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The Spreading of Weeds

By Kara Harders, CSU Extension/NRCS

Calling a plant a weed does not mean that it is undesirable in every situation. However, in Colorado, a noxious weed is a plant that came from another part of the world and therefore, is not controlled naturally by the insects and diseases that evolved to keep it in check. Noxious weeds tend to grow out of control and are non-native. Sometimes they spread in new and unexpected ways. Since seeds generally cannot cross an ocean on their own, human intervention can be blamed for most (if not all) of the non-native weeds in the US.

A common method of introduction is "escaped ornamentals" in which plants were brought over from other continents and intentionally planted in gardens because of their attractiveness, edibility, or other properties.

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Colorado Sustainable Small Acreage News is published and edited by Jennifer Cook, Small Acreage Management Coordinator, NRCS/CSU Extension, 57 West Bromley Lane, Brighton, CO 80601 720-634-3927 jennifer.cook@colostate.edu Please direct all inquiries regarding this publication to Jennifer Cook.

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Two examples of escaped ornamentals are <u>Bouncingbet (Saponaria officinalis</u>), which was introduced from Europe as a garden ornamental, and <u>Dalmatian toadflax (Linaria dalmatica</u>), which in addition to its attractiveness, has been used to make dyes.

Escaped ornamentals are still escaping because nurseries and garden shops continue to sell plants that have the potential to escape and multiply. Double



Bouncingbet

check that the plants you buy are native or are not considered a weed in your area.

Another potential weed source is wildflower seed mixes. Nationwide chain nurseries and generic seed mixes are more likely to include problem plants than locally produced mixes because they were developed for an entire region or country instead of considering what plants are a risk here in Colorado.

A more natural method of spreading weeds is by animal. Many weeds, such as <u>Hound-</u> <u>stongue (*Cynoglossum officianale*)</u>, have developed seeds that naturally get tangled and caught up in animal hair. Once the animal sheds the hair or breaks the seed casing, the seeds could be miles away from where they were picked up! This is an issue with wild animals such as bears and deer, but it also happens when a person moves their livestock from pasture to pasture.

Animals can also transport seeds by eating them and depositing them in a new area via their manure. Some seeds benefit from some scarification (the breakdown of the outer casing), and when they do germinate



Dalmation toadflax

they will be "planted" in a manure pile!

Finally, the transport of hay is a common practice, especially in drought years, when pastures may not have grown enough forage to feed the livestock which depend on it. In years with widespread drought, hay can be trucked hundreds of miles, increasing the spread of weed seeds exponentially.

There are some things you can do to reduce the spread of weeds by animals:

- Try to eradicate the weeds on your property and in your pasture, or at least keep them from going to seed.
- Avoid getting hay from distant places. Or check that the hay is free of weeds. Certified weedfree hay is regulated, but only for certain weeds, do your homework and make sure other weeds aren't in the hay.
- Brush animals or trim the burrs out of their hair before moving them.
- Confine animals for a couple days when they arrive at a new property, this way the seeds in their droppings will (hopefully) only contaminate one area. Continued on page 3

Spreading of Weeds from page 2



Houndstongue seeds stick to animal hair, socks, and fabric.

Humans contribute to the spread of weeds in many ways as well, including the undercarriage of vehicles, tread of shoes, and importing of soil/mulch.

Some weeds have benefited again and again in numerous ways from human transport, one example is Field bindweed (Convolvulus arvensis). First mentioned by a Greek medical herbalist in the 100's (yes, at least 1918 years ago), bindweed has been affecting human agriculture for centuries and is presently considered one of the worst weeds. Bindweed seeds most likely arrived in the US as contaminant in farm and garden seeds. Also known as "wild morning glory" it has been planted ornamentally as groundcover or in hanging baskets. An Oregon settler even tried to use the weed as a cover crop in his orchard. The weed was first noted in Virginia in 1739 and by the 1880's most of the states west of the Mississippi river were infested. Construction of the railroads and travel from the East to the West surely contributed to the spread, however, a larger catalyst was the import of seed every time immigrants settled in a new area.

