Grazing management variables affecting irrigation timing and production

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Water budget method

ET…Evapotranspiration

Evapo = evaporation

how hot is it?

Transpiration = plant water use

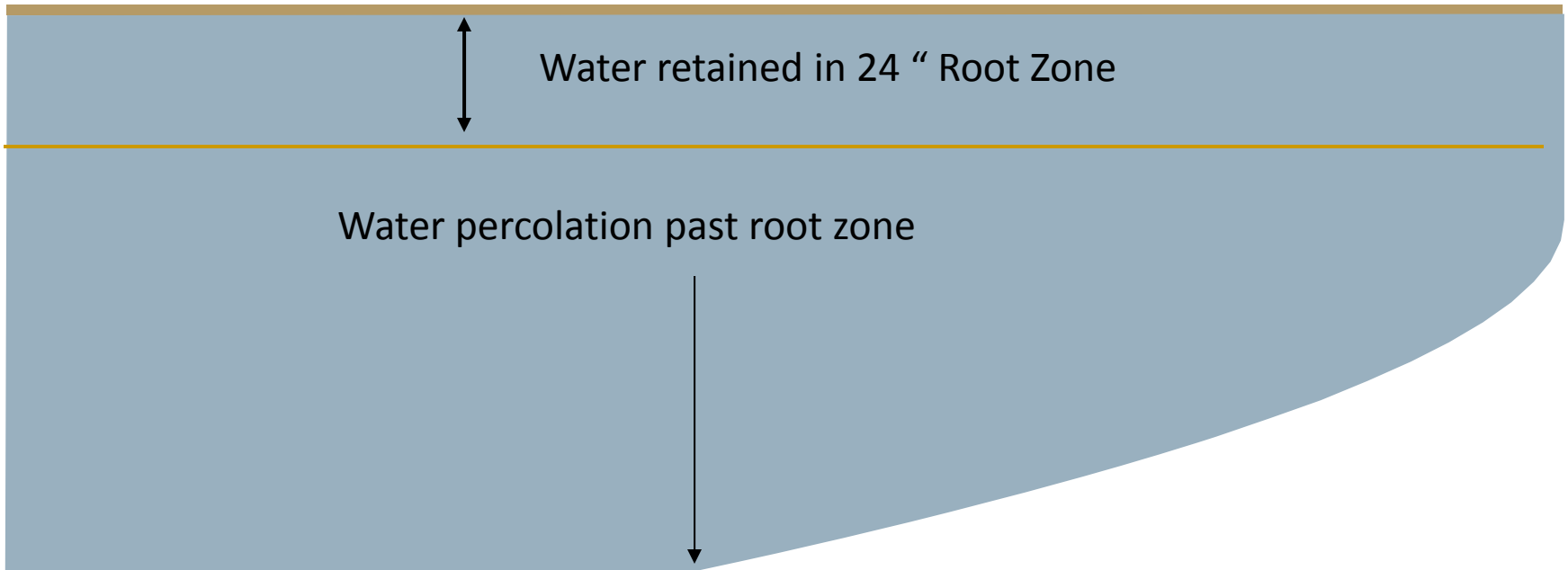
WEEKLY SOIL MOISTURE LOSS IN INCHES

(Estimated Evapotranspiration)

