

Whole Orchard Recycling Practice Review



Healthy Soils Program

CDFA OFFICE OF ENVIRONMENTAL FARMING & INNOVATION

Environmental Farming Act
Science Advisory Panel Meeting
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Ravneet Behla
Program Supervisor

Whole Orchard Recycling

Implementation requirements :

- Only orchards with trees at least ten years of age are eligible.
- Following woodchip incorporation, land must be fallowed or replanted with trees within 3 years.
- Orchards should be chipped and incorporated in place on the field in which they were grown, without exporting chips off-site or to new fields.
- The WOR practice must not be implemented in soils with Soil Organic Matter greater than 20%.
- Chips must be evenly distributed throughout the orchard. If a service provider is contracted, their commitment to spread the wood chips must be in the contract/invoice for verification purposes.
- Chips must be incorporated into the soil to at least 6 inches depth.

Whole Orchard Recycling: DNDC Modelling of Annual Cropping

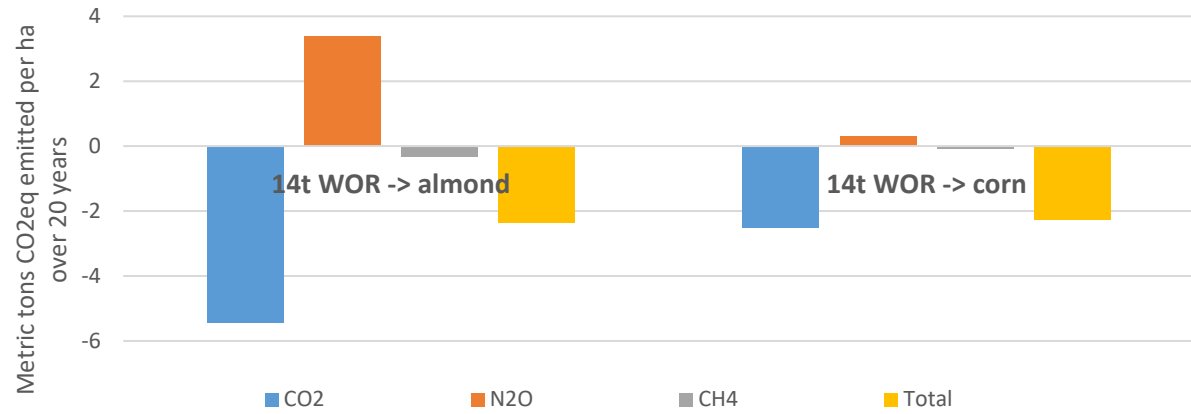
Would annual crops after WOR still offer overall GHG benefits, making it acceptable for HSP incentives?

CDFA undertook modeling:

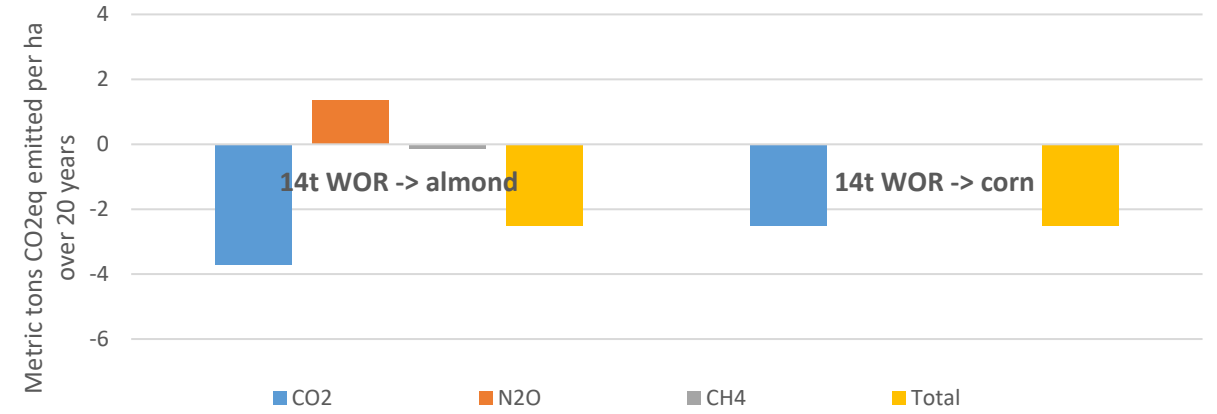
- Grain corn was chosen as the annual test crop
 - Uses high N rates (higher N₂O emissions, making it conservative)
 - Relatively high tillage rates (lowering soil organic carbon sequestration, making it conservative)
 - Well characterized by literature
 - Similar to silage corn (for which less data is available for model parameterization)
 - Relatively wide distribution, including silage corn, overlapping well with almond distribution
- Modelling Parameters followed our procedure from 2019-20:
 - 20 years of modelled effects (monocropping grain corn).
 - County average soil parameters.
 - Daily local CIMIS weather records for 2008-2017 for Years 1-10, then repeated for Years 11-20.
 - Irrigation adjusted for local needs.
 - Nitrogen fertilization held constant at industry standard (310 kg N/ha/yr = 277 lbs N/acre/yr).
 - 14 ton/acre of woodchips applied, reflecting minimum seen in WOR candidate crops (prunes), which is about ½ that seen in almonds.

