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Colorado Quinoa



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

Quinoa (*Chenopodium quinoa* Willd.) (pronounced keen wah) is a cool-season crop which is gaining popularity in the United States as a highly nutritious, nutty flavored grain alternative. Native to the Andes mountains of Peru, Bolivia, and Chili, quinoa means "mother grain" in the Inca language, and still remains an important food for the Incan descendants, the Quechua and Aymara people.

Stop the Japanese Beetle

By Colorado Department of Agriculture

How property owners can help.

Thirty-five states to the east of Colorado are currently considered infested or partially infested with Japanese beetle; the Colorado Department of Agriculture (CDA) is providing valuable tips to homeowners to help protect their property.

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Front Range 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
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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.

Stop the Japanese Beetle continued from page 1

The Japanese beetle (*Popillia japonica*) is an insect pest that is not native to Colorado and can cause significant damage to landscape plants, turfgrass, and fruit trees. Originally introduced from Asia to the Eastern US in the early 1900's, the beetle has slowly managed to expand its range westward.

This pest is under quarantine in Colorado which is a regulatory activity that limits the transport of goods that spread pests or diseases. CDA, in conjunction with the Colorado Nursery and Greenhouse Association (CNGA) and the US Department of Agriculture, is working diligently to ensure that future introductions of this pest are prevented. Japanese beetle is most frequently moved from state to state in infested nursery stock and soil. Currently, all trees, shrubs, sod and ornamental grasses brought into Colorado from infested states to the east, must first be certified by the state of origin to be free of Japanese beetle. While it is illegal to knowingly move plants and soil infested with Japanese beetle into the state, it is also illegal to knowingly move plants and soil infested with Japanese beetle within the state.

What is a Japanese beetle?

Japanese beetle adults are scarab beetles, approximately one-half inch long with a metallic green body and copper-colored wings. There are five distinct tufts of hair along each side of the beetle's abdomen.

The larvae are white grubs that reside in the soil. Grubs are about an inch long and lie in a curled position or 'C' shape when at rest.

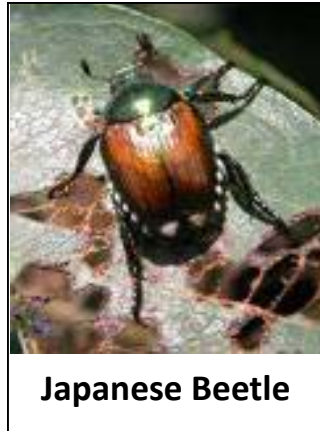
What are their favorite plants?

Japanese beetle larvae prefer to feed on the roots of grasses, such as those found in lawns or

in ornamental beds. The adult beetle has a wide range of plants it prefers including grapes, roses, hollyhocks, black walnut, apples, crabapples, peach, cherry, plum, lindens, mountain ash and Lombardy poplar.

How can the beetle be prevented?

Purchase landscape plants, trees, and turfgrass only from nurseries, garden centers and landscape contractors that are registered with the Colorado Department of Agriculture. Registered nurseries and sod farms are inspected and nursery stock is verified to be Japanese beetle free. A list of registered nurseries and landscape contractors can be found at www.colorado.gov/ag/dpi and click on "Nursery Program."



Quarantine

Don't bring uninspected plant materials into Colorado from infested states. Don't move plants and soil from your property to other portions of Colorado OR to states west of Colorado. This pest is under quarantine and those that bring uncertified plant material into Colorado are subject to fines.

What should one do if they find Japanese Beetle?

If you suspect Japanese beetle, collect it and contact the Colorado Department of Agriculture or your local Colorado State University Extension office. The insect's identity will be verified. Follow best management strategies to manage the pest by watering your lawn as little as possible, avoid using plants in the landscape that are favored by the pest, and hire a licensed pesticide applicator, if you consider using a chemical control.

