



- CATAWBA -
LANDS CONSERVANCY

LAND | WATER | FARMS | NATURE



TALK DIRT TO ME

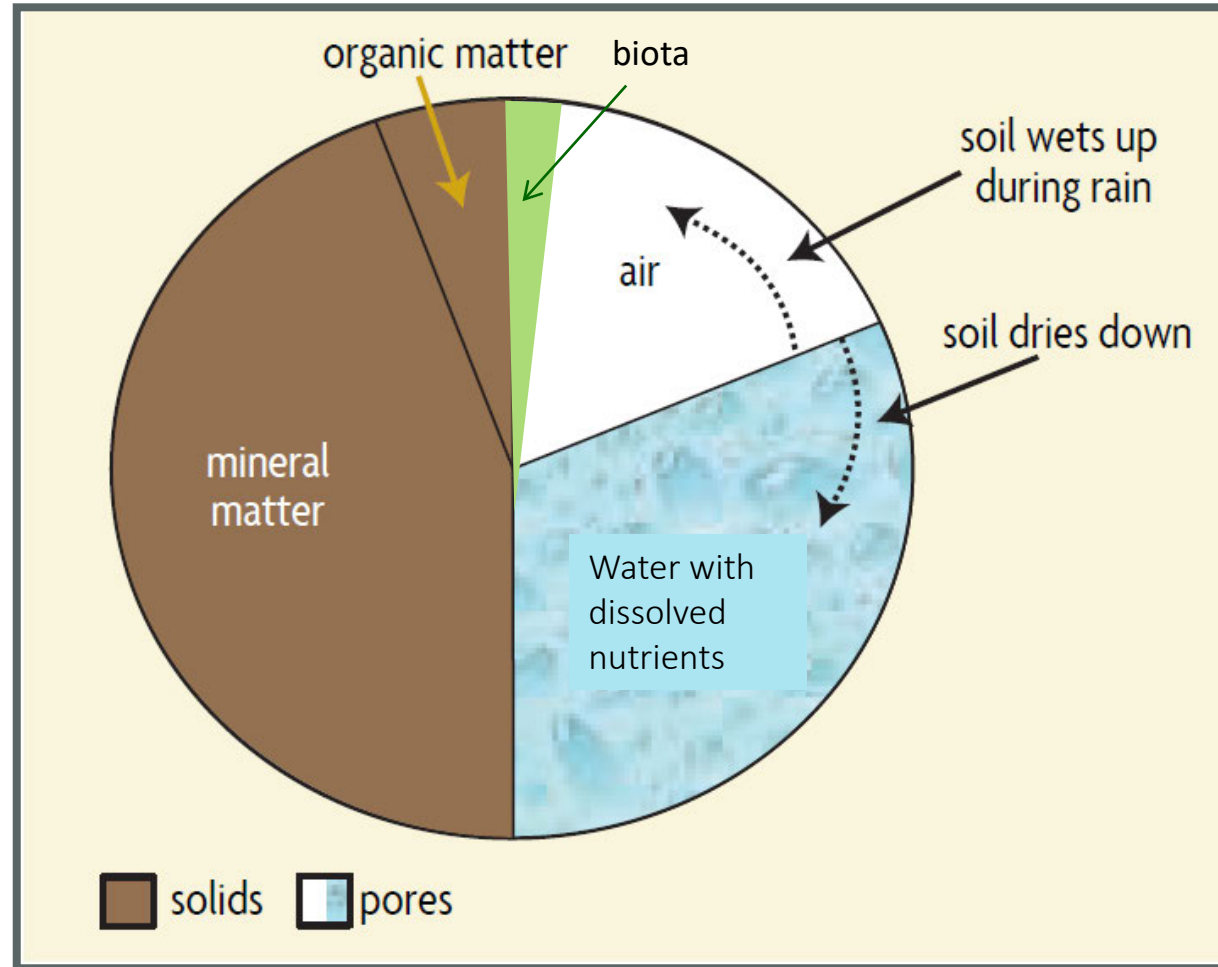
WHAT IS SOIL HEALTH?



