



Integrating Cover Crops and Grazing in Small Farm Livestock Systems

“Growing Soil While Feeding Animals”

Jake Hadfield – USU Extension Juab & Utah Counties

Theme of the Presentation

KISS

K – Keep

I – It

S – Simple

S - Sweetheart



Soil Health Terms

Soil Organic Matter



Soil Organic Matter (SOM): Soil organic matter is a mix of decomposed plant and animal material, microbes, and nutrients. It helps improve soil structure, retains moisture, and provides essential nutrients for plants.

Soil Health Terms

Aggregation



Soil Aggregation: Soil aggregates are clumps of soil particles held together by organic matter, plant roots, and microbial byproducts. Aggregation improves soil structure, allowing for better water infiltration, aeration, and root growth.

Soil Health Terms

Soil Biology



Soil Biology: Soil biology refers to the living organisms in the soil, including microbes, fungi, earthworms, and insects. These organisms help break down organic matter, cycle nutrients, and support plant growth.

Healthy Soil is Never Bare



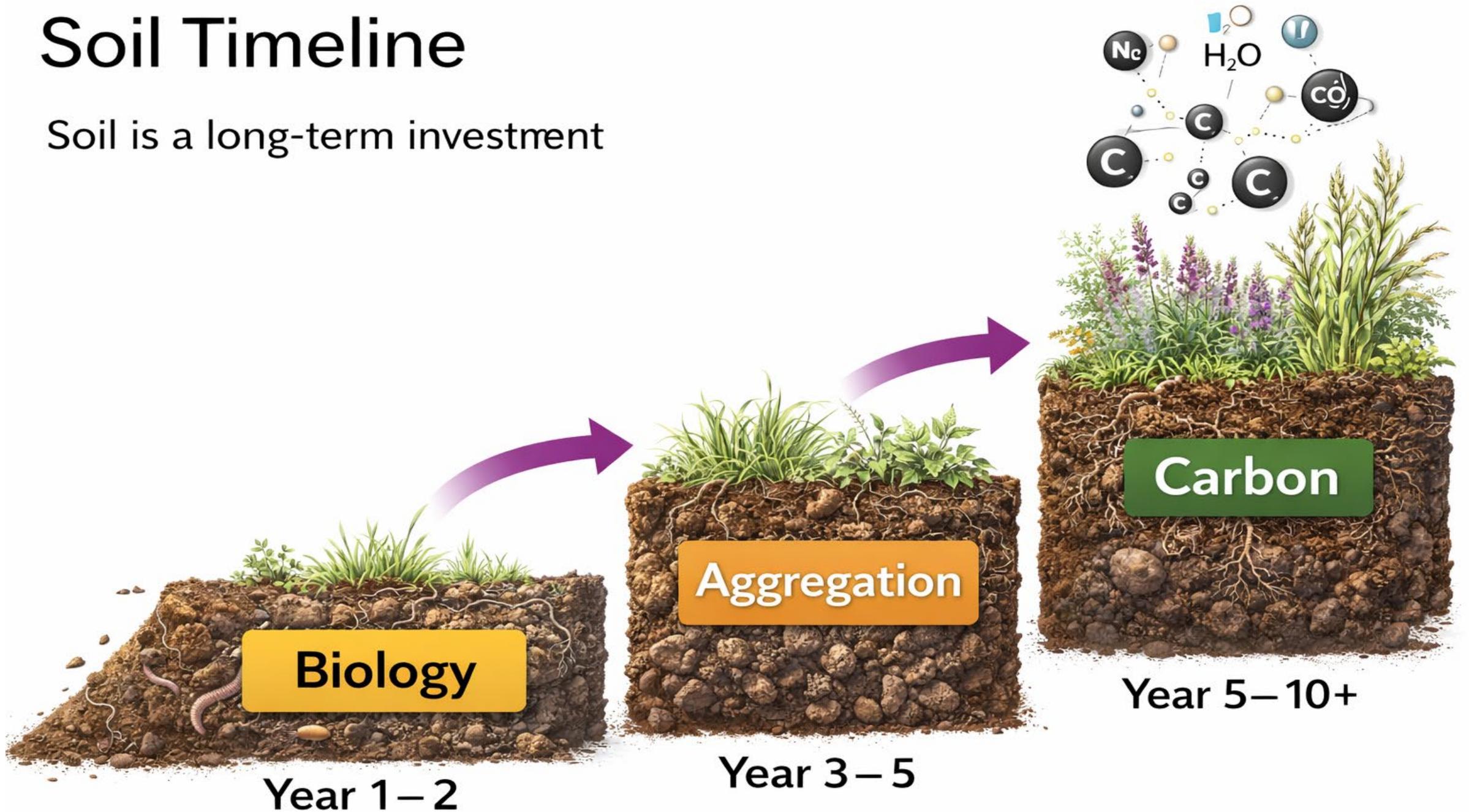


Soil Health Flywheel

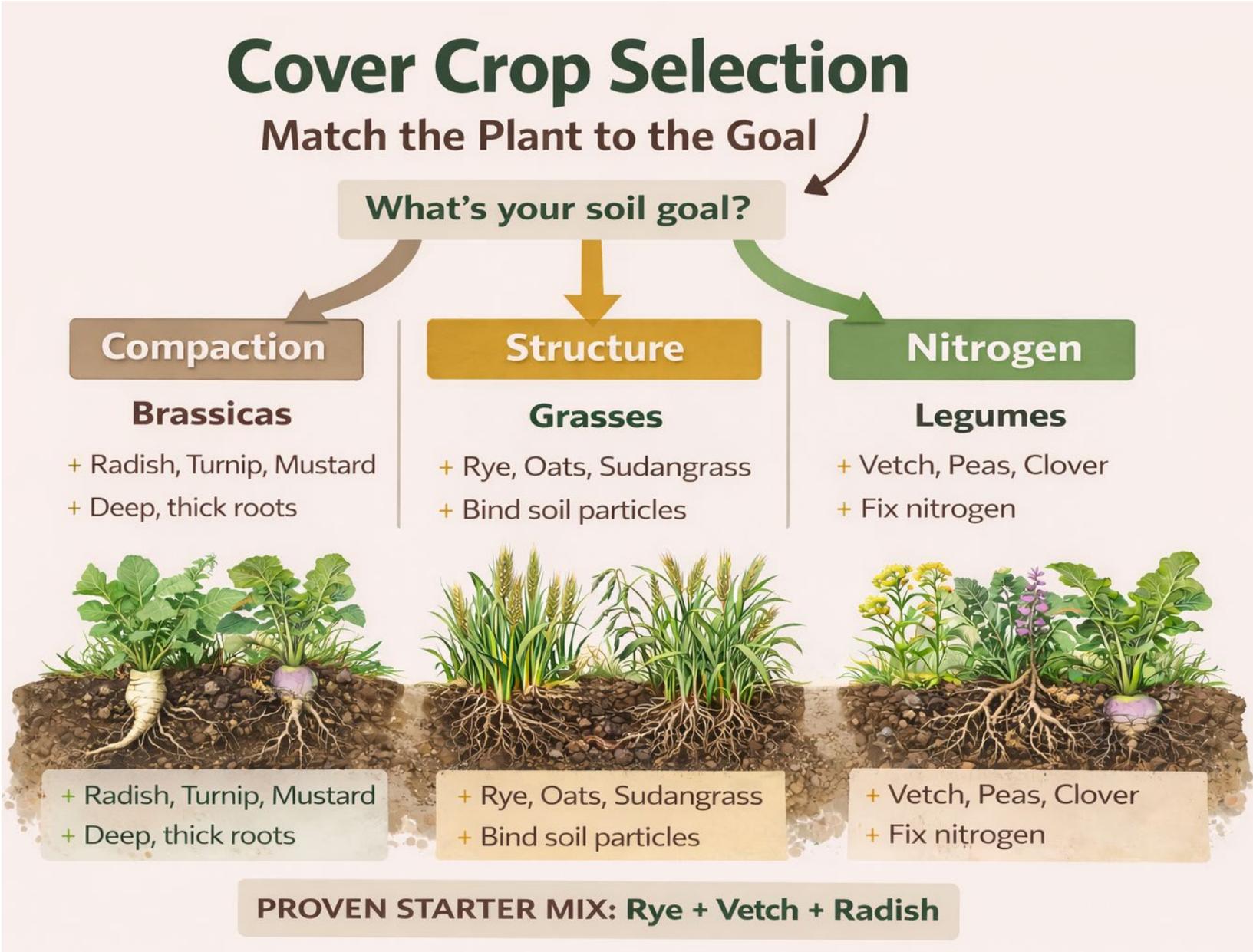
**“Plants capture
sunlight –
Livestock turn
it into soil”**

