The purpose of the California Multi-Species Grazing/Browsing Academy is to teach, demonstrate and provide practical experience in using sheep and goats to reduce fuel loads, control invasive plants, utilize forage for grazing and browsing, and develop saleable product for a profit. The California Multi-Species Grazing/Browsing Academy will be a three day course emphasizing the practical application of research based grazing and browsing principles using sheep and goats.

Target audiences are ranchers, land managers and agency personnel who manage livestock on privately owned or public pasture and rangeland. Participants learn by actually applying the principles taught in range and pasture with live sheep and goats. Topics to be covered include: grazing/browsing principles, ecology, fencing, nutrition, supplementation, grazing/browsing planning, contract grazing/browsing, and much more.

Registration information is included in this newsletter and on-line at http://ucanr.edu/sites/Roger_Livestock/Multi-Species_Academy/

Sign up today for this exciting course.
Rangeland Forage Update - We Are Still in a Drought
Sierra Research and Extension Center

The May 1st forage sampling results showed 2,127 lbs/ac on their rangeland sites. This is 72% of normal production. This will most likely end up being peak production or close to the final result. One more sampling will confirm. Here is a chart from the last 5 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan 1 (lbs/ac)</th>
<th>Feb 1 (lbs/ac)</th>
<th>Mar 1 (lbs/ac)</th>
<th>Apr 1 (lbs/ac)</th>
<th>May 1 (lbs/ac)</th>
<th>Peak Crop (lbs/ac)</th>
<th>% of Peak Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>502</td>
<td>494</td>
<td>703</td>
<td>1,441</td>
<td>2,941</td>
<td>3,794</td>
<td>128%</td>
</tr>
<tr>
<td>2011-12</td>
<td>412</td>
<td>338</td>
<td>496</td>
<td>566</td>
<td>2,389</td>
<td>2,389</td>
<td>80%</td>
</tr>
<tr>
<td>2012-13</td>
<td>533</td>
<td>873</td>
<td>861</td>
<td>1,679</td>
<td>2,881</td>
<td>2,881</td>
<td>97%</td>
</tr>
<tr>
<td>2013-14</td>
<td>52</td>
<td>98</td>
<td>400</td>
<td>1,033</td>
<td>2,218</td>
<td>2,300</td>
<td>77%</td>
</tr>
<tr>
<td>2014-15</td>
<td>333</td>
<td>273</td>
<td>475</td>
<td>1,394</td>
<td>2,127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 Year Average</td>
<td>466</td>
<td>504</td>
<td>678</td>
<td>1,519</td>
<td>2,886</td>
<td>2,971</td>
<td>100%</td>
</tr>
</tbody>
</table>

Despite the good fall rains, forage production lagged behind the average for the whole year. The 4/23 - 4/25 rainstorm resulted in 0.87 inches of precipitation for the Sierra Research and Extension Center. Some foothill areas received more than one inch. This was enough to stimulate more growth and was helpful for areas previously grazed. I feel that residual dry matter left for summer and fall will be tight. Now would be a good time to assess the number of stock day/acre and total stock days available on rangeland.

This can be compared with the number stock days your herd will require to get through November 30th to see if rangeland stock days match up with number of stock days needed for the herd. Does it match up? Do you have more rangeland stock days than the herd requires (understocked)? Do you have less than rangeland stock days than the herd requires (overstocked)?

I would anticipate you are either overstocked or matching range stock days available with herd stock days required. If you were overstocked, I would encourage you to look seriously at destocking. Making the decision NOW will provide more available forage for the remaining animals; meet needed rest periods for the range, and maintain soil cover by plants.

A drought planning reference was developed by the University of Nebraska - Lincoln and the Drought Mitigation Center. You can find it at this link:
Why Maintain Soil Cover?

Roger Ingram

County Director and Farm Advisor, Placer and Nevada Counties

Some of this article was taken from the National Drought Mitigation Website
http://drought.unl.edu/ranchplan/Overview.aspx

The previous article discussed forage yield results, estimating the amount of remaining stock days on the range (carrying capacity), determining the number of needed stock days by your herd (stocking rate). This can serve as an early warning system in case you find you are overstocked.

Never Feed Your Way Out of a Drought! It will bankrupt you financially (cash flow), economically (profitability), and ecologically (more bare ground).

Maintain as close to 100% ground cover as possible

Ground cover can be annual and/or perennial plant roots in the ground (basal cover) plus litter. The ground cover acts as a blanket for the soil that minimizes erosion, maintains more consistent cooler soil temperatures and moisture levels, and maximizes the ability of green growing plants to capture sunlight energy.

How do Plants Grow?

A good reference to read is Building Soil Carbon with Yearlong Green Farming by Dr. Christine Jones (http://www.amazingcarbon.com). I am giving a summary of the paper. I would encourage you to read the paper and others at the website. I had the opportunity to hear Dr. Jones speak at a couple of workshops and she is an amazing wealth of information.

Green plants grow by capturing sunlight energy. This energy serves as a catalyst for photosynthesis to occur. This results in plants drawing carbon dioxide (CO₂) from the air and H₂O from the soil to form carbohydrates (simple sugars - glucose). Oxygen is released to the atmosphere.

