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Sustainable Small Acreage News

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Inside this issue:

Why Do Soils Matter?

By Francine Lheritier, Soil Scientist, USDA-Natural Resources Conservation Service

"Most people don't realize that just beneath our feet lies a diverse, complex, life-giving ecosystem that sustains our entire existence," said Jason Weller, Chief of USDA's Natural Resources Conservation Service (NRCS). To increase awareness of soils and the understanding of soils' important functions, the United Nations and the USDA have proclaimed 2015 as the **International Year of Soil**. This year we will feature a series on soils.

So why do soils matter?

It is difficult to rate the importance of the different soil functions, since all are vital to our well-being, to some extent. However, the function of supporting food and agriculture worldwide is fundamental for the preservation and advancement of human life on this planet.

Soil is also the basis for plant growth and contributes to the maintenance of natural and planted

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Sustainable Small Acreages

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vegetation, including our diverse forests and grasslands and the huge breadth of crop species and varieties (annuals, perennial shrubs, and trees) that are cultivated or managed for their diverse food fiber, fodder, fuel, and medicinal products in relation to the prevailing climate, landscape and soil type, and according to societal needs.

Through plant growth, the soil also plays an important role in supporting animal biodiversity above ground, including wildlife and domesticated livestock. Moreover, the soil itself contains millions of diverse organisms that play many vital functions such as breakdown of plant debris, taking in components from the atmosphere, aerating the soil as well as regulation of carbon, nutrient and hydrological cycling and breakdown of toxic elements.

Soil is increasingly recognized as playing a fundamental role in the quality and availability of our water supply. The soil, coupled with the landscape and its vegetation, is responsible for the distribution of all rainwater falling upon it and thus plays a key role with respect to the water cycle and supply as now recognized by hydrologists.

Related to how water moves through the soil and the absorption properties of soils is the soil's ability to perform an important function in pollution control (pesticides, nitrates etc.).

Soil has always been important for the foundation platform of buildings, roads and other communications. It also provides base materials for these.

Many people are interested in their origins and how earlier man lived. Soil plays an important part in the preservation of the earth's history and cultural heritage.

Finally, soils have been recognized as having a key role in modifying and ameliorating the risks and effects of climate change. Soil organic matter is one of the major pools of carbon in the biosphere and is important both as a driver of climatic change and as a response variable to climate change, capable of acting both as a source and sink of carbon.

-From The Food and Agriculture Organization of the United Nations website

Soils Activity for Kids

This is a great opportunity for the whole family to increase their soil knowledge… and perhaps inspire the next generation of soil scientists and soil stewards! Go to www.fao.org/3/a-i3855e.pdf

Use **Web Soil Survey** to explore soil survey data for your property or area of interest. To get started, go to http://websoilsurvey.sc.egov.usda.gov/ and click on the big green button.

Soils Activity for Adults

Why Use a Native Hedge?

By Maria Bumgarner, Jefferson Conservation District

Hedges are a great way to replace fences, as screens, to mark boundaries, or as wind breaks. They improve aesthetics and are a unique visual interest. Native hedges are the ideal situation for Colorado. They are easy to maintain and establish. There are many benefits to using Colorado native shrubs and adapted non-natives on small acreage. Colorado native shrubs are naturally adapted to their specific Colorado climate, soils, and environmental conditions. When correctly sited, they can be ideal plants for a sustainable landscape that requires reduced external inputs such as watering, fertilizing, and pruning. In order to realize these benefits, the planting site must approximate the natural environmental conditions of the plant in its native habitat.

A benefit of using Colorado natives in landscapes is that they may attract a wide variety of wildlife including mammals, birds, and butterflies. Rapid urbanization in the state is reducing biodiversity as habitat is removed for building and road construction. Landscaping with natives on a large or small scale can maintain biodiversity that otherwise could be lost.

One native shrub that makes an excellent hedge is **curl-leaf mountain mahogany**, *Cercocarpus ledifolius*. It has small dark green leaves that are evergreen. This native shrub has a unique beauty that rivals the water guzzling privet and boxwoods. The water requirements for this shrub are 1-2 deep soaks a month if weather conditions are dry.

Some non-natives are naturally adapted to environments similar to that found in Colorado. An example is **fern bush**, *Chamaebatiaria millefolium*. Though not native to Colorado, it is found in Idaho, Utah, and Arizona which have similar habitats to lower elevations in Colorado. Fern bush is semi-evergreen, has fascinating foliate buds, is cold hardy and has an excellent survival rate. This shrub blooms in July and August with unique clusters of white flowers. The white flowers turn into beautiful bronze seed heads in the fall. Water requirements for fern bush are 1-2 times a summer if rainfall is scarce. During the first season water 3-5 times a month depending on the microclimate and growth rate. Pruning is suggested one time a year in late fall. Therefore, the shrub has the ability to flower and show fall interest.