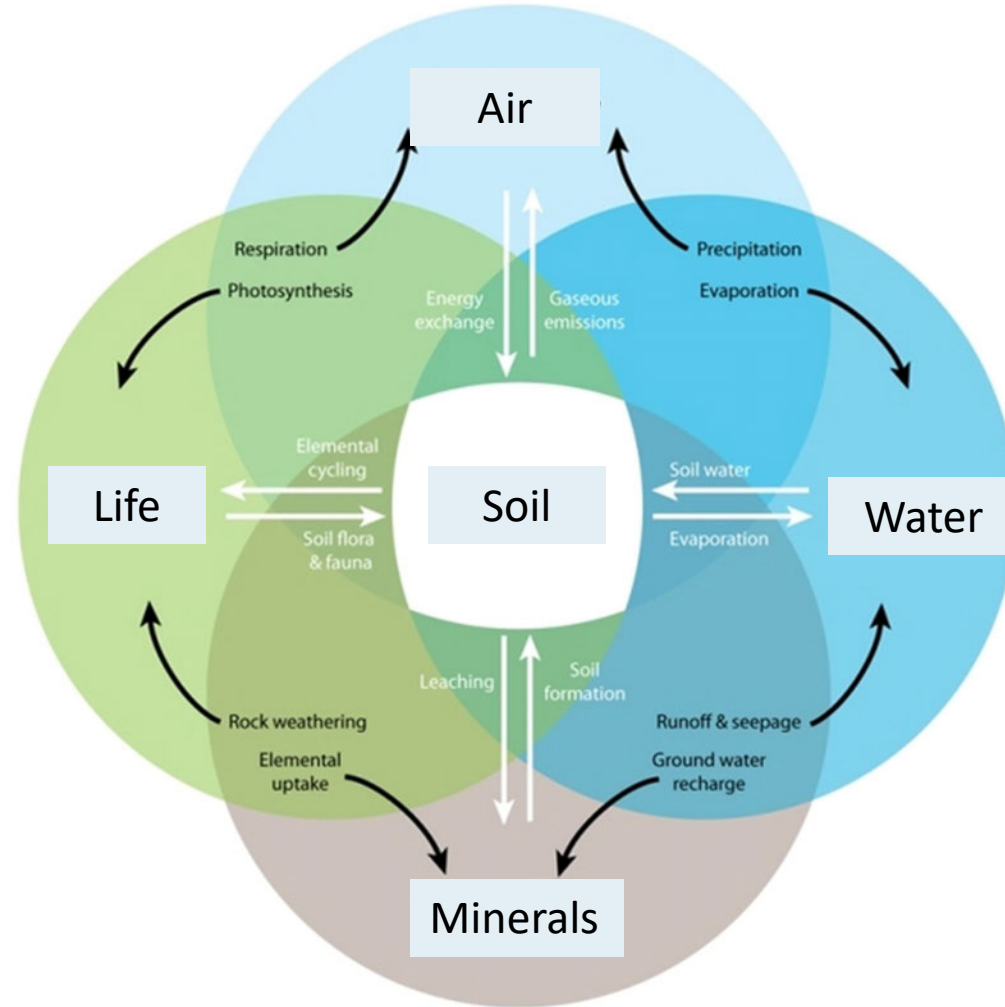
- ▶ Soil health is defined as the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans
- ▶ Healthy soil gives us clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes



