



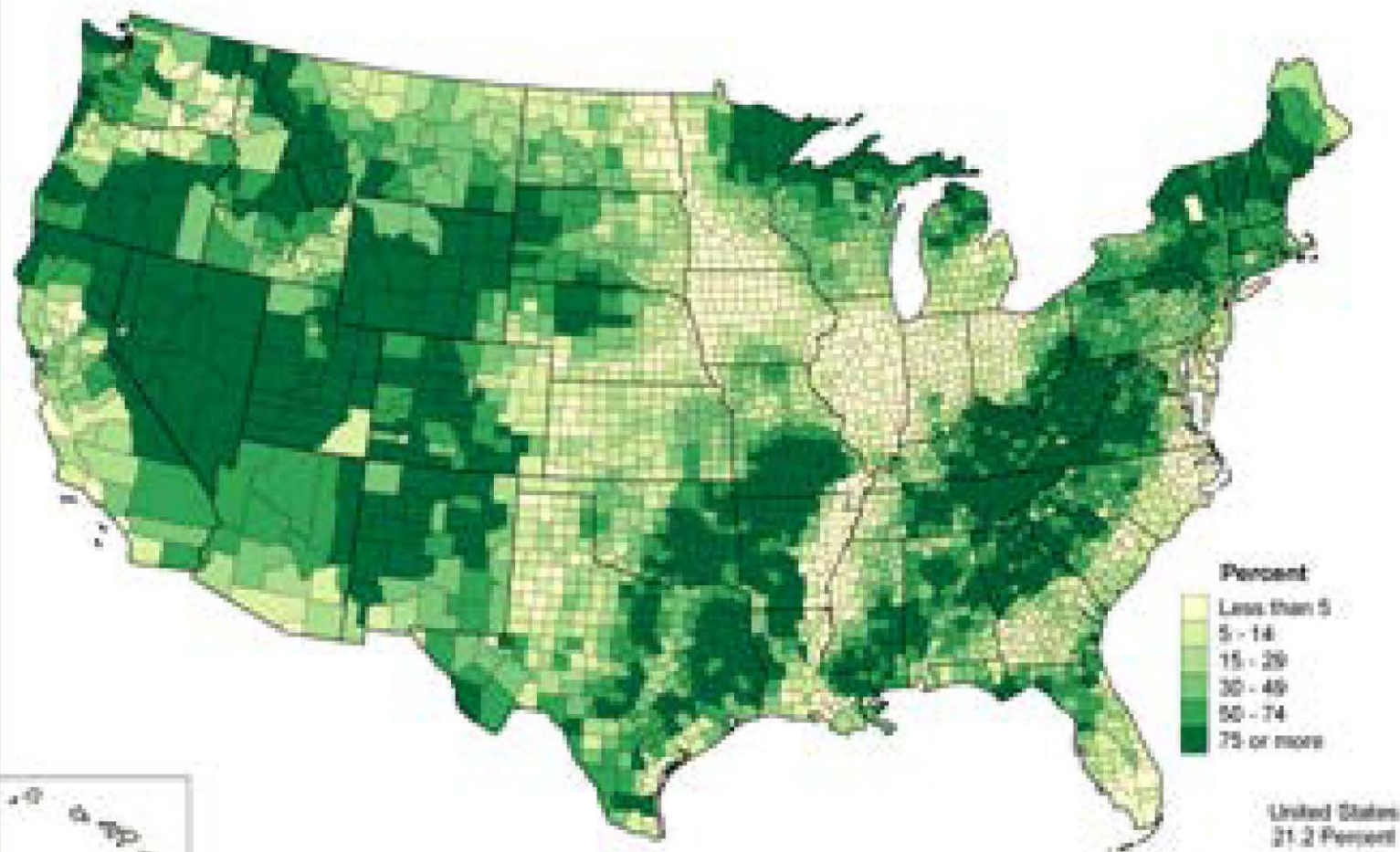
Soil Health

Planning Principles

- Manage more by Disturbing Soil Less
- Grow Living Roots Throughout the year
- Keep the Soil Covered as Much as Possible
- Use Diversity of Plants to add diversity to Soil Micro-organisms

Goal: To create the most favorable habitat possible for the soil food web

Acres of Forage Harvested - Land Used for All Hay
and All Haylage, Grass Silage, and Greenchop
as Percent of Harvested Cropland Acreage: 2002





Soil Health Planning Principles

- **Manage more by Disturbing Soil Less**

This is Disturbance!