Mountain Mahogany hedge

Another native well suited to hedgerows or windbreaks is **Rocky Mountain Juniper** *Juniperus scopulorum*, which provides dense growth suitable for windbreaks and bird shelter, as well as berries on the female plants for birds. It is also extremely drought tolerant.

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Golden currants provide early nectar for hummingbirds and bees, provide edible berries late in the summer, and the leaves turn red in the fall. In very dry weather, it would need soaking 1-2 times per month.

Colorado State Forest Service Seedling Sale
Purchase native and adapted non-native seedling shrubs for use in hedges or windbreaks. Find your local seedling sale coordinator from the list at http://csfs.colostate.edu/pages/buying-trees.html#adams

For slightly moister areas, the dense suckering growth of **chokecherry** provides a nice barrier, flowers for early pollinators, clusters of shiny black berries for birds or humans, and a red color. Chokecherries grow best in riparian areas, but will grow elsewhere if watered when dry.

Learn More
Colorado Native Shrubs for Landscaping, CSU Extension fact sheet, www.ext.colostate.edu/pubs/garden/07422.html.

CSU Extension's Native Plant Master® courses or classes, http://npm.eventbrite.com for a list of offerings in the Metro to Mountain area and www.nativeplantmaster.org for other NPM classes in the state.

Annual Publication Provides Marketing Opportunity for Local Producers

For more than three decades, the Colorado Farm Fresh Directory has been connecting consumers with local producers. Published by the Colorado Department of Agriculture, Farm Fresh promotes Colorado farmers' markets, roadside stands, u-picks, Community Supported Agriculture (CSA) producers, agritourism activities and farms and ranches that sell direct to the public. The 2015 edition is being organized, and producers are encouraged to submit their information for inclusion. Contact Loretta Lopez at 303-869-9175.

Grow Some Vegetables!

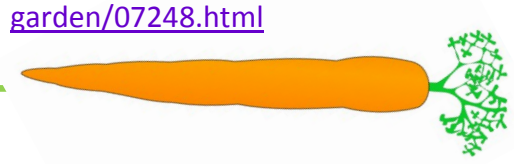
There are hardy cool season vegetables that we can grow anywhere in Colorado, even in the mountains, as long as the soils are good. These include spinach, peas, kale, lettuce, and onions.

If you are new to Colorado or just want to learn more about gardening techniques, take a look at these CSU Extension resources:

CSU Extension Gardening Factsheets, www.ext.colostate.edu/pubs/pubs.html#gard_fv

Vegetable Planting Guide, www.ext.colostate.edu/mg/gardennotes/720.html

Vegetable Gardening in the Mountains, www.ext.colostate.edu/pubs/garden/07248.html



Winter Water for Livestock & Horses

By Jonathan Vrabec, Arapahoe County Extension

Water is an essential nutrient livestock require. The importance of animals having access to clean water year round cannot be over emphasized. In the winter, giving livestock access to a reliable water source can be a real problem because of the snow, ice, and freezing temperatures. Fifty-80% of the animal's live weight comes from water. Animals can lose almost all of their body fat and 50% of body protein and survive, but the loss of only 10% of water can be fatal (Brown, 2006, p. 1).

Livestock require a GOOD supply of water in order to maximize performance (feed intake and production). A "good" water supply would be one that has enough water to meet the animal's needs and one that is of high enough quality (i.e. clean). Livestock water consumption is based on a variety of factors which include:

- Size and kind of animal
- Physiological state of the animals (i.e. a lactating, pregnant, or growing animal will require more water intake than one that is not).
- Level of activity - Animals such as horses that are being worked or livestock that are being transported need more water.
- Type of diet - Animals grazing dry pastures will require more water.
- Water quality (i.e. salt content and purity)
- Water temperature
- Air Temperature

"Do not mistakenly believe that animals can meet water requirements by eating snow or licking ice. With daily water requirements varying from 3 gallons (sheep) to 14 gallons (cattle), one can see that livestock would need to spend every waking hour eating snow to meet their requirements. Ice and snow consumption lowers body temperature and will increase maintenance energy needs, so it should be discouraged." (Kerr, 2008, p.1)

Research has shown that water sources that are warmed to 37 degrees Fahrenheit will encourage animals to drink and help ensure they get adequate water intake. Water tank heaters may be needed to ensure that water sources do not freeze. Always follow manufacturers' recommendations to prevent fires and electric shocks or electrocution of livestock when using water tank heaters. If you do not have access to tank heaters, fresh water needs to be provided several times a day. Breaking ice in water tanks or ponds just once or twice a day may not be enough for an animal to meet its requirements. Ensuring adequate water intake will encourage optimal health and performance of livestock and help prevent serious conditions such as colic and impaction (Kerr, 2008, p.1).

