

# Issues in Vineyard Resource Conservation

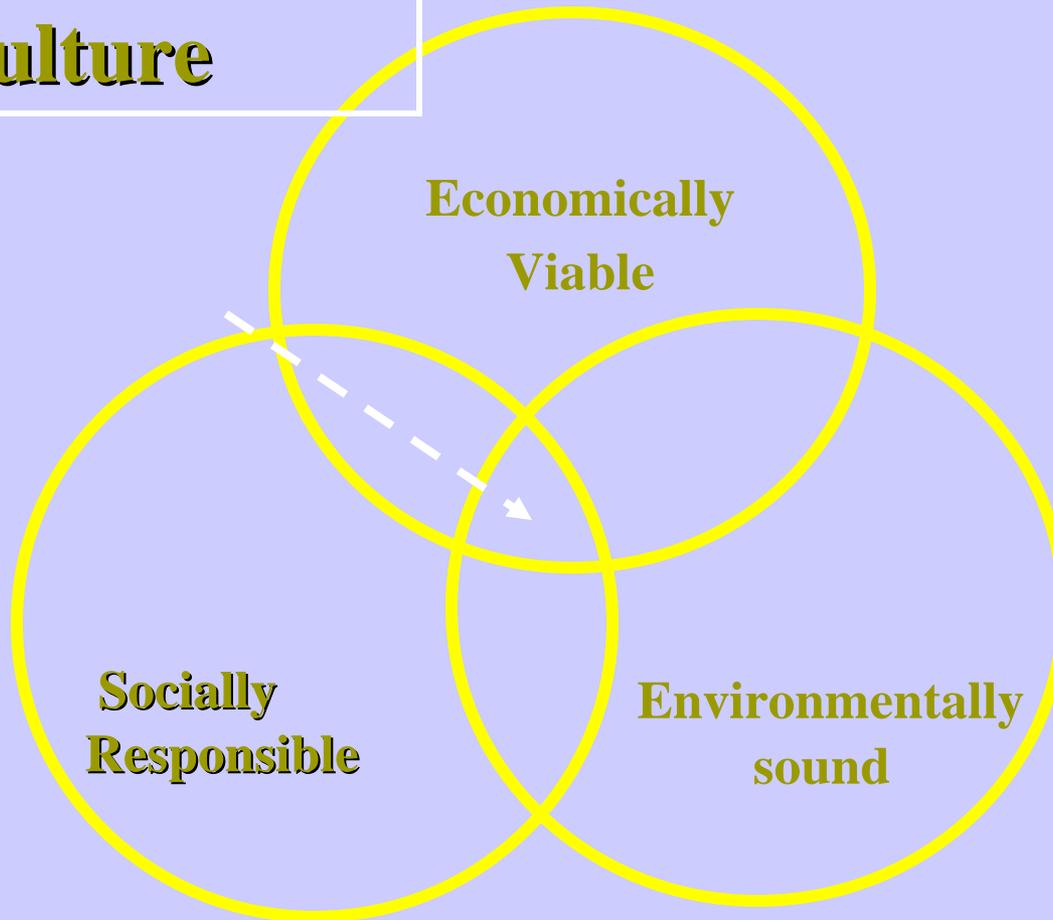
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UCCE  
Mendocino and Lake Counties



# **Sustainable Agriculture**

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*Not codified by law, but is philosophically adhered to by many producers*

# Sustainable Agriculture

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- Farming in a way that protects the resources needed to maintain an agricultural system

# Important Resources To Grow Winegrapes

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- Soil
- Water
- Air
- Financial
- People



# There Are Also Public Trust Resources...

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# The Fishing Industry Then and Now

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# The Concept of Stakeholders

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# Your Vineyard as Part of An Ecosystem

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# Your Vineyard Provides Financial Services:

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- ❑ Taxable income
- ❑ Real estate taxes
- ❑ Employment
- ❑ Employment taxes
- ❑ Excise taxes on alcohol
- ❑ Economic activity for goods and services

# Your Property is Providing Ecological Services:

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- ❑ Habitat for wild life and beneficial insects (in some cases), such as predators, parasitoids and pollinators
- ❑ Carbon cycling, release of oxygen
- ❑ Nutrient cycling
- ❑ Watershed
- ❑ Take advantage of the ecological capital!