Be mindful in your daily activities, especially when you are outdoors. With so many ways to spread weeds, it is easy to do better. Think through how you handle some of the situations that spread weeds and try to help be the solution to the spread of weeds!



Houndstongue



Field bindweed

Pasture Track System

By Heather McWilliams, small acreage landowner

Green grass is here, but how do we keep our horses from overgrazing every blade in the first month and turning our property into a dirt lot? There is hope! A few years ago I read an article about a Texas A & M military reenactment group who were using a track system at their five acre base to keep their horses fit for their weekend duties.

Forward to a couple years ago when we moved to our new property. It was a blank slate with no fencing or any horse amenities. We requested an evaluation from Colorado State University Extension Agent Jennifer Cook, who is a grasses and grazing specialist, to come over to look at the natural state of our property and to advise us on how to best steward and preserve our land while the horses also enjoyed the property. One of her suggestions was a track system.

There are certainly exceptions, but in general, the arid Colorado climate flora cannot sustain continuous grazing. So how do we keep the horses happy, healthy and living the way they were designed to live which is walking and grazing throughout the day? The track system! The principle behind the track system is to sacrifice smaller areas in order to save larger areas while keeping the horses moving and grazing.

The track system can work on most any size of property. In our case, we designated one pen with the water and shelter that the horses have access to all day, and we shut them in there at night for our own peace of mind and so we are more likely to hear them if anything is amiss. The back gate from the pen opens to the track, which is a 12' wide thoroughfare that makes a circle perimeter around about 6 acres. We also created two other wide areas along the track for feeding hay. The recommended track width is 6' to 12' wide. The narrower width will keep them moving more, but wider will provide more escape routes from dominant horses. We have three horses on our track and the 12' width seems to give horses that know each other plenty of room to negotiate.

In the morning, we put hay out in the two larger areas and open the gate to the track. The horses spend their day walking the track to the hay and coming back to the water. There is a little grass that comes up on the track, but the track and the pen are essentially sacrifice areas where the traffic is too heavy to grow much vegetation.



Layout diagram of our track system.

We have divided the area in the middle of the track into three pastures that we use to rotate the horses through for an hour or two each day. That time decreases or may even cease if the grass heights get too low, but they still have the track to keep them walking and busy.

Ideally, we would have slow feed hay nets around larger hay bales in the feeding areas, but that does not work where we are with the elk and deer.

We have noticed an increased level in the fitness of **Continued on page 5**

Pasture Track System from page 4

the horses and are amazed at how they walk the track most of the day, sometimes "doing the loop" at a gallop just for fun. It is a great way to keep your horses fit if you don't get to ride as much as you would like. You will find they move a lot more then they do in an open pasture.

Materials are flexible. We have seen more permanent tracks or just electric fencing. We chose cord electric fencing and T-Posts with caps over the majority of the track to try it out. We picked cord over tape because it does not catch the wind and snow like the tape. Starting with the "temporary" fencing gives you the flexibility to change the width and maybe the route.

Benefits of a track system:

- Sacrifice small areas to save large areas for grazing
- Ease of grazing management
- More stimulating environment for horses
- Prevents boredom and vices
- Preserves the beauty of your property
- Keeps horses moving all day
- Mirrors the natural environment by horses walking, eating smaller amounts at a time
- Keeps horses fit
- The track system can work in all different climates and for different purposes. If the majority of your land is used for arenas or barns, the track system can be a great way to use those smaller spaces and corridors for exercise and turnouts. We have utilized our track system for over two years now and it has been revolutionary for our horse keeping and land management.

For more information: <u>http://www.all-natural-horse</u> -care.com/paddock-paradise.html Paddock Paradise – <u>A Guide to Natural Horse Board-</u> ing by Jaime Jackson

Air Quality and Agriculture

By Jennifer Cook, CSU Extension/USDA-NRCS

While agriculture is certainly not the only contributor to air pollution, some agricultural practices cause emissions (including odors, particulate matter, and greenhouse gasses) that can impact local and global air quality. Air quality is the condition of air expressed in terms of concentration of pollutants relative to established baseline values. Most air pollutants are related to human health and the environment. However, the human health impacts by these pollutants are the main reason we have air quality regulations.

