



# Boulder County Small Acreage Management Newsletter

Winter 2008

<http://www.extension.colostate.edu/boulder/AG/smallacreage.shtml>

## From the Extension Agent

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## Small Acreage Management Coordinator Position Announced

Boulder County Extension is currently advertising for a Small Acreage Management Coordinator position. Currently it is described as a part-time hourly position, but we hope to move it to a part or full-time salaried position in the near future. Increasing interest in local food/agriculture has made it more difficult for me to execute all of my job responsibilities. This SAM coordinator will handle many of my SAM programs and I will devote more time in production agriculture programming.

### Deadline for application is February 1, 2008.

For job description and application process see:  
<http://www.co.boulder.co.us/jobs/Small%20Acreage%20Coordinator.htm>

## Past SAM Newsletters Online

View via the SAM link above.

## SAM Email Listserv

If you are receiving this newsletter for the first time and are not subscribed to the [boco\\_small\\_acreage@colostate.edu](mailto:boco_small_acreage@colostate.edu) listserv, you may request subscription on the SAM website (linked in header above). This quarterly e-newsletter and other timely info will be distributed via this email listserv.

Subscribers may use the listserv also as a SAM info gathering mechanism. For example, you may inquire about who is available in the area supply hay, to perform swathing/baling, etc.

The listserv is not a marketplace, however. Because it is hosted on the CSU server, **NO COMMERCIAL EMAILS ARE ALLOWED. DO NOT ATTEMPT TO SELL ANYTHING VIA THE LISTSERV – THANKS.** Use the newsletter ad section for these purposes.

Currently, there are 171 subscribers to the listserv (up from 167 last quarter).

## CART Manual Available

The Country Acres Resource Team (composed of Extension, NRCS, etc. colleagues in Northern Colorado) have released their "[A Manual for Success](#)" for purchase.

## 2008 Small Acreage Management Conference

The Colorado Agriculture Big and Small Conference will be including a small acreage management day on Saturday, February 23 at Island Grove Regional Park in Greeley. See details at

<http://www.coloradoagriculturebigandsmall.com/>

Sessions will feature presentations on:

- Pasture management
- Weed management
- Planting grass
- Manure management and composting
- Planting and caring for trees in windbreaks
- Working with wildlife
- Vet considerations
- Basic horse foot care
- Buying a horse
- Raising poultry in small flocks
- Barns and outbuildings
- Buying a tractor



Adrian Card  
Agriculture/Natural Resources Extension Agent  
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CSU Extension, Boulder County

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alfalfa/grass mixes, but is usually not the limiting factor for established grasses. Most Colorado soils contain sufficient potassium and sulfur for healthy grass. Therefore, nitrogen, the most commonly needed nutrient for irrigated grass, will be the focus here.

Many of the small acreage horse properties in this county can produce all the nitrogen that they need. Effective pasture management requires careful observation to see how nitrogen comes into the system on the acreage, how it is used and managed, and whether it is recycled within the system or whether it leaves the system. Then the best research-based practices can maximize its effectiveness to increase yield while reducing and pollution.

In a healthy, sustainable pasture system, nitrogen stays within the system and is recycled over and over. It is needed at the root zone of the grass plants to help promote lush growth and high protein content. The healthy grass provides sustenance to the animals when they graze it and they in turn deposit nitrogen-rich manure back onto the grass. Appropriate watering carries the nitrogen in the manure to the root zone of the plants and the nitrogen cycle begins again.

Good management practices promote the continuation of this “closed” pasture system, in which all parts of the system interact and mutually benefit each other. The result is a healthy system that produces higher yield with less resource use, less cost, less labor, and less negative environmental impact than an “open” system where vital parts “leave” the system and more and more external intervention is needed.

