

Residual Dry Matter Management

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*Adapted from presentations by
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Factors of Forage Production

- Precipitation
 - Amount
 - Time
- Temperature
- Soil characteristics
- Residual dry matter (RDM)

...Which one can we manage?

What is Residual Dry Matter (RDM)?



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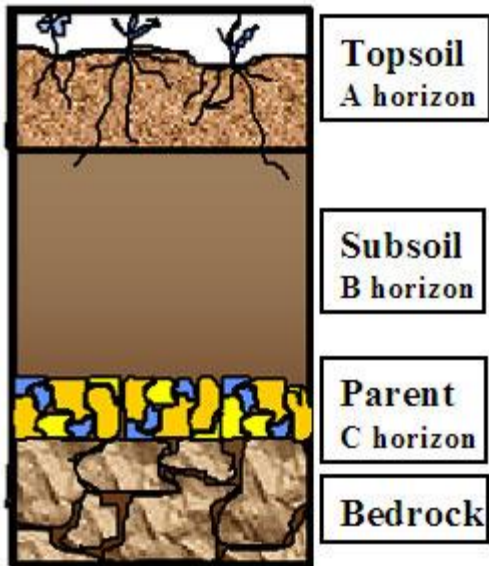


And why do we care about it?

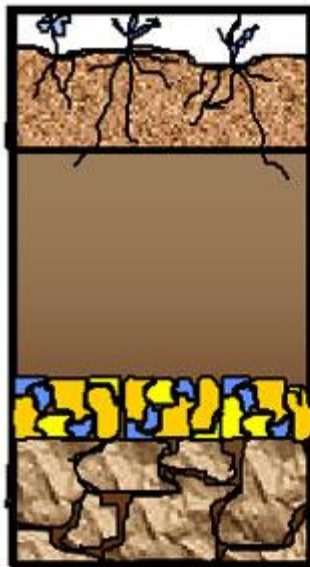
Residual Dry Matter (RDM)

- Improves soil surface conditions for plant growth
- Protects against erosion
- Reduced impact of raindrops and running water
- Infiltration increases
- Less evaporation loss from soil
- Less extreme temperatures in soil
- More organic matter
- Improves soil structure and fertility
- More activity by beneficial soil organisms
- Increased forage production and species diversity

