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Reducing Long-Term Input Costs while Maintaining Production in Native Groves

Charles Rohla

2022 OPGA Conference

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Managing Native Pecans

What is it costing you to manage your native crop.

- Do you do the same thing year after year
- Do you adjust management according to the crop you have or plan to have

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Input Costs per acre

- Fertilizer – $100/ac
- Herbicide – $10 -$20/ac
- Insecticide – $26-$45/ac
- Fuel – $5.50/gallon

  6-12 times through the orchard.
- Harvest cost – ??

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Health of your trees

- Evaluate your trees
- Do you take annual leaf samples
- Do you utilize your leaf samples to adjust fertilizer plan

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Reducing Fertilizer inputs

- Improve our Soil Health
  - Know your soils and develop plan to improve it
  - Long-term

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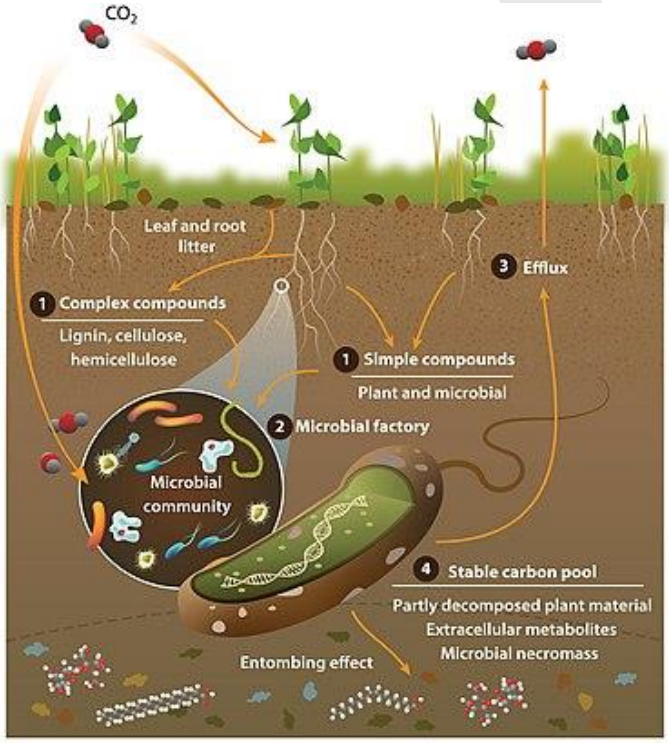
Know your soils

- Haney soil test
- PLFA
- Soil Food Web, Biome Maker, etc.
- Underwear test



Naylor D, et al. 2020. *Annu. Rev. Environ. Resour.* 45:29–59

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Soil Your Undies..

a quick and easy soil microbe observation test

- Bury during the active growing season
- Bury 4 – 6 inches deep
- Bury for 6 weeks
- Observe if microbes are active by state of degradation

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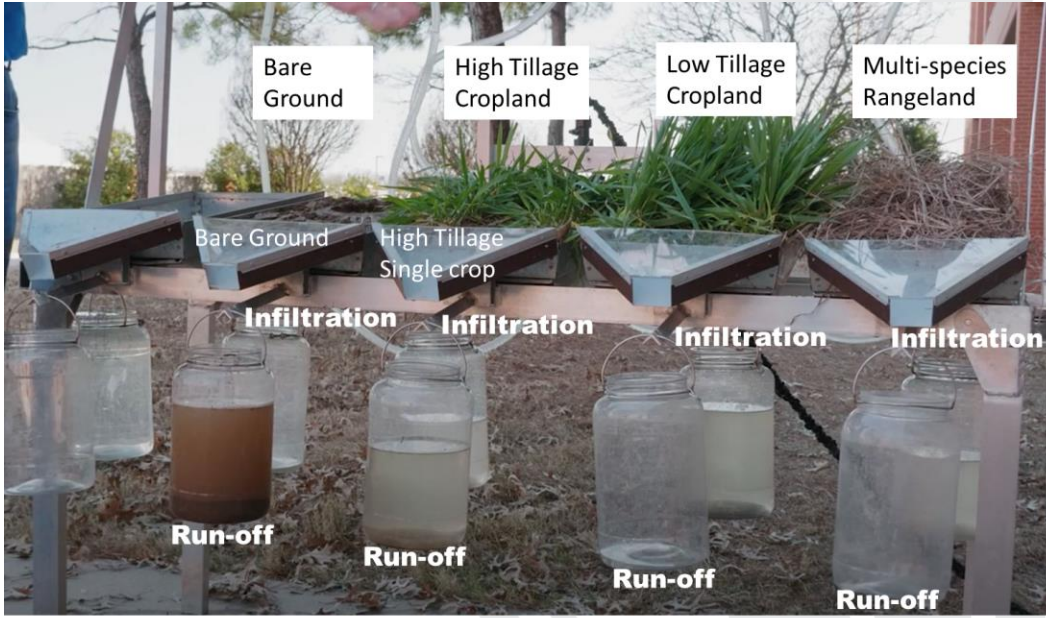
Benefits of Health Soil

- Increased nutrient cycle
- Increase water infiltration
- Increase in beneficials



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Soil Health Principles

1. Know your context
2. Cover the soil
3. Minimize soil disturbance
4. Increase diversity
5. Maintain continuous living plants/roots
6. Integrate livestock

Increase Diversity within orchard

- Remove monoculture effect
  - Plant within or around orchard, cover crops, perennial shrubs, and various annual plants that serve as sources for food and refuge for beneficial species.

