



Boulder County Small Acreage Management e-Newsletter – Fall 2005

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

From the Extension Agent

Bindweed mites now appear to be widespread throughout Boulder County. If you wonder if these are active on your property refer to the “field bindweed” section on this page for ID, background, and management considerations. <http://www.coopext.colostate.edu/boulder/AG/agweedsspecificweeds.shtml> If the mites have not moved onto your landscape, try scouting for the damage shown in the ID pictures on other sites on the plains. I suggest, however, waiting to transplant them to your property until late spring/early summer.

SAM Volunteer Program

We are now accepting applications for the 2006 Small Acreage Management Volunteer Program training.

For more details, see the brochure on this page: <http://www.coopext.colostate.edu/boulder/AG/smallacreage.shtml>



SAM Email Listserv

If you are receiving this newsletter for the first time and are not subscribed to the 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 99 subscribers to the listserv.

If you have not explored the SAM website, please take some time to check out the online resources available within that website.

Adrian Card

Adrian Card
Agriculture/4-H Extension Agent
SAM Program Coordinator
CSU Cooperative Extension, Boulder County

Manure Happens - Methods for Managing Horse Manure

By Chris Masters, SAM Volunteer

Anyone who spends time around horses has first hand knowledge about the need for manure management. A single horse, averaging 1000 pounds, will produce about 50 pounds of manure a day. To save you from doing the math, that's 9 tons of manure a year.....PER HORSE. You can imagine how that piles up at stables and riding facilities where there are many horses.

Why worry about it? Bacteria grow well in a combination of manure and urine and are destructive to hooves. Parasites live where manure exists, so removing manure breaks the cycle of horses ingesting the eggs of parasites from manure-contaminated ground. Fresh manure is also a breeding ground for flies.

For horse owners who have the necessary acres of pasture, horses can graze full time. This means the manure doesn't have to be collected and can simply be spread with a harrow and left to decompose. This is best done in the spring, just prior to new growth. Harrowing will break up manure piles and also loosen old grasses and leaf debris.

For horse owners and stables that are "land poor" and don't have the needed pasture to graze all horses all the time, horses are usually kept in stalls or runs, making some type of manure management mandatory. In addition, manure in these settings is usually accompanied by the necessary bedding used in stalls. Three to six cubic feet of bedding per week can be added to the amount of manure you're collecting. Daily collection of manure and soiled bedding is important, for the health of the animals and reduction of flies and other pests.



There are some options available for manure management and varying degrees of effort and cost associated with each.

Stockpiling

If you are planning to use the manure on the land, you may wish to stockpile it until you have enough for an application. Or you may stockpile it while you wait for someone to pick it up, such as a business specializing in compost (landscapers, gardeners). Manure piles should be placed at least 150 feet away from surface water, such as creeks, irrigation ditches, wells, and ponds. Encircle the pile with a berm or a ditch to control water runoff. Whether the runoff is from the pile, after a rain, or toward the pile, during flood irrigation or creek flooding, it's important to not contaminate the water. It's recommended that you have a buffer area of grass between any close body of water and the stockpile itself, to further help prevent water contamination. In addition, if rainfall is heavy or frequent, it's wise to cover the pile with a tarp, to prevent runoff from rainwater.

Composting

Composting is the process of turning the organic component of solid manure into a decomposed state, using controlled conditions. The decomposed state can be stored, used or spread on the land without negatively impacting the environment. There are many methods of composting, each requiring time and money. How much depends on the type of composting you choose. The end result of composting is a product that is 40 to 65% lighter in weight and smaller in volume than the stockpile you start with. You need microbes to drive the composting process and the right mix of oxygen, temperature and moisture for the microbes to do their work. You may also need to add sources of nitrogen to ensure the right balance with the carbon, to facilitate the composting process. What do you do with manure after it's composted? It can be used to increase the amount of organic materials in the soil of

gardens or sandy agricultural soils. This will increase the soil's ability to hold water and nutrients. It can also be used as potting soil and plant nurseries may be interested in obtaining it from you.