Digging Deeper: Soil Profile



Digging Deeper: Soil Profile

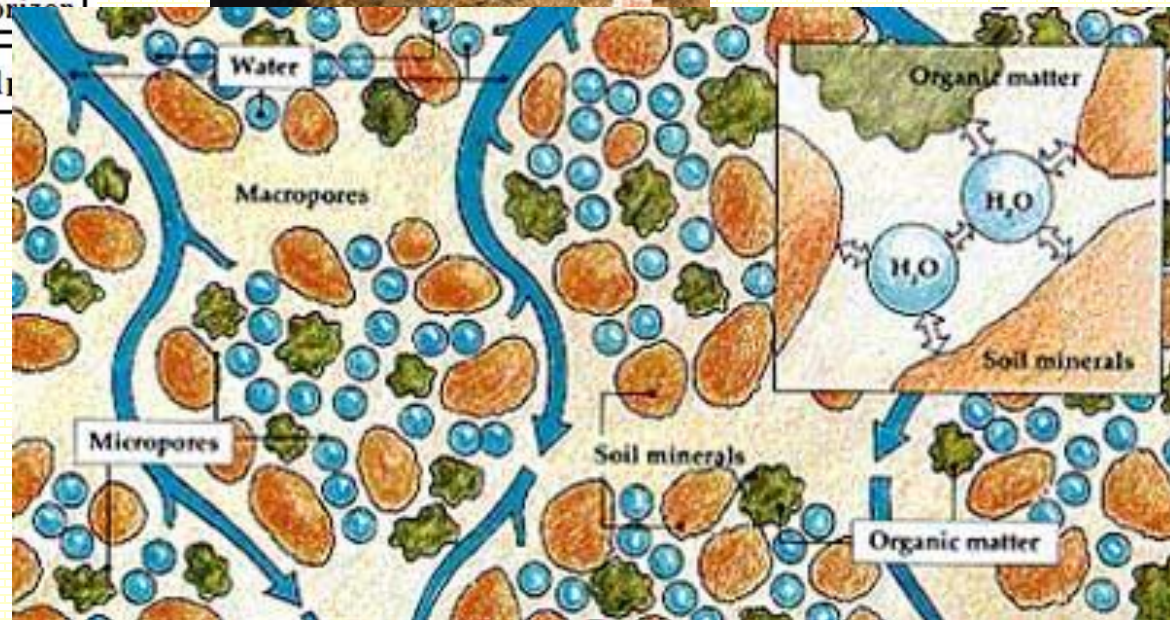


Topsoil
A horizon

Subsoil
B horizon

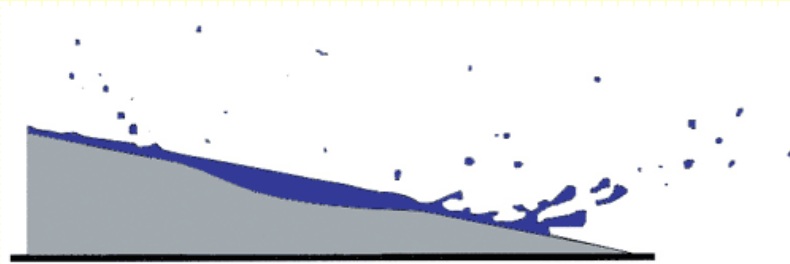
Parent
C horizon

Bedrock



<http://www.fao.org/docrep/009/a0072e/a0072e07.htm>

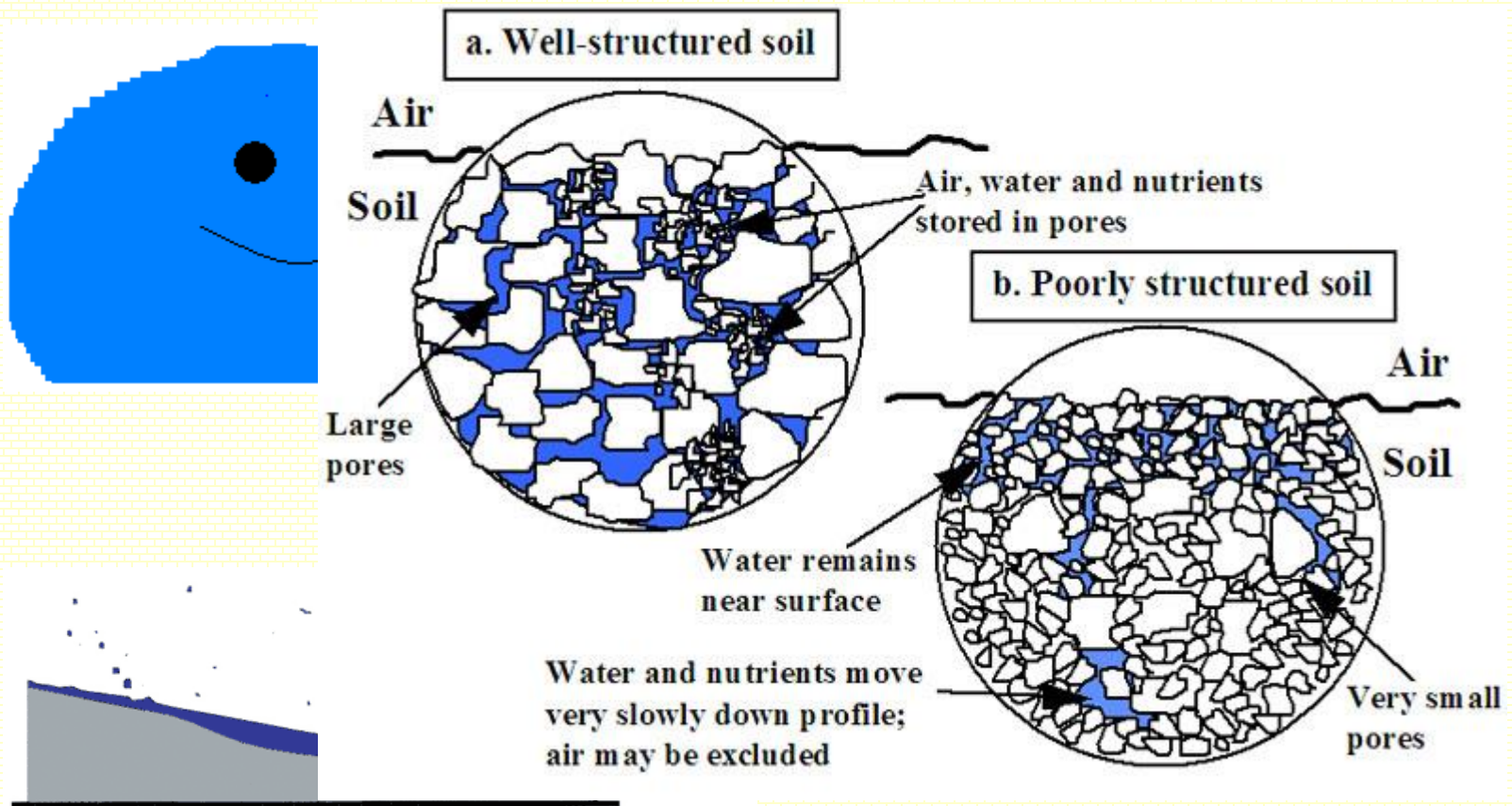
Raindrop and soil pore diagram



<http://www.ipm.iastate.edu/ipm/icm/2005/5-2-2005/reducespringerosion.html> and Hillel, Daniel. 1998. Environmental Soil Physics

<http://agriculture.vic.gov.au/agriculture/dairy/pastures-management/fertilising-dairy-pastures/how-do-the-properties-of-soils-affect-plant-growth>

