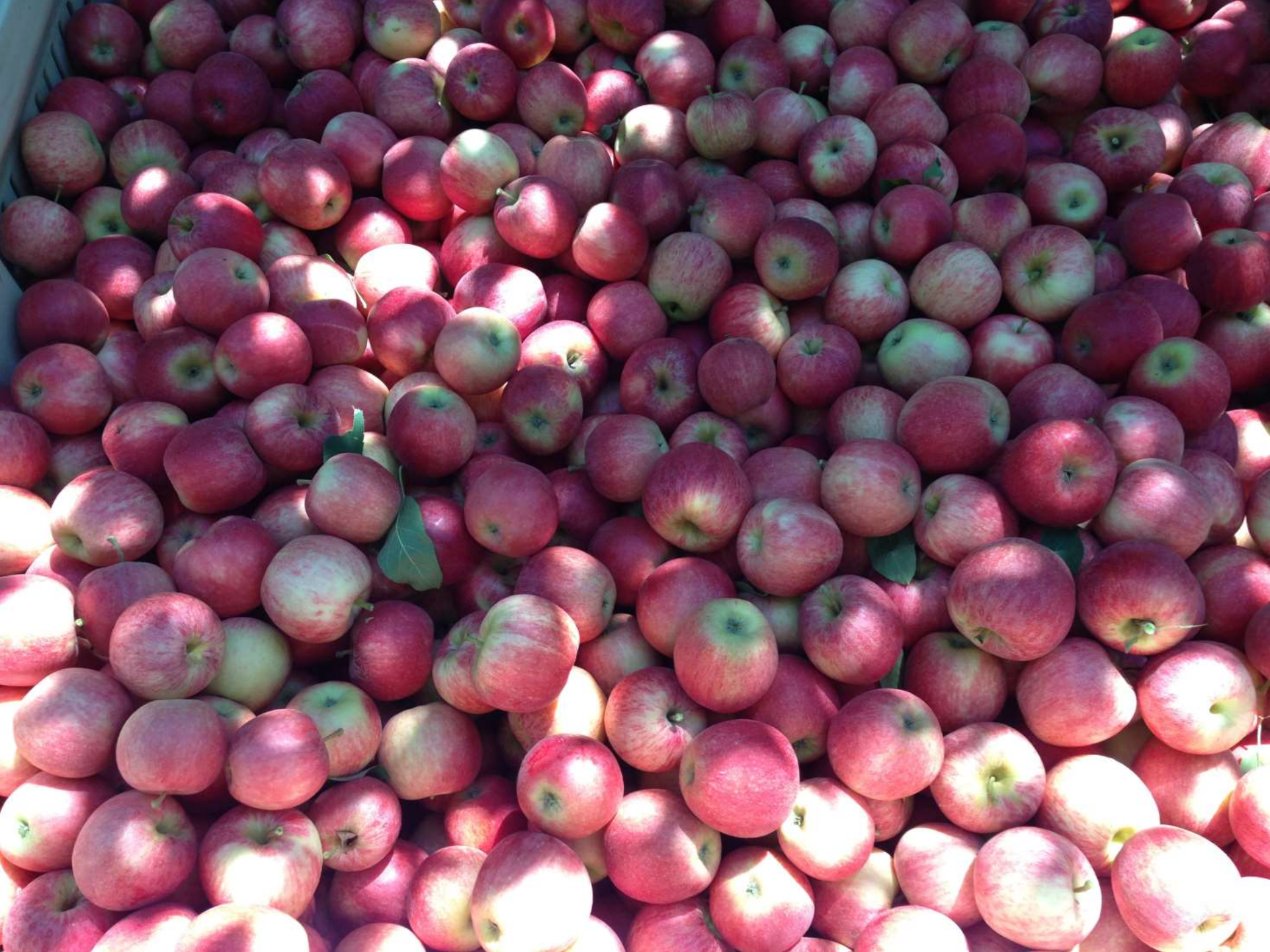