Increase biodiversity above and below ground

- Reduces cost of inputs that plants and microorganisms naturally can supply
- Improves soil structure and biology
- Increases water infiltration rates
- Increases soil organic matter
- Builds soil water holding capacity

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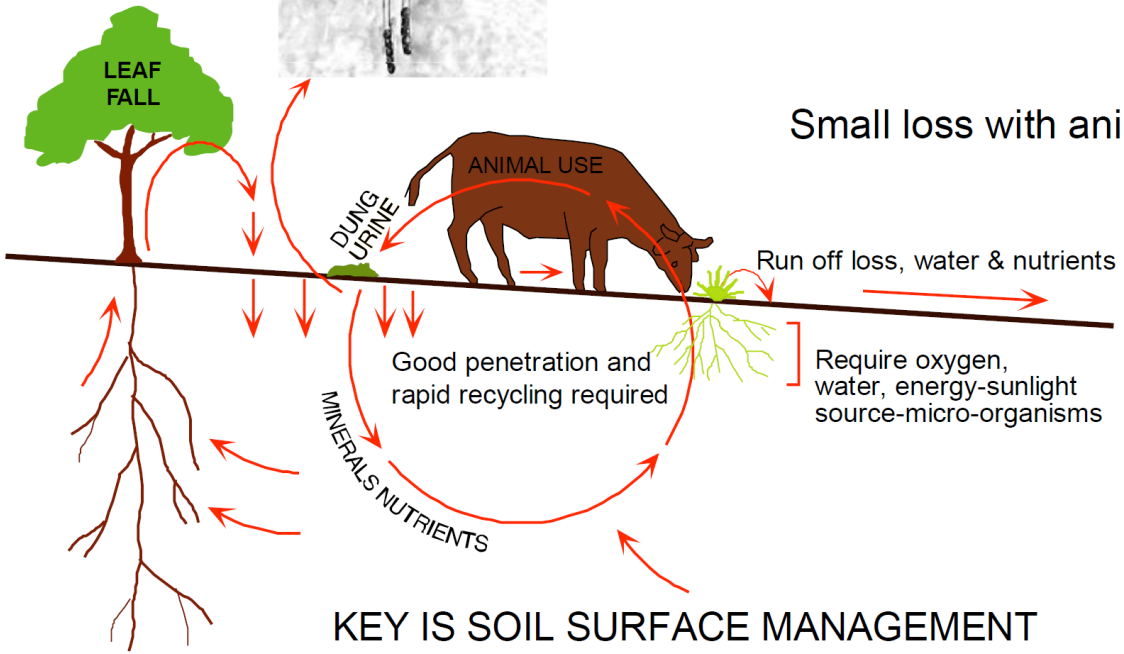
NUTRIENT CYCLE



KEY IS SOIL SURFACE MANAGEMENT

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Reducing herbicide inputs

- Increased plant diversity
- Animal diversity
- Proper grazing
  - High Stock Density Grazing/Adaptive Multi=Paddock (AMP)

Sierra Orchards

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Pest Management

Pest management in pecans is heavily dependent on chemical control.

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Pest Control

- What pest do you have problems with.
- You must monitor and scout to truly know this

Pecan south magazine

UAEX

Pecan south magazine

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Integrated Pest Management

IPM is an ecosystem-based strategy that focus on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms and the environment.

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Integrated Pest Management

- IPM in Pecans
  - Has been well researched and documented
  - Use trapping methods, monitor and scout before applying any pesticide
  - Understand your trees, crop and environment before you apply anything
  - Do not spray because your neighbor is or because the calendar says it’s time to spray

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Alternate Disease Management

- Tree spacing
- Increase air flow
- Orchard hygiene

Pecan south magazine

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Biological pesticides

- Biological pesticides
  - Microbial control for pecan weevil and aphid (Grandevo)
  - Future - Virus biopesticides on hickory shuckworm
- Hormones that disrupt development
- Chemical attractants (traps) or deterrents
- Mating disruption (pheromones)

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Alternative methods

- Orchard perimeter
  - Maintain perimeter to ensure pests are not moving in from nearby sources
    - Pecan curculio, stink bugs
  - Habitat diversification outside of orchard
  - Use trap crops outside of orchard

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Alternative methods

- Proper soil moisture and orchard humidity
- Maintain health trees
- Increase beneficial fungus and nematodes that may help attack pests.
- Remove standing water from orchard floor
- Orchard Sanitation

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Biological alternatives

- Cover crops to attract and provide food sources for beneficials
- Release of beneficial insects (predators/parasites)
- Paper wasps – feed on foliar feeding caterpillars
- Birds in orchards to feed on insects
- Bats https://www.youtube.com/watch?v=-Im27yOFZnM

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“No civilization has outlived the usefulness of its soils. When the soil is destroyed, the nation is gone.”

- Lloyd Noble

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