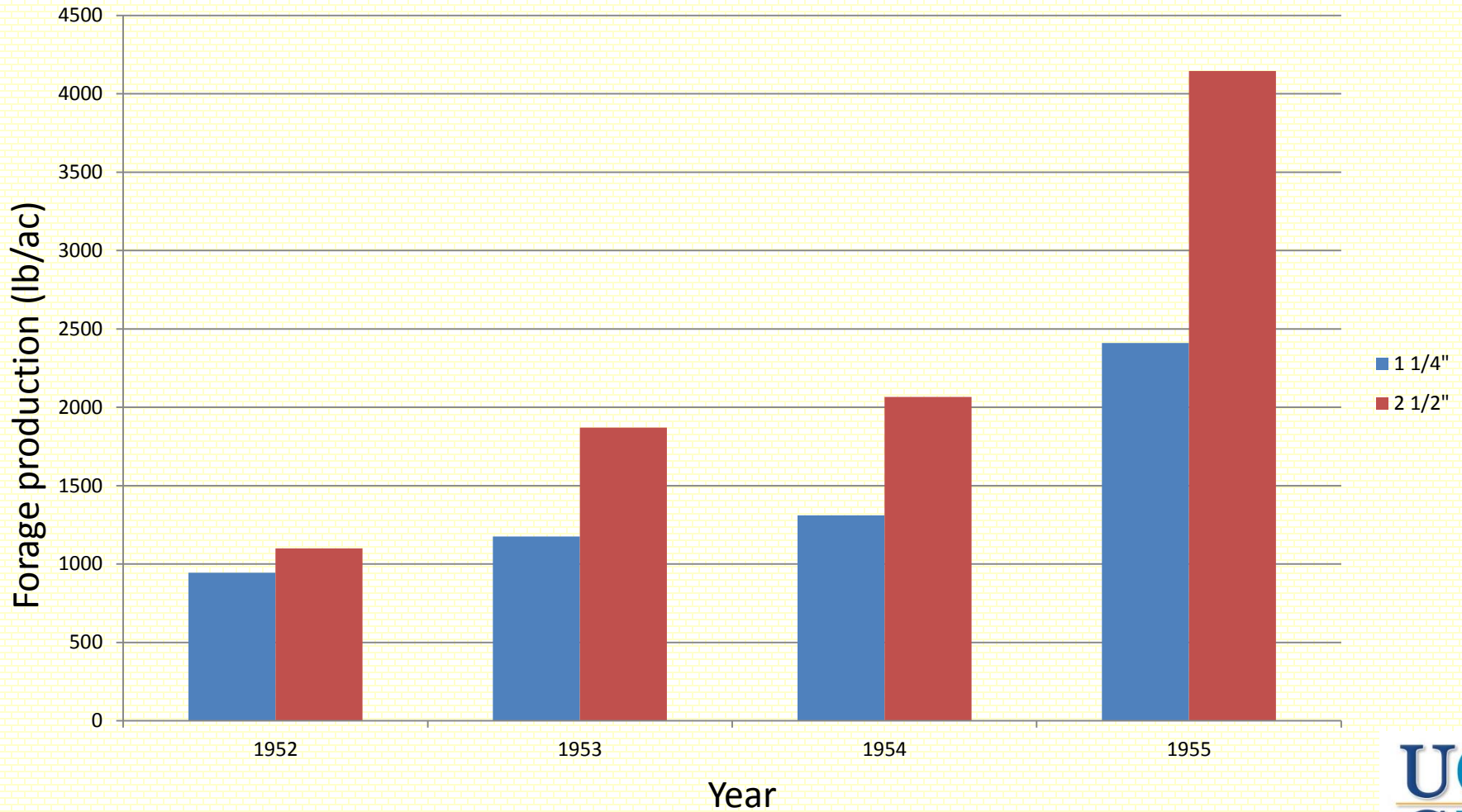
Raindrop and soil pore diagram