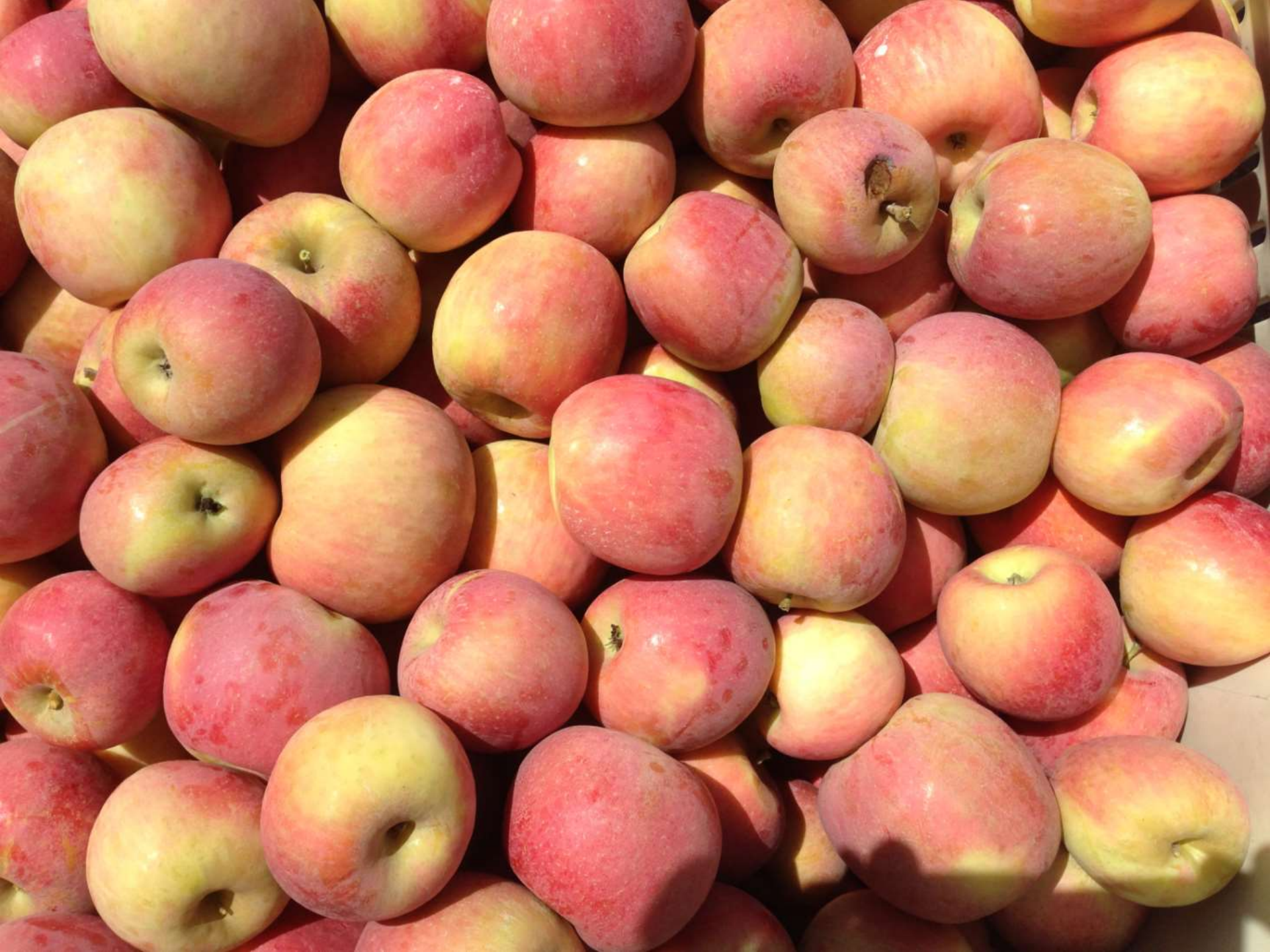


The End Result