SOIL COMPOSITION



SOIL COMPOSITION



SOIL'S FIVE ESSENTIAL FUNCTIONS

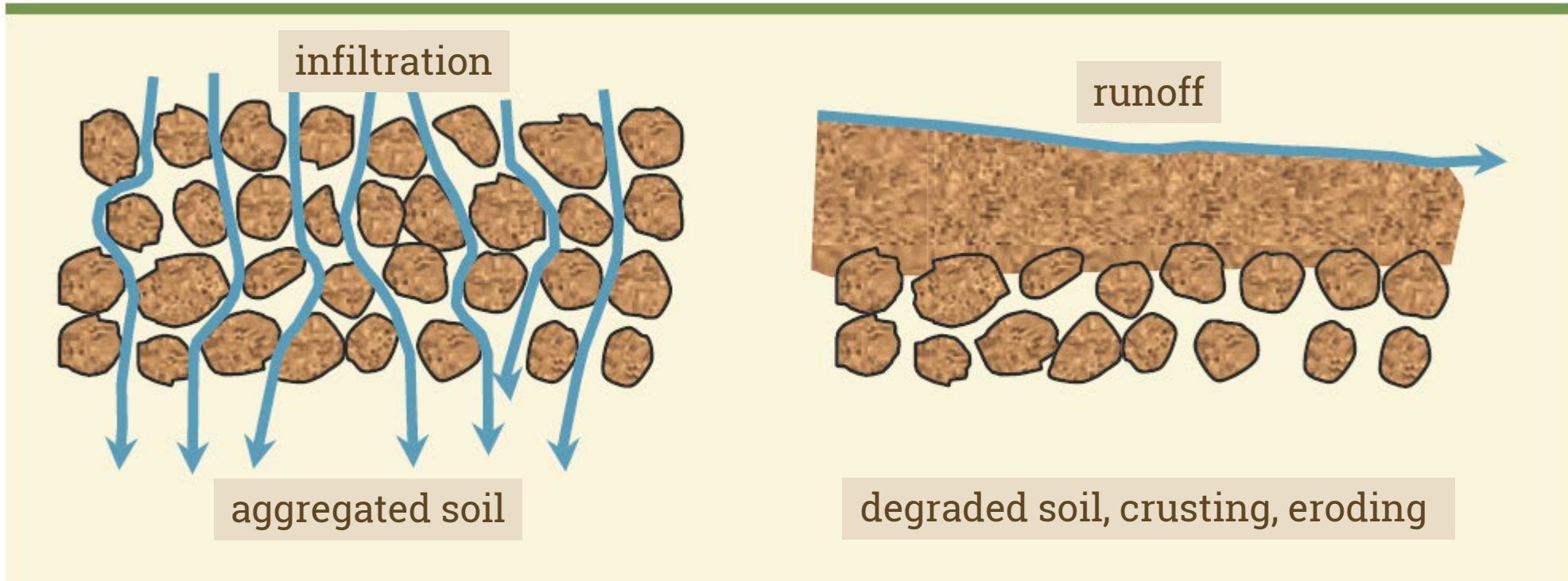
- ▶ Regulating water
- ▶ Sustaining plant and animal life
- ▶ Filtering and buffering potential pollutants
- ▶ Cycling nutrients
- ▶ Providing physical stability and support