So is This!





Soil Health Planning Principles

- Manage more by Disturbing Soil Less
- **Grow Living Roots Throughout the Year**

Corresponding Root Growth



% Leaf Removed	% Root Growth Stopped
10	0
20	0
30	0
40	0
50	2 to 4
60	50
70	78
80	100
90	100

Pasture Soil Quality

by Sid Brantly KY NRCS State Grazing Specialist



Tall Fescue
Rotational

Tall Fescue
Continuous

**Tall Fescue
Continuous**

Orchardgrass
Rotational

Orchardgrass
Rotational

Fescue/Bluegrass
Rotational

Pasture Soil Quality by Sid Brantly KY NRCS State Grazing Specialist



Tall Fescue Rotational	Tall Fescue Continuous	Tall Fescue Continuous	Orchardgrass Rotational	Orchardgrass Rotational	Fescue/Bluegrass Rotational
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OVERGRAZING DANGER!

- Overgrazing is not grazing a plant severely!
- Overgrazing happens when a plant that is growing from carbohydrate reserves is grazed.
“Grazing the roots.”
- Overgrazing happens when we stay too long, come back too soon and graze too soon after dormancy.



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When soil temperature reaches...



140 F

Soil bacteria die

130 F

**100% moisture is lost through
evaporation and transpiration**

100 F

**15% of moisture is used for growth
85% moisture lost through evaporation
and transpiration**

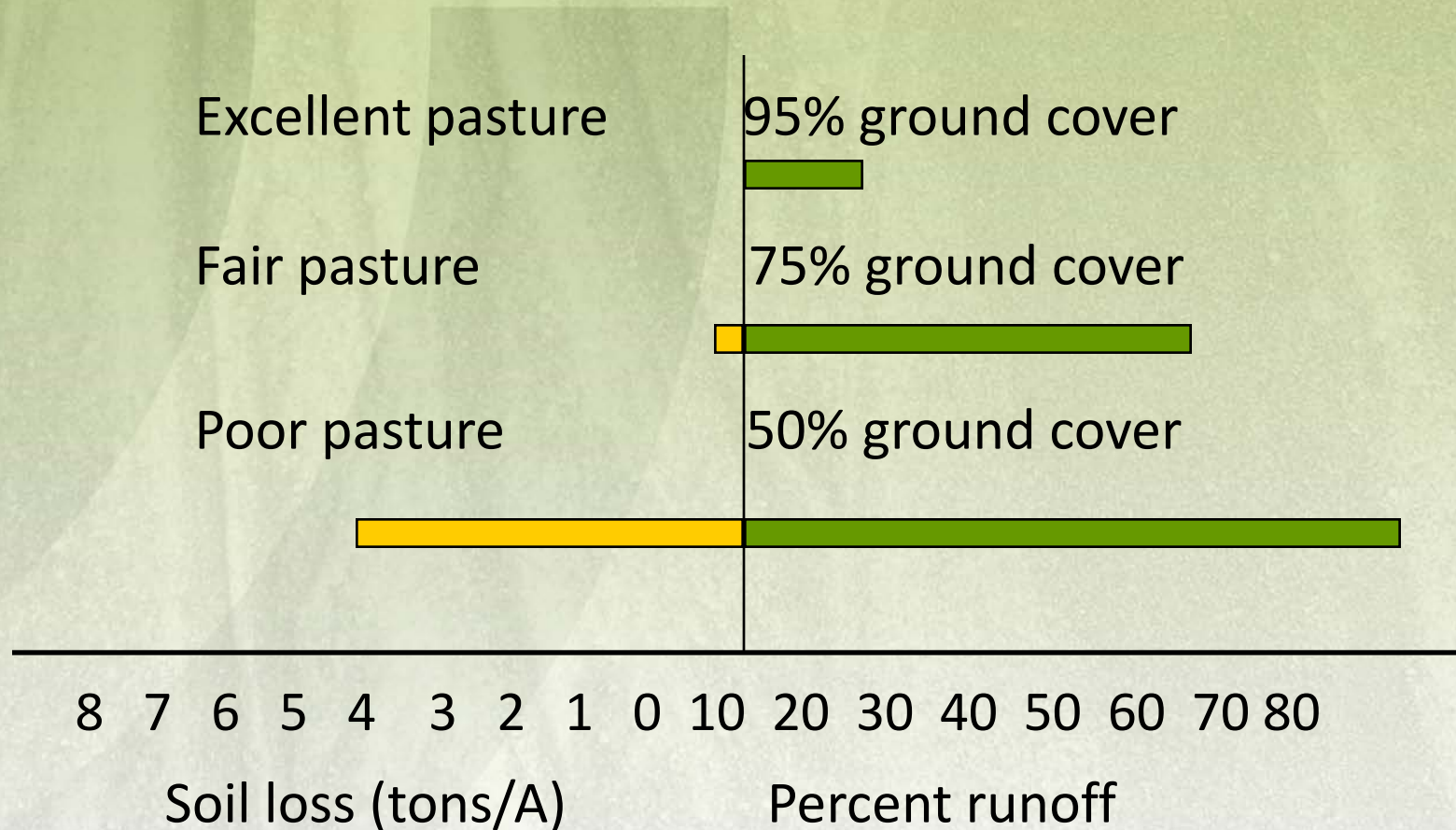
70 F

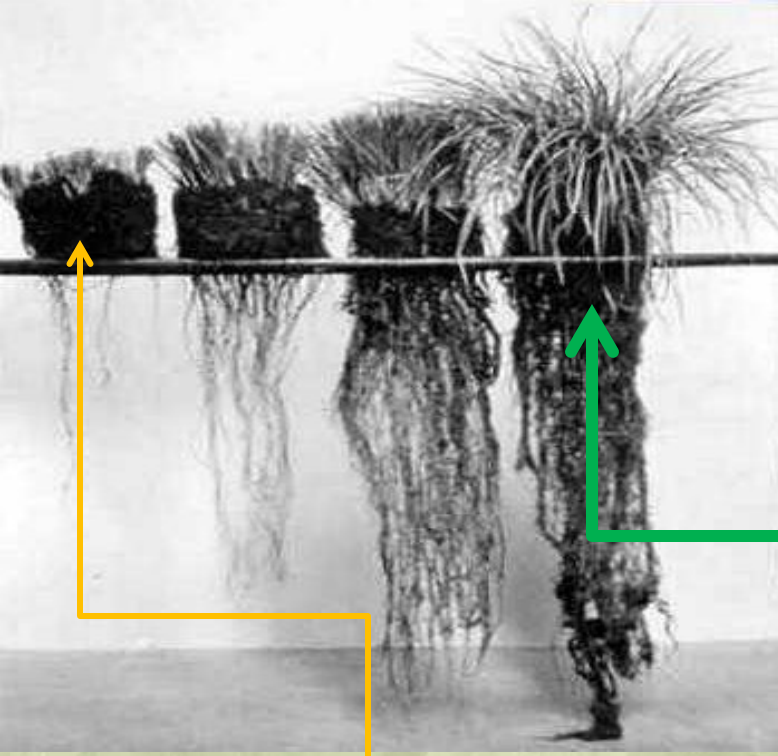
100% moisture is used for growth

Pasture Cover Impacts Infiltration and Runoff



3 inches of rainfall in 90 minutes, 10% slope, silt loam soil
(*University of Nebraska & USDA-SCS, 1937*)