The glucose is resynthesized to a variety of carbon compounds including: carbohydrates, proteins, organic acids, waxes, and oils. These carbon compounds provide energy for livestock, humans, and fossil fuels (carbon stored from previous eras).
Energy from photosynthesis is also provided to soil microbes as 30-40% of the carbon compounds are exuded through the roots. It is a win-win scenario as soil microbes take energy from the plant and provide available nutrients to the plant so it can grow. More ground cover means more green leaves to capture energy and more roots in the ground which results in more carbon added to the soil. Grazing results in root pruning below the surface of the soil which is another source of carbon (organic matter).
Soil microbes resynthesize the carbon exuded from the roots into a more stable form called humus. Humus is stable carbon and forms an integral part of the soil matrix. Part of the formation of humus comes from the association of mycorrhizal fungi which live on the plant roots. One function of these fungi is to produce glomalin, which is a glycoprotein (both protein and carbohydrate), a stable form of carbon. Glomalin helps act like a glue that form soil aggregates. The presence of glomalin helps increase aggregate stability which leads to better soil structure.

**Aggregate Stability and Infiltration**

Small soil aggregates bind to others to make large soil aggregates. The large aggregates create pore spaces in the soil. Pore space is essential for oxygen and water entry into the soil. It allows for air, water, nutrient, and microbe movement within the soil. Large pores associated with large stable aggregates favor high infiltration rates and appropriate aeration for root growth. This means more water soaks into your soil rather than running off and increases root mass. Capturing one extra inch of water can result in up to 500 extra pounds of forage production.

**Overstocking, Overgrazing, and Energy Flow**

If the ranch is overstocked (too many animals and too little forage), you can not effectively give needed rest periods between grazing. This can result in overgrazing – grazing a plant before it has recovered from the previous grazing. Repeated overgrazing will substantially reduce root mass over time. In addition, severe grazing (less than 3 inches) will occur meaning reduced energy flow. This results in an extended recovery period due to removal of all the green leaves (used to capture solar energy). It takes the plant a longer time to mobilize energy from the roots to get leaf area growing again.

**Ecological Impacts, Infiltration (Water Cycle), and Compaction (Nutrient Cycle)**

Reduction in root mass will mean a decrease in the number of soil microbes. Less energy captured by the plant results in less root exudate for the microbes. Less soil microbes means less available nutrients being transferred to the plant. A reduction in mycorrhizal fungi results in less glomalin (glues) being available to form soil aggregates and reduce pore space.
Less pore space lowers oxygen in the soil, reduces water infiltration, and slows movement of nutrients and microbes. Eventually the soil becomes compacted. This causes more water to run off your property instead soaking into the soil. The result is reduced forage production and drying up of streams and springs.

**Bare Ground**

Bare ground is an indicator that soil is becoming more compacted. Since there is minimal cover from plants and litter, surface soil temperature increases. Plants that can survive with increasing bare ground will have narrow leaves, spines or thorns, tap roots to suck more water out of the soil, and reduced palatability for livestock.

**Match Stocking Rate to Changes in Carrying Capacity Annually and Seasonally**

If we match stocking rate to carrying capacity, we retain the ability to give plants needed recovery periods and minimize overgrazing. This will keep more plants growing above the surface of the soil. Roots will stay healthy and provide energy to soil microbes in exchange for available nutrients for plant growth. Soil aggregates will form increasing pore space. Infiltration improves increasing the amount of water captured by the soil and amount of forage growth. There is now an improved environment for more desirable plants with wider leaves, no spines or thorns, and increased palatability for livestock.

Information on estimating carrying capacity was included in the Summer 2014 Foothill Rancher. Here is a link: [http://ucanr.edu/sites/Roger_Livestock/Foothill_Rancher_Newsletter/?newsitem=51889](http://ucanr.edu/sites/Roger_Livestock/Foothill_Rancher_Newsletter/?newsitem=51889)
How Much Do I Need?

The next step is developing a feed budget. This is a monthly calculation of how many animals you have in each class and their daily demand. We can multiply number of head X daily demand X days in a month to determine monthly demand. You would do this for June, July, August, September, October, and November (drought reserve), a total of 183 days. Let’s say we had estimated 21,594 stock days of standing feed by the end of May. We look at our feed budget and see our herd requires 27,302 stock days. We would be 5,708 stock days short (overstocked) and need to reduce demand by 26.4% (5,708 stock days short / 21,594 stock days of standing feed X 100).

The earlier you make this difficult decision, the more grass is conserved for the remainder of the herd. Markets have remained strong throughout this current drought due to low cattle numbers. This is good news on the selling end. More income received in a year can have tax consequences if not managed properly. You should meet with an accountant to understand options. More information can be found at this link:

Livestock_Resources/Economics_and_Finance/

Here is a good reference on determining stock days from Montana State University:

Forage Consumption Estimated Animal Unit Conversion http://animalrangeextension.montana.edu/
forage/documents/forage%20consumption%20estimated%20AUM%20conversion.pdf

Culling Hierarchy

If you reach the decision point to destock, what is the hierarchy that you will use to cull? Here are some suggestions:

· **Wean early** – Weaning early dramatically reduces stocking rate as a dry cow has a much lower nutrient demand than a lactating one.