# Biodiversity

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- ❑ In its natural habitat, California has copious biodiversity
- ❑ Habitat helps to create diversity
- ❑ Two strategies: retain diverse habitat or create it
- ❑ Cover crops are one of the easiest and least expensive techniques to create habitat and improve biodiversity



*A vineyard monoculture*

# Creating Biodiversity in the Vineyard

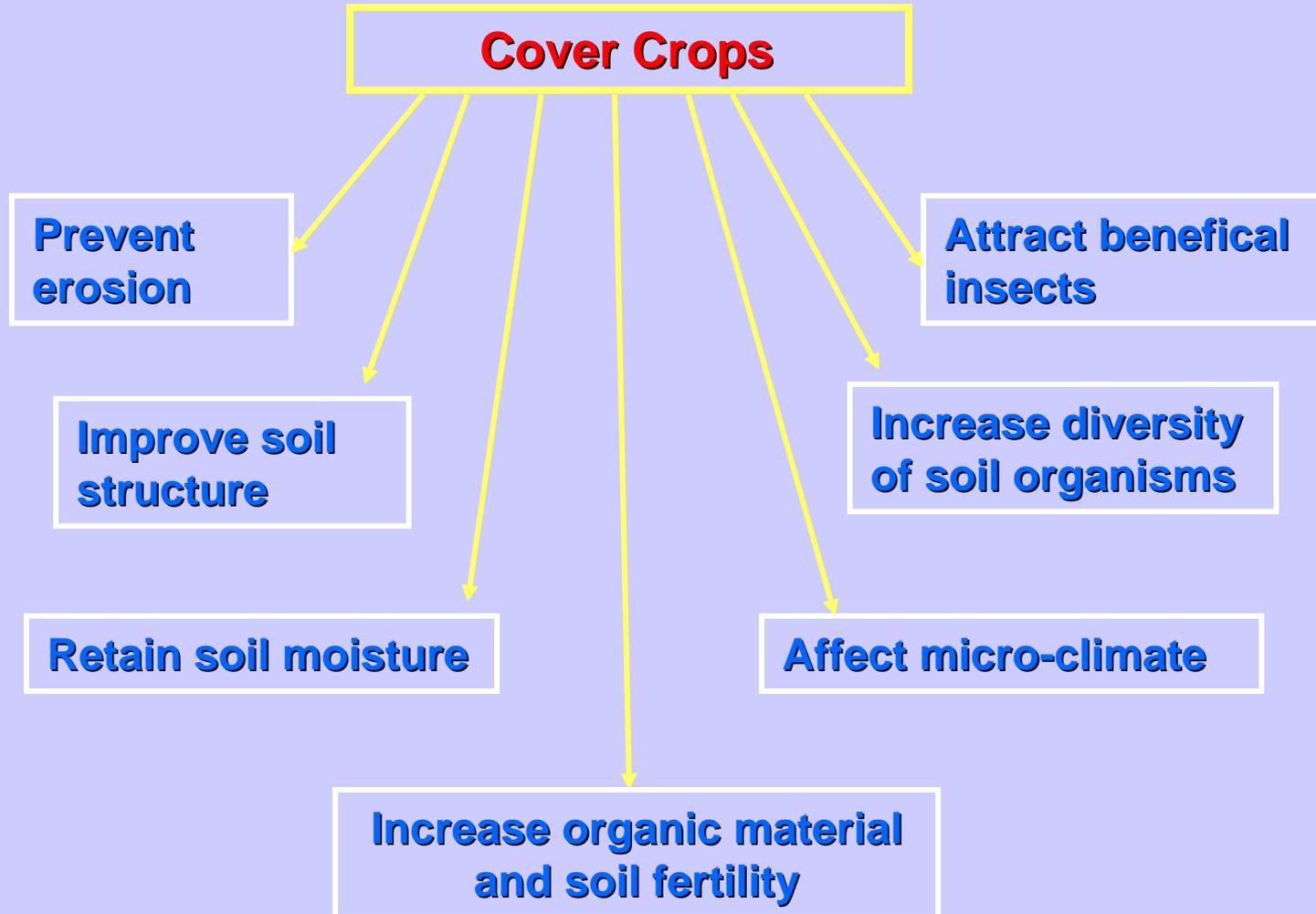
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- ❑ Cover crops
- ❑ Managing hedgerows and noncrop areas
- ❑ Diverse habitat for beneficial insects and spiders