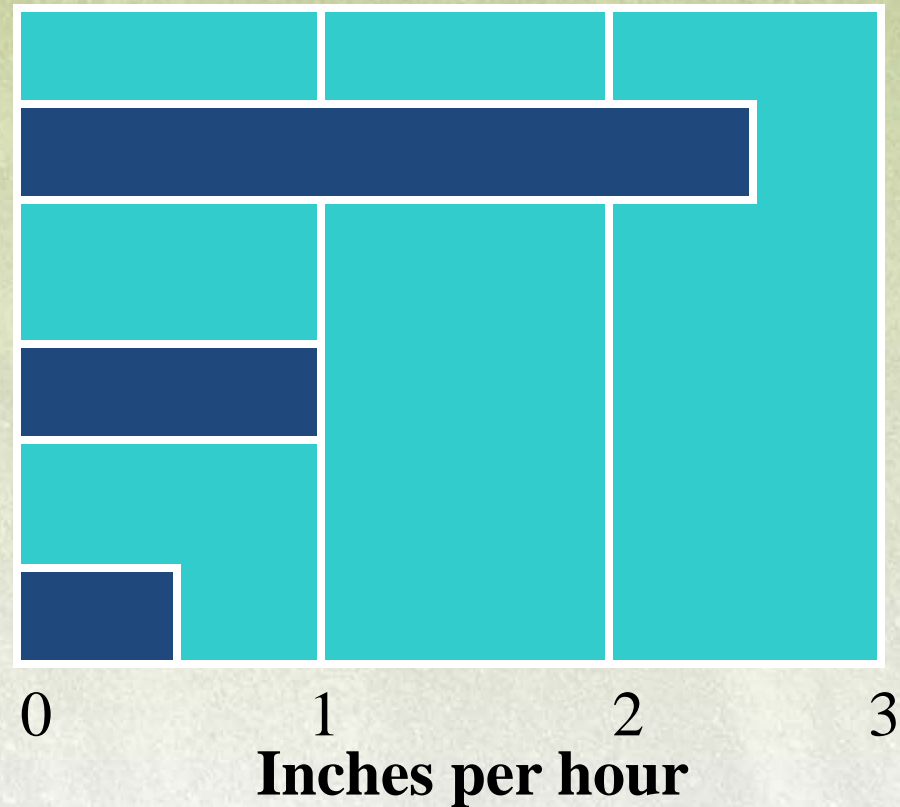


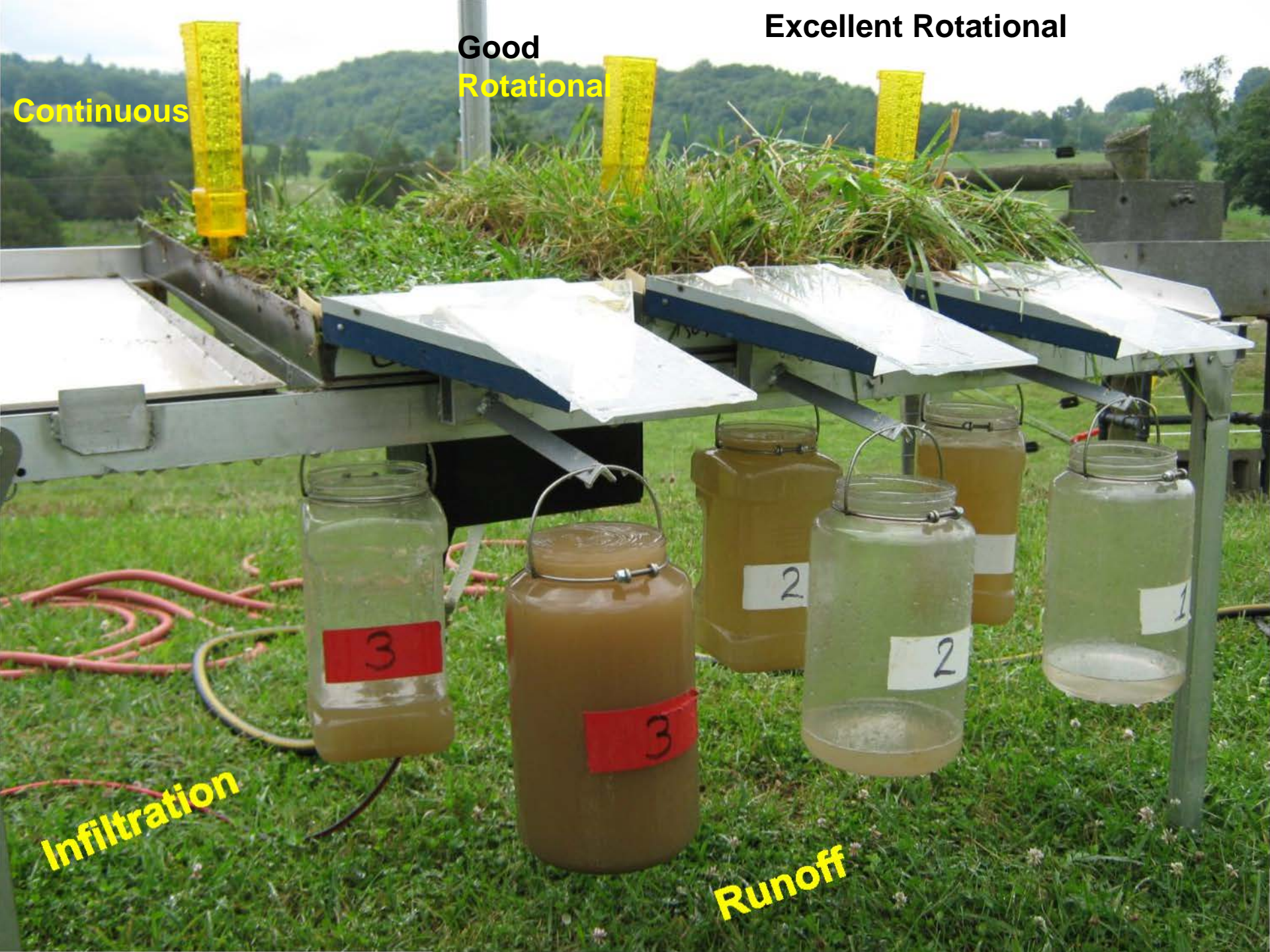
Effect of litter on infiltration rate

Grass and litter present

Grass with litter removed

Grass and litter removed
(bare soil)





Excellent Rotational

Good
Rotational


Continuous

Infiltration


Runoff

Infiltration and Runoff

- Tilled Reduce No-till Short 8" Grass
 till grass



The image shows a laboratory experiment setup for measuring infiltration and runoff. Five rectangular containers hold different soil treatments: Tilled (bare soil), Reduce till (straw mulch), No-till (thick straw mulch), Short grass (short green grass), and 8 inch Grass (tall green grass). Each container has a red funnel at the bottom leading to a clear plastic bottle. The bottles show varying levels of brown runoff water, with the 'Tilled' and 'Reduce till' treatments showing the most runoff, and the '8 inch Grass' treatment showing the least.

- # Infiltration and Runoff
- Tilled Reduce No-till Short 8" Grass
 till grass
- 
- The image shows a laboratory experiment setup for measuring infiltration and runoff. Five rectangular containers hold different soil treatments: Tilled (bare soil), Reduce till (straw mulch), No-till (thick straw mulch), Short grass (short green grass), and 8 inch Grass (tall green grass). Each container has a red funnel at the bottom leading to a clear plastic bottle. The bottles show varying levels of brown runoff water, indicating different infiltration rates.