## Nitrogen Fertilization of Irrigated Grass Horse Pastures by Marsha Williams, SAM Volunteer

Irrigated grass pastures need adequate soil fertility for high productivity as horse forage. The primary nutrient needed for these grass pastures in Colorado is nitrogen (N). Phosphorus is beneficial on new pastures or on

For example, good management requires that animals do not begin grazing grass until grass reaches 8" tall. Then it requires their removal from the grass when it is about 4" tall and rest for the grass until it reaches 8" tall again - sometimes up to several weeks later. Grazing grass off too short gives it too little leaf surface to support the roots, which weakens or kills the plants. Good management allows the animals to rotate through 4 or more "cells" with a "sacrifice area" where they are fed hay until a cell has grown to 8" again. This plan insures that the grass plants remain strong enough to utilize the nitrogen efficiently at their root zones and remain vigorous.

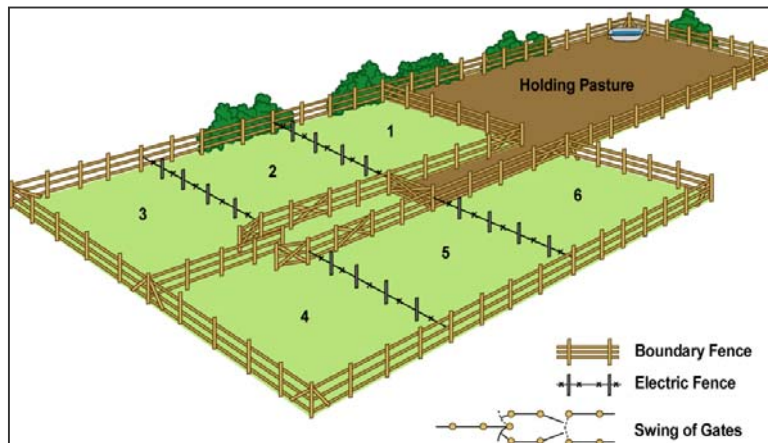
Good management is needed to insure that the manure deposited on the pasture is dragged to distribute the nitrogen more evenly throughout the pasture. If this is not done, areas with more manure, which are less attractive to the animals, are not grazed while other areas are overgrazed resulting in weak plants.

Good management is needed to determine how much irrigation is needed. Too little and the nitrogen from the manure is not carried to the root zone which is about 12-18" down. Too much irrigation will wash the nitrogen away from the roots depriving them of sustenance. Furthermore, this can cause serious nitrogen pollution to all areas downstream from the pasture endangering even drinking water. Moisture needs to be at the roots, but not below the roots.

Finally, watering needs to be done right after the animals are taken off the pasture so that it

will be dry enough to resist the trampling and compacting when they return.

The average 1,000-pound horse produces 9 tons of manure a year containing valuable fertilizer



nutrients, especially nitrogen (~19 lbs of N/ton). This manure produced can be reused successfully by the small acreage manager reducing the problems of

collection, composting, storage, disposal, and pollution associated with that manure. **The following table will indicate how much manure per acre is needed for specific common grass pastures, and the number of acres per horse are needed to provide that amount of manure.**

Table 1: Average Manure Application Rates and Acre Requirements for Yield Goals

<b>Forage</b>	<b>Yield Goal per season (Tons/acre)</b>	<b>Tons Horse Manure Needed Per Acre for Yield Goal*</b>	<b>Acres Need per Horse per year for application rate</b>
Alfalfa/grass mix	2.0	10	.8
Bromegrass	1.5	10	1.0
Orchardgrass	2.0	10	1.0
Tall Fescue	2.0	13	.6

\*Application rate, 2 cubic yards of manure (no bedding) at 30% moisture (moist to touch but not wet) weighs ~1 ton. If with 50% bedding, 4 cubic yards at 30% moisture weighs ~1 ton. CAUTION: accumulation of manure and/or bedding in excess of 1 inch will impede precipitation and sprinkler irrigation from infiltrating the soil surface and can smother grass crowns.

