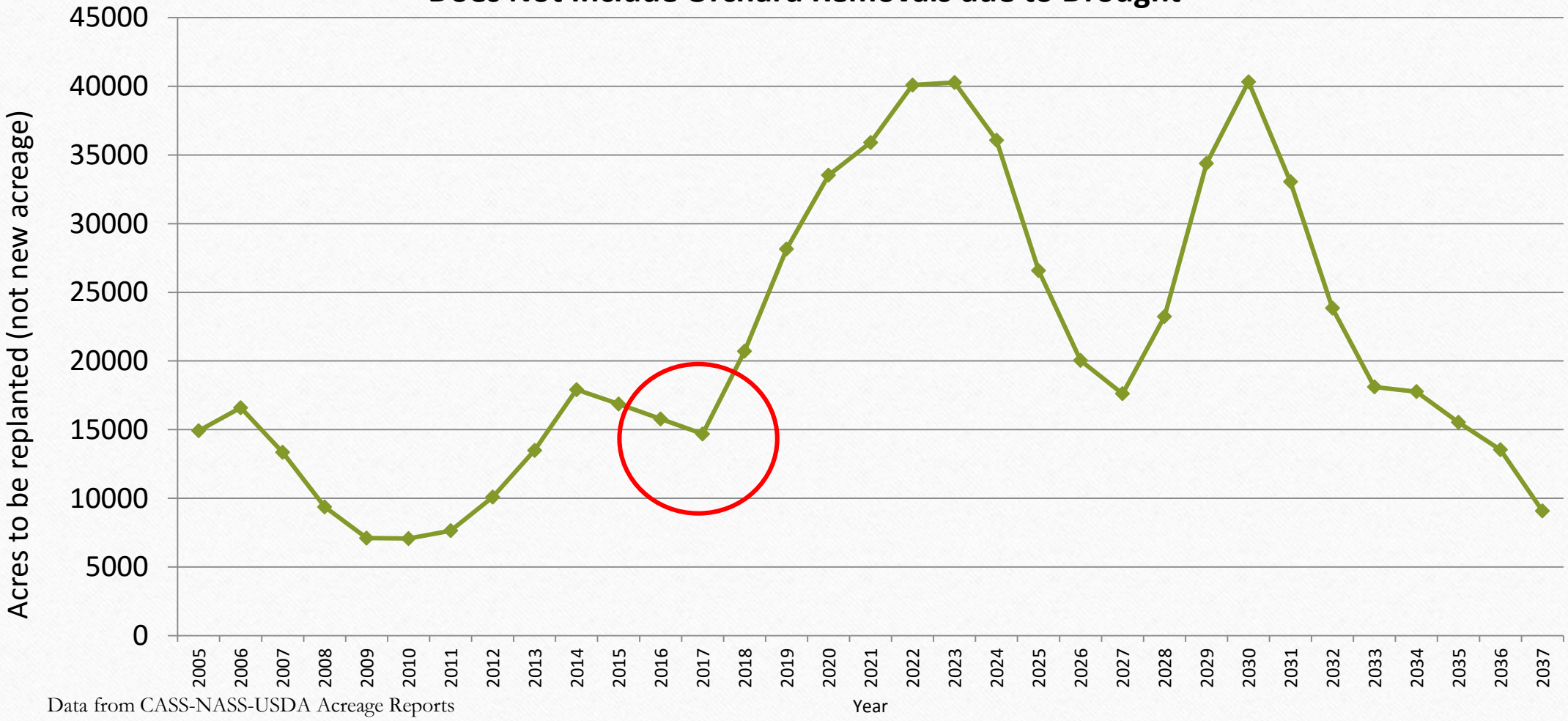
Whole Orchard Soil Incorporation

Mike Curry, Johnson Farms

Johnson Farms

- The Johnson Family is still farming some of the same ground as they were over 100 years ago.
- Johnson Farms is family owned and operated.
- Tim and Tom Johnson are the fourth generation to run the family operation and, the fifth generation is beginning to work on the farm.
- We only farm almonds.
- We own and operate a huller/sheller.

Estimated Number of Replant Acres (removal's)
(based on a mean of 3 years 25 years after planting)
Does Not Include Orchard Removals due to Drought



Data from CASS-NASS-USDA Acreage Reports

Johnson Farms Re-Incorporation

- In 2009 we re-incorporated almond wood chips and re-planted almonds onto 48 acres.
  - Varieties planted
    - Aldrich
    - NP
    - Wood Colony
- We have completed re-incorporation of almond wood chips on 270 acres. This December we will be re-planting it into almonds.