Colorado Quinoa continued from page 1

Quinoa is an annual broadleaf plant ranging in size from 1 ½ to 6 ½ feet tall, with thick erect woody stalks and alternate wide leaves that resemble a goose foot. Seed is produced in large clusters on a pinnacle, similar to sorghum, with unique flower hues of white, yellow, pink, red, purple, or black. Seed color is caused by a resinous coating that contains two to six percent saponin, a bitter substance that must be rinsed off before eating. The root system stems from a tap root, which makes quinoa resistant to drought.

Colorado's high altitude, cool weather, and minimal precipitation, make some areas very suitable for growing quinoa. To set seed, quinoa requires short day lengths and yields best when maximum temperatures do not exceed 90° F. with cool nighttime temperatures. When temperatures exceed 95° F, plants go dormant and pollen becomes sterile. Areas of Colorado between 7,000 and 10,000 feet match the



Quinoa ready to harvest

temperature requirements for quinoa. The high San Luis Valley has been growing quinoa commercially since 1987.

Quinoa can be grown on a large or small scale. Because the seed head is dense, it can yield one to six ounces of seed per plant, or 1200 to 1600 pounds per acre. Quinoa is usually cultivated for its seeds, but the leaves are also edible in salads or steamed, and the raw seeds can be sprouted. Seeds are high in protein, amino acids, calcium, phosphorus, iron, zinc, and lysine.

Joe and Kim Morin planted quinoa on their one and a half acres near Lake George this spring. I talked with Joe about his experiences. "We broadcast the seeds and raked them in with an eight foot drag," he said. Later, they hand harvested with the help of some volunteers. "It maybe took 100 man hours to harvest, and our method was not very efficient." Traditionally, the entire plants are cut and taken to an area to thresh. But Joe and his crew gathered the seeds in the field. He estimates they yielded 600-700 pounds of seed which he still has to have processed and cleaned. Joe's father grew quinoa for many years and Joe is trying to keep his family tradition alive. He plans to grow more quinoa next year. He hopes to use a small-scale combine to harvest in the future and would like to develop a small local processor so the seeds do not have to be trucked across the state to the San Luis Valley for processing.

"It is so fulfilling", Joe explained, "to see this healthy food able to grow in a reliable way to feed Colorado." He sees it as a viable option, even on a small garden scale for one's own consumption. "Its idiot proof" he laughs, "it grows like a weed. One-tenth of an acre can produce 150 pounds of quinoa seed with only a few man days of work."

To grow quinoa in Colorado, use early maturing seed varieties. Joe used a mixed stock seed with a variety of seeds from White Mountain Farm in the San Luis Valley. Germination occurs in 24 hours and seedlings emerge in three to four days.

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Colorado Quinoa continued from page 3

Plant quinoa in late April to late May when the soil is 45°F to 60°F. Joe mentioned that, “The planting window for quinoa may depend more on local micro climate and precipitation than date. At our location even mid May could be risky for killing frost. I planted as late as June 10 (in anticipation of forecasted rain) and did well.” Quinoa has low water needs, about ten inches per year. Given good soil moisture at planting, do not water until the plants have two to three leaves. Joe’s crop was not irrigated and relied only on mother nature for water. Quinoa is usually self-pollinated, but cross-pollination occurs with plants such as amaranth and pigweed, so it’s a good idea to control weeds.

Seeds are harvested starting in October, after the leaves have fallen off and the seeds have dried so that a fingernail can barely make a dent in the seeds. As long as the plant is past the green stage, frost will not damage the seed. Seeds can be stripped upwards off the stalk with gloved hands. Next, clean debris from seeds with a screen and fan. Then, thoroughly rinse seeds until rinse water is non-frothy. This will remove the bitter tasting saponin which coats the seeds. Further dry the seeds before storage by placing them on trays in the hot sun and stirring occasionally. Seeds store for many years in air tight containers.

Select seeds from the most productive plants to save for future planting. Seeds can be cleaned of debris but the saponin does not have to be removed. Joe mentioned that he planted seeds which his dad had saved from 1986 in a coffee can. “The more of us who are growing and saving our best quinoa seeds”, Joe explained, “the better

seed stock we will create for particular areas of Colorado.”