· **Cull Old Stock** – Older animals will generally struggle more to stay in good body condition. Check their teeth to see if they can still graze effectively.

· **Cull Unproductive Breeding Animals** – Anything that does not produce any offspring should be culled. No second chances when forage is scarce. Check for bad udders, eyes, feet problems, and temperament issues.

· **Retain Few if any Replacements** – Weaned females have a high nutrient demand due to maintenance, growth, and reproduction.

· **Improve Herd Genetics** – Drought provides an excellent opportunity to improve the uniformity of the herd. Cull anything that does not fit your vision of the type of animal you want in your herd.

Final thoughts

Matching stocking rate to carrying capacity is good for the plants, roots, and soil microbes. This results in larger soil aggregates being formed and increased pore space. Infiltration is improved and more water soaks into your property. The resulting environment is conducive for more palatable plants to establish and grow. Overgrazing is minimized as you can provide needed rest for plants after grazing. The result - happy land and happy animals. Most likely you will be happy as well. Please contact me if you need help estimating carrying capacity or developing a feed budget.
UPCOMING EVENTS

Contact Roger Ingram at (530) 889-7385 or rsingram@ucanr.edu to register or if you have questions. Check website for updated information at ceplacer.ucdavis.edu

Pastured Pig Workshop

June 4, 2015
6:00—8:00 PM
Dinner Bell Farm, Chicago Park, CA

This workshop is being finalized and will provide you with demonstration and hands-on experience with raising pigs on pasture for both breeding and meat. You will learn about breeds, electric fence, nutrition, husbandry tips, marketing and more. A flyer is included with this newsletter.

Pasture Walk

June 16, 2015
6:00—8:00 PM
Bruin Ranch, Auburn, CA

This workshop will feature discussion on rangeland and irrigated pasture. Grazing management, electric fencing, livestock water development, grazing planning and soil health will be covered. A flyer is included with this newsletter.

California Multi-Species Academy

September 11-13, 2015
UC Cooperative Extension Office
11477 E Ave, Auburn, CA
Cost: $170

The Academy features hands-on experience with grazing/browsing sheep and goats. Topics covered include: grazing/browsing principles, ecology, targeted grazing, nutrition, reproduction, guard dogs, and grazing planning. A flyer is included with this newsletter.

Roger Ingram
County Director, Placer and Nevada Counties
JUNE 4, 2015
PASTURED PIG FIELD DAY

DINNER BELL FARM
CHICAGO PARK, CA
6:00 to 8:00 PM
Cost: $5.00 per farm

Register at http://ucanr.edu/survey/survey.cfm?surveynumber=15264
2015 Pasture Walk

WHEN: Tuesday, June 16, 2015
TIME: 6:00 to 8:00 PM
WHERE: Bruin Ranch Auburn, CA
COST: FREE

Agenda
- Welcome and Introductions
- Drought forage update
- Rangeland Pasture Walk
  - Assess feed supply conditions
  - Perennial grasses on rangeland
  - Managing the dry grass through summer and fall
- Irrigated Pasture Walk
  - Grazing and rest periods
  - Stock density
  - Electric Fencing and livestock water development
- Soil Health Principles
- Grazing Planning for Rangeland and Irrigated Pasture

Participants should wear clothes appropriate for outdoor work.

How to Register

Register on line at: http://ucanr.edu/survey/survey.cfm?surveynumber=15554
2015 California Multi-Species Grazing/Browsing Academy

WHEN: September 11 - 13, 2015
WHERE: UCCE Placer
11477 E Avenue
Auburn, CA 95603
COST: $170.00 (includes meals and course materials)

Registration is required:
NO walk-in registrations due to set-up needed for hands-on activities
NO REFUNDS - Your payment guarantees your space

This Academy is a unique and exciting program emphasizing the practical application of controlled grazing/browsing principles to improve the environment and increase ranch profit. This challenging course consists of a minimum of lecture and a maximum of hands-on experience. Participants learn by actually applying the principles taught in the range and pasture with live animals.

You will learn the following at the Academy: Grazing principles, range and brush ecology, nutrition, guard dogs, reproduction, health, grazing planning, and monitoring.

Speakers
- Roger Ingram, Livestock and Natural Resources Advisor Placer & Nevada Counties
- An Peischel, Small Ruminant Specialist, Tennessee State University

Who Should Attend
Ranchers, land managers and agency personnel who manage livestock on privately owned or public pasture and rangeland.

How to Register
Register on line at: http://ucanr.edu/survey/survey.cfm?surveynumber=14959

OR

Print out and mail-in your payment and application: http://ucanr.edu/sites/Roger_Livestock/files/207699.pdf

Should you have any additional questions contact Roger Ingram at (530) 889-7385 or email at rsingram@ucdavis.edu

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WEB SITE: ceplacernevada.ucdavis.edu

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