As exciting as watching grass grow

Merriam /Webster’s definition of GRASS

1 : herbage suitable or used for grazing animals
2 : any of a large family (Gramineae syn. Poaceae) of monocotyledonous mostly herbaceous plants with jointed stems, slender sheathing leaves, and flowers borne in spikelets of bracts

The title of this article is a fairly common expression that implies a particular activity is boring. For example, my family might say that listening to me drone on about grass (or rain, cows, horses, dogs, guitars, trucks, rodeo, “back when I played ball”, etc...) is about as exciting as watching it grow. Somebody must enjoy it though; you can click on a live website to watch grass grow and there are even You-tube videos about it... so it must be important, it’s on the internet… I know, right? Seriously though, you might not get excited about watching it grow but if your livelihood depends on grass, I’ll bet you get excited about the fact that it does grow. The fact that grass grows and especially the fact that it re-grows after being grazed, is one of the basic principles in range management. Definition 1 from above is based on this phenomenon. Life as we know it wouldn’t last very long if grass growth did not occur. So, is this subject exciting? Maybe not… but is it important? Absolutely, or else we wouldn’t devote a whole Rimrock Report article to it… At this point, I am going to recommend another book to you and for this article, a specific chapter. The book is Grazing Management: an Ecological Perspective (Heitschmidt and Stuth, eds. 1991) and the chapter is number 4, Developmental Morphology and Physiology of Grasses (Briske). If you are not familiar with this publication, I think you will find it a good practical treatment of the scientific basis for sustainable grazing management.

Before we start a discussion of grass growth; we should devote a little bit of time to the basic structure of a grass plant. We will use Figure 4.1 from Dr Briske’s chapter as a reference. The basic unit of grass is the phytomer which (for our discussion) consists of a leaf blade and it’s sheath, attached to a section of stem (Figure A). A group of phytomers is a tiller. The oldest phytomer is near the ground, with progressively younger units as you move upward. A plant then is group of tillers. So, phytomers differentiate and grow from meristems, several phytomers form a tiller and several tillers make up a plant. Nothing to it. Except what exactly is a meristem?
Meristem is just a three dollar word for growth point. This is the specialized area on plants where new cells are produced, organized, and added to the mass of the plant. Grass plant meristems are either apical, which means they are found at the tip of a shoot or root; or they are intercalary, meaning they are found at the base of a leaf blade or node (Figure A). What difference does that make? Well, the distribution of these meristems has a lot to do with how susceptible a particular grass species might be to defoliation. Briske (1991) states that “Grazing resistance is an ambiguous term used to describe the relative ability of plants to survive grazing.” Grazing resistance can be divided into two general strategies: avoidance and tolerance.

Avoidance mechanisms decrease the probability of a plant being grazed. There are two primary methods: mechanical and biochemical. The mechanical strategy can take several forms. As mentioned earlier, location of growth points is important. Plants with these tissues near the base of the plant as opposed to higher off the ground, or toward the inner part of the canopy instead of the outer, are more grazing tolerant. Think of Blue Grama (Bouteloua gracilis; short, leaves originating near the ground) versus Bush Muhly (Muhlenbergia porteri; taller, more jointed arrangement with growth points higher and more exposed). So, your homework assignment is to find out which species can withstand more grazing? Click on the plant names and check out the FEIS species account for each plant on the NRCS Plants Database to find out. I’ll give you little hint, Bush Muhly gets its common name from the fact that it likes to “hide” under shrubs for protection. This just so happens to be another mechanical escape mechanism. Sideoats Grama (Bouteloua curtipendula) is a favorite grass for quail nesting sites. One reason is the bunch grass structure with plenty of material to hide a nest in and another is that Sideoats is often found growing in a Prickly Pear cactus (Opuntia spp). In this case the grass and the quail are both taking advantage of the cover provided by the cactus. Some grasses are a little more self sufficient and take on the job of providing spines or other means of protection themselves. Cheatgrass (Bromus tectorum) is grazed when young and tender but once its seedhead matures the awns get prickly, it is pretty much avoided. Biochemical methods of grazing avoidance include toxins or compounds in the plant that make it unpalatable or undigestible.

Grazing tolerance, the ability to recover from tissue removal, can also be divided into two categories. These are: morphological and physiological. The ability to replace leaf material after defoliation is influenced by the structure of the plant and which types of meristem are involved. Growth originating from existing leaf and stem bases (intercalary) is more productive than that from apical meristems or from new young tillers. Physiological mechanisms are numerous and more complicated. For instance, the rate of photosynthesis in new re-growth versus older tissue, the allocation of carbon, sugar, and water and the effect of leaf area on root production are all involved in the capacity of a plant to withstand grazing.