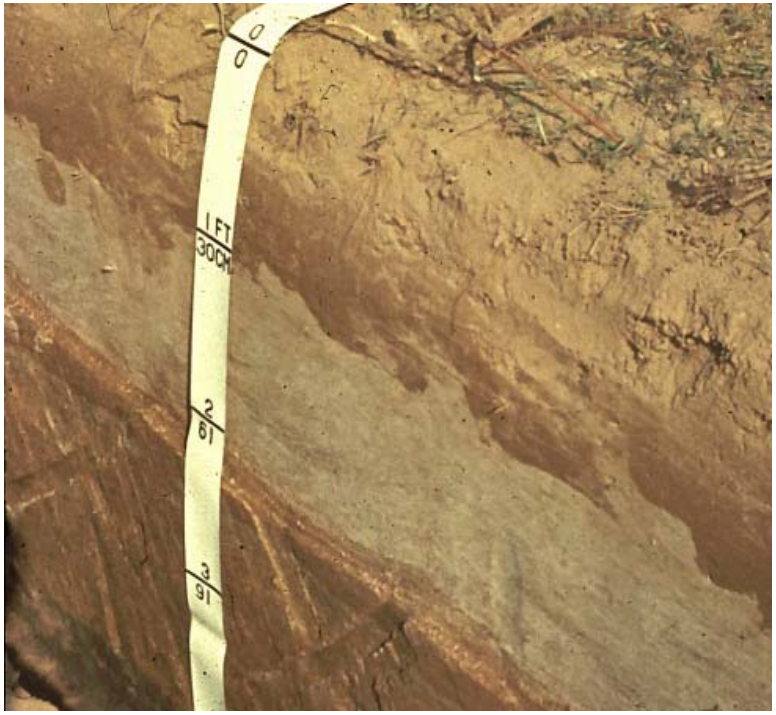
06/28/13 through 07/04/13

West of Sacramento River				East of Sacramento River		
Past Week of Water Use	Accum'd Seasonal Water Use	NOAA Forecasted Week of Water Use	**Crop (Leafout Date)**	Past Week of Water Use	Accum'd Seasonal Water Use	NOAA Forecasted Week of Water Use
2.33	32.06	2.11	Pasture	1.86	27.38	1.88
2.26	31.27	2.04	Alfalfa	1.79	26.61	1.81
1.74	24.25	1.59	Olives	1.42	20.84	1.42
1.53	20.95	1.37	Citrus	1.22	17.96	1.24
2.56	25.42	2.33	Almonds (3/1) *	2.03	21.48	2.09
2.25	23.78	2.04	Prunes (3/15) *	1.79	20.01	1.81
2.27	18.06	2.11	Walnuts (4/1) *	1.80	15.15	1.88
2.13	28.29	1.97	Urban Turf Grass	1.69	24.13	1.75