SOIL: THE GOOD, THE BAD, & THE UGLY

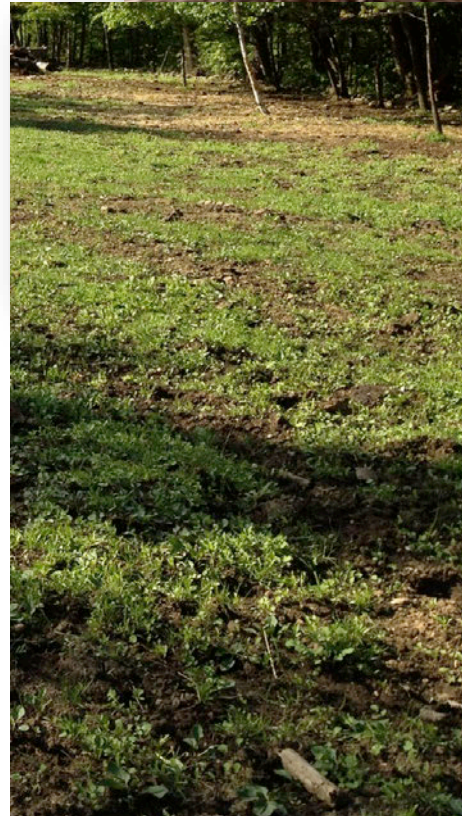


BENEFITS OF GOOD SOIL STRUCTURE



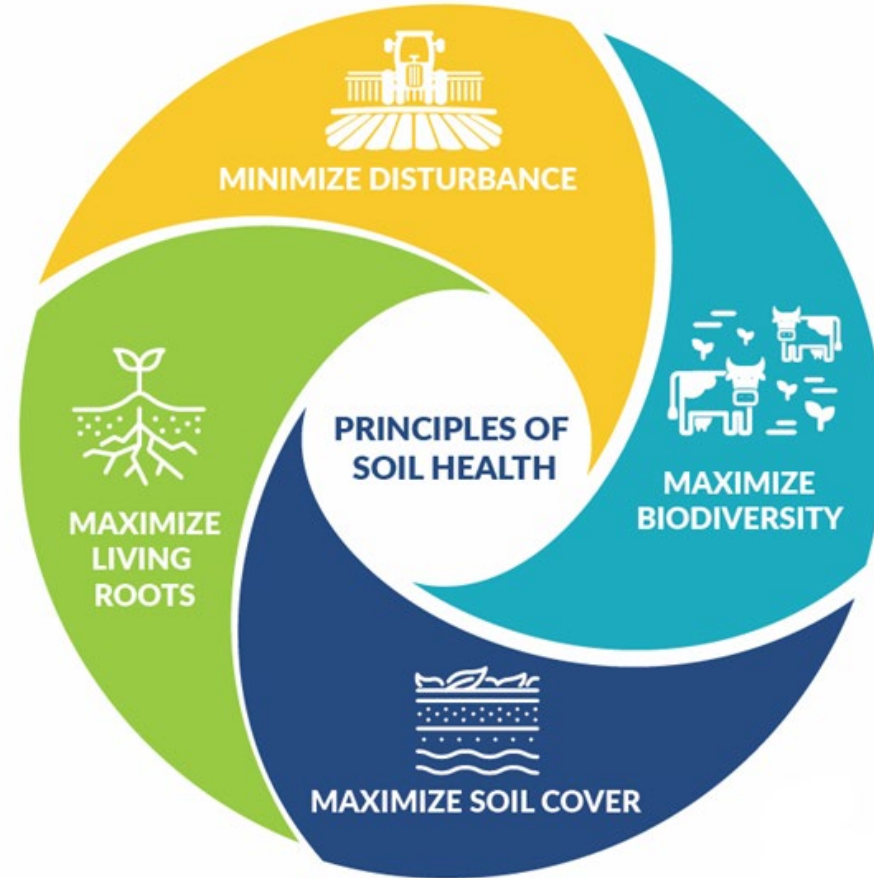
GENERAL SIGNS OF POOR SOIL HEALTH

- ▶ Hard soil, plowing up cloddy soil and poor seedbeds
- ▶ Rapid onset of stress or stunted growth during dry or wet periods
- ▶ Discolored crop leaves
- ▶ Signs of runoff & erosion
- ▶ Poor growth of plants
- ▶ Soil crusting
- ▶ High disease or pest pressure
- ▶ Declining yields
- ▶ Increasing costs, same returns



MANAGING SOIL HEALTH

- ▶ Minimize disturbance
- ▶ Maximize biodiversity
- ▶ Maximize soil cover
- ▶ Maximize living roots



MINIMIZE DISTURBANCE

What Types of Disturbance are Common in Agriculture?

- ▶ Physical (tillage, grazing compaction, heavy equipment traffic)
- ▶ Chemical (fertilizer, pesticides, soil amendments)
- ▶ Biological (grazing, non grazing, fallow systems, monoculture community)

Effects of Excessive/Chronic Disturbance:

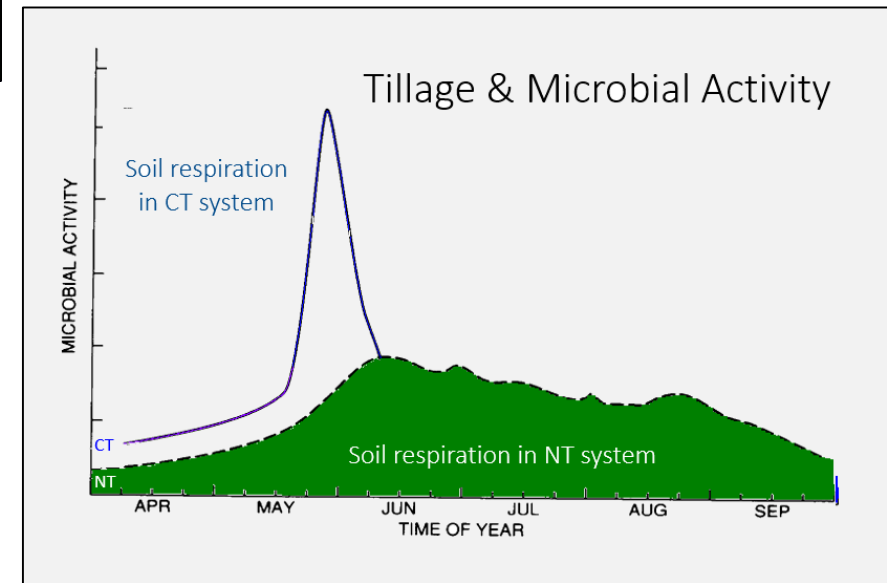
- ▶ ↓ Quality of Habitat for soil organisms
- ▶ ↓ Soil structure



WHAT PRACTICES MINIMIZE DISTURBANCE?



- ▶ Residue & Tillage Management
- ▶ Conservation Cover
- ▶ Nutrient Management
- ▶ Integrated Pest Management (IPM)
- ▶ Prescribed Grazing



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
- ▶ Residue & Tillage Management
- ▶ Conservation Cover
- ▶ Mulching
- ▶ Controlled Traffic
- ▶ Forage & Biomass Planting
- ▶ Prescribed Grazing

MAXIMIZE PRESENCE OF LIVING ROOTS



How?

- ▶ Grow crops or cover crops in the off-season
- ▶ Avoid fallow
- ▶ Increase time in perennial crops
- ▶ Manage rotations, intercropped mixtures, and forage height

What Practices?

- ▶ Conservation Crop Rotation
- ▶ Conservation Cover
- ▶ Cover Crop
- ▶ Forage and Biomass Planting
- ▶ Prescribed Grazing

MAXIMIZE BIODIVERSITY



How?

- ▶ Grow diverse cover crops and legumes
- ▶ Increase diversity of crop rotations and mixtures
- ▶ Integrate livestock and graze cover crops
- ▶ ↑ time in diverse perennial crops

What Practices?

- ▶ Conservation Crop Rotation
- ▶ Conservation Cover
- ▶ Cover Crop
- ▶ Forage and Biomass Planting
- ▶ IPM
- ▶ Prescribed Grazing

