

# Principles of Range Management



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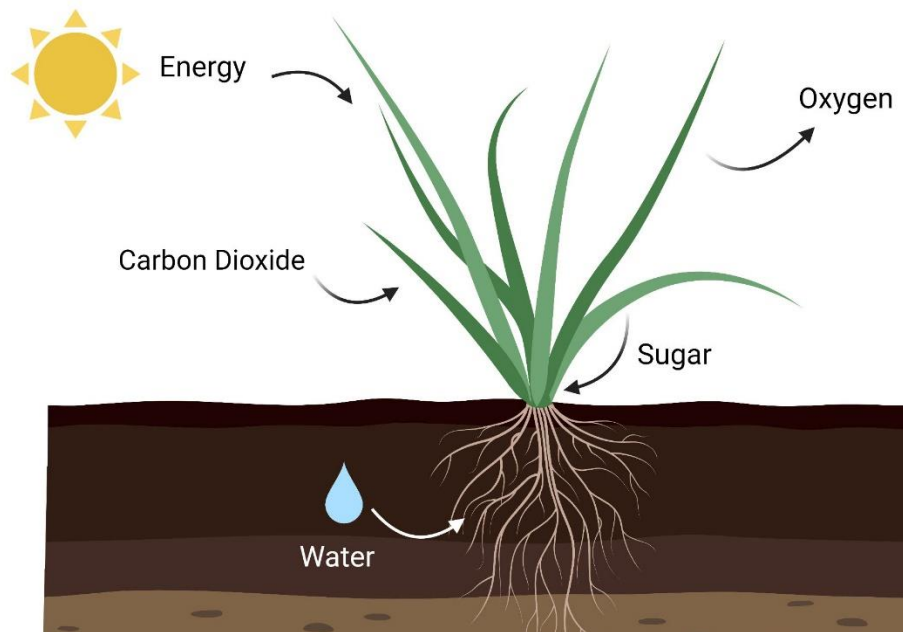
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- **Photosynthesis**
- **Deep roots**
- **Rain capture**
- **Reduce erosion**
- **Dormant season harvest**
- **Plant seed**
- **Grazing systems**
- **Livestock numbers**
- **Invest in the best**
- **Disturbance causes change**

# 1: Understand Photosynthesis



## Photosynthesis



# Plant Nutrients

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- **Plants make their own food**
- **Nitrogen, phosphorus, and other nutrients are used by the plant to convert sugar into starch, proteins, and other compounds needed for plant structure and growth**

# Maximize Green Leaves

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- Basic goal of grazing management is to maximize green leaf production during growing season
- Grazing during the growing season removes the leaves that are producing food for the plant
- Grazing during dormant season does not affect the plant's food supply

# 2: Grow Deep Roots

- Removing green leaves reduces food supply needed for root growth
- Deep roots extend growing season
- Short roots mean less water is available



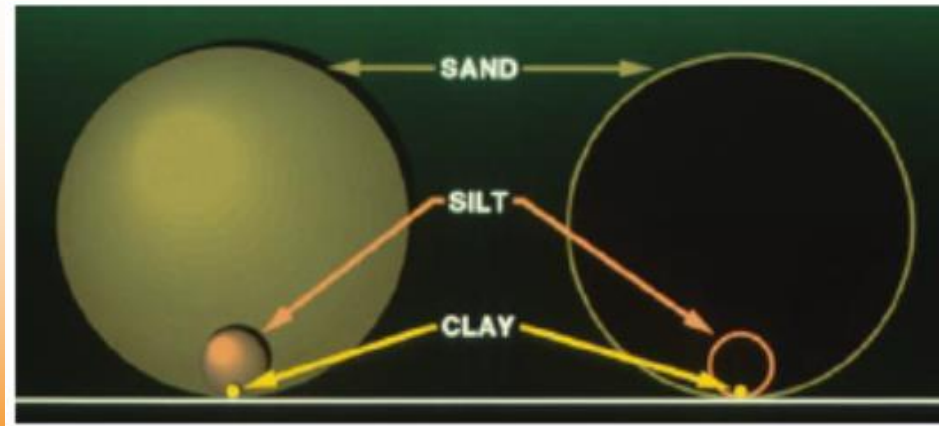
# **3: Capture Rain Where it Falls**

- **Facilitate photosynthesis by capturing precipitation**
- **Capture rain where it falls by keeping healthy vegetative cover on every acre**



