



Summer 2015

Issue 26

www.ext.colostate.edu/sam

Inside this Issue:

Paddock Paradise Track System For Horses	1
Tools for Understanding Land Potential: Ecological Site Descriptions	3
Weed ID and Control	4
Home Energy Audits	6
How Healthy Is Your Soil?	7
What's Wrong With These Leaves?	9
Rain and Hay Production	10



A narrow fenced alleyway or track through the pasture allows horses to keep moving while the owner protects the pasture from overgrazing.

Paddock Paradise Track System for Horses

By Jennifer Cook, Small Acreage Management

A simple track system known as “paddock paradise” can be created on small acreage pastures to allow horses space for exercise while protecting your pasture grasses. Wild horses travel great distances along familiar tracks each day, and paddock paradise tries to mimic this using a track system. Paddock Paradise is a concept based on Jamie Jackson’s research and book, *Paddock Paradise, A Guide to Natural Horse Boarding*.

Continued on page 2

Colorado Sustainable Small Acreage News is edited and published by:
 Jennifer Cook, Small Acreage Management Coordinator, NRCS/CSU Extension,
 57 West Bromley Lane, Brighton, CO 80601 303-659-7004 ext.116 jennifer.cook@colostate.edu
Please direct all inquiries regarding this publication to Jennifer Cook.

Colorado State University Extension and U.S. Department of Agriculture programs are available to all without discrimination. Colorado State University Extension, U.S. Department of Agriculture and Colorado counties cooperating.

Paddock Paradise continued from page 1

The design can be as simple as running temporary fence along the perimeter fence of a pasture to create a narrow alleyway for animals to move within. The more narrow the alleyway, the more the horses will want to keep walking through the track system.

I first learned about paddock paradise from Kristen Galles, a small acreage owner in Golden. Having just moved from Minnesota, where 7 acres of pasture would be plenty for her 2 horses, she was disheartened to learn that her pasture could only support an estimated 17 days of grazing per year! Kristen wanted to keep her pasture grasses healthy and productive but also wanted her horses to stay in good physical and mental shape.

She first tested out her paddock paradise design using temporary polytape fencing and eventually installed permanent fencing when she determined that her design worked. She noticed that her horses' body conditions improved after using the track system for a while, and her pastures improved because she wasn't grazing them as often.

Here are a few strategies to making the track system work:

- Put hay stations strategically throughout the track, especially in winter when there's nothing else to eat. The hay stations will en-

courage horses to keep moving toward the next food stop.

- Be sure water is available along the track
- The more narrow the track, the more animals will want to keep moving. Kristen's track is about 6 feet wide to fit her ATV through.
- Pick up manure regularly in the track to reduce flies
- If possible, connect the track to the barn and corral area for easy access. Horses can walk the track 24/7!

Resources and Videos:

www.aanhcp.net/pages/welcome-to-paddock-paradise

www.all-natural-horse-care.com/paddock-paradise.html

<http://thesoulofahorse.com/blog/our-paddocks-paradise-2/>



Above photo: Tracks allow horses to walk all day to stay mentally and physically fit.



Left photo: Hay station in track system.

Tools for Understanding Land Potential: Ecological Site Descriptions

By Retta Bruegger, Learning from the Land project Outreach and Research Coordinator, Colorado State University

