



Soil Health Principles

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Objectives

1. List and explain the soil health principles
2. Identify and explain how conservation practices address soil health principles
3. Identify *core* soil health practices in your region



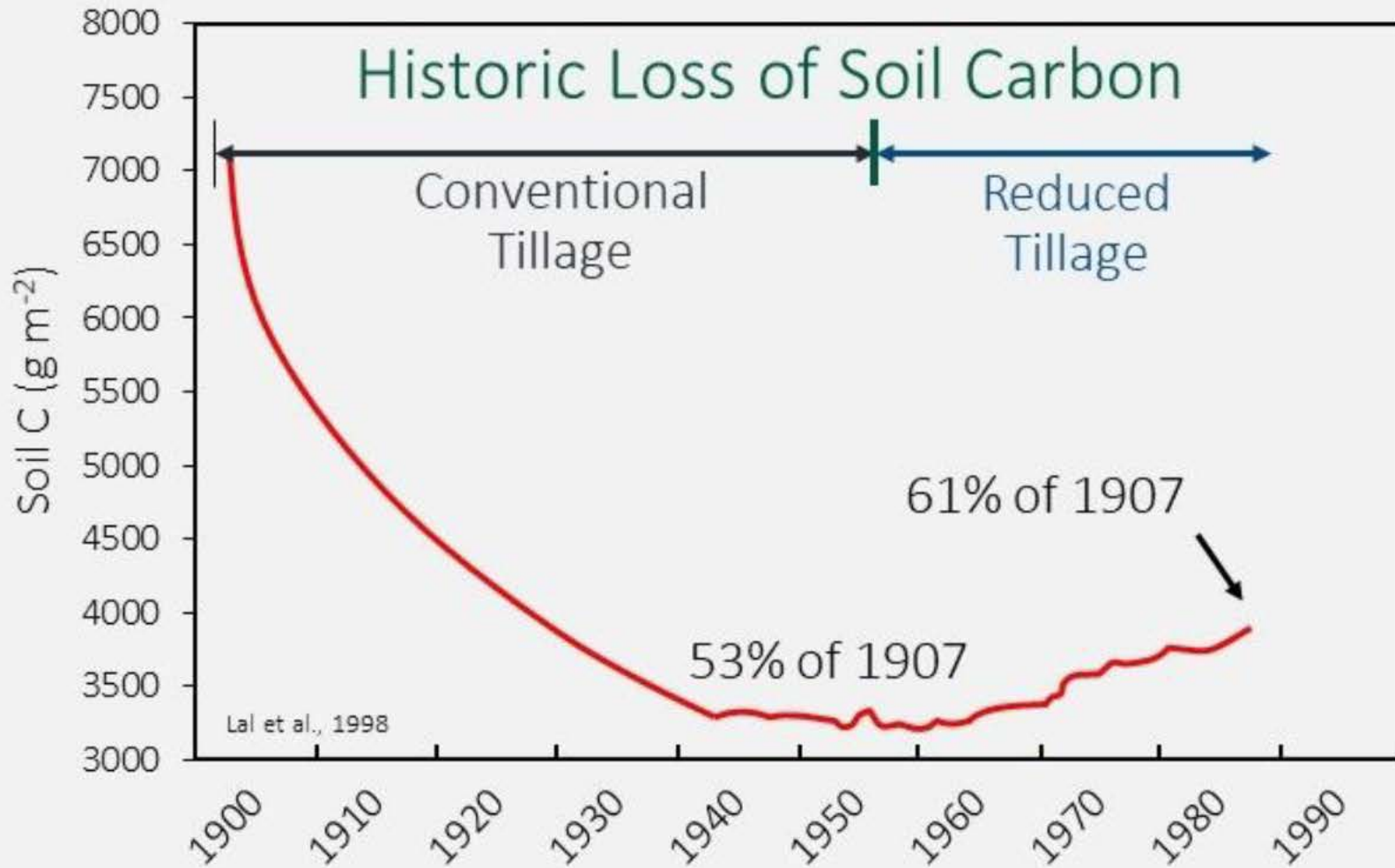


What are General Characteristics of Cultivated Soils?