# Cover crops and their effects in vineyards

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Shelter

Nectar

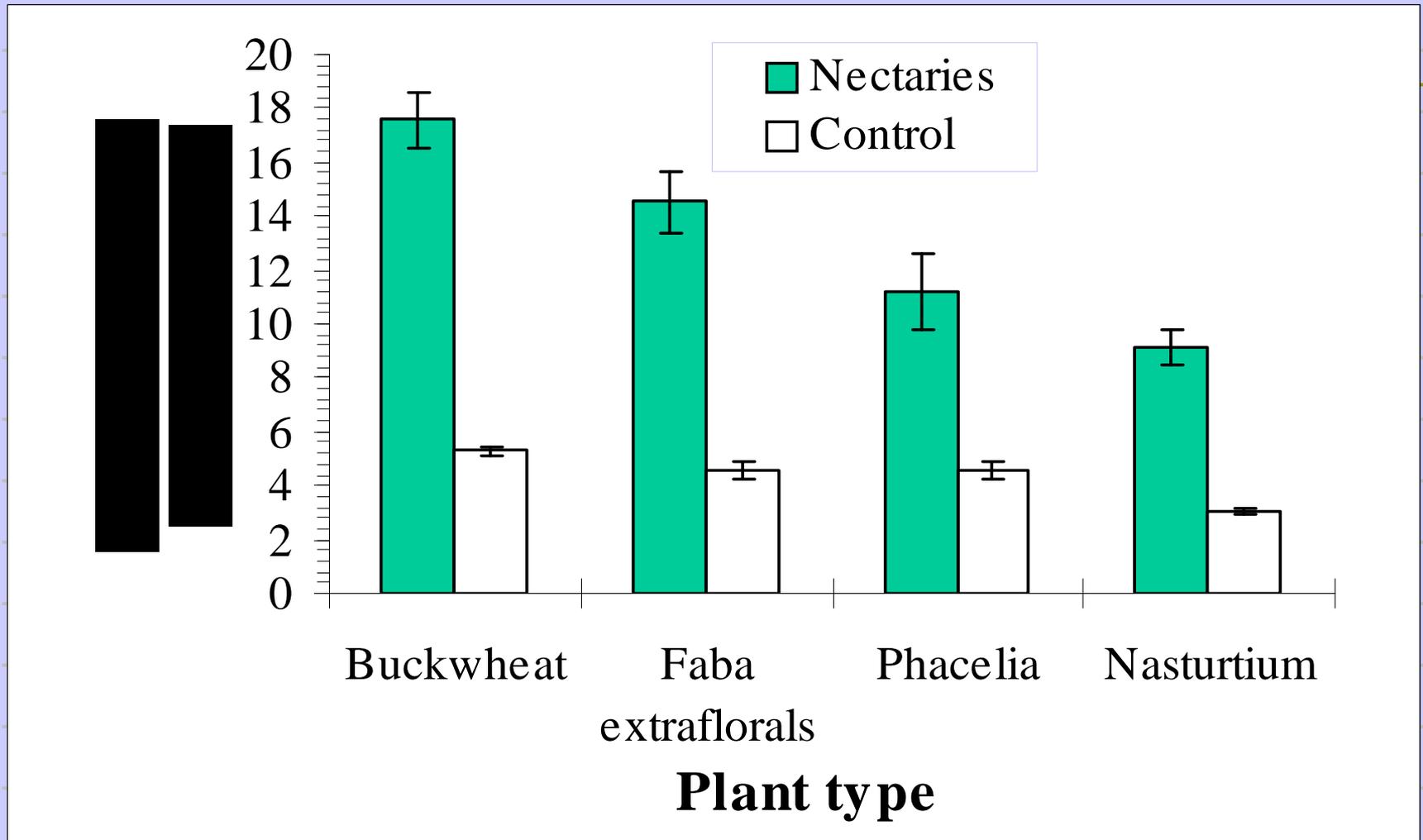
Alternative prey

Pollen

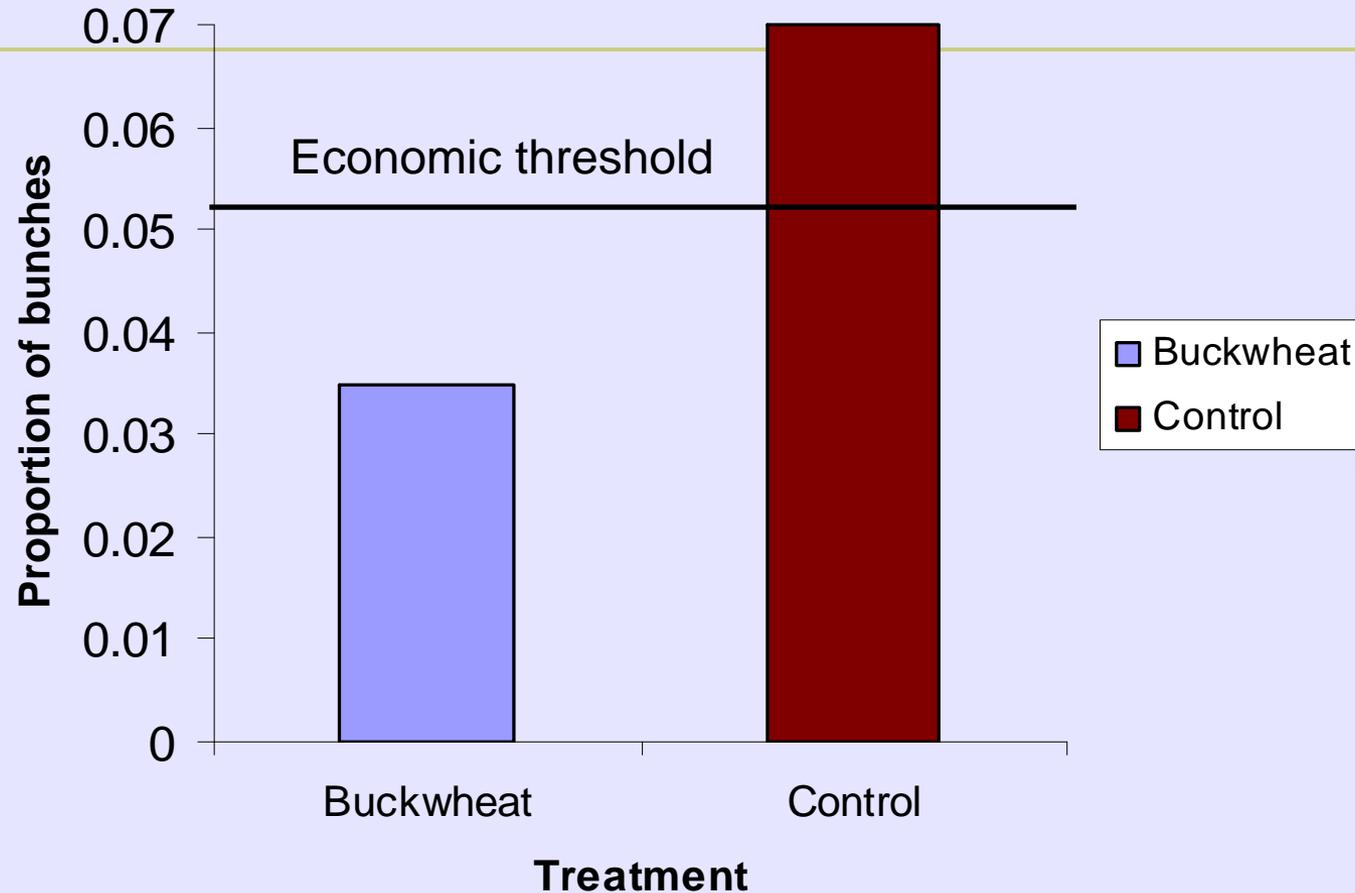




Steve Wratten, Lincoln University



# Leafroller damage



Proportion of bunches infested with leafrollers. Economic threshold for leafrollers shown

# The Good Guys: Predatory Mites

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***Galendromus occidentalis***



# Conclusion:

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- ❑ Put nature to work for you—create habitat, and the good bugs will come
- ❑ Don't spray broad spectrum insecticides if you can avoid it