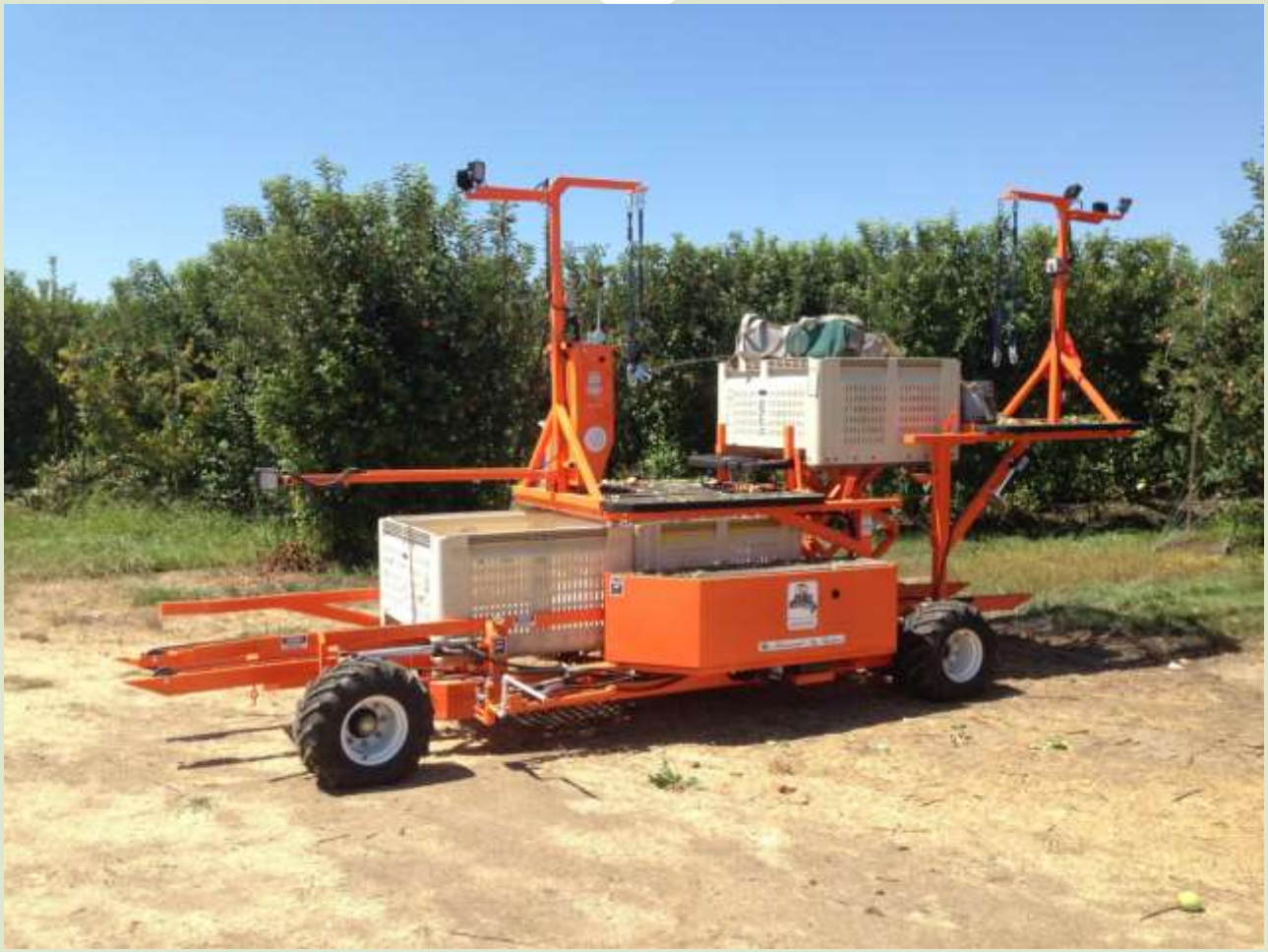
If all goes well!