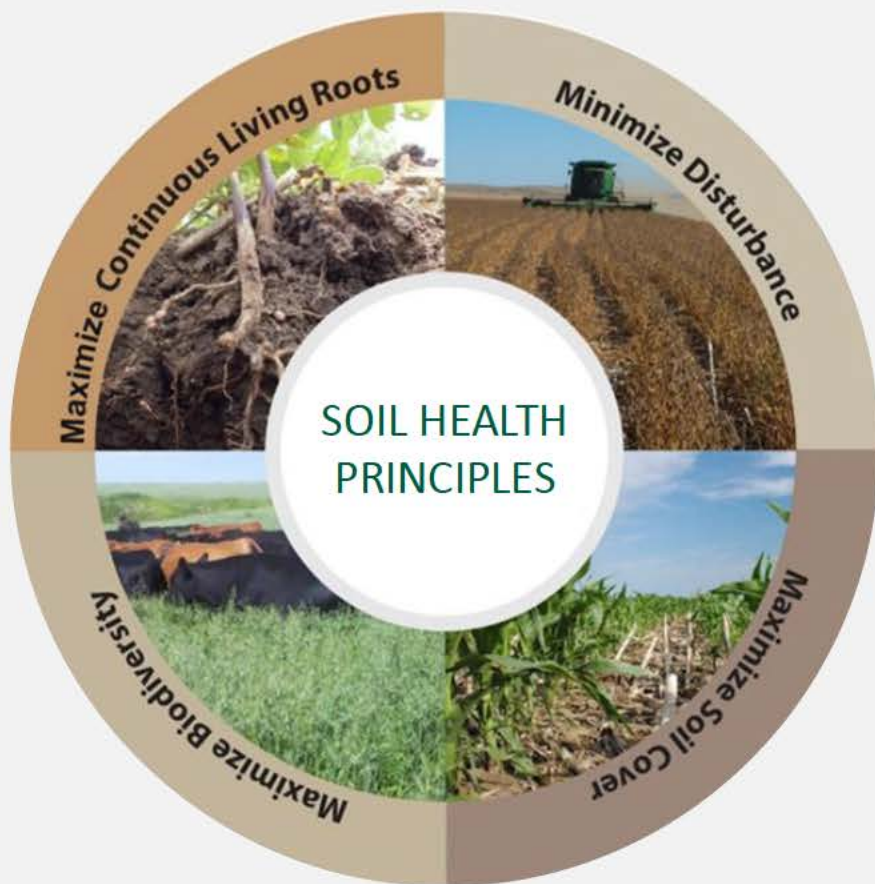
- ↓ H₂O Infiltration & Storage
- ↓ Biological Activity
- ↓ Biological Diversity
- ↓ Efficient Nutrient Cycling
- ↑ Summer Temps
- ↓ Contribution to Vigor
- ↑ Erosion Potential
- ↓ Aggregation

The productivity of conventional agricultural systems are maintained with increased technology, labor, fuel, nutrients, pesticides, water...