We can assume we fill the entire root zone with water



Concept: Available water storage of the root zone



Course loamy sands and sandy loams 0.8 to 1.6 in/ft

Medium and fine silt loams, clay loams, and clays 1.6 to 2.2 in/ft

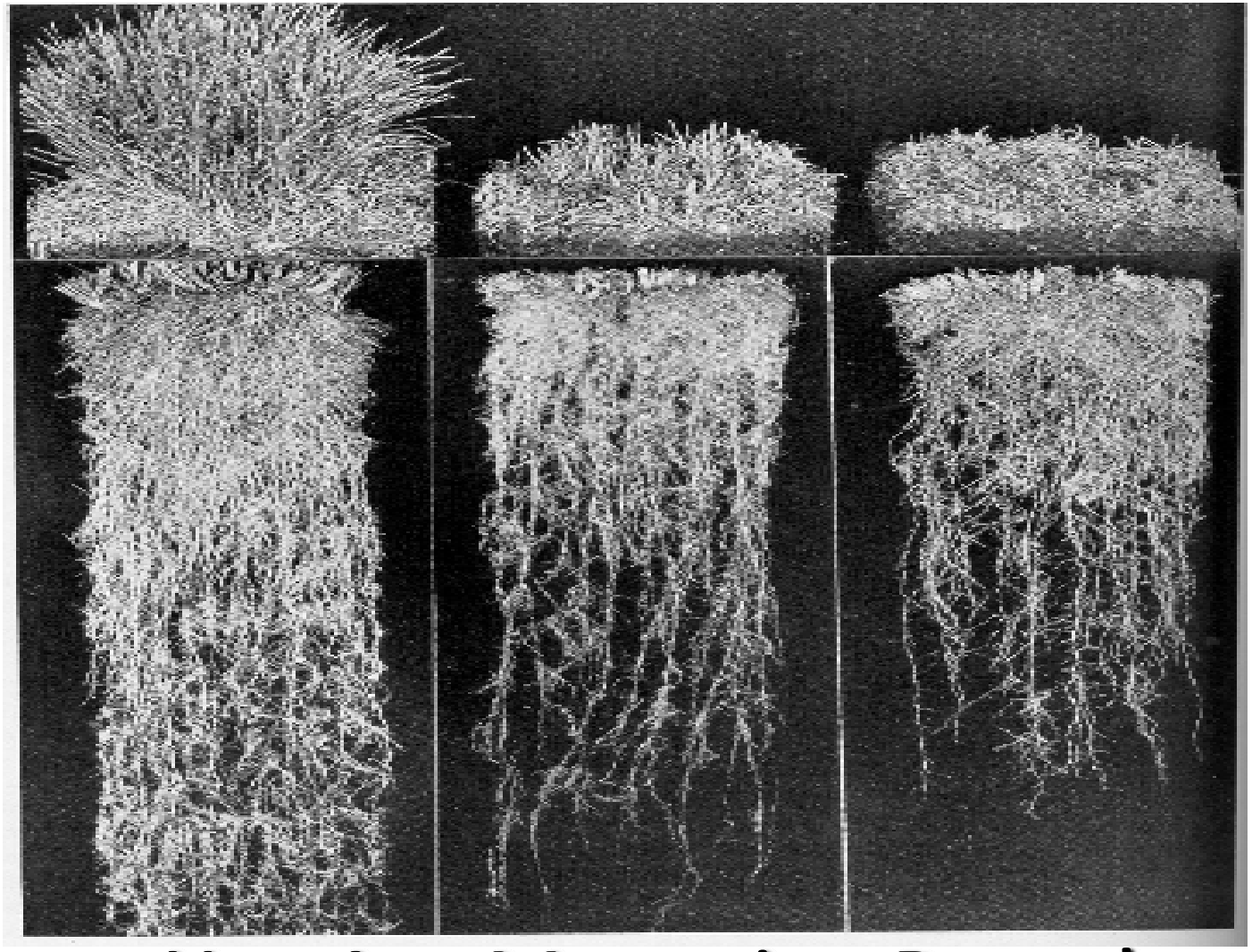
What's left

- We have
  - How much water is used
  - How much water the soil can hold
  - We are completely filling the root profile each irrigation…water quantity not a worry unless sprinklers are used
  - Often we can't control timing or irrigation
  - How deep is the root zone? Then we know how long we can go between irrigations

How deep is the root zone?

This is the one factor we can control

Common examples of this that I see are….



You Are Managing Roots!

I guess…


Overgrazing Reduces Roots????
Were they ever there?