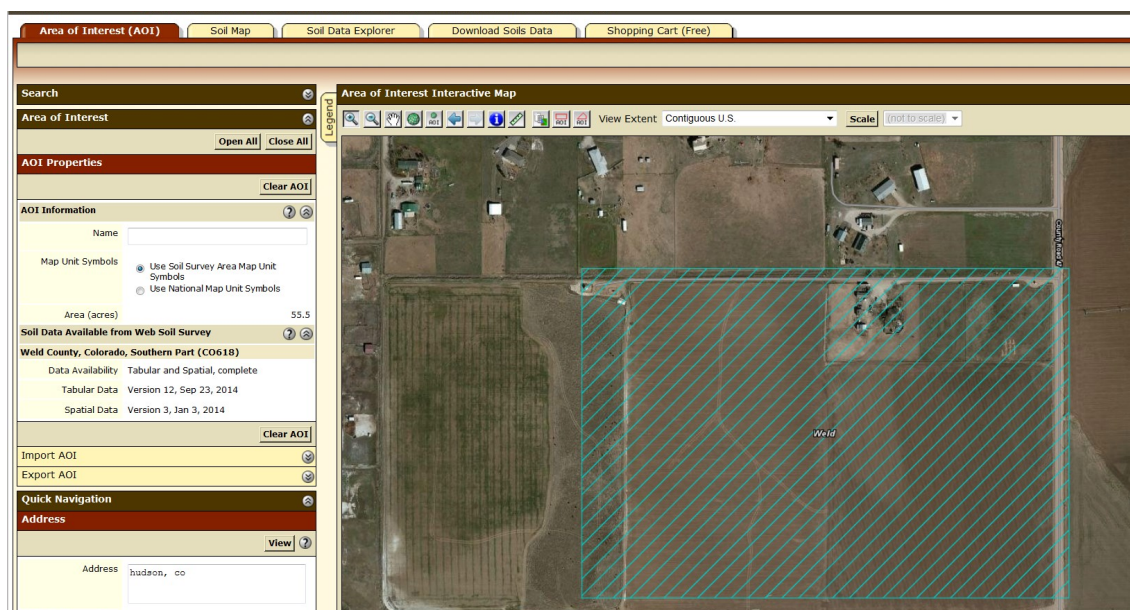
When managing your land, understanding land potential is key to setting realistic goals for your property and avoiding potential risks. Perhaps you'd like to see more native grasses growing on your property? Should you plant native grasses? What is the likelihood that they'll grow and thrive?

There is no one answer to these questions. Instead, the answer depends on context, or, said another way, the *ecological potential* of that particular area. Ecological potential is the idea that soils, topography, and climate determine the amount and kinds of vegetation on a site. While abstract in print, this idea is intuitive if you look at a mountain-side. In Colorado, it is easy to observe differences in vegetation as you move up in elevation, or, differences in vegetation based on whether you are on a north or south-facing slope. Asking yourself questions such as: how much clay is there in your soil? What's the aspect? How many years out of every 10 are likely to be drought years? All help inform your choices as a manager.

Answering these questions can be time consuming and difficult however, and how do you learn about your general location? Fortunately, the NRCS, researchers, and scientists have developed tools that synthesize this information for specific sites, called

Ecological Site Descriptions. Ecological Site Descriptions are tools that classify landscapes based on soils, topography, climate, and consequently the types and amount of vegetation that grow, as well as how vegetation may respond to management (like grazing), disturbance (like fire), or weather (like drought). The NRCS has developed a tool called Web Soil Survey (<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>), which can help you navigate to your property, and generally identify what ecological sites are on your land. In my work, on the Learning from the Land project, we are contributing to ecological site development for sites in Moffat, Rio Blanco, Garfield, and Routt Counties in Western, CO.

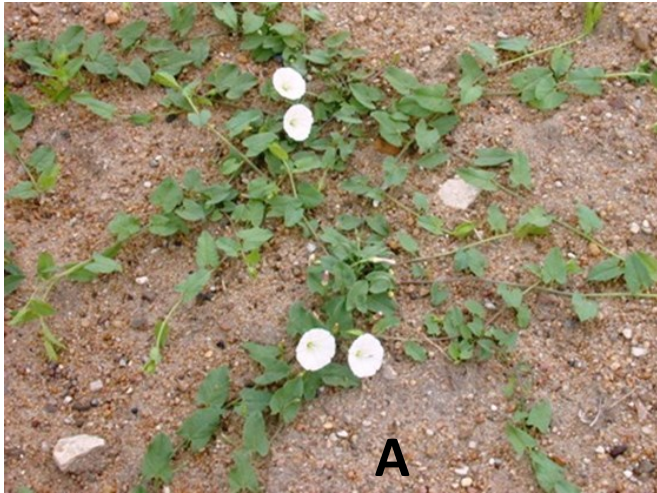
The bottom line is that the first step in answering the question, "Should you plant native grasses?" is learning more about the land you manage. Ecological Site Descriptions synthesize many types of information, and can help you learn about the potential of your land. The more you know about your land, the greater your potential to set realistic goals, and avoid actions that are likely to be destructive, while implementing those that might have a chance of producing the results you want to see.