## Spring Pasture Considerations

By Meg Sitarik, SAM volunteer

If you believe you fall within the recommendations below but wish to verify it, you can run an experiment with a strip of pasture. Fertilize it at the rate of 50 pounds of nitrogen per acre per year for 2-3 years. If no significant difference between it and the rest of the pasture is observed, you do not need more nitrogen on the pasture as a whole. If there are not enough horses to provide enough manure, then an assessment of N removed per season should be done to determine how much nitrogen is needed (see details in the article later in this newsletter). Then additional nitrogen should be added if needed, either by bringing in manure or inorganic nitrogen. A good manager will always follow recommended application rates exactly and follow all of the other management techniques described above whether using organic manure or inorganic nitrogen to be sure the nitrogen is utilized efficiently and to avoid misuse which is costly economically and ecologically.

Source for this article:

<http://www.ext.colostate.edu/pubs/livestk/01219.pdf>

Further information may be found at the websites listed below.

Small Pasture Management Guide – Excellent

<http://www.extension.usu.edu/files/agpubs/pasture.pdf>

<http://attra.ncat.org/livestock.html#Grass>

Soil Sampling

[www.ext.colostate.edu/pubs/crops/00500.html](http://www.ext.colostate.edu/pubs/crops/00500.html)

[www.ext.colostate.edu/pubs/crops/00501.html](http://www.ext.colostate.edu/pubs/crops/00501.html)

[www.ext.colostate.edu/pubs/crops/00502.html](http://www.ext.colostate.edu/pubs/crops/00502.html)

Soon pastures will start to green, which means it's time to make a list of what needs to be done to keep your pasture and livestock happy and healthy. The best place to start is the soil. If there is insufficient manure applied to the pasture and grass vigor is not what it has been, then an assessment of N removal rates should be done (see article later in this newsletter). This will allow you to apply the appropriate fertilizer in the correct amount. Fertilizer is one of the many products made from crude oil. The price of fertilizer will follow the price of crude oil, which as of December 31, 2007 had increased in price 57% from the same date last year. It's easy to waste a lot of money applying fertilizer that is not necessary. Like driving down a highway tossing ten-dollar bills out the car window. No one in their right mind would do that. So why would you do the same with your fertilizer purchase?

If you think that other nutrients or salts are a problem, do a soil test. I put this off for years it seemed time consuming, expensive and difficult. I can assure you it is not. All you need is a clean shovel and a plastic or stainless steel container. You will need to dig 5-10 samples (depending on size of area) from the soil depth of the roots of your plants. Place all samples in a plastic bag and mix thoroughly then spread out on paper towels to dry. After the sample is dry put 1.5-2 cups in a bag, seal and send to the CSU Soil Lab. Be sure to read the instructions on soil sampling before you collect your soil sample, they are easy to read and simple to carry out. All the information you need is on the application form, which is available at the CSU Extension office located at the Boulder County Fairgrounds. The cost is \$20-\$30 depending on the tests you order. The results come back in an easy to read table that compares your results with the optimum results. Also included is a sheet of nutrients needed for your pasture and why\*. More information is available at <http://www.extsoilcrop.colostate.edu/SoilLab/soillab.html>

\*There is debate currently on the models used by the CSU for pasture grass nitrogen fertility. This model was developed over 25 years ago and was based on shaky data at the time. Current models suggest that grasses will extract most of the available N from the soil and store it in their tissues. This will show an N deficiency in the soil when sufficient N may be present in the plant for growth and yield goals. Most agronomists now use a nutrient removal method for determining N fertilizer rates and do not perform routine soil analysis for pasture fertility. The method is simple and seeks to quantify pounds of N removed from a grass pasture and replace N removed. See article later in the newsletter for this method.