Sources

Brown, Lance (2006), Livestock Watering Requirements Quantity and Quality, Livestock Watering Factsheet, British Columbia Ministry of Agriculture and Lands.

Kerr, Susan (2008), Winter Livestock Management, Vol III No.1, Oregon State University Extension Service: Small Farms.

Build Your Own Solar Stock Tank, visit www.motherearthnews.com/diy/solar-stock-tank-zmaz10onzraw.aspx

Food Labels

By Jennifer Cook, CSU Extension/NRCS Small Acreage Management Specialist

Consumer research conducted by CSU revealed that many consumers make food purchasing decisions based on moral or social ideals, such as paying more for a "local" apple to support the local economy or to reduce our carbon footprint. As food consumers we are regularly faced with choosing between brands and while price is important, we also look at labels to help us decide.

Interestingly though, the survey conducted by CSU found that while many people will pay more for "free range" eggs, or "naturally grown" chicken, when asked to define these terms, most consumers didn't get it right. If it's important to you to know where your food comes from and how it was raised, understanding the meanings of some common labels will help you evaluate label claims.

Organic

This is a USDA certified label which means that the food is grown and processed using no synthetic fertilizers or pesticides, sewage sludge nor irradiation. Pesticides derived from natural sources (e.g., biological pesticides) may be used. It's worth noting that organic farmers cannot use genetically engineered seeds, so if you are worried about eating genetically modified foods, just purchase organic products.

Organic meats and dairy products are hormone-free and antibiotic-free. Livestock are fed organically-raised feed, and have access to the outdoors.

Organic farmers often use manure as a nutrient source and cultivation for weed control. The manure does not have to be from organically raised animals. Growing and raising products organically usually costs more because it can be more labor-intensive, and organic seeds, feed, and fertilizers often cost more. Furthermore the certification and yearly approval process requires intensive record keeping, time, and money.

Naturally Raised

This USDA certified label can be used on meat and meat products. All products labeled with a naturally raised marketing claim must incorporate information explicitly stating that animals have been raised in a manner that meets the following conditions: 1) no growth promotants were administered to the animals; 2) no antibiotics (other than ionophores used to prevent parasitism) were administered to the animal; and 3) no animal by-products were fed to the animals.

Farm Fresh

This is not a certified label and it really has no substance.

Grass-Fed

All cattle eat grass for the first 6-12 months of their lives and then most are shipped to a feedlot to "finish" or fatten on grain. The USDA Grass-Fed label requires that cattle be fed only mother's milk and forage (grass and other greens) throughout their lives. Forage can be in the form of hay, but cattle must have access to pasture during the growing season. This could mean that from October to March (outside the growing season), cattle are confined and fed hay. This label has no standards regarding the use of antibiotics or hormones. For small herds (less than 50 cattle or less than 100 ewes) there is a label called **Grass Fed Small and Very Small (SVS) Producer Program**. For more information on this program go to www.ams.usda.gov/AMSv1.0/GrassFedSVS

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Free-Range

This USDA label means that chickens are raised in a manner where they have unlimited access to the outdoors during their production cycle to get sunlight, fresh air, and freedom of movement. However, the amount of time and the size of the outdoor space are ambiguous.

Cage-Free

Cage-free chickens are able to freely roam a building, room, or enclosed area. Although the number of chickens per area is not regulated, on average there is one chicken per square foot of space. Cage-free living allows chickens to spread their wings and roost at night, but if you've ever raised chickens you might guess that too many chickens in a confined space can lead to injury and possible death from pecking.

Humane

While this label is not regulated by USDA, there are multiple labeling programs that offer this certification, and each has its own requirements for practices such as handling, marking, indoor space requirements, animal health, transportation, and slaughter. Animal Welfare Approved, Certified Humane, American Humane Certified, and Validus Certified are popular programs that offer this label. Visit their websites to learn about specific standards.

No Added Hormones and Raised Without Hormones

USDA regulations have never permitted the use of hormones or steroids in poultry, pork, and goats, so for these products the label isn't important. However, hormones are commonly used in dairy and cattle production. For example, hormones such as rBGH or rBST are used in dairy production to increase cows' milk production. Most beef cattle today are given estrogen (estradial) and/or other combinations of hormones to promote growth and fatten them up. Use of the "no added hormones" label for beef and dairy products is administered by the USDA.