If you are interested in composting, there's a lot to learn about the different methods, to determine which is right for you.

Vermicomposting uses worms. Windrowing is another method and can be further defined by either dynamic or static methods of windrowing. Check with your local Cooperative Extension Office to get specific information.

Daily Land Application

The most direct management, if you are able, might be to remove the manure from the animals' area and spread it while fresh on the cropland. You can apply the manure directly or apply the composted material. You'll want to apply the manure uniformly and track how much was applied and when. You might want to analyze the manure or compost periodically and use that information in calculating future land fertilization needs. In particular, manure tends to have high levels of salts.

When spreading manure on the land, avoid doing it when the land is frozen or saturated with moisture. As well, don't spread manure on land that has erosion problems, as the manure will erode with the soil. Don't spread manure within 150 feet of bodies of water, to avoid contamination. Spread it thinly and harrow it to promote rapid drying. It's ideal to spread fresh manure on land other than that which horses will graze on in the same year the manure is spread. The best time to spread manure on row crops is during tilling in the spring, before planting.

For information on how to calculate manure applications and calibrate a spreader, contact your local Cooperative Extension Office.

If you don't have the capability to manage the manure yourself, try and find someone who can use it, whether you give it away or sell it. Horse manure is a resource worth using. Manage it wisely and reap the benefits.

For more information and links to some Factsheets below visit:

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

References

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Card, A.B., Anderson J.V., Davis, J.G.; Vermicomposting Horse Manure, Colorado State University Cooperative Extension, no. 1.224; 7/2002.

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Card, A.B., Davis, J.G.; Composting Horse Manure in Static Windrows: Passively Aerated Windrow Method, Colorado State University Cooperative Extension, no. 1.226; 7/2002.

Whiting, D., Wilson, C., Card, A.; Using Manure in the Home Garden, Colorado State University Cooperative Extension, no. 7.742; 3/2005.

Ott, E.A., Johnson, E.L., Nordstedt; Composting Horse Manure, University of Florida Institute of Food and Agricultural Sciences Extension, 3/2000.

Bary, A., Cogger, C., Sullivan, D.; Fertilizing with Manure, Washington State University Extension, Pacific Northwest Extension, 7.2004.

Hill, C.; Manure Management, www.horsekeeping.com; 1998.

Soil Test Description

By Sharon Bokan, SAM Volunteer

Once you've had your soil tested and you get the soil test report what does it all mean.

Lab No. and file number - identify the sample. Unless you have sent in more than one sample there should only be one.

PH – is a measure of the acidity or alkalinity. It ranges from 0 to 14 with neutral being 7. Values from 0 to 7 are acidic while 7 to 14 are alkaline. Colorado soils tend to be alkaline and are in the range of 7 to 8. A reading above 8.5 indicates excess sodium, which may be a problem in growing some crops.

Salts – is a measurement of the soluble salts in the soil. Crops vary in their tolerance to salts. Depending on the crop you want to grow you may have to consider planting an alternate crop.

Value	Interpretation
0.2	Satisfactory for crops
2.4	Affects "sensitive" crops
4.8	High for most crops
8+	Very high for most crops

Lime (CaCO₃) – is reported as low (0-1%), medium (1-2%) or high (above 2%) and is a measure of percent free lime. Lime percentage becomes an important number when using sulfur to add as an amendment for sodium reclamation.

Texture - the type of soil. The different types are sand, clay, silt, loam and the various combinations. Most soils in Boulder County plains area are clay loams but there are areas of sandy loams.

SAR (sodium absorption ratio) and gypsum – These tests are usually run in conjunction with

each other and are not normally run and evaluate the soils sodium content. Greater than 15 indicates excess sodium in the soil. If sufficient gypsum is present sodium affected soils can be treated without amending with additional gypsum or sulfur.