Greenhouse gasses from agriculture include carbon dioxide, nitrous oxides, and methane. Other air pollutants produced from agriculture are particulate matter, odors, and ozone. This article will review air impacts from agriculture and offer suggestions on how we can improve air quality on small acreages.

Land managers play an important role in reducing atmospheric carbon dioxide, a greenhouses gas. Carbon sequestration is the process by which atmospheric carbon dioxide is taken up by grasses, trees, and plants through photosynthesis, and stored as carbon in soils, roots, branches, and foliage. Carbon sequestration offsets carbon dioxide emissions from sources such as burning fossil fuels and forest fires. **Continued on page 6**



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Tilling, burning, and tearing up the soil releases all this stored carbon and increases particulate matter (inhalable particles such as dust and smoke) into the air.

Small acreage landowners can improve air quality through carbon sequestration. Practices include:

- Maintaining healthy perennial pastures.
- Maintaining healthy forests to reduce wildfire.
- Utilizing minimum
 or no-till cropping systems, stop tilling land.

Livestock impact air quality through methane (a greenhouse gas), odors, particulate matter, and ozone. The digestive processes of ruminants (such as cattle, sheep, goats, and yaks) and livestock manure contribute a quarter of the human-made methane (a greenhouse gas) into the atmosphere.

Livestock/horse manure, chicken manure, and nitrogen fertilizers release ammonia into the atmosphere, which when mixed with other emissions can cause particulate pollution. However, an increase in ammonia does not equally correlate to an increase in particulates, as this complex relationship depends on meteorology and the concentrations of other particulate precursors (such as sulfate and nitric acid -commonly produced by vehicles) in the air.

Small acreage management practices that will reduce methane, odors, nitrous oxide, ammonia, and particulate matter in the air:

- Windbreaks, or dense rows of trees and shrubs, can prevent particulate pollution by slowing winds thus reducing transport of gases, odors, and dust.
- Regularly remove excess accumulated manure from open pens and corrals.
- <u>Compost stored manure</u> to reduce odors and ammonia emissions. A cover over manure composting area can also help to reduce gas transmission. Covers may be tarps, geotextile fabric, chopped straw, barley or corn stalks, plastic, and wood.

Carbon sequestration - process by which atmospheric carbon dioxide is taken up by grasses, trees, and plants through photosynthesis and stored as carbon in soils, roots, branches, and foliage.

Particulate matter – extremely small airborne particles and liquid droplets (aerosols), linked to respiratory disease in humans and can impact water quality and visibility. Sources of particle pollution include construction sites, unpaved roads, and fires. Many particles form as complex chemical reactions from pollutants emitted from power plants, industries, and automobiles.

Greenhouse gases – a range of compounds that affect the amount of solar radiation that is maintained in the Earth's atmosphere. Agriculturerelated gases include methane, nitrous oxide, and carbon dioxide.

Climate Change – Any long-term significant change in the average climate of a region. Climate change is inseparably linked to air quality and energy effects.



- ⇒ If a manure pile becomes anaerobic (high moisture, low aeration) odor, methane, nitrous oxide and sulfur dioxide levels increase. Turn the pile often to increase aeration.
- ⇒ If the C:N (carbon to nitrogen) ratio is not high enough, ammonia can increase. Add more carbon such as straw or leaves to increase C:N ratio.
- \Rightarrow Low moisture conditions can lead to increased particulate pollution.
- If spreading manure is desired, compost manure first. Composted manure is stable and will not pose significant air emission risk when land applied.
- Spread nitrogen fertilizers at the rate that crops Continued on page 7

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 will use, and at the right time for crops to utilize the nitrogen (usually spring is the best, under cool, low wind conditions). Unused nitrogen pollutes air and water. Use a reputable <u>lab to</u> <u>test soil and composted manure</u> to determine appropriate rates when fertilizing land.