Soil Timeline

Soil is a long-term investment



Cover Crop Decision Tree



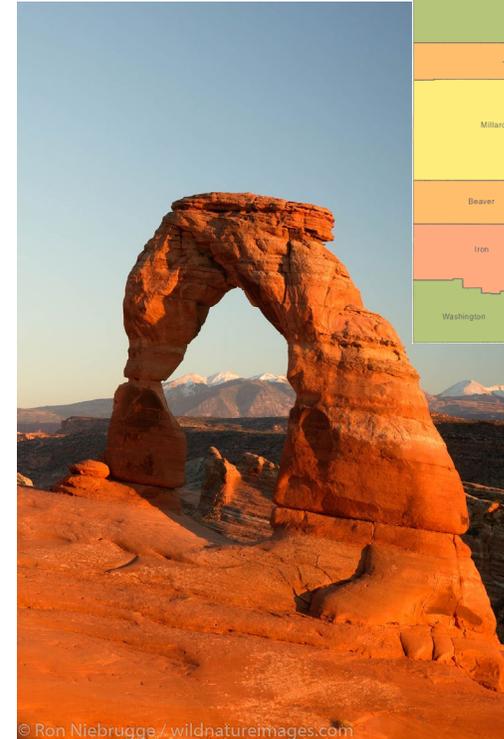


Cover Crop Mixes

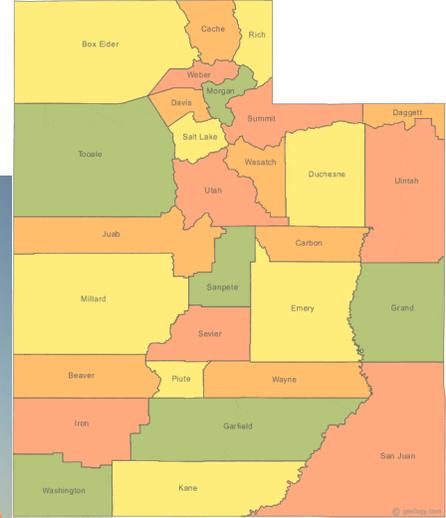


Utah's Unique Adaptations

- Water is the main limiting factor
 - Plant earlier than you think
 - Terminate earlier in drought
 - Expect slower SOM gains
-
- In dry climates – soil organic matter is water storage



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Cover Crop Planting Calendar

- **Fall = Primary Window**
 - Rye, Vetch, Radish
 - Late August – Mid Sept = Ideal
 - Late Sept = Rye only
- Spring Options
 - Oats, peas, barley, vetch
- After early vegetables
 - Buckwheat, Oats, Sudangrass
- Biggest mistake is planting too late
- **Remember: Biomass is key**





Cover Crop Termination

Mowing

Crimping

Winterkilling

Cover Crops & Grazing



Cover crops alone are good, but cover crops & livestock can be transformational



Animals convert plant biomass into biologically active nutrients that stimulate soil life

Grazing: Soil Builder or Soil Destroyer?