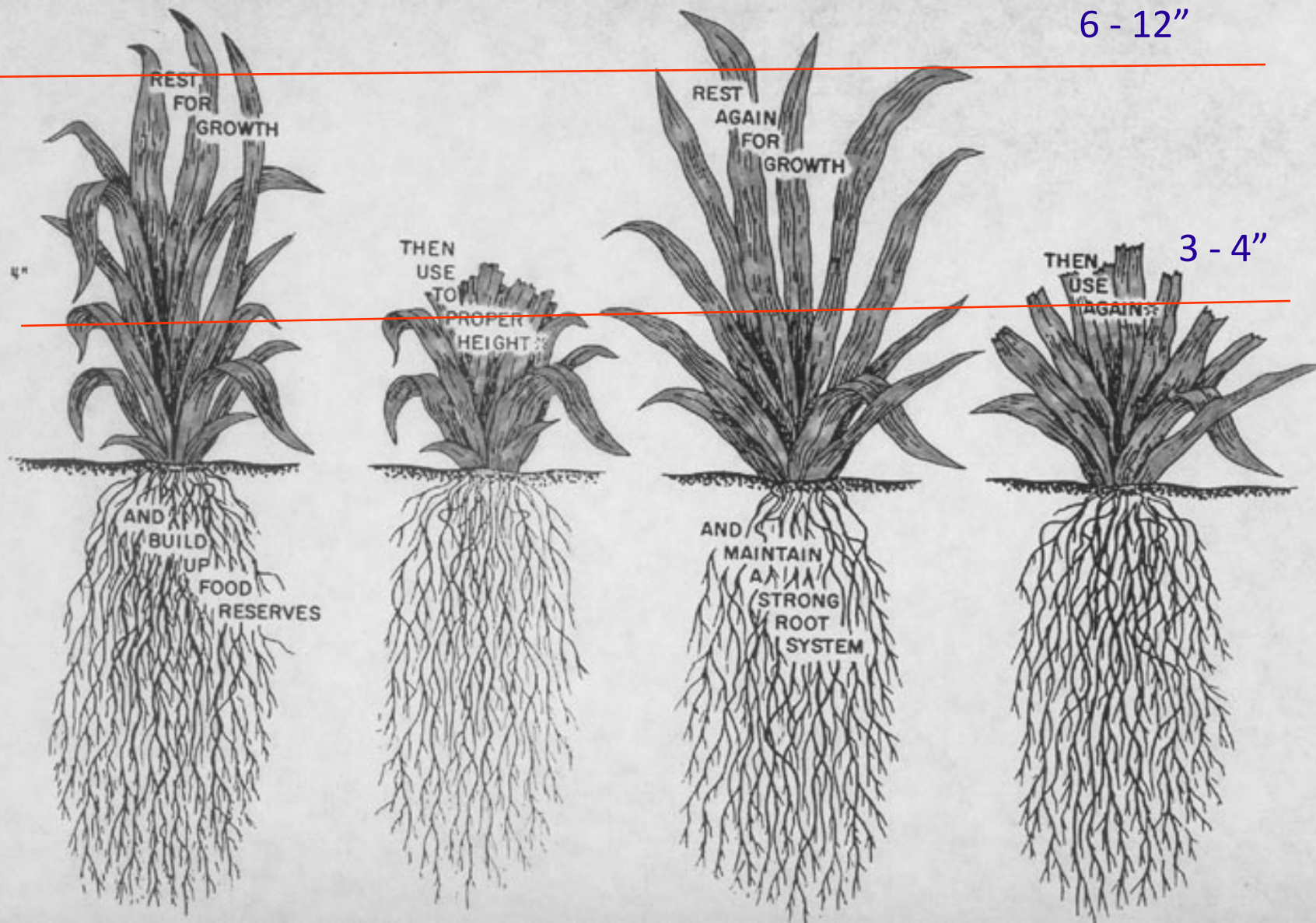
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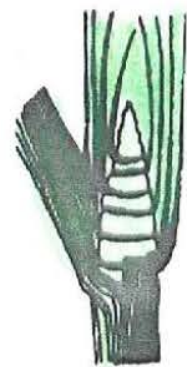
GRAZE AND REST PASTURE

6 - 12"