# Soil as a Resource: Protect and Enhance

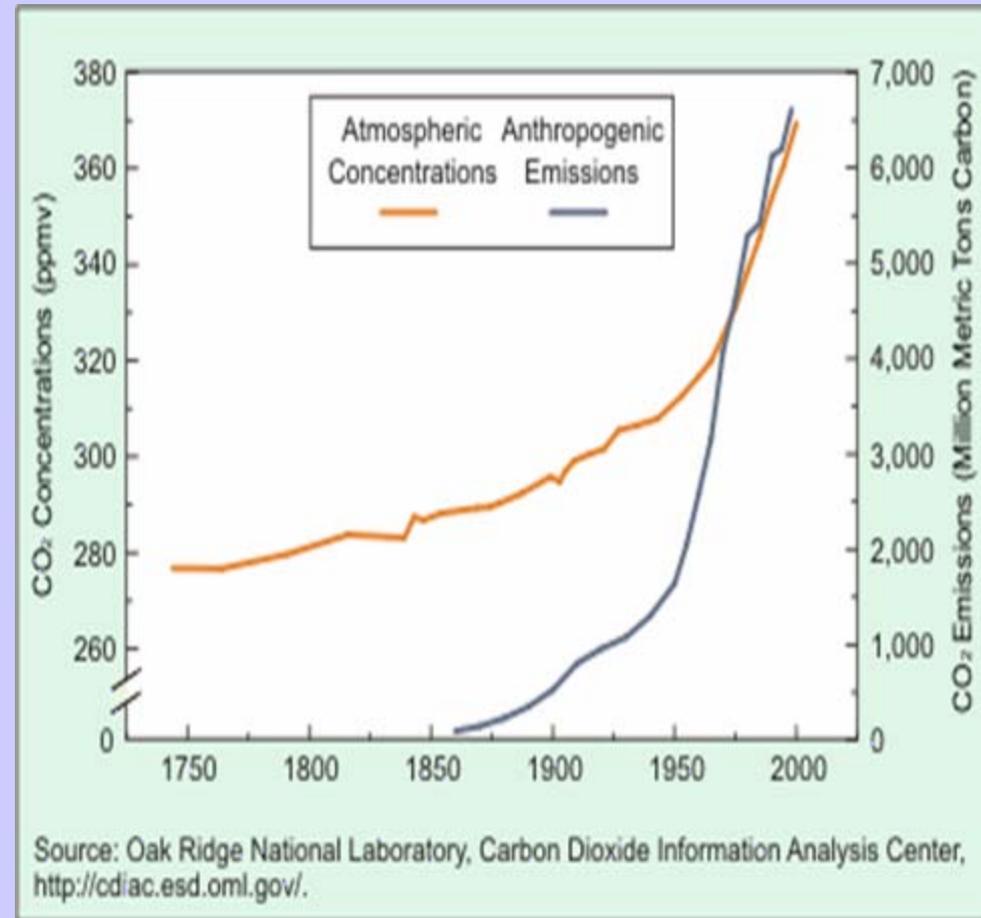
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Mendocino County Soils Tops For Red Wine Grape Varieties

# Carbon Sequestering and Global Warming:

- Increase of atmospheric CO<sub>2</sub> from human activity
- Loss of carbon from soil by tillage = 30% of total CO<sub>2</sub> generated



# Improving Soil Quality: Increasing Soil Organic Matter

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- ❑ Cover cropping
- ❑ Compost applications

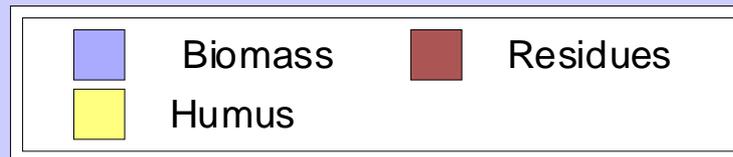
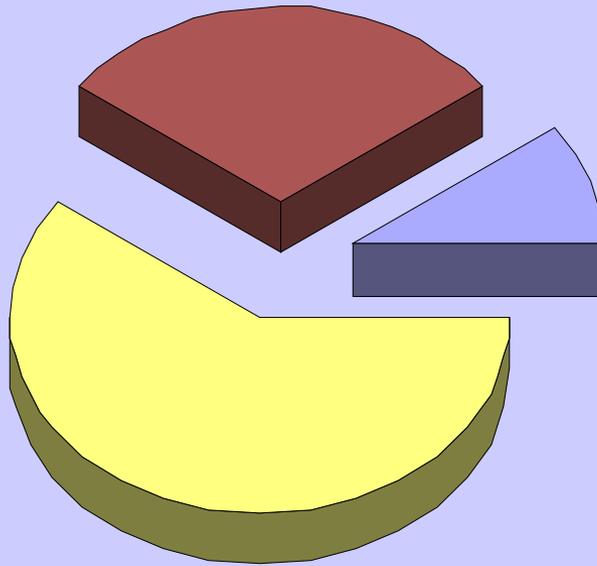
# Organic Matter