- Livestock can accelerate soil health – or destroy it – depending entirely on management
- Outcomes will depend on
 - Timing
 - Stocking Density
 - Residue Remaining



Grazing Golden Rules

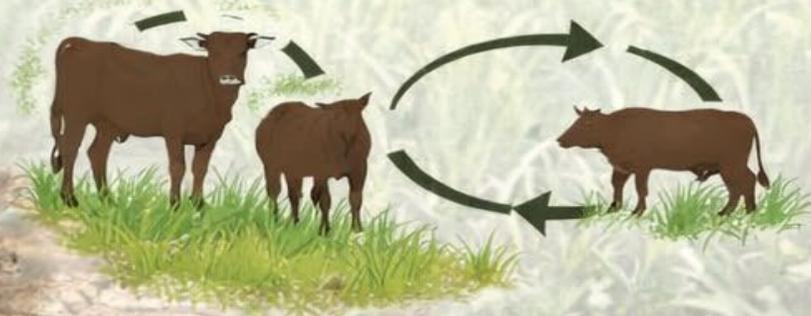
Never Graze Wet Soil!



Leave 40 - 50% Residue!

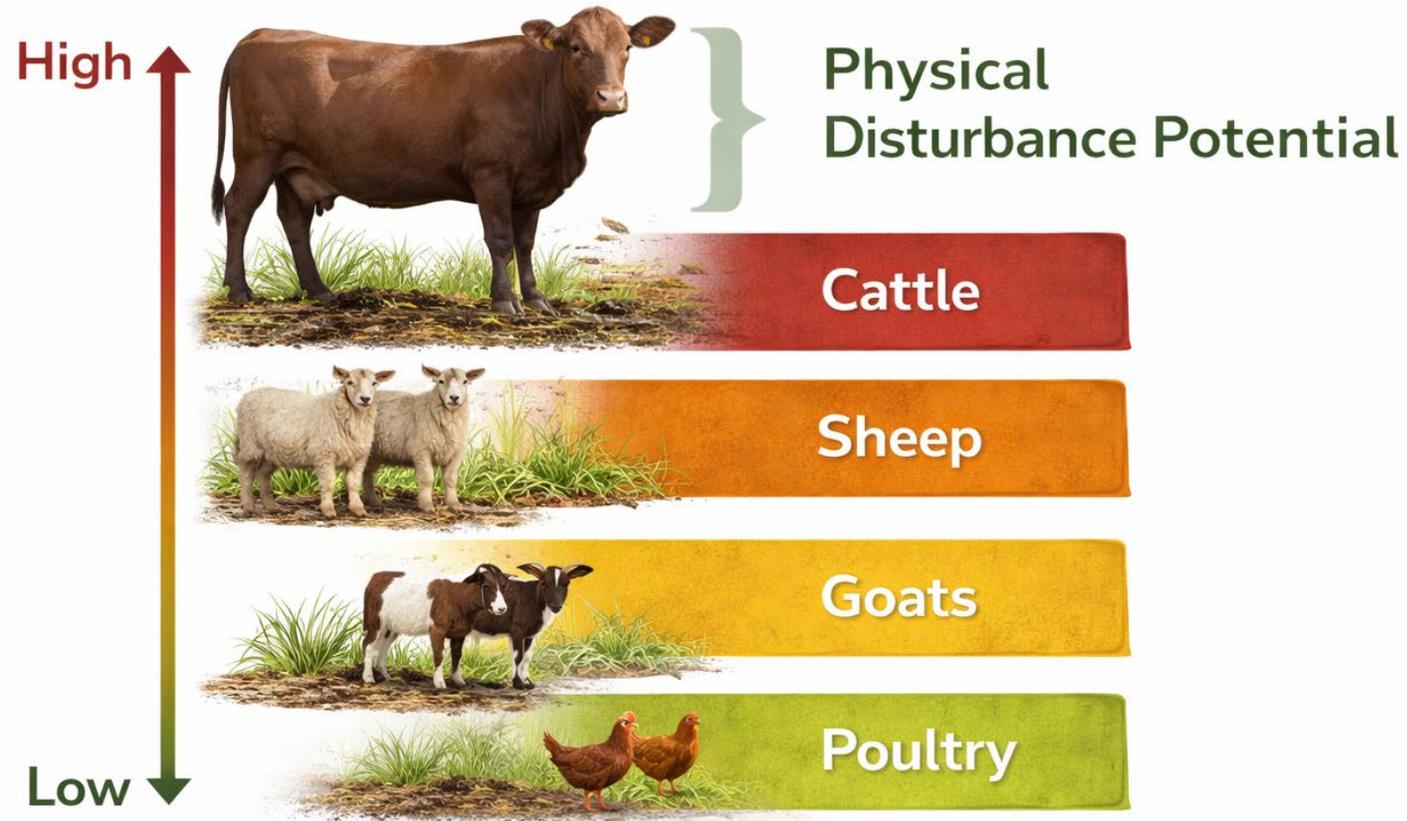


Rotate Quickly!



**Lots of dirt =
Grazed too hard**

Livestock Impact Ladder



Management Determines Outcome

Impact is not bad, unmanaged impact is bad



Cattle

- Best for:
 - High Biomass
 - Manure Cycling
 - Root Stimulation

- Biggest Risk:
 - Compaction

Sheep

- Best for:
 - Lower Compaction
 - Efficient Grazers
 - Easier Fencing
- Risks
 - Overgrazing (Rotate Faster)



Goats

- Best for:
 - Weed Management
 - Browsing Mixes
 - Field Edges
- Risk:
 - Target Leafy Plants First





Poultry

- Use Strategically
 - AFTER Ruminants
- Best for:
 - Spread Manure
 - Reduce Flies
 - Minimal Compaction
- Risk
 - Overstocking = Bare Soil Fast

Cover Crops to Graze

- Cool Season
 - Plant in Spring & Fall
 - Graze Fall/Winter/Spring
 - Rye, Triticale, Clover, Alfalfa
- Warm Season
 - Plant in Late Spring
 - Graze in Summer
 - Sorghum-sudangrass, Teff grass, Berseem Clover



Triticale



Rye



Oats



Sorghum-sudangrass



Teff grass



Vetch



Clover



Sainfoin



Mustard



Turnip



Radish



Radish

Cover Crop Palatability Chart

Highly Preferred = 

Cover Crop	Cattle	Sheep	Goats	Poultry
Rye				