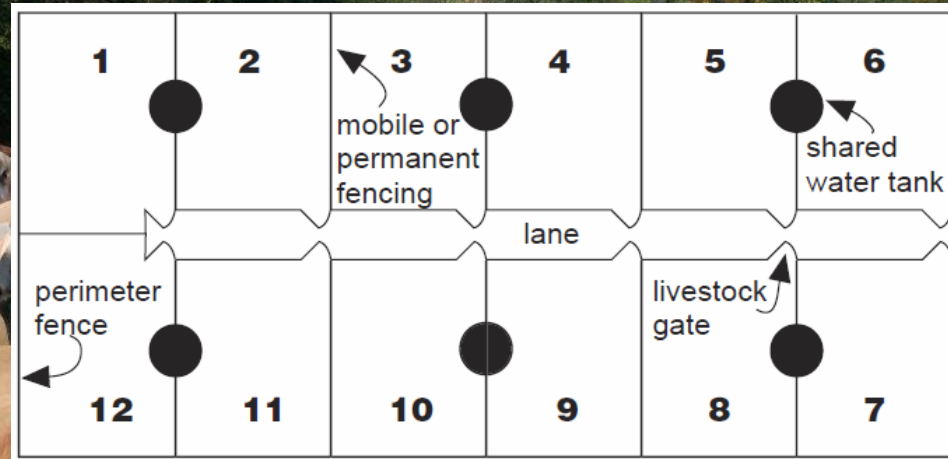


GOOD PASTURE MANAGEMENT BUILDS HEALTHY SOIL

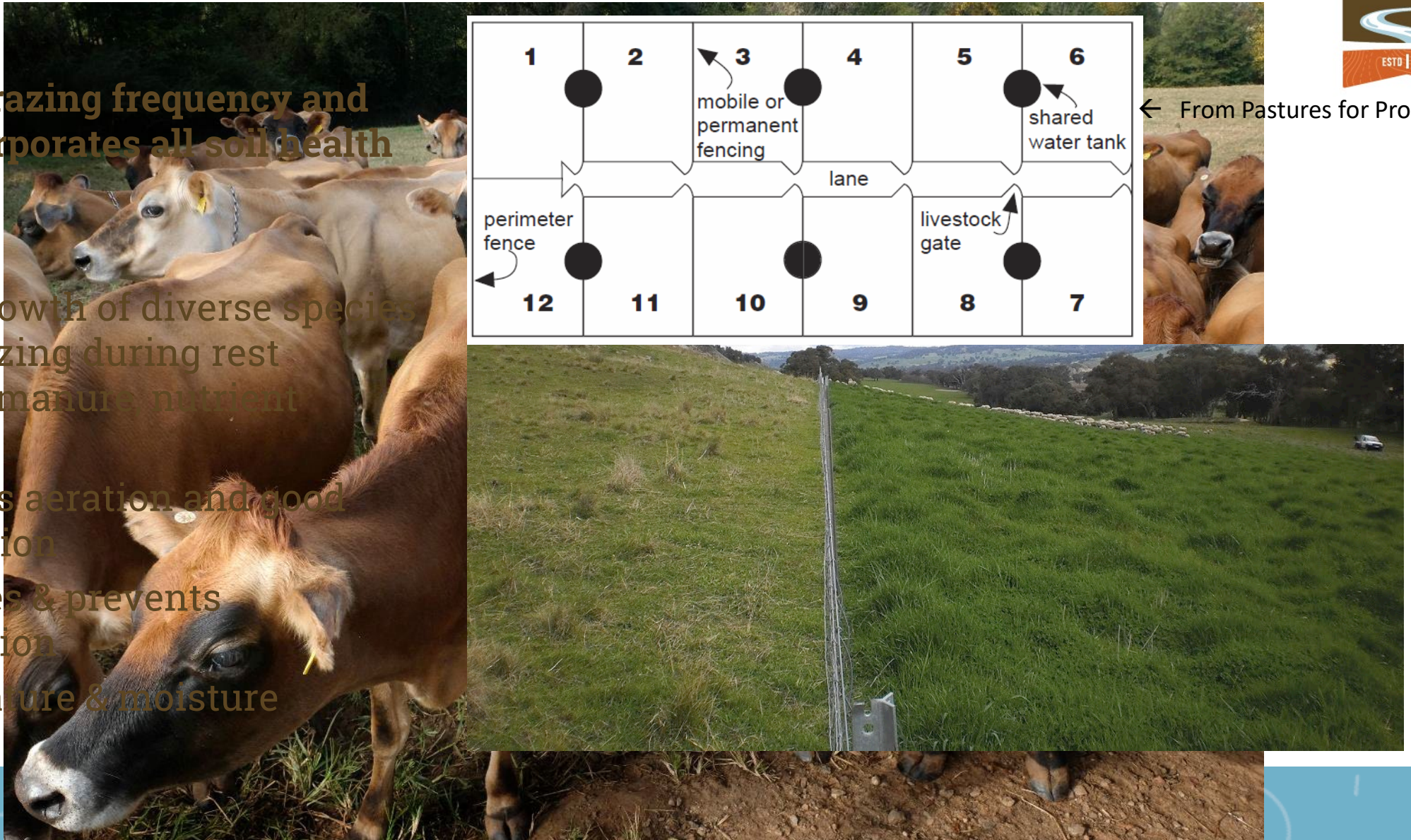


Appropriate grazing frequency and intensity incorporates all soil health principles

- ▶ Full regrowth of diverse species after grazing during rest periods, manure nutrient cycling
- ▶ Promotes aeration and good aggregation
- ▶ Alleviates & prevents compaction
- ▶ Temperature & moisture balance