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- ❑ Decomposed plant and animal residues
- ❑ Helps bind soil particles together to give the soil “structure”
- ❑ Good source of plant nutrients
- ❑ Gives the soil its dark color, as it coats the mineral portion of the soil
- ❑ Improves CEC and water retention

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## Soil Organic Matter by Percentages



# Vineyard Organic Matter Per Year, kg/ha

Item	Conventionally Farmed	Organic/Biodyn. farmed
Prunings	1000	1000
Leaves	1400	1400
Weeds/cover c.	1200	1200-12000
Compost	0	2300
Total, kg/ha	3600	5900—17900
Total, tons/acre	0.75	1.2—3.5

# Compost and Organic Matter— Helping Your Soil Come Alive

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- ❑ Recycled Pomace
- ❑ Manure, lime, gypsum
- ❑ Produced on Farm or Winery
- ❑ Process takes about one year
- ❑ Applied at one or two tons/ acre

# On Farm Composting

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# Compost Applications: Beneath vines or across the vineyard floor

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# Soil Protection With Cover Crops

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- ❑ Cover crop foliage shields soil from rain splashing, slaking of aggregates
- ❑ Infiltration rates stay elevated
- ❑ OM conserved by preventing erosion
- ❑ Mulching effect keeps soil cool in summer, protects OM from oxidation

# Cover Crop Types

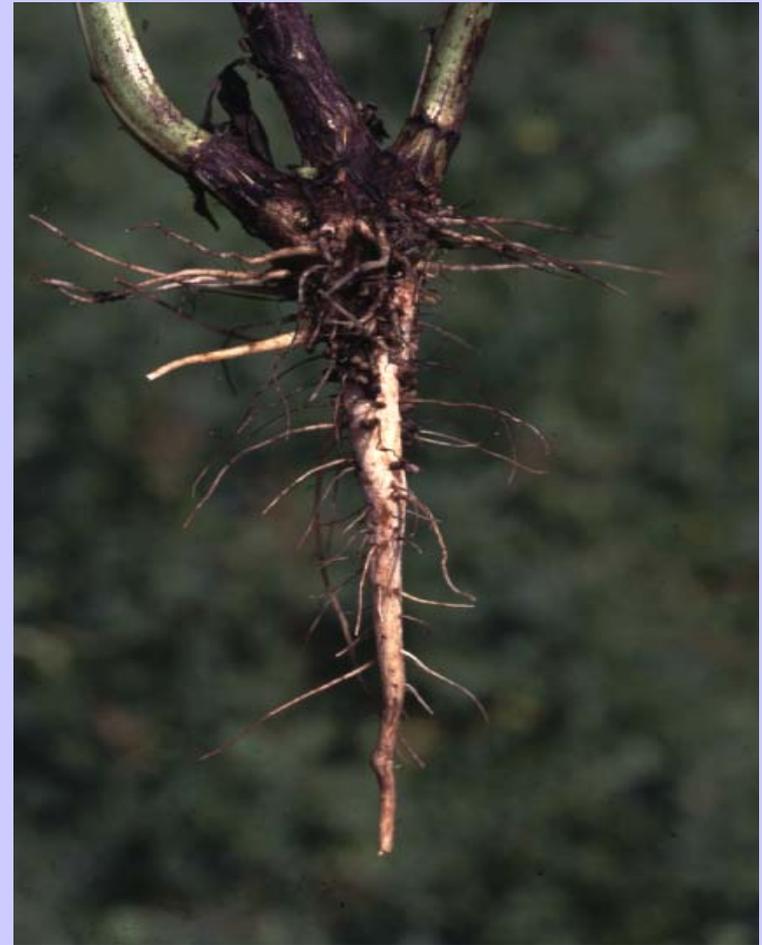
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# Short Term Physical Improvements with Cover Crops

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- ❑ Creation of macropores by tap roots
- ❑ Fibrous roots help aggregate soils



# Beneficial Activities of Microbes

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- ❑ Decomposition of plant residues for energy and growth
- ❑ N cycling
- ❑ Increase availability of P, Fe, So, K and others
- ❑ Humus formation, C cycling
- ❑ Aggregate formation
- ❑ Suppression of pathogens
- ❑ Mycorrhizal relationships

# Grass and Legume Mixes

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- ❑ Important to have N to build SOM
- ❑ Much of biomass is respired into the atmosphere