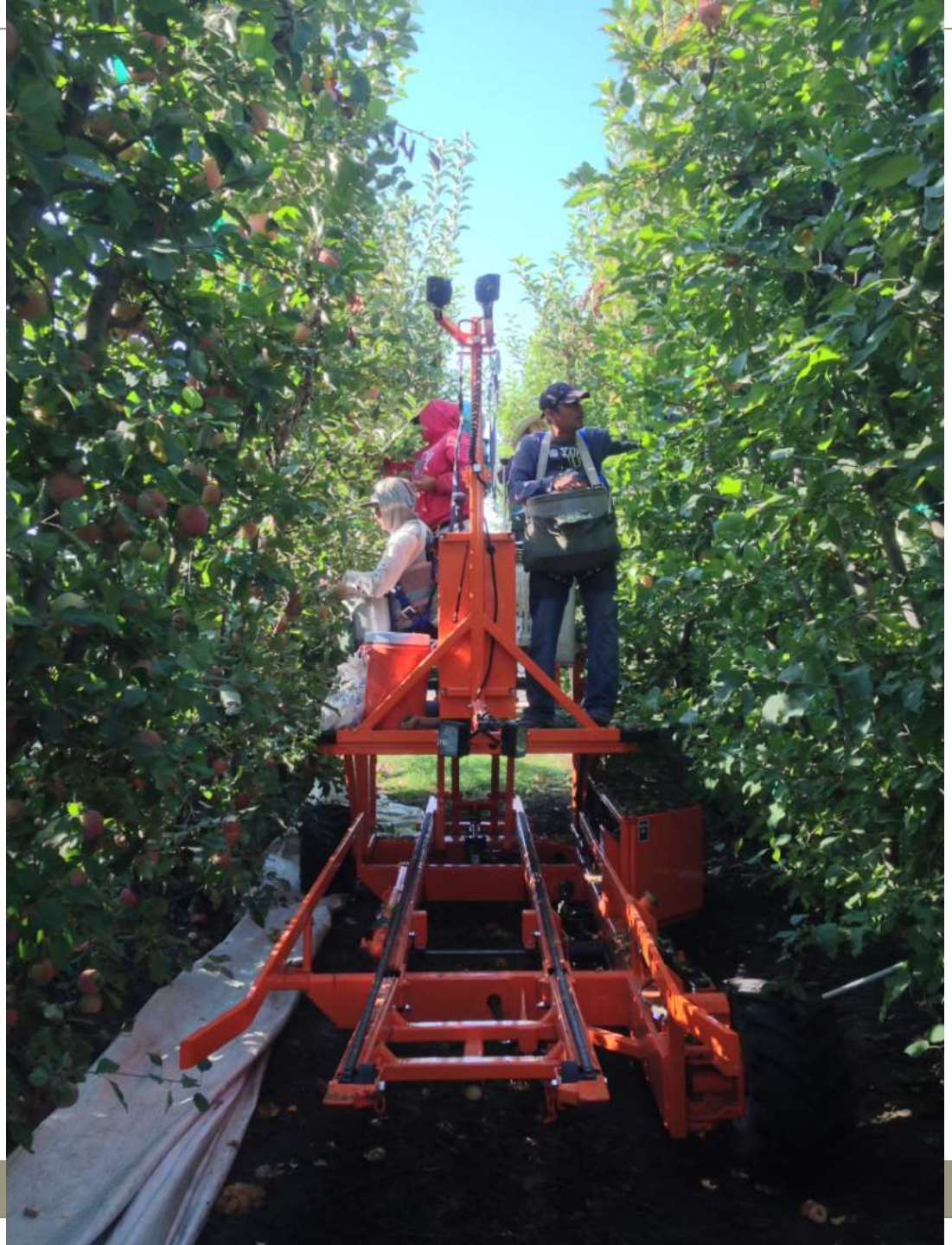






Picking Platform





- Questions?
- Comments!