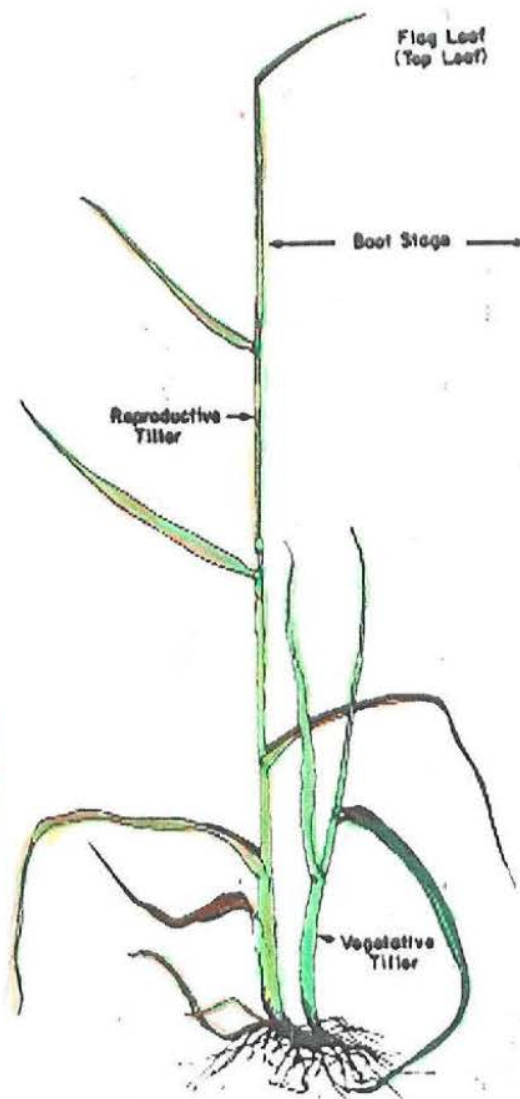


Effect of Plant Residual Left (Height)





A



B



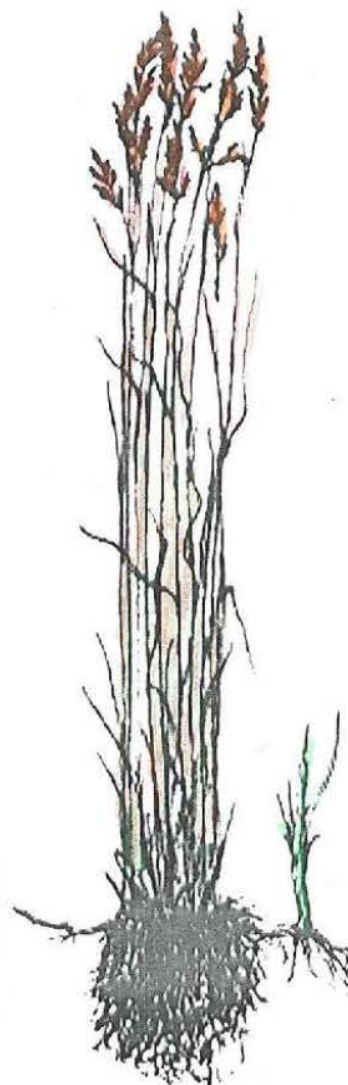
C



D



E



F



G

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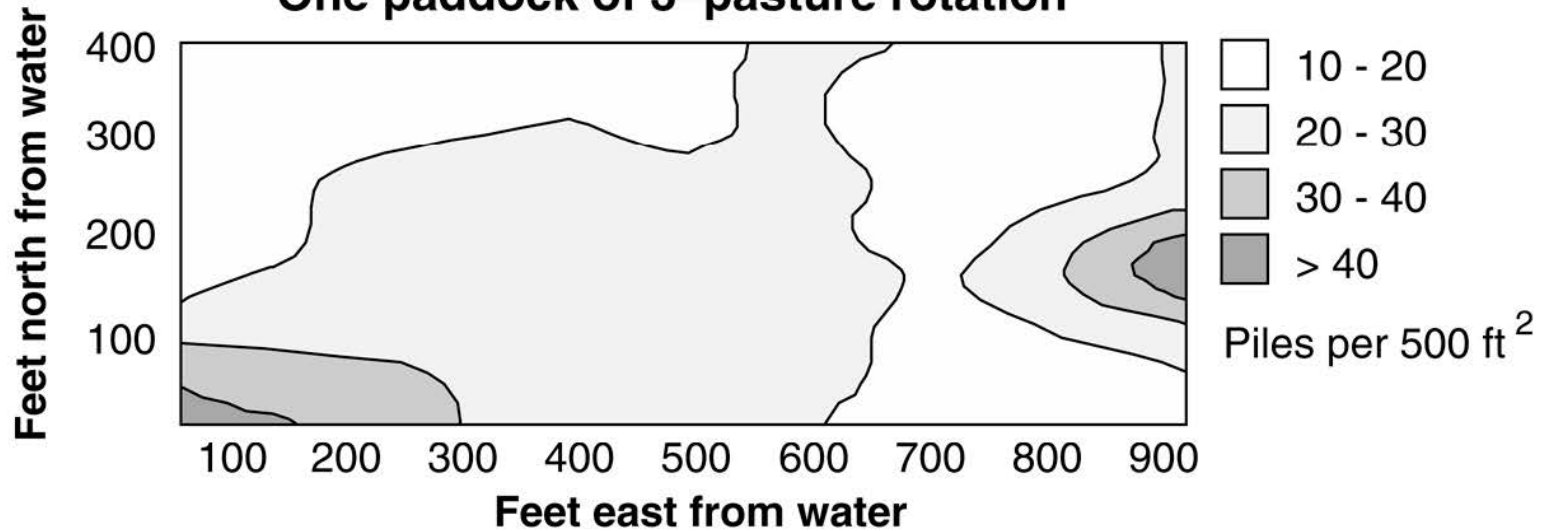
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Fast Track to Soil Health