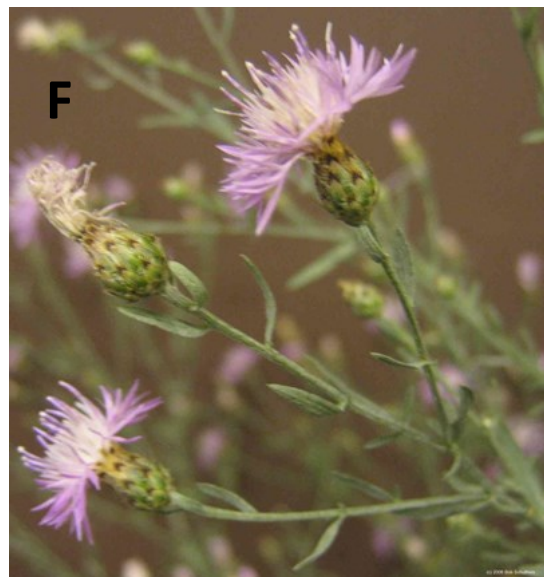
In Web Soil Survey, after defining the Area of Interest (AOI), click on the Soil Data Explorer tab to discover property soil types, determine average crop yields, and more. Use the Ecological Site Description tab to see what native grasses and trees are suited for the site.

Weed ID

Match the correct name for each weed photo. Answers are on page 5.



Canada Thistle
Puncturevine (Goat head)
Ragweed
Field Bindweed
Spotted Knapweed
Curley Dock



Weed ID Answers

A—Field Bindweed

B—Curley Dock

C—Ragweed

D—Puncturevine

E—Canada Thistle

F—Spotted Knapweed

Weed Control Options:

A—Field bindweed is a perennial noxious weed with a deep taproot. It reproduces by seed and roots. Field bindweed can accumulate high levels of nitrates and can be toxic to animals, and the seeds contain tropane alkaloids that act on the nervous system and cause colic. Control Options, according to *Larimer County Weed Reference Guide, 5th edition*:

- Bindweed Gall mites can be introduced onto dryland sites as a method of controlling the weed. Visit CO Department of Agriculture "Request A Bug" program to order mites at www.colorado.gov/pacific/agconservation/request-bug
- Watch **Using Bindweed Gall Mites to Manage Field Bindweed** at www.ext.colostate.edu/media/sm_acre/index.html
- Apply herbicide just after full bloom or in the fall. The most effective herbicides are Perspective, Tordon, Habitat, Plateau, Paramount, dicamba and 2,4-D
- Do NOT till. Tillage can be counter-productive, spreading roots and creating a denser more uniform stand of bindweed

B—Curley Dock is a perennial weed with a deep taproot making it hard to pull, and portions of this root left in the ground will regenerate. Fairly pleasant tasting, the leaves are very rich in vitamins, especially vitamins A and C, and can be eaten raw or cooked. The roasted seed has been used as a coffee substitute. It is also a very important food plant for

the caterpillars of many butterflies. In the spring, basal leaves emerge from a stout taproot. These elongated leaves have wavy margins, thus the name "curly" dock. In summer, the plant has reddish, rigid stems, 2-4 feet tall. Flower stems have greenish flowers. Control options:

- Mowing seed heads will suppress spread of Curly Dock by keeping seeds from reproducing
- Use a shovel to remove crown 2 inches below soil surface
- Combination herbicides containing mecoprop, dicamba and 2,4-D are effective in the control of Curly dock in fall and/or spring

C—Ragweed is an annual weed. Seedlings appear in early spring and flowering occurs in late summer. Seeds are mature by October. Ragweed is not competitive with grass and only occurs in areas which are overgrazed with bare and/or infertile soil. Control Options:

- Ragweed reproduces by seed so it can be controlled by mowing or hand pulling
- Good grazing management will also help reduce its spread

D—Puncturevine is a mat-forming annual weed which reproduces by seed. Flower and seed production occurs July to October. Control Options, according to *Larimer County Weed Reference Guide, 4th edition*:

- Pulling or digging is effective control. If seed has set, plant material should be bagged for disposal so seed will not spread. A handy trick to pick up multiple seeds safely is to press a slab of Styrofoam on the ground in the infested area
- Pre or post-emergent herbicides can be effective

E—Canada Thistle is a deep rooted perennial that reproduces by roots and seeds. Canada thistle can be poisonous to cattle and alpacas due to nitrate accumulation. Controlling this weed will take multiple years of persistent control using a variety of methods. Control Options according to *Larimer County Weed Reference Guide, 5th edition*:

- Mow every month. Mowing and/or grazing

Control Options continued from page 5

throughout summer will suppress, but plants will quickly regrow after management has stopped.

