September 13, 1979
Wayne Jensen
Farm Advisor - Santa Barbara County

W. James Clawson
Extension Range Specialist

Here is my summary of what we accomplished on September 6, 1979, on the Cojo Ranch in Santa Barbara County. Three 150 ft. x 150 ft. areas were staked out in Field No. 2 of the Cojo Ranch at Pt. Conception. Forage samples were taken on each of the 3 plots by clipping the dry forage to approximately 1/2 inch above ground and attempting to clean up most of the forage residue without obtaining dirt. The clippings were taken by four random tosses of a 2.4 square foot quadrat which totaled 9.6 square feet. Photographs were taken of plot 2 and plot 3.

Plot No. 1 - A west coastal exposure. Located 1 mile east on the road south of the corrals. The plot is south of this road and south of a thistle patch. The plot is on Santa Lucia shaly clay loam (SAE 2), 15-30% slope. It is classified as a loamy range site which is assigned a forage yield ranging from 1,000 lbs to 2100 lbs.per year with grazeable forage at 700 lbs to 1500 lbs.

Plot No. 2 - South exposure. Located 1/2 mile east on road just north of corrals with the plot south of the oak knoll at the edge of the brush. This site is also on Santa Lucia shaly clay loam (SAE 2), 15-30% slope. There may be some conception fine sandy loam (WAC 2) at the lower edge of the plot.

Plot No. 3 - Flat with some south exposure. The plot is also located 0.2 miles east on the road just north of the corrals. The plot is immediately north of the road. The plot was located on conception fine sandy loam (WAC-2).

There was abundant gopher and badger activity on all three plots. The forage sampling purposely avoided any of that activity. It was estimated that at least five percent of the land area was distrurbed by this activity.

WJC/gj

cc: Bill Weitkamp

14"

April 1, 1980
Wayne Jensen
Farm Advisor - Santa Barbara County

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Extension Range Specialist

Here is the information from our sampling on the Cojo Ranch on March 20, 1980.

Plot 1--Plants present were ripgut, hordium, bur clover (weevil damage), fiddleneck, white-stem filaree mustard. Clipped 4 quadrats in the exclosure - 3' from each corner. Three quadrats clipped at 4 inches in height and one at 9 inches.

Plot 2--Plants present are ripgut, hordium, fiddleneck, bur clover and wild oats, all of which were flowering. Heavy alfalfa weevil damage on the bur clover. Clipped 4 quadrats 3' in from each corner with 3 at 5 inches and 1 at 10 inches herbage height.

Plot 3--A panel broken on southside of exclosure allowing grazing inside. Samples taken from the southeast and southwest corners at 3'x3'9" from corners with the other two quadrats taken 3' from each side in the corner. Three quadrats were clipped at 8" herbage height and one at 11". Plants present were ripgut, hordium, fiddleneck, bur clover (weevil damage), white-leaf filaree, pepper weed, milk thistle and mustard.

Dry weights are obtained by sample weights ($0.4\ m^2$)x22.5=lbs/acre.

Plot	Dry Weight (gms)	lbs/acre*
1	103.1	2300
2	52.6	1175
3	72.9	1630
Average	76.2	1700
Outside - 5 inches high	67.3	1500
Outside - 18 inches high	165.1	3680

*Rounded off to the nearest 5 pounds

Am enclosing your notes for what they are worth.

WJC/gj

Enclosure

P. S. Samples ground and sent to Extension Lab for both the March sampling and the September or October 1979 sampling.

$$\frac{\text{Energy}}{\text{Weight}} = \frac{\text{weight x vertical distance}}{\text{weight}} = \text{vertical distance}$$

The vertical distance is the quantity termed head, which is energy per unit weight of water.

Water flowing downhill flows from higher to lower position in the gravitational field and, therefore, from higher to lower level of potential energy. But if pressure is applied to water at lower elevation it can be made to flow to higher elevation. Thus, it may be said that water has energy due to pressure and that there are two components of total potential head.

To visualize potential head relationships, consider a tank of water. The water in the tank is at rest and the total energy of the water must be the same at all points. However, the components of energy are different at different points. For an element of water near the water surface, the pressure energy is small, and because it is at higher elevation, the gravitational energy is large. Near the bottom of the tank the reverse is true.

In flow problems the important factor is change in energy rather than absolute value. Therefore, any convenient reference elevation (datum) may be selected and head is measured from the datum.

$$\text{Gravitational energy per weight of water} = \frac{\text{weight x height above datum}}{\text{weight}}$$

$$= \text{height above datum}$$

In the same way, pressure can be expressed as pressure head.

$$\text{Pressure head} = \frac{\text{pressure energy}}{\text{weight}} = \text{depth below water surface}$$

It can be seen that for any point in the water, the total potential energy per unit weight can be given as a vertical distance, i.e., the height of the water surface above the datum.

Total potential head = pressure head + gravitational head = height of the free water surface above the datum. A free water surface is one subjected to atmospheric pressure.

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