Another action for consideration by small acreage landowners is use of clean energy technologies. Clean energy includes both energy efficiency and renewable energy sources such as solar, wind, and hydropower. Some clean energy measures such as using a more efficient heating system could reduce emissions from your land. Other measures such as installing solar panels will reduce greenhouse gas emissions from nearby power plants. <u>Home energy</u> <u>audits</u>, farm energy audits, and <u>renewable energy</u> <u>assessments</u> can help you decide if clean energy is right for you.

Sources:

<u>Air Quality and Animal Agriculture</u>, Penn State fact sheet

Research Verifies Health Costs of Air Pollution from Agriculture, NASA,

Air Quality and Atmospheric Change, USDA-NRCS

Lavender Production and Management

Lavender is a small, aromatic shrub used in the fragrance, specialty-food, and alternative-medicine industries, and it can be a profitable addition to small and medium agriculture operations. This recently updated publication, <u>Lavender Production,</u> <u>Marketing, and Agritourism</u>, discusses geographic and climatic considerations for lavender, soil preparation and cultivation techniques, lavender propagation, and field production.

It also addresses marketing options for lavender, including essential oils, essential-oil distillation, direct marketing of a variety of lavender products, and information and resources about lavender agritourism and value-added lavender products. Download the publication for FREE at <u>ATTRA.</u>



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More to the Business than Harvesting and Selling

By Kara Harders, CSU Extension/NRCS

In many ways small and backyard farmers are making wonderful changes to our food industry - more local products, better understanding of where food comes from, a higher appreciation for "ugly veggies." However it is important to remember that food safety is a key principal for all producers, large and small.

It would be hard to have missed the December 2018 *E. Coli* outbreak in Romaine lettuce. Even though evidence indicated romaine lettuce from the Central Coastal growing regions of northern and central California was the culprit, all Romaine lettuce, nationwide, was taken off shelves.

While a smaller producer likely wouldn't have the large market that made this a nationwide issue, food safety is still important. The truth is, there is a possibility of contamination of germs and bacteria that cause food borne illness (FBI), at nearly every step of the way. Luckily, Colorado has a ton of resources to help producers grow and market a safe product for their consumers.

An excellent resource to get started on is the <u>Colorado Farm to Market website</u>—

<u>cofarmtomarket.com</u>. The site was developed to familiarize Colorado food producers and food product manufacturers with federal, state and local food licensing regulations and to help ensure a safe path from farm to fork. With a wide range of topics including raw agricultural products, value added products, prepared foods, regulations, and licensing, this page is a great starting point to discover what rules and best practices apply to you and your specific products.

Another resource is the <u>Nutrition, Food Safety, and</u> <u>Health page for CSU Extension</u>—<u>http://</u> <u>extension.colostate.edu/topic-areas/nutrition-food</u> <u>-safety-health/</u>. In addition to contact information



and fact sheets, you can also see their various newsletters focusing on topics such as food safety or food nutrition.

Becoming aware of the ways FBI travel and contaminate food can help you make better processing choices and habits. Some good agricultural practices (GAPs) are common sense, such as washing your hands and wearing gloves, while others are a little less obvious, such as testing the water you use for its microbial water quality. Other GAP practices include: Signage (in multiple languages), established farm policies, easy access bathrooms and hand washing facilities, first aid supplies, designated smoking and eating areas, and worker/volunteer trainings.

Lastly, make an effort to determine if your business is covered under the Produce Safety Rule. This is a newer rule under the Food Safety Modernization Act (FSMA) which establishes science-based minimum standards for the safe growing, harvesting, packing, and holding of fruits and vegetables grown for human consumption. Head to this site to learn more: <u>http://www.coproducesafety.org/</u>.

It can be easy to consider yourself exempt from food safety rules due to small size, but we believe that every bit counts! Now that we are in the offseason for many farms, consider what you can do on your property to make food production/ consumption safer and cleaner, even if it is just washing the veggies you buy for your own family.