For More Information:

Alternative Field Crops Manual, Minnesota and Wisconsin Extension Service

<http://www.hort.purdue.edu/newcrop/afcm/quinoa.html>

Salt Springs Seeds

<http://www.saltspringseeds.com/scoop/powerfood.htm>

Front Range Living, Colorado Quinoa-Transplanted from the Andes

<http://www.frontrangeliving.com/cooking/quinoa.htm>

Photos of Joe and Kim Morin’s 2010 quinoa harvest

<http://gallery.me.com/tleewilloughby#100514>



After harvesting quinoa, debris can be cleaned from seeds using a screen.

How To Eat Quinoa

Quinoa can be eaten as a porridge for breakfast, stirred into soups or stews, or used as a substitute for other grains in a recipe. To cook quinoa, bring equal parts of quinoa and water to a boil. Simmer and cover for 12-15 minutes. Add stock or vegetables for flavor.

Attention Horse Owners:

By Eric McPhail, CSU Extension, Gunnison County Director

Are they pets or are they livestock? For years this discussion has been debated. According to Webster, the definition for pet is “any domesticated or tamed animal that is kept as a companion and cared for affectionately.” The definition for livestock is “useful animals kept or raised on a farm or ranch.” These definitions might suggest one to ask; do I keep my horse for pleasure or for utility purposes?

Politically, this debate might warrant attention. However, for most horse owners, this topic rarely makes it to the dinner table. The majority opinion suggests that most small acreage owners view their horse as a pet, and most large acreage owners view their horse as livestock. No matter which one you choose, it’s important to note that the definition has nothing to do with animal welfare or treatment. In actuality, the definition only suggests how we use the horse, and suggests nothing about how the horse feels towards us.

Whether you choose to value your horse for pleasure or work, its health and happiness (i.e. welfare) are your responsibility. A horse whose nutrition and feeding levels are too little or too great is not healthy. Also, a horse that gets little to no exercise or one which is exercised excessively is not happy. Simply put, if we want to care for our horses well, then we’ll feed and exercise them well.

Caring for a horse on a small acreage can come with many challenges. Many of which, a large acreage owner doesn’t have to deal with. In fact, welfare can be quite high for a horse that gets to roam vast areas selecting the food it wishes to graze, and doing so in the company of other horses. However, this is not to say that stalled horses can’t be happy, but rather if we do confine our horses, we have to be aware of the challenges to their health and happiness.



Exercise is important and something most horses crave. When a stalled horse gets turned out what’s the first thing it does? Typically it bolts, runs, jumps, kicks, farts, bucks, and hopefully doesn’t hurt itself with all the built excitement

and energy. It’s required, although I’m not sure by whom, that a horse be allowed once a day to at least stretch its legs and run a bit. By doing so, many joint problems, hoof problems, bad habits, digestive tract disorders, and emotional problems can be curbed. While being turned out with a few friends in a large safe enclosure might be best, a lunge line or round pen can be used also, as long as, equal directions of movement are allowed.

When we think about feeding a horse, whether it is in a pasture or in a stall, forages should be our primary concern. Working with your local CSU Extension agent or local veterinarian may help you to decide what forage is best for your horse. Pastured horses might only need supplemental feeding with high quality forages, while stalled horses might need continuous feeding of a lesser quality forage. Most locally grown forages will meet a horse’s maintenance requirements and care should be given when supplementing a horse’s ration with grains or other energy / protein supplements. All too often, over feeding a horse is the norm, and causes many unintended consequences. Important to note at all times, whether stalled or pastured, horses should have available clean water, salt, and a balanced horse mineral supplement.

So remember, no matter if you keep your horse for pleasure or utility purposes, properly feeding and exercising your horse will enhance its welfare and we all know that a happy horse makes for a happy horse owner.