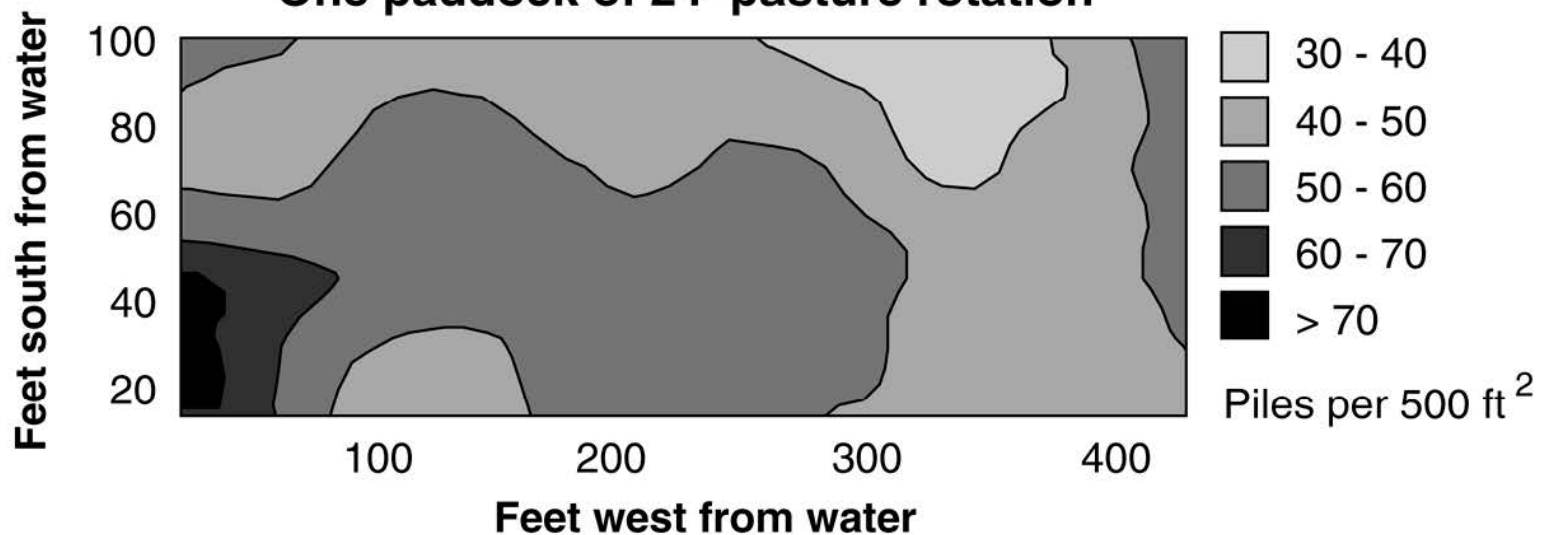
- Get the pH and fertility balanced in medium category
- Manage for cover: green and brown
- High density grazing minimum 4,000 lb to over 100,000 lb/ac
- Leave at least half of forage behind, 2/3 is better
- Recovery period of at least 30, 45 day average, but in general not over 90 days in growing season.

Manure Distribution

One paddock of 3-pasture rotation



One paddock of 24-pasture rotation





09/17/2009



Photo: Eddie Jolley, AL

50,000 Pounds Stock Density Per Acre



Soil Health Planning Principles Works for Grazing Systems Too!



Management Can:

- Disturb the Soil Less
- Grow More Living Roots Throughout the year
- Keep the Soil 95% Covered
- Bring Diversity of Plants to add diversity to Soil Micro-organisms

This creates the most favorable habitat possible for the soil food web