High Altitude Baking

Jeff Dodge, CSU

CSU is the birthplace of high-altitude cooking adjustments, thanks to pioneering efforts by Inga Allison and Charles Lory in the first half of the 20th century. "Inga would drive to a high-elevation location, such as the Fall River Road shelter house near Estes Park, to do cooking experiments," says CSU Extension Specialist Elisa Shackelton. "With the help of then-CSU Physics Professor Charles Lory, the high-altitude cooking laboratory was conceptualized and built in the Guggenheim Building in 1927. It consisted of a huge steel cylinder room with altitude controls, enabling Inga and her staff to work inside to test recipes for altitude conditions ranging from sea level to 12,000 feet."

Shackelton recommends making recipe adjustments one at a time, to isolate the effects that each change has. And take careful notes.

The ingredients, their amounts and proportions, even the way they are put together, can impact the final result. We have an added challenge in Colora-



The Fall River Road shelter house where Allison experimented with high-altitude baking.

do because most recipes weren't developed at our elevation, so cookies tend to flatten and spread out.

But usually some adjustments can help to ensure you get the chewy, crunchy, delicious cookie you envisioned.

For more detailed information about highaltitude cooking and baking, visit <u>https://</u> col.st/yM3vC. The De-



partment of Food Science and Human Nutrition is part of CSU's College of Health and Human Sciences.

High-altitude Baking Tips

• Consider increasing the recommended oven temperature, by no more than 25 degrees, to keep cakes from collapsing and cookies from spreading. But you will likely have to reduce the baking time, so keep an eye on your goodies using the oven light (opening the oven door lets heat out).

• Slightly decrease the amount of baking powder or baking soda the recipe calls for, since leaveners or yeast react with more force at higher elevations.

• By the same token, slightly decreasing the amount of fat and sugar can offset their tendency to become more concentrated at altitude.

• Switching to a higher-protein flour can solidify the structure of rising baked goods at our elevation. Even those labeled "all-purpose flour" can vary between 10 percent and 12 percent protein. (And don't forget to deposit the flour into your measuring cup with a spoon instead of scooping it out of the bag with the cup, since weights can vary widely by how hard the flour is packed.)

• Use extra-large eggs instead of large eggs. They not only provide more of the aforementioned protein, but contribute more moisture to offset the effects of our high, dry climate. For this reason, a slight increase in liquid ingredients is advisable as well.

• Using a dark baking sheet can make cookies too brown; place them on a sheet of parchment paper.

Low-Cost Seedling Trees Available for Landowners

Low-cost seedling trees and shrubs from the Colorado State Forest Service are now available for order, as part of the 2019 Trees for Conservation seedling tree program. The program aids landowners impacted by recent fires, to obtain seedlings at a minimal cost to replace damaged or lost trees. The seedlings can also be used for conservation and land rehabilitation purposes. Early orders are encouraged while a larger species selection is available.

The focus of the tree seedling program is to help landowners to meet conservation goals, restore forests impacted by wildfire and other disturbance, reduce soil loss, and enhance wildlife habitat. The program also allows landowners to plant vegetation in areas impacted by tree insects and diseases.

Forester Mike Till hopes the program will inspire landowners to take personal pride in the care of their properties through planting trees or shrubs. Planting seedlings can help increase the resilience of the forest to natural disasters by re-establishing lost vegetation, reducing soil erosion, improving air quality, and improving regional species diversity.

Visit the <u>Colorado State Forest Service website</u> to find your local seedling sale and get local assistance on tree species selection and ordering.



CSU Extension Land Stewardship Program offers Land Management Training Online!

CSU Extension has teamed up with CSU Online to offer a first of its kind, <u>Land Stewardship Program</u>, in an online format. The badge program is designed to help land owners or managers gain a better understanding of the available natural resources, how to cultivate them sustainably, and build an effective long-term land management plan. This program has been specifically developed for the arid west's soil and climatic conditions, providing the learner with more localized land strategies.