Tree Seedling Sale

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

Every year, Colorado Conservation Districts team up with Colorado State Forest Service Seedling Tree Program to provide tree seedlings to local landowners. If you've been thinking about planting some trees or shrubs, or maybe some wind rows on your property, now is the time to place your order with your local Conservation District.

The seedling tree program allows owners of at least 2 acres in Colorado to purchase seedling trees for windbreaks, wildlife control, erosion control, noise

barriers, snow fences and a variety of other uses. Trees are available in 30-50 tree lots with cost ranging from \$36 to \$56 per lot. Some larger trees are sold individually at \$7.50.

Seedling trees come in a vast variety of species and sizes. Evergreens, and deciduous trees that are recommended for your region are available in potted and bareroot lots. Tree heights vary upon species and size of pots.

Supplemental supplies are also available. These supplies include drip irrigation systems, weed barrier cloth, tree guards, fertilizer tablets and polymer.

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Which Colorado Conservation District do I live in?

Tree Seedling Sale continued from page 6

Also through your local Conservation District, you will find help with things such as:

- proper design of a windbreak on your property;
- planting the right trees for your soil type and water availability; and
- how to plant and maintain your tree seedlings

Who are Conservation Districts?

Conservation Districts are non-profit natural resource organizations that provide grass-roots support to local farmers, ranchers and small acreage landowners. District Board members are volunteers who own land within their district boundaries. The Conservation Districts in Colorado were formed in 1937 during the Dust Bowl to represent private and public landowners in an effort to coordinate activities of the State Legislators to local conditions, needs and priorities. Today the districts also coordinate local, state, federal and private funds to conserve our Natural Resources.

Contact your local Conservation District to learn more. Use the map on page 6 to determine what conservation district



Blue Spruce

you live in. Then go to <http://www.ag.state.co.us/ccdd/> to find contact information for your local Conservation District.

Watch and Learn: Educational Videos

Various short educational videos geared toward small acreage landowners, are now available for viewing at the CSU Small Acreage Management website http://www.ext.colostate.edu/media/sm_acre/index.html

Videos include:

- How Grass Grows
- Pasture Management Strategies
- Small-Scale Solar Irrigation
- Using Bindweed Gall Mites to Manage Field Bindweed
- Wind Energy: How Much Wind is Needed?

These videos were produced for a grant funded pilot project to develop innovative ways to educate landowners. The videos are very short but provide expert information in a fun format. Viewers can take a very short survey after watching a video to rate the effectiveness of these videos.



Facts About Scotch Thistle

By Tina Booton, Weld County Weed Division Supervisor

Scotch thistle has been credited with helping Scotland fend off a Viking invasion. As the Vikings moved into Scotland for a sneak attack, they yelled out in pain when they stumbled through thistle plants. Their cries alerted the Scots. Since then, Scotch thistle has been the national emblem of Scotland. It is believed it was introduced in the late 1800's. Scotch thistle is sometimes sold as an ornamental plant. It has reportedly been used for treating cancer and ulcers. The oil from the seeds has been used for burning and cooking in Europe.

Scotch thistle is a non-native biennial forb that reproduces solely by seed. A biennial is a plant that completes its lifecycle within two years. During the first year of growth, Scotch thistle appears as a rosette in spring or fall. During the second year in mid to late spring – the stem bolts, flowers, sets seed, and the plant dies. A prolific seed producer, Scotch thistle can produce 110 to 140 seeds per flowering head. The average Scotch thistle has 70 to 310 flowers per plant. This produces 7700 to 43,000 seeds per plant. These seeds can remain dormant in the soil from five to 20 years. Scotch Thistle seeds contain a water soluble germination inhibitor that allows the seed to germinate only when buried in the

soil or under ground litter. Therefore, the key to managing this plant is to prevent seed production.