# Cover Crop Rotations

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# Who Can Help With Soils Information and Cover Cropping

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- NRCS
- UCCE
- Private Consultants
- Seed Companies

*Beneficial Use of  
Water for  
Winegrowing*



# Water Rights Are Critical For Long Term Sustainability

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- Riparian and Lacustrian
- Appropriative
- Ground water

# Water Quality Laws That Will Impact All Winegrowing Operations in California:

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- Porter-Cologne Act
- Clean Water Act

# State Water Resources Control Board

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- ❑ State Board Supervises 9 Autonomous Regions
- ❑ Each Region is Free to Set Its Own Rules and Policies
- ❑ Scientists Unfortunately Are Subordinate To Lawyers

# TMDLs: A Shift in Focus

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- ❑ TMDL: Total Maximum Daily Load
- ❑ TMDLs determines each category of pollutant a water body can absorb daily without becoming polluted.
- ❑ All combined sources of each pollutant in the watershed, including nonpoint sources are limited to discharging no more than that total limit.

# Big Problems for Agriculture:

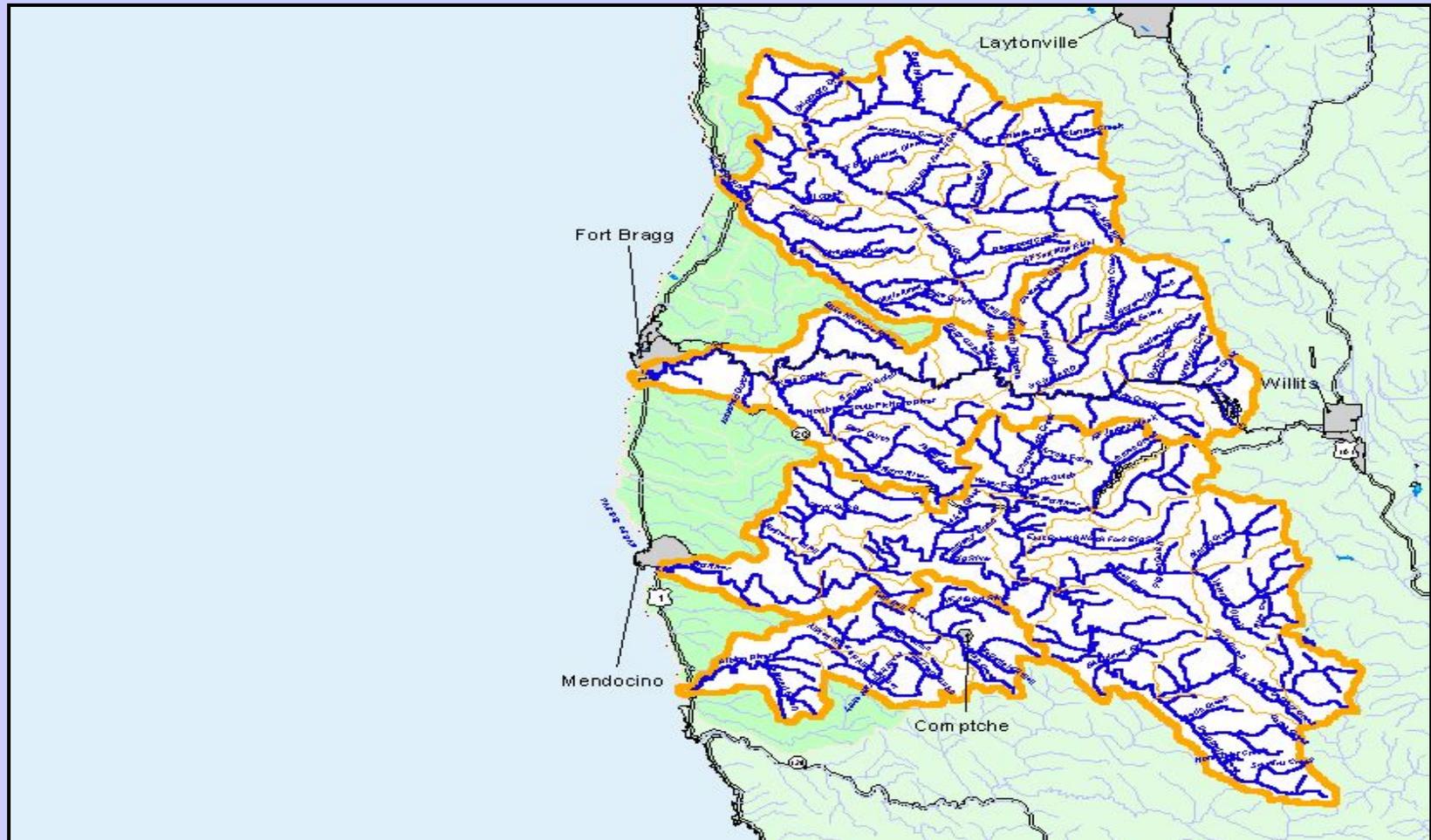
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- ❑ Listing of most North Coast streams and rivers by EPA as “impaired water bodies”
- ❑ Listing of steel head trout, chinook and coho salmon as “threatened species”