The online program is ideal for anyone who owns or manages property in Colorado or the Western United States, including: Small acreage land owners, farm operators, urban and rural hobby farmers, gardeners and horticulturalists, landscapers and property managers, and other land-based agricultural professionals.

Courses in the Land Stewardship program are now open and available for registration:

- Stewardship Planning (Trek Badge \$40)
- ♦ Soil The Basics (Trek Badge \$50)
- ♦ Water The Basics (Trek Badge \$50)
- ♦ Management of Forage Plants (Trek Badge \$50)
- Management of Invasive and Noxious Weeds (Trek Badge \$50)
- Management of Wildlife in Colorado (Trek Badge <u>\$50</u>)
- ♦ Emergency Preparedness (Trek Badge \$50)

Courses in this program are self-paced. Study on your own schedule and customize your learning experience to match your individual goals. Take all courses to earn your Mastery Badge, or take only the courses you're most interested in. Learn more about available courses and how digital badging works by going to the website: <u>CSU-</u> <u>LandStewarship.com</u>

New Program Supports Agricultural Intern Opportunities

The Colorado Department of Agriculture is launching their new Agricultural Workforce Development Program, which provides incentives to agricultural businesses, including farms and ranches, to hire interns. Qualified businesses may be reimbursed up to 50% of the actual cost of hiring an intern, not to exceed \$5,000 per internship.

The intent of this program is to support and train the next generation of Colorado farmers and ranchers. The Program is the result of legislation introduced during the 2018 Colorado General Assembly by the Young and Beginning Farmers Interim Study Committee, aimed at providing hands-on educational opportunities for individuals aspiring to a future career in agriculture.

The internships must be completed between April 1 and June 30 of 2019. Priority will be given to internships focusing on production agriculture.

The business application period will open January 2, 2019 and close February 15, 2019. Businesses selected to participate in the program will identify their own candidate for the internship. Interns must be approved by the department and an agreement implemented between the business and CDA prior to the start of the internship. Approximately \$40,000 is available for internships through June 30th, 2019. Qualified internships must include at least 130 hours of work experience and provide a focused learning opportunity for the intern. The application period for businesses interested in participating in the program is now open.

For more information and to apply, visit the <u>Agricul-</u> <u>tural Workforce Development Program</u>. For further questions about the program, contact Traci Saylor at 303-869- 9171 or at traci.saylor@state.co.us

Western Colorado Food and Farm Forum

This year's forum, in Montrose on January 25 and 26, includes twenty workshops focusing on innovative crops, livestock, specialty crops, marketing and regenerative management practices that will help farmers increase profits, create a sustainable future and lower stress.

Joel Salatin, "The Most Famous Farmer in the World," will attend all day Saturday delivering the keynote address, participating in breakouts, and hosting a Hot Tamale Roundtable, and an all conference, community presentation of *Dancing with Dinner: Healing the Nutritional Deficit in the Urban, Rural Divide.*

The Farmer to Farmer Invention Convention returns with \$500 in cash prizes.

Half-day workshops on Friday January 25 will feature:

- Ben Hartman, author of "The Lean Farm: How to Minimize Waste, Increase Efficiency and Maximize Value and Profits with Less Work," provides an in-depth half day workshop and breakout session.
- Bill Parker, Parker Pastures presents, Performance Based Planned Grazing: Determine stocking rates, create drought reserves, and maximize livestock performance using regenerative planned grazing techniques in a half-day workshop.
- Western Water Workshop Understanding Colorado water law, local administration and enhancing water stewardship – half day workshop.

When: January 25th - January 26th, 2019 Where: 1800 East Pavilion Place, Montrose, CO 81401

For more information and to register, visit <u>Western</u> <u>Colorado Food and Farm Forum website.</u>

Colorado Small Acreage Services Database

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

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



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 <u>sam.extension.colostate.edu/</u>

Do you have a question about managing your small acreage?

Contact CSU Extension /NRCS Small Acreage Coordinators:

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