Organic matter – the percent of organic matter (decaying vegetation, manure, etc.) Organic matter contains 95% of all soil the nitrogen. For each 1% organic matter in the soil, approximately 30 pounds of nitrogen per acre is released per year. This is important to remember when calculating a nitrogen budget and fertilizer applications

Nitrate nitrogen - nitrate nitrogen is the most available form of nitrogen to plants. To calculate the nitrogen amount per acre multiple the test result (N ppm) by 3.6.

Phosphorus, potassium, zinc, iron, manganese and copper – the test indicates the total percentage of these elements in the soil that are readily extracted during the test. See table below for the recommended percentages. If percentages are adequate, no fertilization is recommended.

The field information provides your information of how large your field is, how you irrigate it and what crops have been grown on it and what crop you are planning to grow on it, and what yield you would like. The recommended fertilizer amount is based on what crop you want to grow and the yield you want from the crop. This recommendation is strictly based on the nitrogen reported in the soil. If you plan to add organic matter or to till under the current crop to plant a different crop, the recommended nitrogen addition can be reduced by the organic matter nitrogen amount. To determine this amount, you need to perform a nitrogen budget. You can reduce fertilizer costs and not lose the additional nitrogen either to the air or as nitrates to ground water.

Nitrogen Budget

By Sharon Bokan, SAM Volunteer

Nitrogen budgeting saves money on fertilizer applications, clarifies how much N is needed to meet consumptive use by crops, and prevents negative environmental impacts.

Nitrogen crop requirements are expressed in terms of pounds of pure N per acre of land. Since N fertilizers do not contain pure N, this budget process allows you to convert various sources of N in your agroecosystem to pounds of pure N.

To perform a nitrogen budget you will need a current soil test report, manure/compost test report and application rate, water test result, previous legume crop information (if applicable)

Multiply percent of organic matter by 30 to get pounds of nitrogen per acre from organic matter _____N

Multiply ppm of nitrogen by 36 to get pounds of nitrogen per acre from soil _____N

Manure (use these only if tilled into soil, no good figures now for release rates of surfaced applied manure).

If tested multiply total nitrogen by 50% (1st year only) by tons of dry manure _____N
Or

If not tested multiply tons of manure by 10 (average from various species) _____N

Multiply ppm of water nitrogen by 2.7 to get nitrogen available per acre-foot of water _____N

If alfalfa was previously grown on the property and is tilled under, estimate the stand percentage
>80% 100 – 140 pound nitrogen per acre
60-80 60-100 pounds nitrogen per acre
0-60 0-60 pounds nitrogen per acre _____N

Other legume crop 30 pound per acre, Multiply acres by 30 _____N

Add up the total of each source of N in the system and deduct this from the N required for the desired crop yield. Total _____N

Here's an example:

Irrigated Pasture Grass requires 185 pounds of N per acre – figure 90 lbs N/ac for dryland (from CSU Factsheet: <http://www.ext.colostate.edu/pubs/crops/00537.pdf>)

Soil/ Water tests show you have:

1.5% organic matter
- 1.5 x 30 = 45 pounds of N

Residual soil N is 10 ppm
- 10 x 36 = 36 pounds of N

Water has 10 ppm N
- 10 x 2.7 = 27 pounds of N
+ _____

108 pounds available

185 lbs. N required – 108 lbs. N avail. =

77 lbs. N per acre needed

****See how this can save you \$\$\$!!!!**

[CSU hopes to conduct research in the near future to answer the question about N release rates from surface applied manure or compost.]

For more on managing nitrogen fertility see:

<http://www.ext.colostate.edu/pubs/crops/xcm172.pdf>

Russian Olive Trees – Environmental Friends or Foes? By Chris Masters, SAM Volunteer

What is the Russian olive tree?

The Russian olive tree is no relation to the edible Olive tree of the Mediterranean. It's a large, perennial deciduous shrub or tree. The Russian olive tree was introduced in the late 1800's to the western and central regions of the United States, but can be found throughout North America. In Colorado, the tree grows below 6500 to 7000 feet elevation. It's often found in floodplains, hedgerows, grasslands, along rivers and irrigation ditches. Although it averages closer to 20 feet, it can grow to between 25 and 50 feet in height. It flowers from May to June and produces an edible berry-like fruit from August to October. The lifespan of this tree is approximately 50 years.