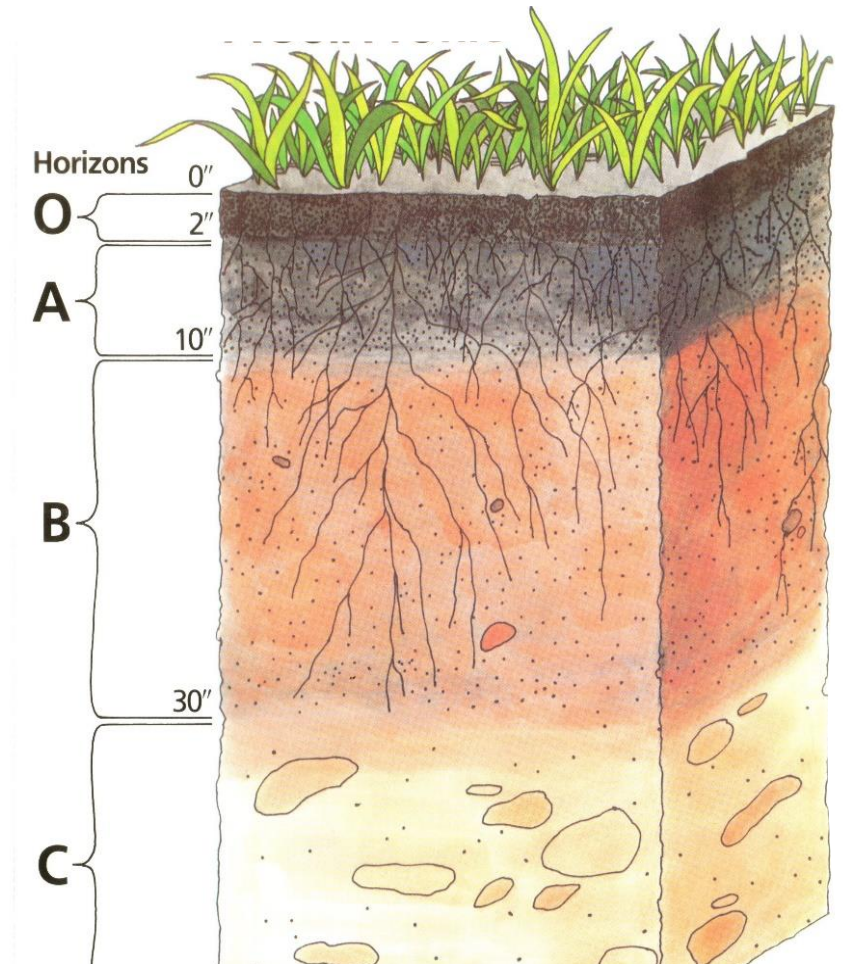
# Soil – Water Relationship

- Soil texture - percent of sand, silt, and clay
- Soil texture affects water infiltration rates and impacts soil water holding capacity
  - Rocks and cobbles take up space, reducing water holding capacity
- Salty and limy soils make the plants work harder to extract water from soil



# 4: Prevent Soil Erosion

- Wind and water carry away seed and plant litter
- Reduces organic matter and nutrients in the A horizon
- Clays, salts, and calcium accumulate in the B horizon



# 5: Dormant Seasons are for Harvesting

- Photosynthesis only happens in green leaves
- During dormant seasons, harvest the crop you grew
- Leave enough cover to capture rain



# 6: Plant a Crop of Seed Every Year

- Grazing during the growing season removes seed from your desirable forage species
- For spring species wait to graze until the seed has fallen
- For summer species wait to graze until after the 1<sup>st</sup> frost knocks seed to the ground



# Every Species Responds Differently

Each species has unique seed germination requirements (rainfall and temperature)

Transect Data	Freq	Freq	Freq	Freq	Freq	Freq	Freq
	10/82	11/83	11/85	10/86	11/89	11/90	11/91
PERENNIAL GRASSES							
Arizona cottontop		3	2	2	2	3	1
Beardgrass, Cane			2	2	1	1	2
Bristlegrass, plains			1	1	1	2	
Bush muhly				1			
Curly mesquite			2	2	1	2	4
Grama, black	11	11	9	10	6	7	10
Grama, hairy	23	15	25	23	18	20	10
Grama, rothrock	28	40	30	20	2	23	20
Grama, sideoats	9	5	12	16	7	11	12
Ring grass			1				
Spidergrass	9	24	21	22	14	11	1
Sprangletop, green		1	1	2		1	1
Squirreltail	4	7	6	10	6	8	7
Tanglehead				1			
Threeawn, blue	3	3	3	4		1	1
Threeawn, mesa	8	6	18	16	4	10	13
Threeawn, parish				1		1	
Threeawn, purple			1				
Threeawn, red	23	22	29	35	18	15	26
Threeawn, wrights			1	1	2	3	5
Plains lovegrass					1		

# Stolons and Rhizomes

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Many grasses can produce new plants from above ground stolons and/or underground rhizomes.