Now wasn’t that exciting? As exciting as watching grass grow? If you are not sure… just stare at Figure B for awhile, and let me know how it goes.
As exciting as watching grass grow....continued

Figure 4.1 (Briske 1991)

Figure 4.1. The developmental morphology of grasses originates from the successive differentiation of phytomers from the apical meristem of individual tillers. Individual plants are composed of an assemblage of tillers originating from axillary buds of previous tiller generations (adapted from Ettler 1951).
Plant of the “week” by Guest Writer Lisa Gerber

*Sphaeralcea ambigua* or globemallow is one of my favorite native plants in the desert because it looks so cheery against the green and brown landscape. A perennial forb with bright orange flowers, it is a drought tolerant native that is found growing in Arizona, California, Nevada, and Utah along roadsides, banks of sandy washes, and flats. A member of the Malvaceae family, globemallow grows in large multistemmed clumps to a height of about 40 inches and is found below 3500 ft. elevations. The grayish green maple-like leaves are 3 lobed with scalloped edges covered with fine hair growing up to 2½” long and wide in an alternate arrangement. The flowers are five petaled with yellow stamens that bloom in spring and summer. There are 16 species of *Sphaeralcea* found in Arizona with flower color variations of white, pink, purple, and reddish hues. The orange/apricot color is the most common. Desert globemallow is grazed by deer, elk, bighorn sheep, and pronghorn antelope.

The Native Americans used the plant stems as a type of chewing gum. Additional Native American tribes have been recorded as using the different parts of the plant for various remedies such as a cold remedy, a contraceptive, an emetic, teas for respiratory ailments, and poultices for cuts, sores, pain, and inflammation.

Desert globemallow is also called desert mallow, desert hollyhock, and sore eye poppy (due to the leaf hair being an eye irritant).

The Blue Collar Plant site, more formally called **Yavapai Native & Naturalized Plants** has information and photos on many plants in Yavapai County. If you haven’t been to the site, it really is worth a look.
Test and renew your Plant ID skills at the 2012 Arizona Section Summer Meeting!!!

Presented by the Young Professionals Committee

Who: Everybody
When: August 8-10
Where: SRM Summer Meeting
Why: For Fun and bragging’ rights!!

First Prize: Plant ID Buckle
Second Prize: Illuminated Hand Lens

A table with 10 -12 important rangeland plants will be on display at the campsite for you to identify at your leisure.
Save the date!

AZ Section Summer Meeting
August 8, 9, 10 2012 in Young, Arizona
More details available soon.

Brianna Pena, a fourth grade student at Bales Elementary School in Buckeye was recently presented with a ‘Range Rocks” t-shirt for outstanding achievement at the Science Fair in a Range science related topic. Her proud parents Adrianna Sanchez and Jose Granion were on hand. Brianna is also a Science Club member. The Science Club started the project as research to see what type of environment a plant grows in. It is one of several projects the students are working on in order to learn more about plants and their environment. Brianna decided to enter her project into this year’s Bales/Buckeye Science Festival. Brianna’s teacher, Tracie Burns says that Brianna is one of her most dedicated students when it comes to Science and the environment. Brianna is pictured below with her parents, her poster, and her prize!
Well, a lot of things have happened since the last Rimrock Report. The winter meeting for the Arizona Section of SRM in Tucson was a success. We started with Miss Hopi on Wednesday and ended with over 100 years of range research and management at the Santa Rita Experimental Range on Friday. In between, we heard about the history of ranching in southeast Arizona, fire ecology and management in the southwestern US, how to deal with fire on a personal basis, how to apply grazing for ecological restoration, how the University of Arizona is positioning itself to help feed the world and how rangelands will play a part in that…not bad for the price of admission. Once again, I had a lot of great help, thanks to all of you, you know who you are. The Rangelands West group also held their annual meeting in Tucson. You will hear a lot more about this group and the new website launch in the next Rimrock Report. Stay tuned. Last time, we advertised for a range tech at the V Bar V and research specialists for a cooperative monitoring project between the university and BLM. We have spent quite a bit of time interviewing candidates for those jobs and I hope to introduce the new “rangers” to you in the next issue. I was fortunate enough to have a co-authored article published in the current issue of Rangelands, and to have the cover photo. You can find both of these at:

http://www.srmjournals.org/toc/rala/34/1. The research deals with elk and cattle diets and the photo is from the House Rock Valley area on the Grand Canyon Trust’s Kane Ranch. I just got back from Nogales setting up the remote mineral feeder down there.

I am heading to the Arizona/Utah Range Livestock Workshop April 10,11,12. After that, I’m out with the Grand Canyon Trust and Arizona Game and Fish to collect mule deer samples to kick off a diet quality study on the Kaibab. Next, I’m off to West Texas for some NIRS work, and back to the V Bar V for cattle NIRS, then plan some restoration work in Cedar Flat and Wickiup… same old stuff, like an Arizona sunset.

Till next time,

Doug