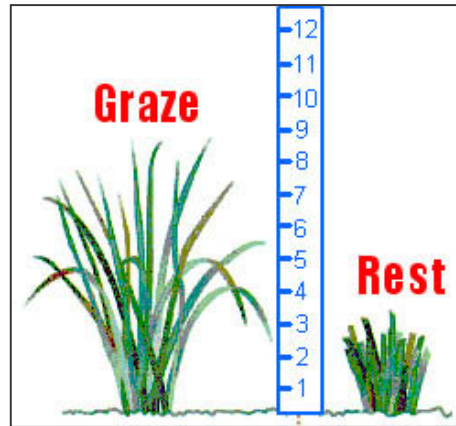
Weeds are another factor to consider. Every fall I walk my pastures making mental notes of what I need to spray in the spring. Every spring I stand in my pasture wondering what I was planning to eradicate and where. This past fall I finally remembered that I can't remember and decided to mark the areas. I used hot pink marking tape, some small garden stakes and marked each area with a flag. In some spots tied a piece of tape to a fence or tree branch. Hopefully in the spring I will remember why neon pink is dotting my fields. Most weeds start to emerge in April and May. Plan now by identifying what weeds you have and methods to control them. CSU Extension has numerous Fact Sheets on

noxious weeds in Boulder County. You will find these on-line at our web site.

[http://www.coopext.colostate.edu/boulder/AG/ag\\_weeds.shtml](http://www.coopext.colostate.edu/boulder/AG/ag_weeds.shtml) These Fact Sheets have pictures of each weed, general plant information and control methods.

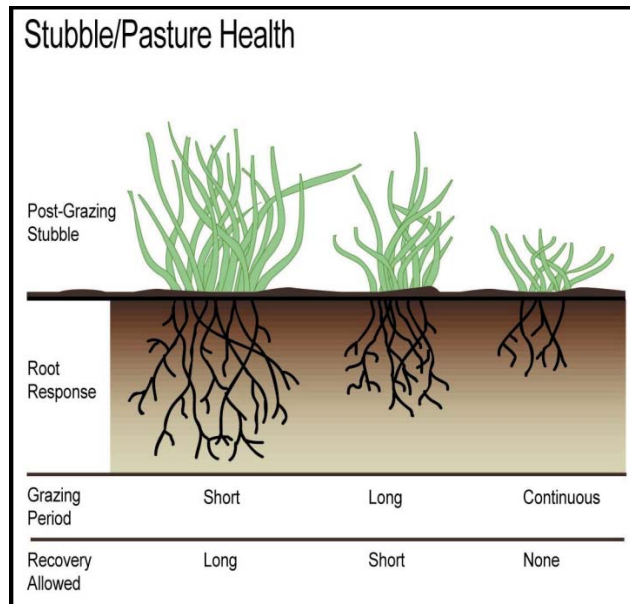
If you need further assistance with weed identification and control plans you have two options. The first option is to call the CSU Ext office at 303-678-6238 and they will connect you to the Small Acre Management hotline. The second option is to bring in a weed sample (be sure to include roots) for identification. The first 2 samples are free then \$3 for every sample after that. Volunteers from the Small Acre Management Program will ID the sample and will also provide information on control methods.

The last issue is grazing and livestock. Before turning any animal out on the pasture be sure that the plants are at least 8" tall. Grazing too early in the season is the most common pasture management mistake and will have a long-term effect on future pasture health. If too much leaf is removed the



plant root structure weakens making it difficult for the plant to recover. The pasture is then vulnerable to weed invasion and erosion leading to a decrease yield. The best way to keep a pasture healthy is to utilize rotational grazing. Once again, something that seems difficult but isn't. More in depth information is available on our web site at

<http://www.coopext.colostate.edu/boulder/AG/smallacreagregrowth.shtml>



Horses, ponies and lush spring pastures can be a recipe for disaster. Spring pasture grasses are high in sugars, especially during periods of rapid growth. Equines that ingest large amounts of young lush green grass are in danger of developing colic and/or laminitis. The equine digestive tract is not set up to process large carbohydrate loads. Any change in their diet needs to be introduced over a 2-week period. This includes grain, alfalfa and hay. To avoid such problems equines should be limited to 30 minutes of grazing per day for the first few days then increase time periods daily for 2 weeks.