These plants can become dominant on areas where grazing has prevented seed production from bunch grasses.

# 7: Understanding Grazing Rotations

A simple 3 pasture grazing rotation

	Spring			Summer			Fall			Winter		
Year	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	Graze Pasture 1			Graze Pasture 2			Graze Pasture 3			Graze Pasture 1		
2	Graze Pasture 2			Graze Pasture 3			Graze Pasture 1			Graze Pasture 2		
3	Graze Pasture 3			Graze Pasture 1			Graze Pasture 2			Graze Pasture 3		
Start Over at Year 1												

# **Grazing Management**

**Preference** – Which species are grazed

**Timing** - When does grazing occur (dormant period, growth period, seed production period)

**Intensity** - How much is removed. How much is left to grow roots and protect the soil from erosion? How much is left to capture rainfall?

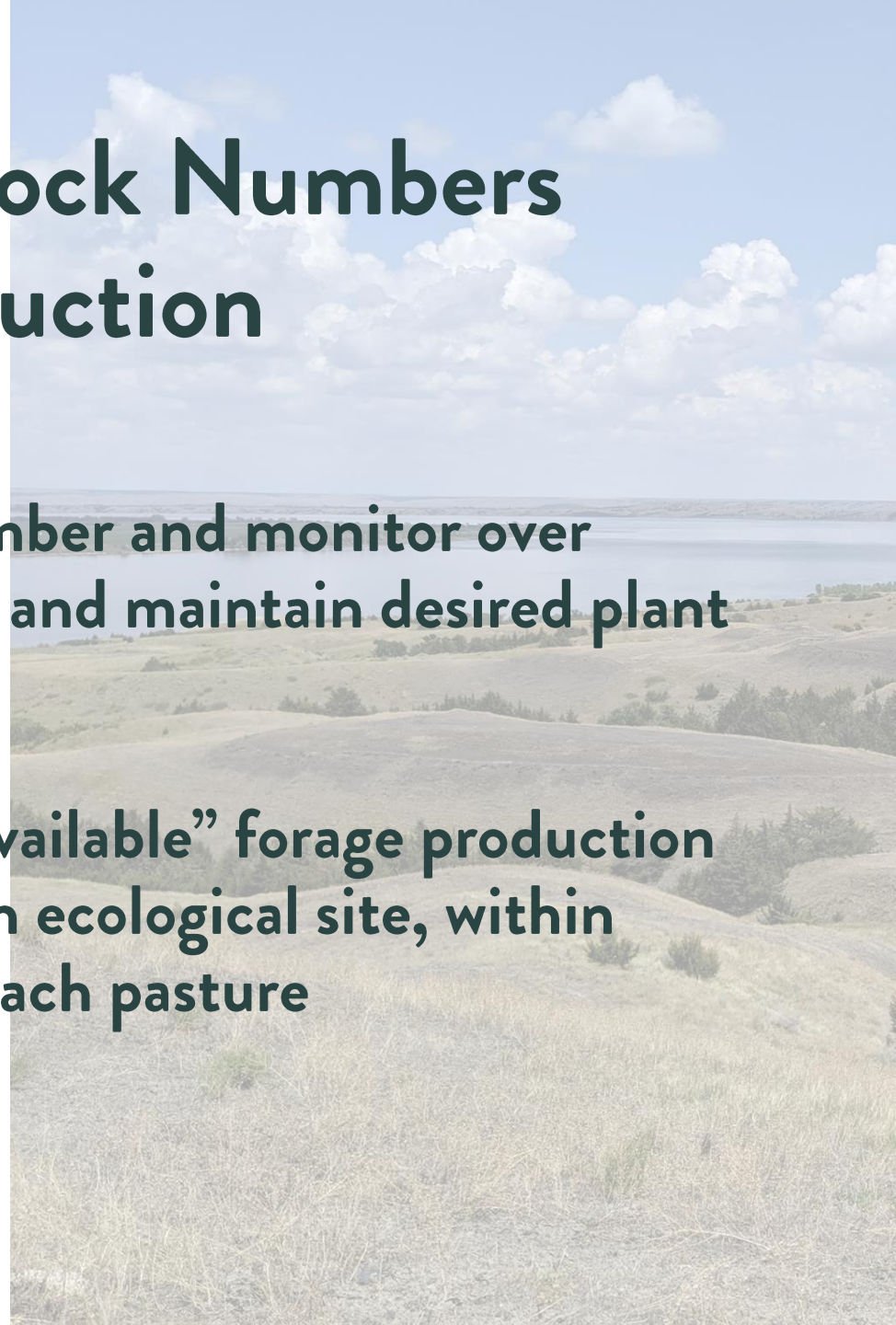
**Duration** – Length of grazing, how often are plants re-grazed