← From Pastures for Profit

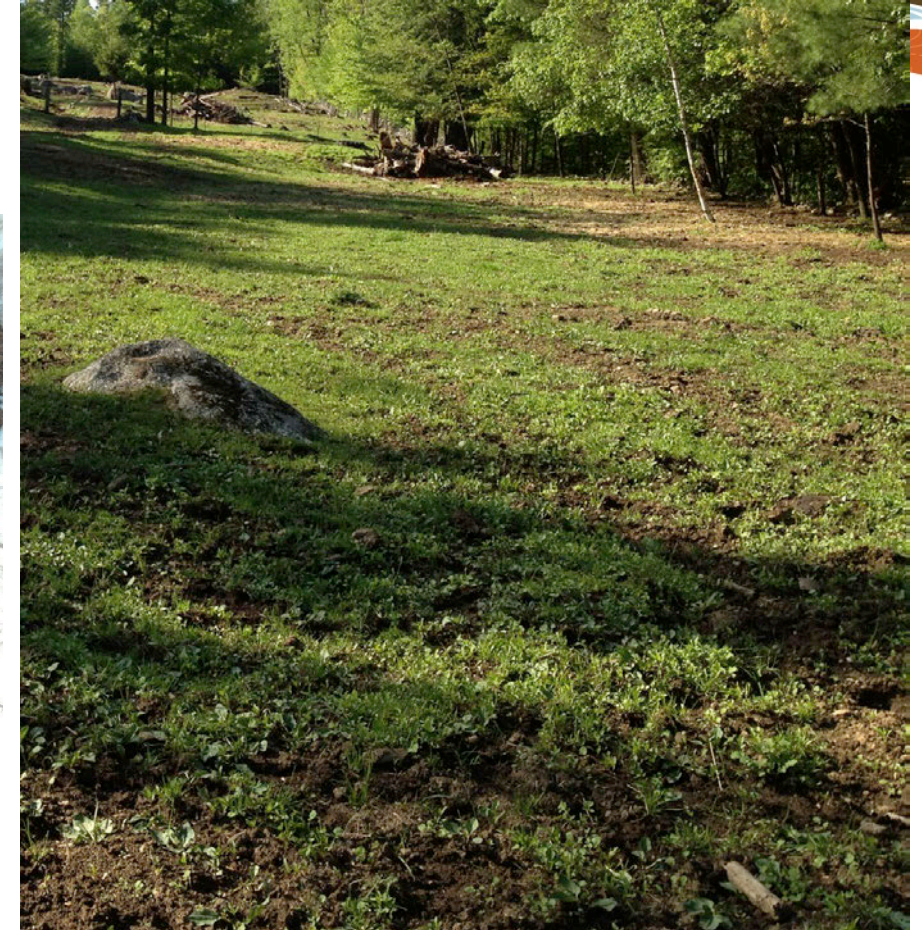


POOR PASTURE MANAGEMENT AND SYMPTOMS



Continuous grazing leads to:

- ▶ Uneven fertility
- ▶ Poor productivity
- ▶ Weeds, poor-quality pasture species
- ▶ Compaction and erosion problems



Continuously grazed pasture with constraining surface and subsoil compaction and erosion issues

SOIL HEALTH PRACTICES

RIVERBEND FARM (LUTZ)

► Practices

- Rotational Grazing
- Native Warm Season Grass



► Benefits

- Reduced risk of ergot toxicosis
- Infection Prevention
- Reduced Soil Erosion
- Wildlife Habitat

SOIL HEALTH PRACTICES

BUFFALO CREEK PRESERVE



- ▶ No-Till Farming
- ▶ Field Buffers
- ▶ Conservation Crop Rotation
 - ▶ Corn & Soybean



SOIL HEALTH PRACTICES

JONES AND POLLY PHARR



- ▶ No-Till Farming
- ▶ Cover Crops



SOIL HEALTH PRACTICES

GEORGE CLARK



► Practices

- Retained Slash
- Understory vegetation

► Benefits

- Prevents Soil Erosion
- Adds Nutrients to soil
- Reduces evaporation