**Equines that are over weight or prone to laminitis should not be turned out on spring grass.**

The information above is very basic. I encourage you to spend some time wandering around our web site. You'll be surprised at the amount and wide range of information available and best of all it's free. This spring test your soil, apply the right fertilizer, control grazing and you will be rewarded with a happy pasture and healthy livestock.

## **Determining Nitrogen removal from grass pastures**

by Adrian Card, Extension Agent

This method is recommended for more accurate fertilization of grass pastures. As mentioned previously, grasses will take up much of the available nitrogen (N) in the soil and hold it in their tissues for later use. Soil sampling for N fertility with grasses thus often shows a deficiency of N when sufficient N may be present. By figuring how N has been removed from the system we can then calculate how much to put back for the desired yield goal

Two pieces of data are needed. The first is **pounds of grass removed per acre**. If you are practicing good grazing management (densely stocked grazing cells, periodically harrowed to

scatter manure), then you are likely replacing most of the N the grass needs (although some will be lost in gaseous forms). Feeding before turnout onto pasture will add N to the system. If you are haying fields, determine yield for each cutting by average bale weight x number of bales per acre or use truck scales. (1 ton = 2000 lbs.)

Another method for determining tons of grass removed is the hoop toss. Cut 11 feet of black poly pipe (or other semi-rigid material) and join the ends to form a hoop with a radius of 21 inches. Toss this into a pasture that is ready to be grazed or hayed. Cut all of the grass inside the hoop to 4" above ground (or height of cutter bar) and collect into a bag. Dry in a 200F oven for 48 hours and weigh the dried sample in grams. Multiply weight in grams by 10 to get pounds of grass per acre. (136 grams = 1,360 pounds per acre). An enclosure in a pasture (fenced off from grazing) can provide this data for an entire season of grass growth. Mow the enclosure after the hoop toss to height of surrounding grass.

After determining pounds of grass removed, the second piece of data is **percent of nitrogen in the sample**. This can be derived from a percent crude protein figure. Use lab data from your forage sample or estimate. **Divide CP% by 6.25 to get N%**. Smooth brome varies from 15% CP early grazing to 10% CP at hay harvest. If grass is 12% CP then grass is 1.92% N.

With data of pounds of grass removed per acre and percent nitrogen, simply multiply these numbers to determine N removed. If removal was 1,360 pounds per acre (0.68 tons/ac, 2000 lbs/ton) of 1.92% N, then 1,360 lbs x 0.0192 = 26 pounds of N removed per acre. Fertilizer rates should then replace the 26 lbs of N per acre removed. The following example shows how to replace 26 lbs of N per acre.

<b><u>Table 1 – Typical Crude Protein and Nitrogen percentages of forages</u></b>		
<u>Forage</u>	<u>CP %</u>	<u>N %</u>
Bromegrass – fresh immature	15	2.4
Bromegrass – hay mature	10	1.6
Fescue – fresh immature	15	2.4
Fescue – hay mature	12	1.92
Orchardgrass – fresh immature	18	2.88
Orchardgrass – hay mature	11	1.76
Timothy - fresh immature	11	1.76
Timothy – hay mature	8	1.28
Crested Wheatgrass – fresh immature	11	1.76
Crested Wheatgrass – hay mature	11	1.76
Source: “Sheep production handbook”, American Sheep Industry Association, 1996		

demand and geopolitical instability to keep upward pressure on energy costs early in 2008.

Until we see a drop in crude oil prices I expect there will be no relief for the hay buyer.