- Apply herbicide in the Fall, Milestone
- Spot treat escaped plants
- Do not apply excess Nitrogen fertilizer

F—Spotted and Diffuse knapweeds are noxious weeds that reproduce by seed and spread rapidly. These knapweeds are similar in appearance (flowers are lavender or white) and are often found together. Spotted knapweed is a short-lived perennial that flowers from June through October. Diffuse knapweed is primarily a biennial that germinates in summer and overwinters as a rosette. Diffuse knapweed flowers in spring and summer, then break off at the base to become tumbleweeds by winter. Control options according to *Larimer County Weed Reference Guide, 5th edition*:

- Seedhead and root weevils have shown some success in controlling knapweeds. Visit CO Department of Agriculture “Request A Bug” program to order beetles at www.colorado.gov/pacific/agconservation/request-bug
- Hand pulling is effective as long as the plants that have produced seed are bagged
- Mowing only suppresses infestation
- Transline and Tordon applied in late flower stage to prevent seed production

Download this handy **Weed Management Pocket Guide** which will help you identify weeds and determine the best methods of control for each.

Download at
www.ext.colostate.edu/sam/weed-flyers.html



Home Energy Audits

By Cary Weiner, CSU Extension Energy Specialist

A professional home energy audit will reveal where in your home you waste energy. Auditors then suggest different ways to improve your efficiency according to financial costs and benefits. And while many utility companies offer rebates for professional audits, you can also conduct a basic home energy assessment on your own.



Watch a video to learn how to use the [Home Energy Audit Loan \(HEAL\) program kit](#) from your local Extension office

- Conduct a [DIY home energy audit](#), agriculture energy audit, solar assessment, or wind assessment
- Download a [fact sheet](#) or online decision tool
- View recorded webinars and [videos](#)
- Borrow a [School Energy Activity Loan \(SEAL\) program kit](#)
- Teach from our [Clean Energy Curriculum for Colorado Middle and High Schools](#)
- Sign up for a free [solar or wind energy assessment for your center pivot](#)
- Ask an [energy expert](#)
- Track energy legislation in Colorado and nationwide using the CSU Center for the New Energy Economy's [Advanced Energy Legislation Tracker](#)
- Visit the Colorado State University Extension energy website at www.ext.colostate.edu/energy

How Healthy is Your Soil?

By Francine Lheritier, Resource Soil Scientist,
Natural Resources Conservation Service

A healthy soil by definition must be alive! In fact, teeming with life. The Natural Resources Conservation Service defines soil health as “the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans. Soil is an ecosystem that can be managed to provide nutrients for plant growth, absorb and hold rainwater for use during dryer periods, filter and buffer potential pollutants from leaving our fields, serve as a firm foundation for agricultural activities, and provide habitat for soil microbes to flourish and diversify to keep the ecosystem running smoothly.”

Soil inherent and dynamic properties drive soil function. Inherent soil properties, like texture, cannot be easily changed with management. Based on inherent properties, a sandy soil will infiltrate water faster than a clayey soil. However, dynamic soil properties like soil structure and organic matter can be changed with management and will also impact

the soil’s ability to function including absorbing and holding water. A healthy soil is one in which the dynamic soil properties are managed to enhance the soil’s ability to function.

The soil bacteria and fungi enhance the soil’s ability to infiltrate and hold water by exuding biological glues. It’s the biological glues that maintain the pore spaces even when the soil is wet. Pore spaces are more than habitat for soil microbes, they also provide the voids within the soil that enables water to be infiltrated and held in the soil. When soils lack the biological glues or water stable structure, then the soil can collapse when wet and form surface crusts. Air and water exchange is decreased which can impact plant vigor and nutrient cycling.