No Antibiotics

While antibiotics are rarely used on hens for egg production, antibiotics are commonly administered to livestock in diary, poultry, and meat production. Antibiotics are used to reduce disease and sickness in a herd. The USDA label "no antibiotics" can be used on poultry and meat products. For antibiotic-free dairy products, look for the organic label.

References

USDA Meat and Poultry Labeling Terms
www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/meat-and-poultry-labeling-terms/meat-and-poultry-labeling-terms

Farm Fresh? Natural? Eggs Are Not Always What They're Cracked Up To Be. December 23, 2014
www.npr.org/blogs/thesalt/2014/12/23/370377902/farm-fresh-natural-eggs-not-always-what-they-re-cracked-up-to-be

USDA Food Labeling Fact Sheets
www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling

Animal Welfare Certification Programs – Understanding Opportunities and Costs Related to Certifications for Humane Farm Animal Treatment, CSU Extension
www.coopext.colostate.edu/ABM/Animal%20Certification%20Programs_final.pdf

Western Whorled Milkweed Poisoning in Livestock

Gene Niles, DVM, DABVT, Director,
CSU VDL Rocky Ford Branch

Within the last several months, four cases of poisoning have been presented to the Rocky Ford Laboratory due to ingestion of western whorled milkweed, also known as horse tail milkweed. Three cases involved horses; one, goats. In all of the cases, the milkweed was found in alfalfa hay.

Plants in the genus *Asclepias* are generally divided into two broad categories labeled as broad-leaved and narrow-leaved milkweed. All animals are susceptible to illness due to milkweed, but clinical signs and affected symptoms differ by genus.

Clinical signs associated with broad-leaved milkweeds such as *A. latifolia*, or showy milkweed, *A. syriaca*, or common milkweed, and *A. speciosia*, or broadleaf milkweed, involve the digestive and cardiovascular systems.

On the other hand, narrow-leaved milkweeds can produce clinical signs of digestive and cardiac toxicity as well as neurotoxicity. Narrow-leaved varieties of milkweed with verticillate leaf patterns are sub classified as verticillate-leaved milkweeds. This subcategory only causes neurotoxicity. *Asclepias fascicularis*, Mexican milkweed, *A. verticillata*, eastern whorled milkweed, *A. pumila*, plains whorled milkweed, and *A. subverticillata*, or horsetail milkweed, all fall into this category.

Horsetail Milkweed

Horsetail milkweed is the plant of most concern throughout the southern plains. It commonly grows in dense stands within pastures and areas surrounding hay fields. Unlike the cardiotoxic milkweeds which are extremely unpalatable, horsetail milk weed is eaten by some animals when green — even more readily when presented in hay. Drying seems to improve its palatability and the plant easily blends into the hay during baling. Poisoning due to horsetail milkweed has been previously reported in horses, sheep, cattle, and poultry. The toxin is cumulative, with clinical signs occurring in horses and sheep when plant material approaching 1 percent of the body weight of the animal is eaten. Cattle require ingestion of approximately 2 percent of their body weight to produce clinical signs. The amount required by goats is not known. Illness can occur rapidly when large amounts of milkweed are eaten at one time or can be delayed for several hours.

The leaves contain the most toxin, but all parts of the plant are toxic. The toxicity does not diminish with drying. The specific neurotoxic agent in verticillated milkweeds has not been identified. Horsetail

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Horsetail milkweed a.k.a. Western whorled milkweed (*Asclepias subverticillata*) is one of the more toxic species of milkweed plants.

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milkweed has very fine stems and narrow leaves allowing it to blend in with grass and alfalfa hay, making thorough examination necessary to detect contaminated hay.

Hay the likely culprit

In the cases involving horses presented to the Rocky Ford VDL, all owners initially found multiple horses dead without any previous signs of clinical illness. Clinical signs observed in the other horses on these farms included depression, anorexia, ataxia with progressive posterior weakness, vague signs of colic, frequently laying down, stumbling and falling resulting in lateral recumbency ending with seizures, paddling and convulsions. All the horses that became non-ambulatory and had seizures in these cases died. The horses and goats that remained on their feet and continued to eat survived. In two instances, it took several weeks for the horses to become clinically normal. In the case involving the goats, six out of 13 adult Boer does were found to have varying degrees of incoordination, muscle tremors, stumbling and falling within two hours after they were fed a bale of newly purchased alfalfa hay. Three of the goats began convulsing and died. The other affected goats recovered uneventfully.