# Water Quality Laws Will Be Enforced on a Watershed Basis

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# Watershed Components

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# Human Activities and Cumulative Impacts

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# Porter-Cologne Act:

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Provides for a three tiered approach to achieving water quality objectives

**Tier 1 - Voluntary Implementation of Management Measures**

**Tier 2 - Regulatory Based Encouragement of Management Measures**

**Tier 3 - Effluent Requirements/Waste Discharge Permits**

# Possible Actions:

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- ❑ Ranch or Vineyard Water Quality Plan and Letter of Intent
- ❑ Watershed Group: Pay an Annual Fee for Monitoring Water Quality
- ❑ Certification Such as Fish Friendly Farming
- ❑ Discharge Permits and Enforced Water Quality Monitoring

# Possible Actions In Water Quality Plan:

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- ❑ Reduce Harmful Pesticides
- ❑ Protection and Improvement of Riparian Areas, including repairs of actively eroding banks, revegetation (Streambank Restoration)
- ❑ Cover cropping to reduce siltation
- ❑ Replace or remove culverts that block access to habitat for fish

# Sources of Help:

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- ❑ UC Cooperative Extension
- ❑ Natural Resource Conservation Service
- ❑ Resource Conservation Districts (administer EQUIP cost share programs)
- ❑ Resource Agencies including Fish and Game, US Fish and Wildlife, National Marine Fishery Service

# Air Quality Laws

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- ❑ State Air Resources Control Board enforces laws
- ❑ Administered on a county basis
- ❑ You may need permits and have to monitor some activities

# Air Quality Laws

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- ❑ PM 10 monitoring and mitigation
- ❑ Big offenders: Diesel smoke, sulfur dust, vineyard soil dust, smoke from ag burning
- ❑ You may need to retire some stationary motors and other agricultural engines
- ❑ Tractors are not affected yet, but may be in the near future

# Sources of Help

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- ❑ Local County Air Quality Control District
- ❑ County Farm Bureaus for Information (strong advocates for property rights of land owners)

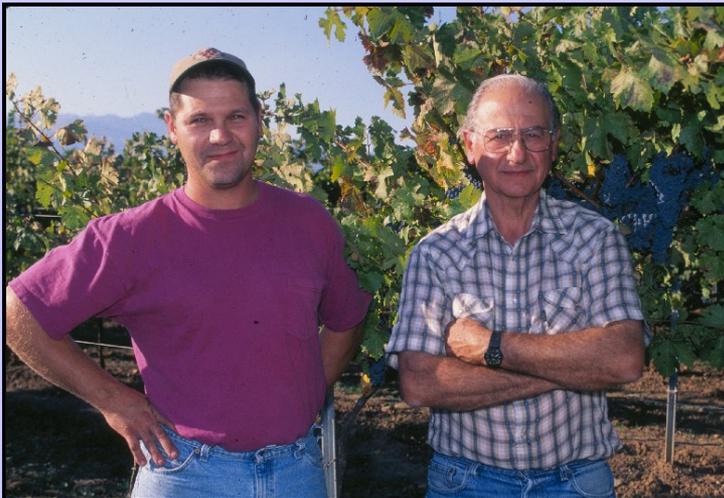
# Human Resources: Tradition and Experience

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# Human Resources: Multiple Generations

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# Human Resources: Adequate Labor Supply

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- Farm workers
- Technical Help
- Managers
- Can be a problem to source help in areas with few vineyards

# Who Can Help?

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- ❑ Farm Labor Contractors
- ❑ Trade Groups
- ❑ Employment Development Department
- ❑ Friends and Neighbors (be considerate—don't steal key employees!)

# More Questions?

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- Contact Glenn McGourty:

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