Why is the tree so popular?

The Russian olive is very hardy, one of the reasons it was selected for revegetation of disturbed areas. The tree is very drought tolerant and is able to thrive without much water. It can adapt to growing in a variety of soil types, from sand to heavy clay. It can survive extreme temperatures, ranging from a cold minus 50 degrees to a hot 115 degrees Fahrenheit. It grows in sun or in the shade of other trees and shrubs. Its silvery green foliage is attractive and dense, with a sprawling shape, making it good for hedges. The tree's fruit is food for some birds and mammals and its thick branching growth provides nesting sites.

Then what's the fuss about?

The Russian olive is now listed as a noxious weed in Colorado, New Mexico, and Utah. The states of California, Nebraska, Wisconsin and Wyoming list it as an invasive weed. Because the tree is so hardy, it can become a menace to native species, such as the cottonwood and willow tree of Colorado. The Russian olive

trees crowd out other trees and shrubs and provide dense shade that blocks sunlight needed for other trees and plants. As it grows, the tree adds the nutrient nitrogen to the soil. Since most native Colorado plants have evolved to be able to grow in nitrogen poor soils, the addition of nitrogen supports growth of weeds and other non-native plants, which further crowds out native plants. Wildlife is displaced by the loss of natural habitats.

The trees produce seeds after the 4th or 5th year of growth. These seeds, eaten by birds feasting on the fruit of the tree, are scattered quickly and are very resilient. The trees spread quickly, growing up to 6 feet in a single year and establish an extensive root system, making them difficult to remove.

Why is the tree still being planted?

The Russian olive tree has been banned from state nurseries and should no longer be available as an option for planting. It remains popular with those who are looking for hardy trees and who don't understand the threat of this tree to the native environment.

How do I get rid of them?

There are currently no biological controls for use on Russian olive trees. This tree is difficult to destroy. Since the tree produces root crown shoots, called "suckers", it isn't enough to simply cut them down. To eliminate the trees it is necessary to either remove the stump or combine stump burning with an application of herbicide to prevent possible re-sprouting of the tree. The most effective way of eliminating the trees may be to combine mowing the shoots with spraying. Foliar spraying has also been successful. During the growing season, apply glyphosate at label strength. Some herbicides are labeled for Russian olive control. Stumps should be cut as close to the ground as possible.

What else can I do?

If you have Russian olive trees, Kerri Badertscher, the Horticulture Agent in Boulder County for the Colorado State University Cooperative Extension Office, has a plan. She is currently gathering information on tree locations in support of a grant request. If you are interested in removing the trees, email the following information to: CSUResearch@co.boulder.co.us

- Your name
- Your physical address
- Your phone number
- Your email address
- The size and number of trees on your property:
 - How many with a trunk diameter less than 2 inches
 - How many with a trunk diameter between 2 and 4 inches
 - How many with a trunk diameter between 4 and 6 inches
 - How many with a trunk diameter over 6 inches

Be as accurate as possible with your tree count, especially with the larger trees.

What other choices do I have to replace my Russian olive trees?

- There are other trees that have qualities similar to those of the Russian olive. There are trees that have the same ornamental look and trees that are drought tolerant. Many also bear fruit, to attract birds. The Silver Buffaloberry tree is almost identical in looks to the Russian olive tree, but is a tree native to Western Colorado. It is tolerant of cold temperatures and drought tolerant.
- Autumn olive is a shrub to small tree that has silver leaves, fragrant flowers and fruits much like the Russian olive.
- Salt trees are shrubs that have gray-green leaves and lavender flowers. They tolerate poor or salty soils.
- Seabuckthorn is a small tree that tolerates poor or salty soils.

- The Russet Buffaloberry, a tree native to Colorado, has leaves that are silver on the underside. This tree is not tolerant of drought and prefers partial shade.
- Silverberry has silver leaves, fragrant flowers and fruits like the Russian olive. This shrub suckers extensively and may require management of the spread.