Considerations for Whole Orchard Recycling

- Soil type
  - Some soil in other areas of the State may not require additional organic material.
  - Soil types may require different processes.
- Incorporation is key
  - Deep ripped three different directions.
  - Huller/Sheller concerns if incorporation and breakdown isn't sufficient.

Farming Practices After Re-Incorporation

- Farming Practices after re-incorporation
  - Additional tilling may be needed before the first harvest. This translates to more passes.
  - If not incorporated into soil what are down stream impacts (huller/sheller).
  - Re-incorporating wood chips is NOT a single solution.
  - We do add other soil amendments. For example compost and gyp.

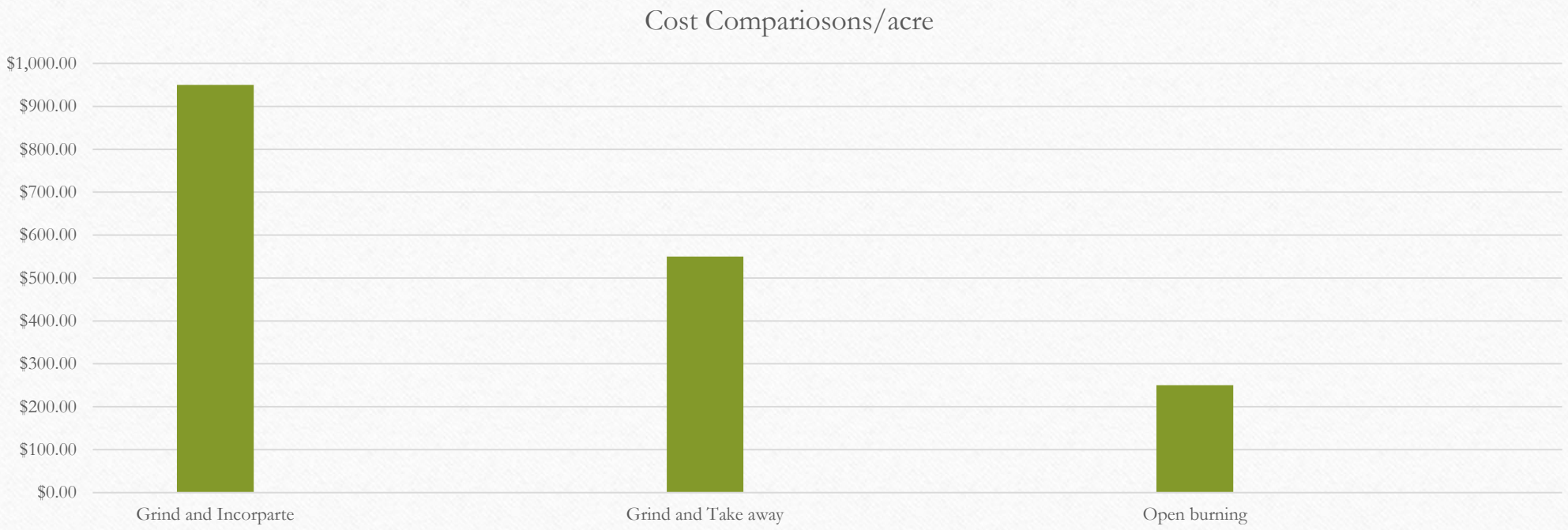
Effects of Whole Orchard Recycling

- Tree Health
  - Trees are healthy and uniform
  - Adding organic material into soil, increases water holding capacity and biological activity, which helps promote strong root growth. This allows for more efficient uptake of nutrients by the tree.
  - Potentially saving on costly nutrients and minimizing leaching into the ground water.
- Yields/Productivity since first harvest:
  - Aldrich Average per acre yield – 2918lbs/acre
  - NP Average per acre yield – 1917lbs/acre*
  - Wood Colony Average per acre yield – 2756lbs/acre

Pest and Disease Issues

- Nematode issues
  - We fumigated the 48 acres prior to planting.
  - We did not have a nematode issue with the 270 acres, we did not fumigate.
  - No disease issues.
- Almond Board is funding at least seven different research projects focused on the impacts of by-product incorporation into the soil, including whole orchard recycling, hulls and shells.
  - Example - biosolarization research underway

Cost Considerations/per acre



Final Thoughts

- Cogen plants must still be available for woody materials
- Re-Incorporation is not the only answer and, its expensive
- Incentive funding