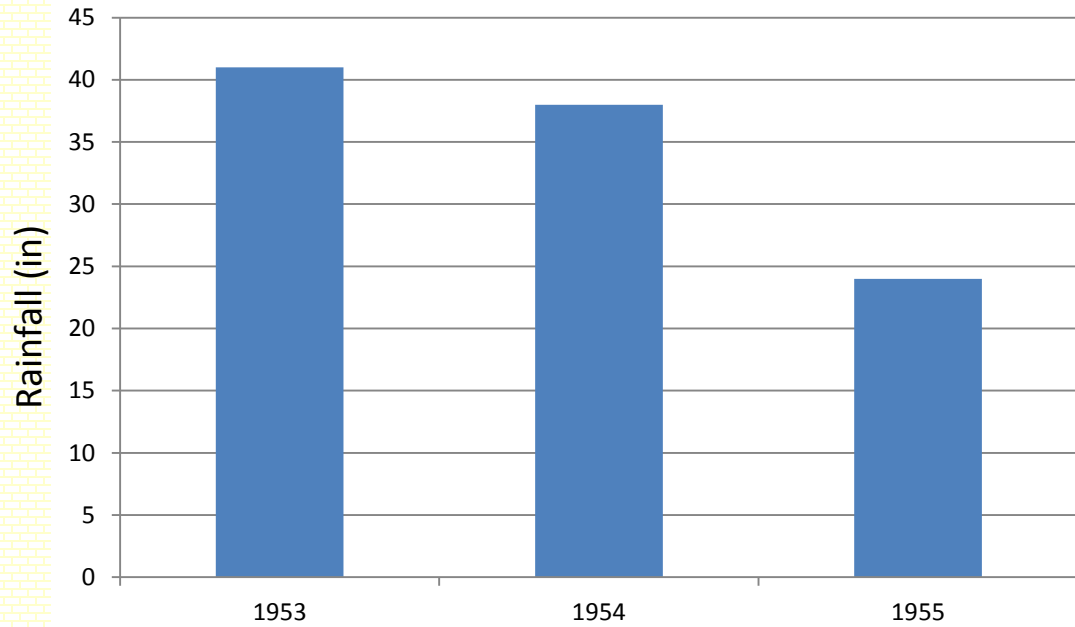
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