Scotch thistle can grow up to 12 feet tall. Stems are numerous, branched, and have broad, spiny wings. The leaves are large, green, spiny, and covered with fine dense hair giving the leaf a woolly appearance. The flowers are violet to reddish in color, numerous (70-100/plant), and are surrounded by spine-tipped bracts. You can expect to see flowers from mid-June to September.

Due to the robust, spiny nature of Scotch thistle, this plant can act as a living barbed wire fence, making areas impassible for wildlife, livestock, and people. It is a competitive weed in improved pastures where it favors soils with high levels of nitrogen. Scotch thistle is avoided by stock because of its dense spines and this encourages its spread in heavily grazed pastures. If eaten, the spines can cause damage to stock, particularly around the mouth. Spines and dead leaves contribute to vegetable fault in wool. Scotch thistle invades rangeland, over-grazed pastures, roadsides, and irrigation ditches. It also prefers moist areas adjacent to creeks and rivers.



Year 1: Scotch thistle in rosette stage



Year 2: Scotch thistle flowers and produces seed

Pasture Grasses

Sharon Bokan, Small Acreage Coordinator

Are you thinking about reseeding or overseeding your pasture this fall? Are you confused about what grass to use? Here is a little bit of information about some common pasture grasses to help you decide. Contact your local NRCS or CSU Extension for additional help.

First a couple of definitions.

Cool season grasses have two growth times. The first growth time is the spring and in normal years is greater than the second, which occurs in the fall. They grow when temperatures are cooler. They tend to have a higher percent crude protein and break down quicker in the digestive system due to thinner cell walls. Warm season grasses have only one growth time and that is in the heat of summer.

Warm season grasses tend to produce more bulk but are of lower feed quality than cool season grasses. Warm season grasses also tend to utilize the water they receive more efficiently. They also tend to be lower in protein but animals can use the protein more efficiently.

Sod forming grasses produce a Kentucky bluegrass type pasture.

Bunch grasses grow as separate bunch plants that usually have space (bare ground) between each plant.

Cool season grasses

Smooth Brome

Introduced, sod forming. It is highly palatable with high protein, moderately tolerant of low grazing, requires a minimum of 12" precipitation but prefers irrigation and can be invasive or sod bound (becomes overcrowded).

Orchardgrass

Introduced, bunch grass. It is highly palatable with 3-4% winter protein, but cannot tolerate close grazing (you must leave 6-10" of growth), requires 15" of precipitation or irrigation and does not tolerate dry, cold winters.

Timothy

Introduced, bunch grass. A short-lived, highly palatable grass that holds the protein level well, moderately tolerant to low grazing but prefers richer soil and moist bottomlands with 16" precipitation minimum.

Western wheatgrass

Native, sod forming. A palatable grass that has highest protein levels in the spring. It is grazing resistant and very drought and cold tolerant needing 10-14" precipitation.

Crested wheatgrass

Introduced, bunch grass. Crested wheatgrass is highly palatable in the spring and fall with up to 18% protein in the spring, tolerates low grazing, requires 10" precipitation, is winter hardy and must be kept grazed or mowed for palatability.



Crested wheatgrass

Meadow brome

Introduced, bunchy sod former. A highly palatable grass that has moderate protein levels, is moderately tolerant to overgrazing and has moderate drought resistance, requiring 14-16" precipitation.

Other wheatgrasses

Tall—Introduced, bunch grass;

Intermediate—Introduced, sod former;

Pubescent— Native, sod former;

Slender— Native, bunch grass

These are all palatable and nutritious grasses that are moderately tolerant to low grazing and drought, requiring 11-24" of precipitation.

Warm season grasses

Sideoats grama

Native, bunchy sod former. A highly palatable grass that is not greatly resistant to overgrazing. It stays green longer than most warm season grasses and can therefore be grazed longer.

Blue grama

Native, bunchy sod former. A nutritious and palatable grass for livestock. Its highest quality occurs when it is green but it retains its nutrition level when dry, making it good fall and winter grazing. It withstands grazing well, but is not suitable for hay production. It is very drought tolerant.