Soil organisms drive nutrient cycling in the soil. The whole soil food web from microbes to arthropods are players in nutrient cycling. Most soil nutrients are converted to a plant-available form by soil microbes. Many plants release root exudates into the soil and stimulate microbial nutrient cycling.

Continued on page 8



Healthy soils are held together by soil glues, or glomalin, that are produced by fungi. Soils rich in soil biota hold together, while soils devoid of soil life fall apart and form a layer of sediment in the bottom of the jar. The soil on the left is from a field that has been managed using no-till for several years. The soil on the right is from a conventionally-tilled field.

From USDA-NRCS Soil Glue Guide

Soil Health continued from page 7

There are many soil health assessments. Here are a couple to get you started:

Note: The Spring 2015 newsletter has a guide for determining soil texture. Consider comparing the soils in your yard, garden, or farm field that have similar textures but are managed differently.

1. To determine if your soil has water stable structure, gather one inch soil clods from the top soil in your yard, garden, lawn, or other area. Let the clods dry for about a day. Then place the clods in a cup of water. Do the clods fall apart immediately or retain their shape? If your clods held their shape for 5 minutes, congratulations! You have water stable aggregates! If not, please read the article in the next newsletter on how to manage for soil health.
2. The next time it rains, observe how well your soil is infiltrating water. Is water running off? After the storm, dig a hole. How deep did the water infiltrate? Compare a compacted area to a non-compacted area.
3. Look for soil organisms. Dig a hole. What evidence of soil organisms do you see? Place a small cup tight in a small soil hole so that the lip of the cup is below the soil surface. Leave it for a few hours and observe the organisms captured in the cup. A healthy soil is teeming with life!!
4. Dig up a plant root. Are the roots covered in soil? If yes, it has what Dr. Christine Jones calls a rhizosheath and could be a sign that the plant is stimulating the nutrient cycling benefits of soil microbes by releasing root exudates.



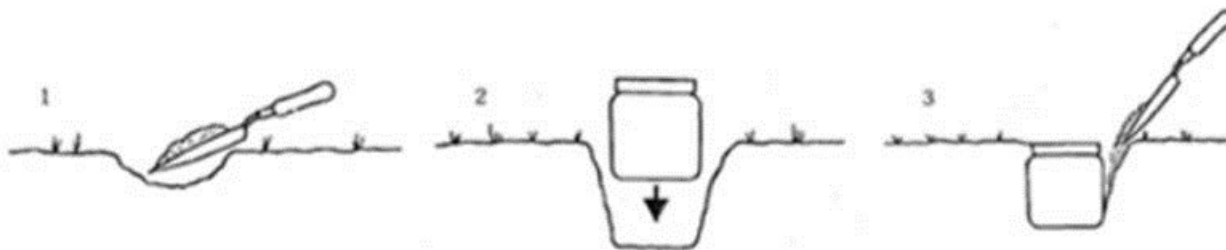
Rhizosheaths

Photo by Clark Harshbarger

This is the third in a series of soil articles in honor of the International Year of Soils. The next article will discuss How to Manage for Healthy Soil.

For more information, visit [NRCS's soil health webpage](#), the [International Year of Soils webpage](#), or [Web Soil Survey](#).

For more information on how soil biology enhances soil health, please check out the Soil Biology Primer at <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/biology/>.



Use a pitfall trap to observe what organisms are in your soil.

What's Wrong With These Leaves?

By Irene Shonle, Director CSU Extension in Gilpin County

Have you been seeing some odd looking leaves on trees and shrubs lately? Are you wondering what's going on with them?

Let's start with aspen. Eriophyid mites are common culprits of deformed aspen leaves (other plant species can also be affected by different species of the mite, but aspens are the most common hosts in the mountains). They cause anything from a few raised whitish or reddish bumps on a leaf, or they can transform an entire leaf into something gnarled and finger-like.

It's quite remarkable that these tiny insects (you almost need a microscope to see them) can cause such dramatic effects. As they feed or lay eggs on young leaves, the mites transfer a growth hormone to the leaf – this is what causes the abnormal growth (gall). The galls are only formed when the leaves are small; fully expanded or mature leaves do not respond to the growth hormone. Mites then hatch and develop in the gall that they create.