The Challenge

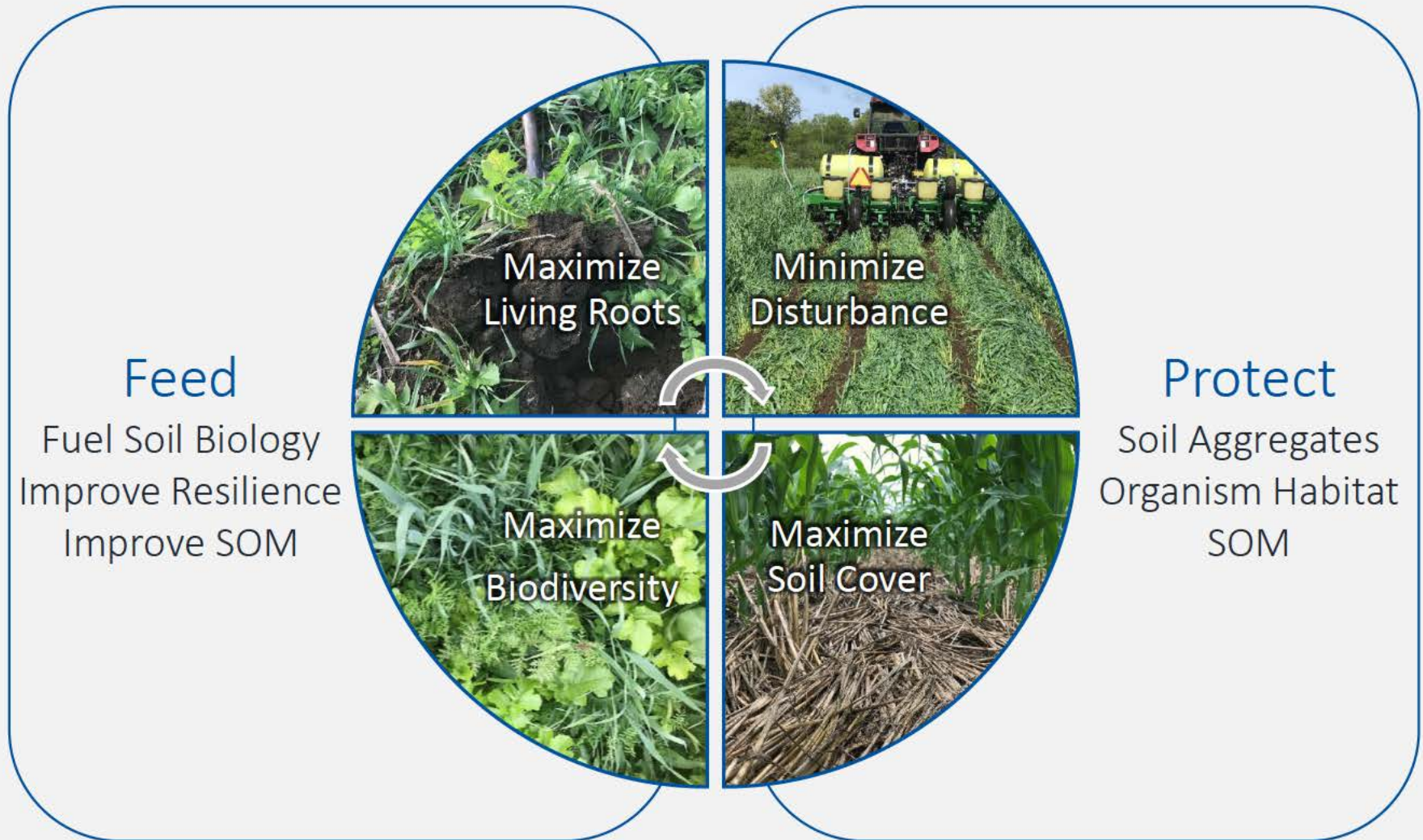


The Principles that Conserve the Soil Ecosystem



- Minimize Disturbance
- Maximize Cover
- Maximize Biodiversity
- Maximize Continuous Living Roots

Soil Health Principles to Support High Functioning Soils



How Soil Health Principles Support Soil function – PROTECT



- Maintain stable aggregates
- Manage erosion
- Buffer temperature
- Reduce evaporation
- Maintain soil organic matter

Minimize Disturbance

Excessive (chronic) Disturbance can:

- ↓Habitat for soil organisms
- Destroy soil structure

What Types of Disturbance are Common in Agriculture?

- Physical (tillage)
- Chemical (fertilizer, pesticides, soil amendments)
- Biological (grazing, non grazing, fallow systems, monoculture community)

Dr. Don Reicosky

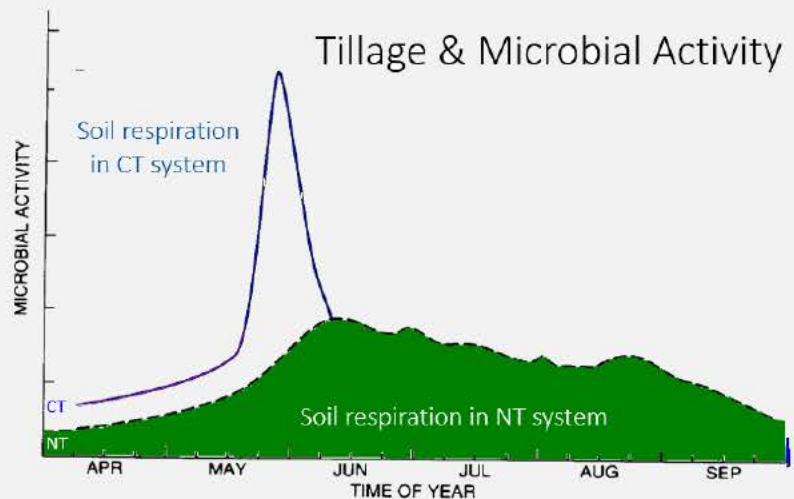


What Practices Minimize Disturbance?



Photo: Echo –Y Farms

- Residue & Tillage Mgmt. (329/345)
- Conservation Cover (327)
- Nutrient Mgmt. (590)
- IPM (595)
- Prescribed Grazing (528)



Why Maximize Soil Cover?

- ↓ Erosion
- ↑ Infiltration
- ↓ Evaporation
- Moderate Soil Temp
- Habitat for Soil Organisms ↑
- Food for Biota ↑
- Mitigate Compaction from Machines & Livestock



What Practices Maximize Soil Cover?

- Cover Crop (340)
- Residue & Tillage Mgmt. (329/345)
- Conservation Cover (327)
- Mulching (484)
- Controlled Traffic (334)
- Pasture Hayland Planting (512)
- Prescribed Grazing (528)



How Soil Health Principles Support Soil Function – FEED



- Stimulate below-ground diversity
- Increase SOM
- Improve nutrient cycling
- Enhance plant growth
- Break pest cycles
- Increase predator & pollinator populations



How Do We Maximize Living Roots?

- Grow crops in the off-season
- Avoid fallow & ↓ re-cropping interval
- ↑ time in perennial crops
- Manage rotations & forage height

What Practices?

- Conservation Crop Rotation (328)
- Conservation Cover (327)
- Cover Crop (340)
- Pasture Hayland Planting (512)
- Prescribed Grazing (528)



How Do We Maximize Biodiversity?

- Grow diverse cover crops & legumes
- ↑ diversity of crop rotations
- Integrate livestock & graze cover crops
- ↑ time in diverse perennial crops

What Practices?

- Conservation Crop Rotation (328)
- Conservation Cover (327)
- Cover Crop (340)
- Pasture Hayland Planting (512)
- IPM (595)
- Prescribed Grazing (528)

Core Practice Review

Cons. Crop Rotation (328)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Flax / Chickpeas added to wheat rotation

Conservation Cover (327)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Cover Crop (340)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Core Practice Review

Residue/Tillage Management (329, 345)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Mulching (484)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Nutrient Management (590)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Core Practice Review

Prescribed Grazing (528)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Pasture and Hayland Planting (512)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



The Ohio State University

Integrated Pest Management (595)

Principles Addressed

- Disturbance
- Cover
- Diversity
- Roots



Strips of flowering cover crops in potato field

Discuss Practices in Your Area That Address the Principles



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