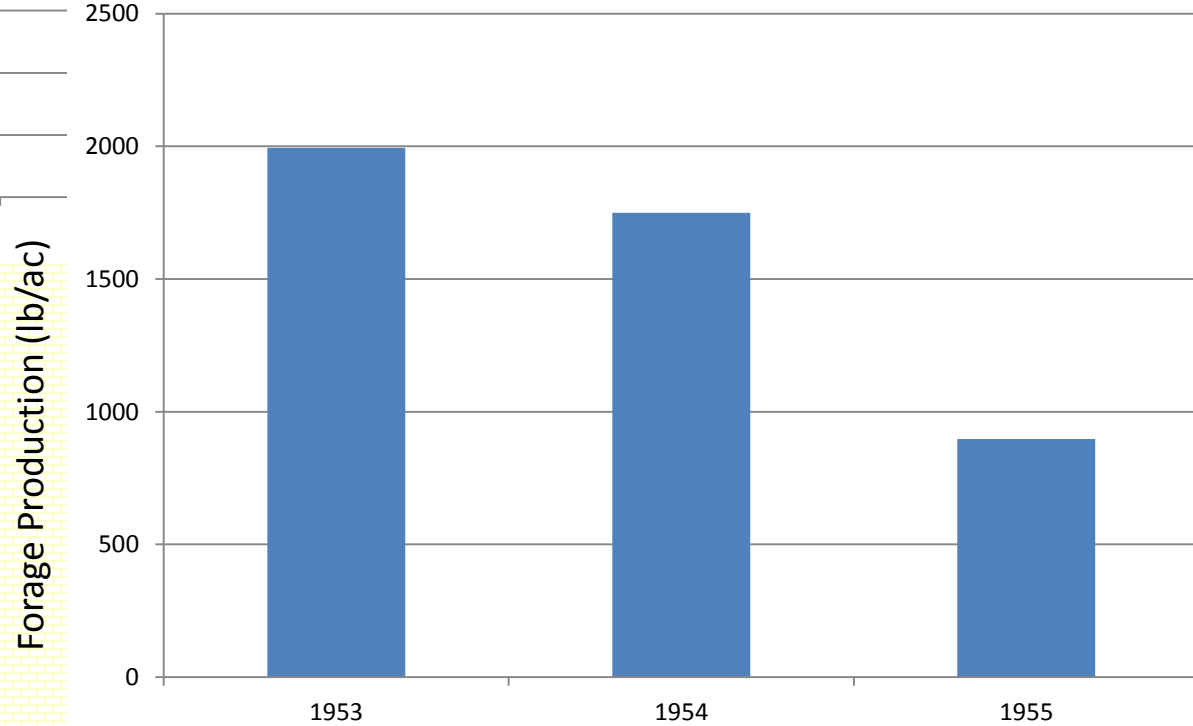
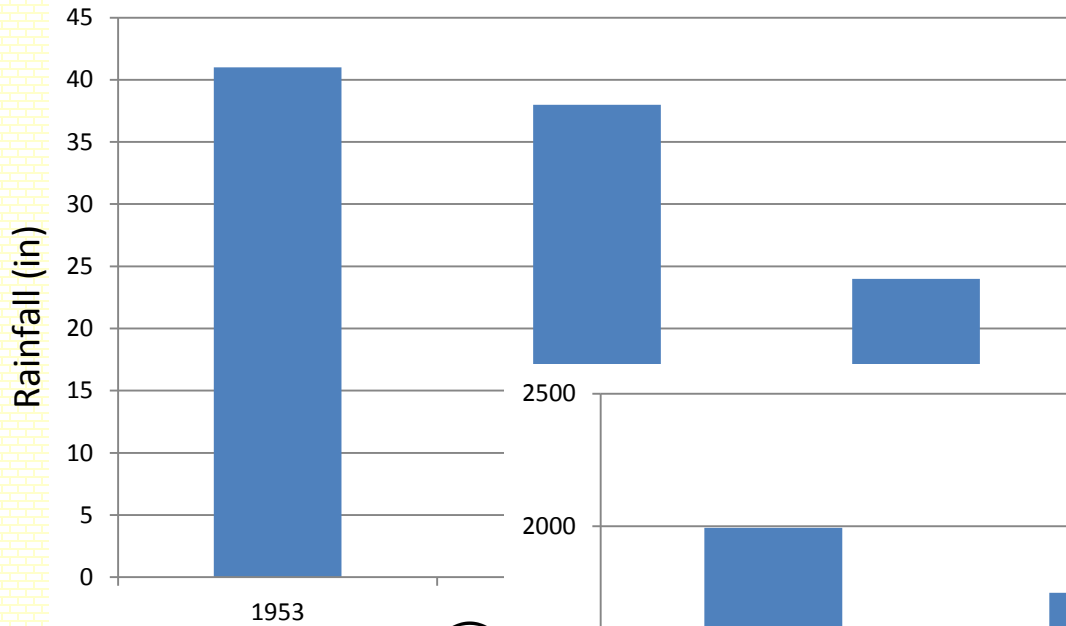
Hopland Study