References:

Non-native Trees Invading the Southern Rockies, Weir, Stuart, 1998.

Introduced Species Summary Project Russian Olive (*Elaeagnus angustifolia* L) – Columbia University.

http://www.columbia.edu/itc/cerc/danoff-burg/invasion/bio/inv_spp_summ

<http://www.northern.edu/natsource/TREESA1/Russia1.htm>

Russian Olive;

http://www.usgs.nau.edu/SWEPIC/factsheets/ela_nsf_info.pdf

1750 Russian-olive alternatives ;

<http://www.ext.colostate.edu/ptlk/1750.html>

Elaeagnus angustifolia;

<http://ucce.ucdavis.edu/datastore/detailreport.cfm?usernumber=46&surveynumber=182>

Russian Olive (*Elaeagnus angustifolia*); Bennett, Rob;

<http://www.cnr.uidaho.edu/range454/2003%20Pet%20weeds/Russain%20olive.html>

Organic Controls for Canada thistle By Adrian Card

Boulder County Cooperative Extension has teamed up with CU Boulder and Boulder County Parks and Open Space to conduct on-farm research for Canada thistle comparing control strategies approved for certified organic use.

Adrian Card, Extension Agent with CSU Cooperative Extension in Boulder County, initiated this research fall 2004 after discussions with organic farmers in Boulder County. Many indicated a need for improved control measures for Canada thistle on their farms. Ewell Culbertson, Pachamama Farm near Hygiene, offered a section of his field, containing a high population of *C. thistle*.

Winter of 2005 Adrian contacted Tim Seastedt, Professor in the Department of Ecology and Evolution Biology. Dr. Seastedt conducts biological weed control research in Boulder County. He asked Tim if he might recommend a student to assist with the *C. thistle* research. Tim suggested an undergraduate student he advises, Thomas Saielli.

Tom has conducted the majority of the 2005 research treatments and data collection of pre- and post-treatment biomass percent with the initial guidance of Adrian, Tim Seastedt, and Boulder County Parks and Open Space Weed Coordinator, Tim D'Amato.

The treatments have used several commercially available, organically approved liquid herbicides. Burnout II and Matran 2 are clove oil based and Deadeye and AllDown are acetic acid (vinegar) based herbicides.

Other spray treatments were made by diluting 30% acetic acid (kitchen vinegar is 5%) to 10%, 15%, and 20% tank mixes with the addition of a yucca based surfactant to increase spray adhesion, dispersion, and penetration of the *C. thistle* leaf cuticle.

The remaining treatments utilized hoeing, hand pulling, and flame weeding.

Working with three replicated plots, these 10 treatments were done every other week in one replication, every month in the next replication, and every other month in the last replication (30

plots total). Research design was intended to find the most effective treatment and frequency of application for organic farmers and not for data for statistical use.

It should be noted that these sprays merely burn down the above ground vegetation. They do not translocate into the plant and damage roots.

Research findings will be available by November 2005. Contact Adrian Card at acard@co.boulder.co.us



Left to right: Adrian Card, Tim D'Amato, Thomas Saielli – May 15, 2005 – inspecting plots and discussing data collection



Plot immediately after treatment with Burnout II on July 14, 2005, treated every other week since May 10, 2005. Notice untreated growth of Canada thistle in background as comparable control.

**B List Weed Profile:
Canada thistle**
By Sharon Bokan, SAM volunteer

**The Colorado Noxious Weed Act of 2004 will require private and public land owners to prevent the spread of all weedy species on the B list.*

Canada thistle (Cirsium arvense)

Canada thistle was introduced to Canada in the late 1700's as a crop seed contaminant from southeastern Eurasia. It spreads by both seed and a very extensive root system. Stems can reach 4 feet tall with ridged branches and oblong or lance shaped, spiny irregularly lobed leaves. One unique feature of Canada thistle is that the plants are unisexual (separate male and female plants). Male plants still continue to grow through the root system. Flowers are purple (sometimes white) and 0.5 to 0.75 inches wide and no spines.