What is the ‘real world’ outlook to take

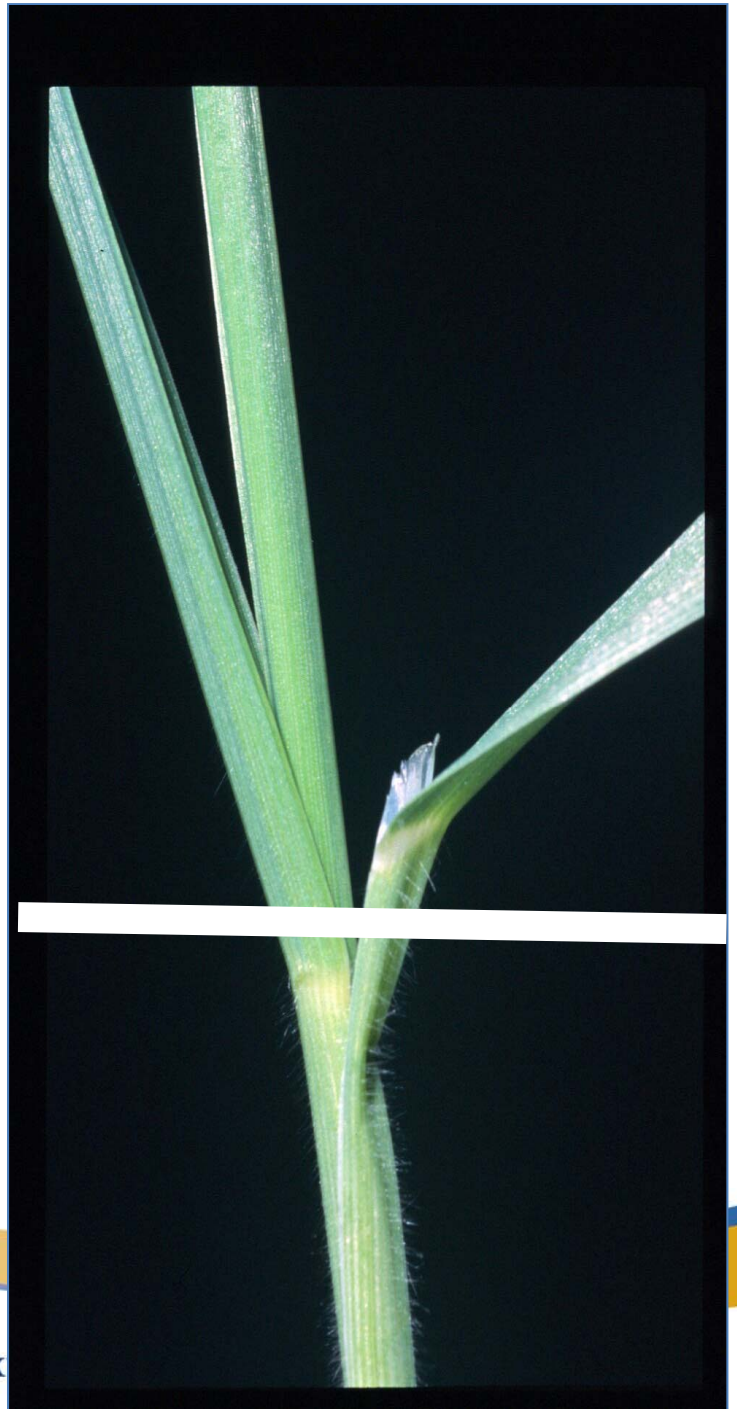
1. The roots mine nutrients and water from the soil
2. The leaves mine sunlight above the soil surface
3. The **crown** stores the energy required for growth – You can see and manage that!

What can we manage

- The bigger the crown, the more energy stored
  - More energy = more roots
    - Deeper water collection and greater nutrient absorption
  - More energy = more leaves
    - More leaves = higher grazing capacity

We can manage the crown… basal leaf storage

What's the crown?