Hopland Study



Hopland Study

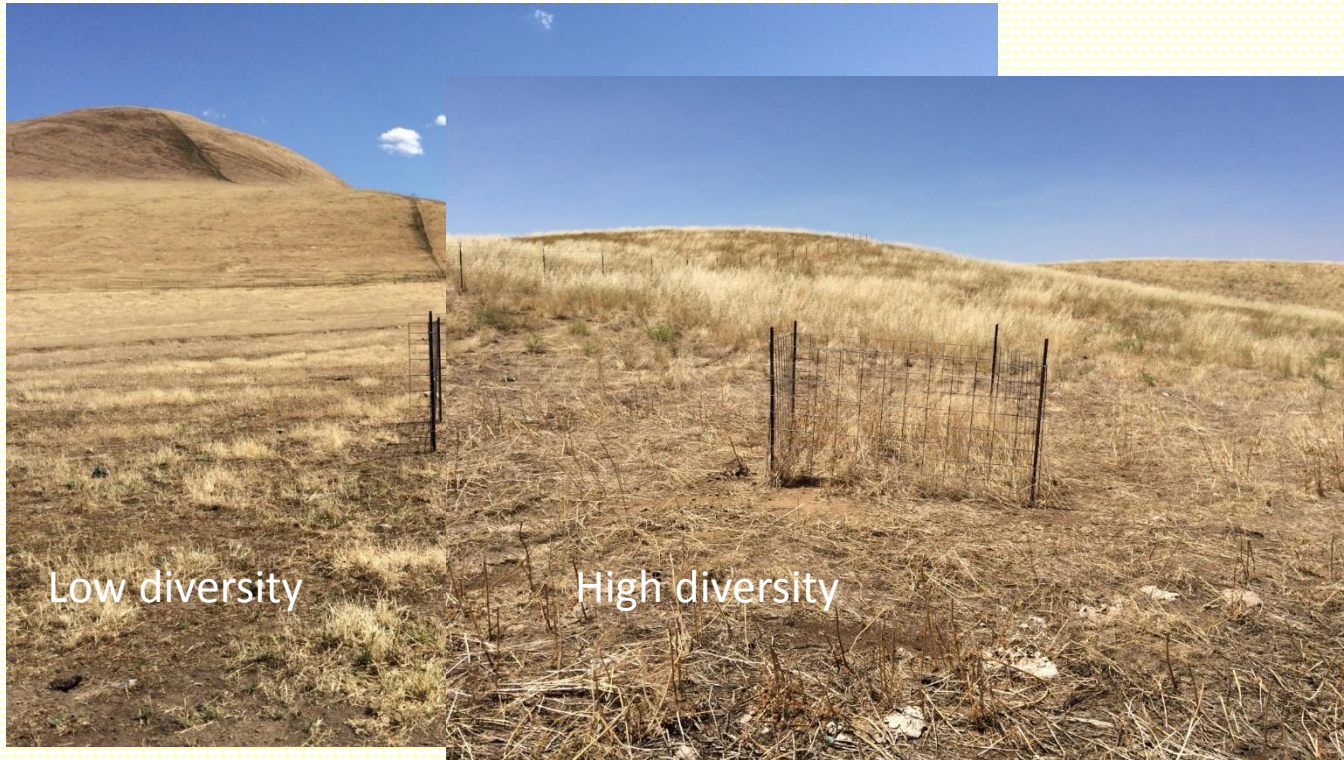


Species Composition and Grazing Intensity



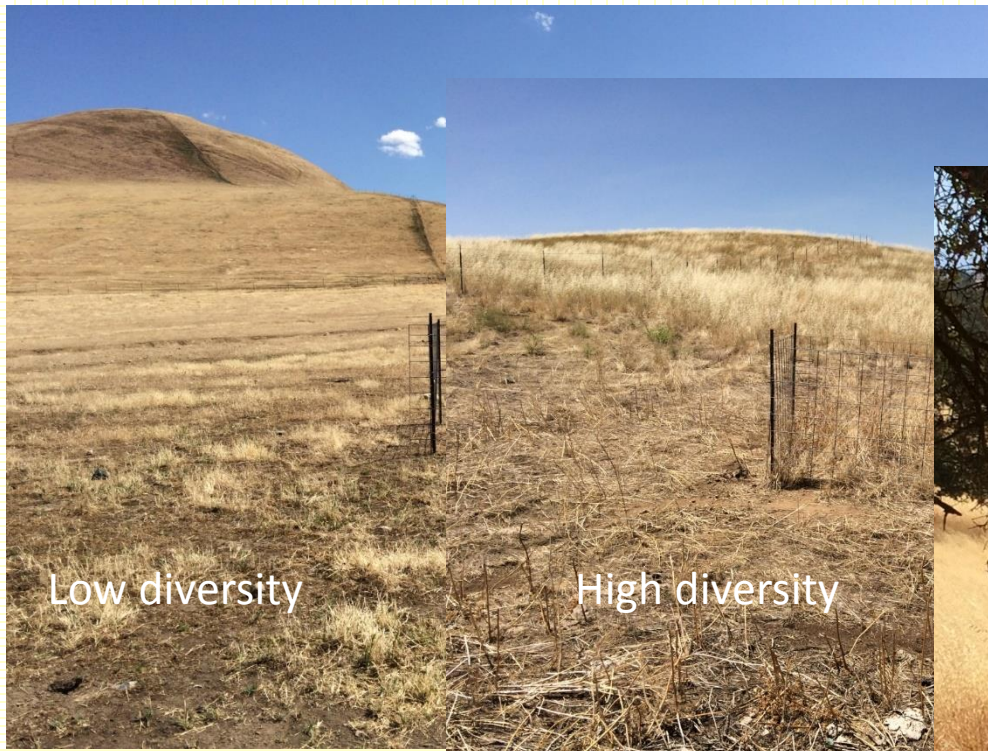
- Filaree
- Clovers
- Turkey mullein

Species Composition and Grazing Intensity



- Filaree
- Clovers
- Turkey mullein
- Wild oats
- Soft chess
- Ripgut
- Medusahead