Vetch				
Clover				
Brassicas				
Sorghum-sudan				



Bloat Warning!

- Introduce Animals Slowly
- Avoid Turning Hungry Livestock onto Lush Legumes

Why Grazing Accelerates Soil Health

Livestock convert plant biomass into:

Manure



Urine



Microbial
Food



Faster Nutrient Cycling



Managed Disturbance Builds Soil

- Natural Ecosystems Evolved with:
 - Grazing
 - Trampling
 - Manure
- What Harms Soil is **Continuous Pressure**

Biggest Small-Acreage Mistakes

- ✗ Overgrazing
- ✗ Grazing wet ground
- ✗ Bare soil
- ✗ Continuous grazing
- ✗ Expecting fast results
- ✓ Residue is armor
- ✓ Roots rebuild soil
- ✓ Recovery matters



Soil Health Flywheel

**“Plants capture
sunlight –
Livestock turn
it into soil”**



The 80/20 Rule

- Large portion of soil improvement comes from keeping living roots in the ground
- Not expensive inputs
- Not complex mixes

Conclusion

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Thank you for Attending Animals Session

14th Annual Urban and Small Farms Conference

1. Q&A will continue on this link.
2. Take the conference evaluation. The link is in the chat box.
 - It will also be posted to the conference website.
3. Tuesday - Afternoon
 - 1 pm MST Water Quality Considerations and Resources for Small Producers.
4. These presentations will be recorded and made available on www.diverseag.org after the conference. We will send an email to everyone that registered when they are available.