**Frequency** – How often is the pasture re-grazed

**Distribution** – which parts of the landscape are available

# 8: Balance Livestock Numbers with Forage Production

- Calculate an initial number and monitor over time to adjust, restore, and maintain desired plant communities
- Determine the total “available” forage production (air dry weight) on each ecological site, within plant communities in each pasture



# Ecological Site

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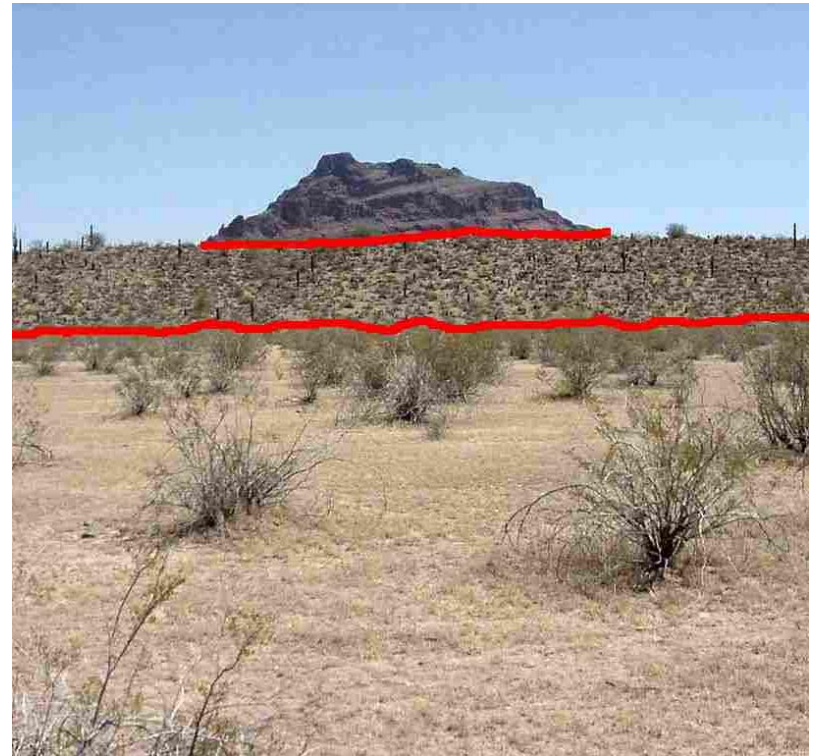
- **Distinctive kind of land**
- **Specific soil and physical characteristics**
- **Differs from other kinds of land in its ability to:**
  - **produce a distinctive kind and amount of vegetation**
  - **respond similarly to management actions and natural disturbances**

# Ecological Sites

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**Ecological sites are different plant communities you see on different soils within a land resource unit (climate zone)**

**Boundaries of ecological sites can be recognized by characteristic pattern landforms, soil, species composition and plant community structure**



# 9: Invest in the Best

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- Always spend your first dollar on your best country. Find it during your inventory.
  - If you still have money left, then expand your plan into the next best areas
- Use your worst areas for emergency grazing after a fire or during droughts
- Fixing a gully requires good grazing management on the watershed above the gully to capture every drop of rain where it falls – then the gully will stop growing

# 10: Disturbances Change Plant Communities

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- If the available moisture on the site is being fully used by the existing plants, only a significant disturbance will create a change in the plant community. Many undesirable plants are long lived.
- But do not create a disturbance until you know what the response will be.
- Prescribed burning, brush control, and other practices can create a disturbance

# 11: Plan for Fire and Drought

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- Fire, drought, and disease can open up plant communities to significant change
- Fire or drought might lead to reduced forage, lack of water, and plant mortality
- Keep livestock numbers in balance with available forage



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# THANK YOU

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