Species Composition and Grazing Intensity



- Filaree
- Clovers
- Turkey mullein

- Wild oats
- Soft chess
- Ripgut
- Medusahead

- Medusahead
- Taller grasses
- Less clover

Nutrition



RDM tables

Table 1. Minimum RDM standards for dry annual grassland in pounds per acre (dry weight)

Woody cover (%)	RDM standard for percent slope (lb/acre)			
	0–10	10–20	20–40	> 40
0–25	300	400	500	600
25–50	300	400	500	600
50–75	NA	NA	NA	NA
75–100	NA	NA	NA	NA

Note: Metric conversion: 1 lb/acre = 1.12 kg/ha.

Table 2. Minimum RDM standards for annual grassland/hardwood rangeland in pounds per acre (dry weight)

Woody cover (%)	RDM standard for percent slope (lb/acre)			
	0–10	10–20	20–40	> 40
0–25	500	600	700	800
25–50	400	500	600	700
50–75	200	300	400	500
75–100	100	200	250	300

Note: Metric conversion: 1 lb/acre = 1.12 kg/ha.

Table 3. Minimum RDM standards for coastal prairie in pounds per acre (dry weight)

Woody cover (%)	RDM standard for percent slope (lb/acre)			
	0–10	10–20	20–40	> 40
0–25	1,200	1,500	1,800	2,100
25–50	800	1,000	1,200	1,400
50–75	400	500	600	700
75–100	200	250	300	350

Note: Metric conversion: 1 lb/acre = 1.12 kg/ha.

RDM standards

- RDM at or above the minimum enhances next year's forage production
- RDM breaks down even when not grazed
 - Physical weathering – wind, rain
 - Grazing by wildlife, including insects
 - Chemical decomposition
- Thus, standards in the tables are what you want at the *end* of summer, before the first fall rains

RDM standards

- Calculate backwards from the standard to know what should be left at the end of grazing
 - Assume first rain falls on October 1
 - Assume 500 lbs recommended RDM
 - Assume grazing ceases June 1
- How much mulch should be on the ground on June 1?

June 1: 668lb July 1: 622lb Aug 1: 578lb
Sep 1: 530lb Oct 1: 500lb

Finally...Economics!

- My assumptions
 - 1,200 lb cows, eat 3% daily
 - 2,500 lbs of production per acre (1,000 lbs usable forage)
 - 1 acre ~ 1 AUM
 - \$150/ton of hay
 - \$5,000/acre to purchase land
 - \$15/acre to rent land
 - Value of mulch is 1/3 to 1/2 less than forage
 - Cost of soil loss not considered

Finally...Economics!

- Cost of 500 lbs of mulch = \$3.75/acre (0.0075/lb)

	Rent	Hay	Own
Cost of Feed	0.015	0.075	5.3

	No Mulch	500 lbs/acre	Forage lost	Opportunity Lost	Hay
55-56	794	2012			
56-57	1800	2477	677	177	\$ 13.28
57-58	576	3498	2922	2422	\$ 181.65
58-59	411	2092	1681	1181	\$ 88.58
59-60	897	1808	911	411	\$ 30.83
Average	895.6	2377	1482	982	\$ 73.64

One last thing...

- We need your help to update our cost studies. Livestock cost studies in the Valley have not been updated *since 1993*.
- Cost studies...
 - Help Extension advisors do research (and make better presentations)
 - Help livestock owners, new and experienced, to evaluate costs and budget
 - Help define competitive rates for leases, insurance

One last thing...

- Your role:
 - Point out what's the same, what's changed
 - Completely confidential and anonymous, will be averaged with all other information
- If you are willing to participate, let me know!

Questions?

Call 559-241-6564 or
email rkozeran@ucanr.edu