Managing the crowns

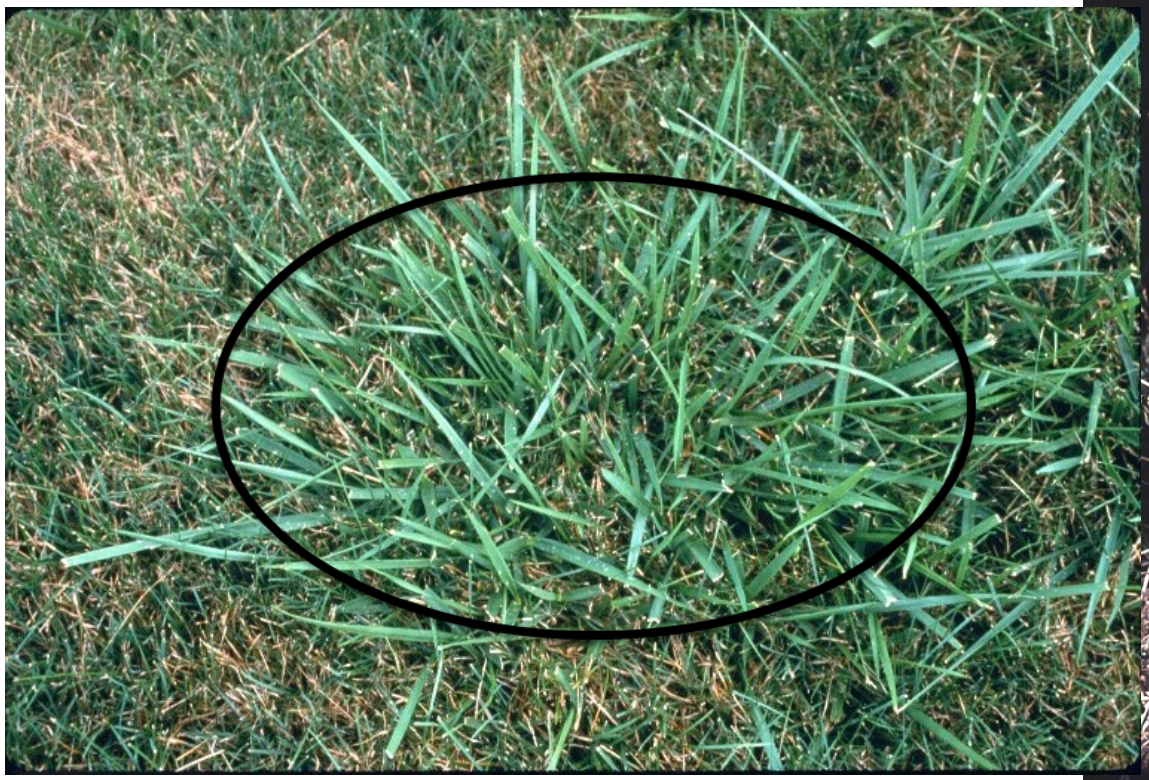
- The crown stores sugar…not the roots (usually)
  - Sugar tastes great!
- Larger, usually wider, crowns mean more leaf and root growth
- Grasses differ in their storage/crown height and development
- Higher crowns = more grazing management


Why is this part growing

Perennial ryegrass

Annual ryegrass

Tall fescue



Dallisgrass

What's the trigger then

- Graze no more than the actual leaf of the plant…Preferably a touch less

Considerations?

- Different grasses have different crown sizes and growth rates
  1. Fescue
  2. Dallisgrass
  3. Orchardgrass
  4. Perennial ryegrass

- Dallisgrass & Tall fescue
  - 18+, 24+, 36+
- Orchardgrass
  - 12+
- Ryegrass
  - 12+

Match grazing to planting to maintain crown

ryegrass

fescue

Grazing to the planting… the reasoning is:

- Different palatability/quality

1. Perennial ryegrass
2. Orchardgrass
3. Fescue

Odd ball is dallisgrass. Warm season grasses = high palatability & low quality

Grazing
Take home

- Most grasses have equal quality and palatability at the same stages of growth
- The problem is they don’t all have the same growth curves
- Unequal growth means unequal palatability
- Plant grasses with equal growth and everyone is grazed the same

Manageable combinations

- Tall fescue and possibly dallisgrass
  - Take longer to establish because they develop big crowns
  - Make grazing rotations quicker or set stock to keep up with growth
  - Mow excess growth, especially seedheads, to keep palatable
  - Deep rooted, best match for long irrigation intervals
  - Consider newer fine leaved fescues – **Note new**!

Manageable combinations

- Perennial ryegrass and orchardgrass
  - Ryegrass will always be high quality due to small leaf size and modest growth
  - Both have high crowns that easily suffer from grazing damage
  - Noticeably shorter rooted and will require more frequent irrigation

Ryegrass example

- Arbuckle soil type
  - 12.64% available water storage
  - 15 inch root zone
  - 1.9 inches of water storage in root zone
  - Water use the first week of august 2013 = 1.88”
    - 0.26” per day
  - 7 day optimal irrigation interval

Tall fescue example

- Arbuckle soil type
  - 12.64% available water storage
  - 30 inch root zone
  - 4.5 inches of water storage in root zone
  - Water use the first week of august 2013 = 1.88”
    - 0.26” per day
  - 14.5 day optimal irrigation interval

Final thoughts

- Managing to avoid crown damage is the key
  - Less production
  - Less root depth
    - Greater chances for moisture stress and more required fertilizer
- Grazing above the crown will encourage it to
  - Increase tillering
  - Store more energy
  - Remain more grazing tolerant


Questions?