Despite the drama, the problems the mites cause are usually just aesthetic. In most cases, the mites will not attack the same tree two years in a row, and they rarely cause much damage. The odd-looking leaves can be removed if desired, but this is rarely necessary. Predatory mites will sometimes

take care of the problem, or the mites may simply move on.

On other species, aphids are the cause of gnarly, cupped leaves. Chokecherry aphids (see picture) and green peach aphids can build up in great numbers, and their extensive feeding causes all new growth to twist, curl and dry. They also produce a sticky, shiny honeydew which can attract yellow jackets and ants.

If the plant is heavily infested, it may not flower since most flowers and fruit arise from new growth. Other than that, the overall health of the plant is not usually greatly impacted. Natural controls such as ladybugs, bald-faced hornets, and other predators will often take care of the aphid population, and the leaves will return to normal the following year. However, if several years go by and the damage levels do not improve, then it might be time to take action.

Both the mites and the aphids can be controlled with horticultural oil applied during early spring (before leaf buds emerge). This will smother the overwintering eggs and adults. These oils can be purchased at a garden center; follow the directions on the label.



Left photo: Eriophyid mite on Aspen.



Right photo: Damage from Chokecherry aphids.

Rain and Hay Production

By Bill Ekstrom CSU Extension Agent , Agriculture
4-H/Youth

Rain this year has been wonderful for the recovery of drought-damaged range land, but not all hay was put up in great shape. Remember when plants are cut for hay, they do not immediately die. Dry matter loss of 5% per inch of rain is possible. As long as moisture is above 40%, they will continue to respire (exchange oxygen and carbon dioxide), a process that burns energy. This can lead to losses in quality and a loss in dry matter.

When rainfall occurs after a cutting, the timing of it will also influence quality. If rain occurs immediately after cutting, the plant cells are still relatively turgid, or firm, from retained water, and, though some losses will occur, little moisture will enter the cells and leach the water-soluble cell contents. If plants have been drying a couple of days and then

-digestible fiber) increases thus lowering the energy value of the hay. A study in Kentucky found that 90-95% of the Vitamin A was lost when hay remained in the windrow for three weeks.

In the rush to get hay baled in between rains this year, some hay may have been baled with extra moisture. At these moisture levels, there will be an increase in mold, which leads to animal refusal and increased dry matter losses. If mold has occurred, it is also a sign that a drop in energy has taken place as the sugars (energy) in the hay have been used to fuel the growth of the microbial population. In extreme cases, temperatures can rise in a bale to the point that a portion of the protein becomes bound to the fiber fraction of the plant cell and is essentially unavailable to the animal consuming it.

Some hay appears to be baled brown sticks. It may not even look like hay and certainly has no more value than poor straw. To find out how good it is

call for a forage analysis. Samples collected from your hay can be tested for protein and energy as well as micro nutrients.

Information from these tests can be used to develop a ration program for next winter. Why not sample your hay and cut the cost of unnecessary feed supplements?

To have your hay tested please contact your local extension office for advice.

CSU Soil, Plant, Water Testing Lab forage analysis information at www.soiltestinglab.colostate.edu/



are rained on, plant cells will re-absorb moisture and a greater leaching of cell contents will occur. Sometimes rain will not reduce hay quality significantly; the only way to know for sure though, is to test the hay. Losses of over 3% protein and 10% TDN (energy) have been documented. NDF (or non

Colorado Small Acreage Services Database

The source for landowners to find contractors, equipment, and services



<http://sam.ext.colostate.edu>

Need help with weed control?

Have a small pasture seeding project?

Search the site today to find a local contractor!

Contractors—Advertise your services here!



This is a free service brought to you by USDA-NRCS, CSU Extension, and your local conservation district

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?

Contact CSU Extension /NRCS Small Acreage Coordinators:

Jennifer Cook
Front Range Coordinator
303-659-7004 ext. 116
Jennifer.cook@colostate.edu

John Rizza
Western Slope Coordinator
970-243-5068 ext. 128
john.rizza@colostate.edu



Colorado
State
University
Extension

USDA NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service