\*see Hay Price article in [Fall 2007](#) issue

If using urea (46% N), this is 46 lbs of N in 100 pounds of urea. The math is:

$$\frac{46 \text{ lbs of N}}{100 \text{ lbs of urea}} \times \frac{26 \text{ lbs of N per acre}}{X \text{ lbs of urea}}$$

$$46X = 2600$$

$$X = 56 \text{ lbs urea/ac needed to replace 26 lbs N/ac}$$

### **Oh where oh where have my hay prices gone? By Meg Sitarik, SAM volunteer**

All prices quoted in this article are for good to premium quality small bales of grass hay. The Colorado Hay Report from the Colorado Department of Agriculture reported in September 2007 that in this area the average price was \$5-5.50/bale. The most recent Hay Report, December 27, 2007, lists the same as \$6.25-6.50.

I expect this price will continue to slowly rise over the next few months until first cutting in June. Even then we may only see a minimal drop in price. Crude oil prices\* reached \$100 per barrel on January 3, a 57% increase since this time last year. Market analysts expect rising

### **Plan now for winter annual weed control by Adrian Card, Extension Agent**

In 2007 we saw a major population boom of winter annuals, likely spurred on from the precipitation we received from record snowfall on the plains. Remember all the yellow and purple flowers blooming across the landscape in May? Those were flixweed, tumble mustard, blue mustard, and others. Any of those plants allowed to produce seed will likely be showing up again this spring.

Remember, winter annuals only reproduce from seed and complete their life cycle in June, producing seed and dying. Some winter annual seed will germinate in the late summer and early fall while others will germinate in late winter and early spring. Given this, much of the winter annual weed population is alive and is currently dormant as a seedling.

To check your own property, try to remember where you saw cheatgrass, redstem filaree, the winter annual mustards mentioned above, and other weeds that browned out in June. Or if there is lingering plant residue of these, look for

those areas (granted dead weed idea is not the easiest). These spots may have these winter annual seedlings, less than ½” tall, perhaps off green or reddish-purple in color from winter stress, just waiting for warmer temperatures to initiate growth.

Winter annuals are more problematic than they are noxious. As a pasture manager, you should be concerned that they will drink up early season soil moisture and nutrients that your grasses need. This competition added to less vigorous grass stands, especially if previously stressed from overgrazing and/or drought, is harmful for grasses attempting to reestablish. As winter annuals die, they become a fine fuel for grass fires (especially cheatgrass). Hay producers should seek to remove winter annuals to improve the quality of their hay. For these reasons, plan now to control winter annuals.



Spot spraying weeds

As seedlings, all are vulnerable to mechanical injury. Harrowing early can provide some control, but likely not 100%. Any organic desiccant sprays are also going to damage grasses coming out of dormancy and are only effective at temperatures above 65F.

Synthetic herbicide applications are best done now thru April, depending on the species and product used. Spray options include:

- ❑ Winter annual mustards = Telar, Escort or Weedmaster
- ❑ Redstem filaree = Weedmaster
- ❑ Cheatgrass = Plateau (if all other desirable grasses are dormant, usually Jan – mid-Feb, a low rate of glyphosate will work and not harm desirable grasses)
- ❑ Common mallow = Weedmaster

Start with positive ID of the weeds in question. See online resources, including a link to all of these product labels at:

<http://www.coopext.colostate.edu/boulder/AG/agweeds.shtml>

If plants have flowered, mowing is recommended to reduce weed seed formation, as many can produce viable seeds as they are dying from herbicide injury.

### **Start Biennial and Perennial Weed Control in March by Adrian Card, Extension Agent**

As with winter annuals, start with positive ID of the weeds as control strategies with vary by species and life cycle. Both will begin to initiate growth from storage carbohydrate reserves in their roots sometime in March.

Mechanical controls can begin just after March growth starts and spray controls can begin in April.

Organic control strategies include: preventing seed production, preventing seedlings from establishing, undercutting taproots of biennial species, and exhausting root carbs of established biennials and perennial species. For biennials, undercut with a shovel to sever taproot 6” beneath the surface. Desiccant sprays are non-selective (will damage all vegetation) and are only impactful at temperatures >65F. Treat biennials with desiccant sprays every other week to exhaust root carbs. Any plants with flowers should be cut and bagged and landfilled to prevent seed deposition.