Source: https://americanalps.wordpress.com/2010/11/

Other clinical signs reported to occur in livestock include mydriasis, head pressing, muscle twitching, jaw chomping, standing with its head high and back arched and moving with a high-headed, jackrabbit-like gait when excited. Ruminants may salivate excessively and bloat.

Diagnosis and therapy

Gross and microscopic lesions are nonspecific. Careful examination of stomach and rumen contents for horsetail milkweed is indicated when acute deaths and clinical signs suggest the possibility of milkweed poisoning.

Even though the horses that became non-ambulatory and had seizures in the cases reported here all eventually died, horses exhibiting violent seizures have been reported to make complete recoveries. Therapy for verticillate-leaved milkweed is symptomatic. Medication to control seizures and administration of activated charcoal is indicated, when possible.

More Info

USDA Agriculture Research Service
www.ars.usda.gov/Research/docs.htm?docid=9955

eXtension
www.extension.org/pages/54927/milkweed

Landscape Health Update: Cold Snap Lingering Effects

CSU Plant/Insect Identification and Diagnostic Clinic

The sudden, dramatic temperature drop in early November 2014 will have lingering impacts on trees along the front range of Colorado. Through early and mid-fall, warm temperatures persisted, in some cases setting record highs for that date such as (81-degrees F on October 24). Wild fluctuations preceded the deep freeze in the days leading up to the event, with daytime highs hovering around 60 and nighttime temps in the lower 30's.

In preparation for winter, plants undergo a two-stage process: dormancy and chilling. This cold hardening enables woody plants to withstand winter weather. As day length shortens, deciduous woody plants undergo a process called resorbing, which converts leaf starch, proteins, and other complex molecules into soluble molecules, such as sugars and amino acids, and moves them into storage cells. These storage cells are in the inner bark of twigs, the outer sapwood of the main stem and in root tissues. In spring, the stored nutrients are remobilized and used for the flush of new leaves and burst of growth in other tissues.

Once resorbtion is complete, woody plants form an abscission layer between the branch and the leaf petiole. This abscission layer closes off pathways into the leaf, protecting the plant from drying out or invading diseases, and allowing the leaf to fall. Gradually freezing temperatures ensure the plant is cold hardy for the remainder of winter.

On November 10, the high was 58F at 8 am, by 11 pm that day the temperatures had dropped to 16F. Due to the warm, lengthy fall, trees and shrubs had not completed hardening off for winter. When our freeze hit, many plants such as elms, callery pears, and oaks had not completed the hardening off process. Many conifers and deciduous trees and shrubs showed freeze damage immediately with straw-colored needles or flash-frozen leaves. Buds and shoots suffered freeze injury that in some cases resulted in death of buds or the entire plant, however, long-term impact on these buds won't be seen until spring.

Leaves left on trees from the rapid temperature change are known as a "marcescent" fall, defined as "to wither without falling off". There are two types of marcescence, one type occurs naturally on trees such as English Oak, hazelnuts and beech. The other type, which is what happened to some of the Front Range trees, occurs when temperatures plummet before the abscission layer has formed, killing the leaves but leaving them attached to the tree. Marcescence does not directly harm the tree, but if there is a snowfall while the leaves still cling to the tree, marcescence creates a high risk of limb breakage from snow being held by the leaves. Winds eventually will remove the leaves.

Conifers showed damage immediately. While yellow or brown needles with some green where the needles attach to the branch,are a hallmark of winter damage to pines, symptoms from the intense cold are needle scorching, with tips turning white, gray, silver or straw-colored, leaving green fascicles near the branch. Twig dieback can also occur. The freeze burned needles will not green up, but new needles will mask the damaged ones.

If you are concerned about the evergreen's health, gently press a bud, found on the tips of the twigs and branches, between your thumb and first couple fingers. If the bud feels soft, it is alive and will produce new growth the following spring. If the bud is dry and brittle, it is dead. Check in several places around the plant as not all buds may have been killed. Monitor your trees this winter and next spring for sign of damage. Look for black, shriveled shoots or buds.

Winter watering may help, but care of the trees in the spring will depend on how much freeze damage the trees have sustained. Additional fertilizer in the spring is not recommended. Conifers may grow out of the damage with new growth masking the frozen needles. Deciduous trees may need judicious pruning to remove the dead twigs and branches.

Upcoming Small Acreage Events

For a list of upcoming events in your area visit CSU Extension Small Acreage Management website
www.ext.colostate.edu/sam/

Do you have a question about managing your small acreage?

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