Whole Orchard Recycling: Modelled GHG Emissions

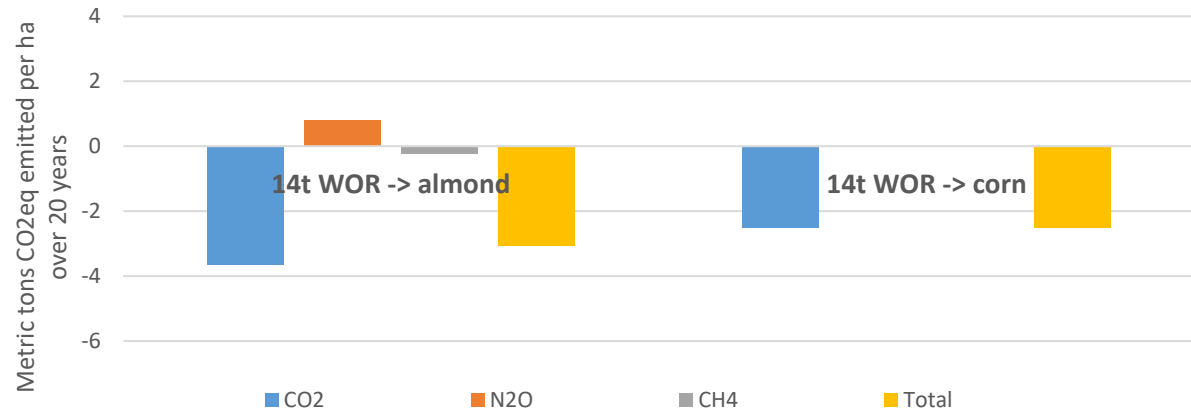
Colusa County WOR Effects



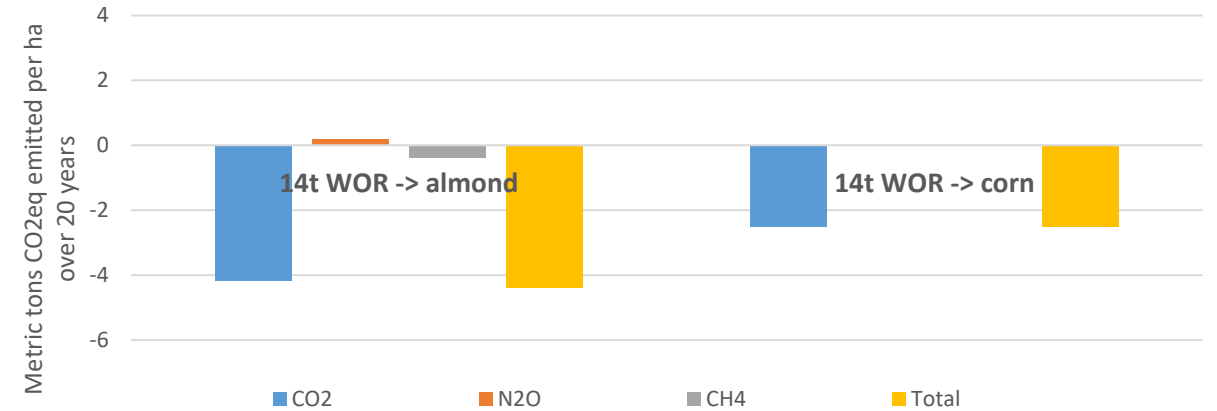
Fresno County Effects (Original Research Site)



Stanislaus County WOR Effects



Tulare County WOR Effects



In DNDC simulations, Corn planting after WOR shows substantial benefits in soil organic carbon sequestration, with only small increases in N₂O emissions.

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Thank you! Questions?



Contact us:

CDFA.HSP_Tech@cdfa.ca.gov

Healthy Soils Program Staff

Guihua Chen, Ph.D.
Senior Environmental Scientist

Elizabeth Hessom, M.Sc.
Senior Environmental Scientist

Nina Bingham, Ph.D.
Environmental Scientist

Dana Yount
Environmental Scientist

Ajay Sandhu, Ph.D.
Senior Environmental Scientist

Ravneet Behla, Ph.D.
Senior Environmental Scientist,
Supervisor