Perennials with taproots must be undercut to 8” to kill. Other strategies listed for biennials are also impactful on perennials. Such non-tillage



strategies make for a slow death for many rhizomatous (branching, connected roots) perennials. Non-tillage organic controls for Canada thistle showed biomass reduction only when treated every other week. After 2 years of this regime, C. thistle was diminished but not eradicated.

Insect biocontrols may suppress some biennial and perennial species but likely will not eradicate them. Grazing mimics mowing and will need to be done frequently to exhaust root carbs. Many small acreage pastures cannot support this frequency of grazing.



Rhizomatous root system of Canada thistle

Chemical controls for biennials include:

- ❑ Diffuse knapweed = Milestone, Tordon, Weedmaster, Curtail, etc.
- ❑ Musk thistle = same
- ❑ Scotch thistle = same
- ❑ Bull thistle = same
- ❑ Teasel = Milestone
- ❑ Chicory = Milestone, Weedmaster, etc.
- ❑ Houndstongue = Weedmaster

Chemical controls for perennials include:

- ❑ Canada thistle = Milestone, Tordon, Weedmaster, Curtail, etc.
- ❑ Field bindweed = Tordon, Weedmaster, etc.
- ❑ Dalmatian Toadflax = Tordon, Plateau, etc.
- ❑ Myrtle spurge = 2,4-D Hardball
- ❑ Curly dock = Milestone, Weedmaster, etc.
- ❑ Hoary Cress = Escort, Plateau, etc.

Links to Factsheets for many of these weeds and to product labels for all of these herbicides are at:

<http://www.coopext.colostate.edu/boulder/AG/agweeds.shtml>



Advanced bindweed mite damage on field bindweed. [Bindweed mites](#) are microscopic, host specific, and very widespread in Boulder County.

## Conservation District News

By Nancy McIntyre, Longmont and Boulder Valley Conservation Districts Manager

### Seedling Tree Sale

The Longmont and Boulder Valley Conservation Districts offer seedling trees at a minimal cost to area landowners. The requirements to purchase these seedlings are that you own at least 2 acres of land and that you may not resell the seedlings

as a living plant. We, in no way, want to compete with the local nurseries. The seedlings are sold in lots of 30 or 50 all of the same species. The 50 bareroot seedlings sell for \$36 for the lot and have a top height of 10-30 inches. The 30 potted seedlings sell for \$48 and have a top height of 12 inches. There are about 40 different varieties available for use as windbreaks, wildlife habitat, visual screens, erosion control and noise barriers. You can even use them for Christmas trees if they are cut down.

If you need further information or would like to get an order form, please contact the Conservation District office at (303) 776-4034 x3.

### Camp Rocky Scholarships

The Longmont and Boulder Valley Conservation Districts offer scholarships to teens aged 14-19 that would like to attend a conservation camp during the summer. The dates this year for Camp Rocky are July 6-12. The camp is held at the Rocky Mountain Camp near Divide Colorado. Camp participants have fun learning about forest management, rangeland science, soil and water conservation and fish & wildlife management. There is also plenty of time for fun and getting to know other young people with the same interests.

Please call the Conservation District Office at (303) 776-4034 x3 for a brochure with information on how to obtain an application for the camp. The cost for the week is \$250.

## **Place your SAM related classified ad or print advertisement here!**

### **Classified Advertising Rates are as follows:**

SAM Volunteer: 20 cents/word

4-H Member/Leader: 20 cents/word

General Public, Individual: 25 cents/word

General Public, Business/Show: 30 cents/ word

### **Print Ad Rates are as follows:**

Quarter Page Ad: \$50.00

Half Page Ad: \$80.00

Full Page Ad: \$100.00

**Email Adrian Card for more details**

[acard@co.boulder.co.us](mailto:acard@co.boulder.co.us)