Control – Plowing plants only serves to break up and spread roots. Mowing in combination with herbicide application is most effective. Herbicides are Tordon, Transline, Curtail (in fall), Redeem, Telar, dicamba, 2,4-D
<http://www.ext.colostate.edu/pubs/natres/03108.pdf>

Eurasian Watermilfoil

Eurasian watermilfoil is native to Europe and Asia. It is a submersed evergreen perennial. Roots are submersed 1 – 5 feet deep and they tolerate moderate salinity. EWMF can quickly take over lakes, rivers, irrigation canals, farm ponds and other watery habitats. Boulder County is one of the few current locations in Colorado. Control is problematic.
http://www.coopext.colostate.edu/boulder/AG/Eurasian_watermilfoil_8x10_FINAL_Tim.pdf

Become a Colorado Master Gardener
By Carol O'Meara

The Colorado Master Gardener program of Boulder County is currently taking applications for the Spring Master Gardener class.

If you would like to play an active role in the education of gardeners in our community, join the Colorado Master Gardener team! Our volunteers help the community by answering questions on garden care and provide education by teaching classes, writing news articles, working with special audiences, and maintaining demonstration sites. Our program is innovative and flexible in its outreach and works to match volunteer skills and schedules. Each year, Colorado Master Gardeners in our counties help over 8,000 people make the right choices for their garden care.

You could be a part of this dynamic team! If you are interested in gaining knowledge and helping others, the Colorado Master Gardener program is for you. Classes run January through March and will be held in Boulder every Wednesday, 9:00 a.m. to 4:00 p.m. Please contact the Colorado State University Cooperative Extension Office in Boulder County at 303-678-6238 to receive an application.

*The Colorado Master Gardener program-
How do you want to grow?*

<http://www.bcmg.colostate.edu/>



Fall Grazing Management Considerations

By Adrian Card

The vigor of your pasture for next season (2006) is being created now. Before pasture grasses become dormant they are moving carbs from photosynthesis in the leaves (grass blades) into the crown and roots of the plant. Without sufficient leaf surface area (if grazed below 4"), grasses go dormant without enough fuel (carbs) to initiate strong growth in the spring, reducing forage biomass production.

Some of the late summer/early fall energy is put into bud formation. Similar to woody perennial species (trees, grapes, etc.), grasses establish all of the potential for next season's vegetative growth before they go dormant. If grasses are stressed from drought, trampling, overgrazing, etc. during bud formation, fewer buds will be formed, also reducing forage biomass production for the next grazing season.

Critical periods for carbohydrate storage and bud formation include the months of September and October. Prevent access to pasture until grasses are observed to completely brown-out, usually after several hard freezes. Dormant grazing has little impact on grass health, unless trampling becomes severe. Trampling will damage/kill grass crowns and buds.

Conversely, plan to remove animals from pasture when cool season grasses initiate growth in late winter/early spring. Grasses will use root and crown reserves (not new photosynthetic carbs.) until they have 4-5 leaves (about 6-8" tall). Grazing during this regrowth period reduces overall forage production. When grasses send out new growth in March/April, prevent access to pasture until grasses have reached at minimum average height of 6-8" tall.

See for more info:

<http://www.ext.colostate.edu/pubs/natres/06108.pdf>

Dormant Seeding in November

By Adrian Card

Plan to reseed non-irrigated/dryland pasture areas when daily average soil temperatures fall below 40F (measured in top 1" of soil).

Seed is preferably drilled (broadcast as a second choice) in November and lies dormant in the soil until spring when rising soil temperatures and moisture initiate seed germination. Spring precipitation and cool temperatures are ideal for cool season grass establishment on dryland pastures.

See "Reseeding" on this page for more info:

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

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
***all ads will be printed in black & white, no exceptions

Email Adrian Card for more details

acard@co.boulder.co.us