Buffalo grass

Native, sod former. A very palatable grass that can withstand heavy grazing, in fact it can increase with grazing, however it produces low quantities of forage but is very drought tolerant.

Switch grass

Native, sod former. Switch grass is not as palatable as other grasses but does produce good quality hay if cut before maturity. It holds its nutrient value well. As the season progresses, do not graze as low, raising the length left after grazing to protect the plants. Switch grass is winter hardy and needs 16-18" precipitation.

Prior to doing any planting it is always a good idea to get a soil test so you know what species would be good for your area. The type of grass you may want for your pasture may not be appropriate for you soils, elevation, site, and needs. Also consider the type of livestock you will have grazing and their actual nutritional needs. Consider whether you will be using the grass for hay production or grazing. Your local Extension or NRCS office, Co-op or seed company can help you with your selection.

References:

<http://plants.usda.gov/java/factSheet>

Guide to Grasses, Pawnee Buttes Seed Company, Third edition, January 2008

Switch grass



© James H. Miller



Sheep Health and Management Workshop

December 4, 2010 (10am – 4pm)
Fowler, CO

The sheep and goat industry is continuously changing, and general care and upkeep of your flock is vital in producing the healthiest and most profitable livestock possible. Join us for an informational program addressing issues that affect the everyday upkeep of your flock. Lunch will be provided for pre-registered participants.

Topics:

- **Sheep Health Issues and Poisonous Plants**— Dr. Tony Knight, Extension Specialist (Veterinarian), Professor of Clinical Sciences, Colorado State University
- **Pre-lambing Nutrition**—Steve Levalley, CSU Animal Sciences Assistant Professor, Sheep & Wool Specialist
- **Feeding Aftermath Feeds**—Tom McBride, CSU Extension Agent, Agriculture, Adams County
- **Getting Ready for Lambing**—Marlin Eisenach, CSU Extension Agent, Livestock, Morgan County
- **Enterprise Budgeting** - Jeff Tranel, CSU Agriculture and Business Management Economist, Southern Regional Office
- **Wool Handling and Care/Wool Pools**—Ron Cole, Wool Consultant, American Sheep Industry Association
- **FSA Wool Support, Farm Finance & Disaster Programs**—Chuck Hanagan, Farm Service Agency

To register, contact janet.golden@colostate.edu

Growing Native Plants in the Front Range

January 11, 2011
Noon-12:30 pm Webinar

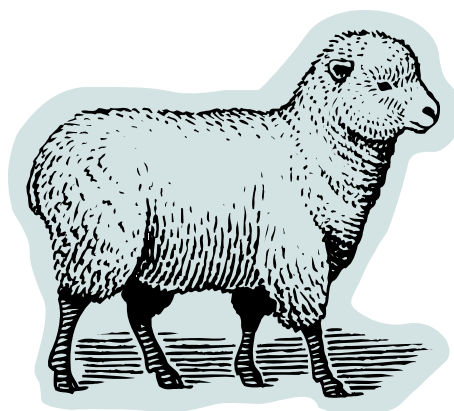
Learn why natives are important. Examples of specific native plants in the Front Range will be discussed. Presented by Crystal Strouse, City of Fort Collins Natural Areas Program Botanist . A webinar is an online seminar. You can participate from any computer with internet access. Email jennifer.cook@colostate.edu for more information and to register. It's a free and easy way to learn.

Septic System and Well Basics

February 10, 2011
Noon-12:30 pm Webinar

An overview and troubleshooting guide for homeowners living on well and septic. Presented by Mary Sue Liss, Environmental Health Specialist, Elbert County Health & Environment. A webinar is an online seminar. You can participate from any computer with internet access. Email jennifer.cook@colostate.edu for more information and to register. It's a free and easy way to learn.

More events on page 12





Colorado Big and Small Conference

February 16-17
Brighton, CO

Where: Adams County Fairgrounds (Brighton)
Waymire Dome Complex

Who: featuring sessions from farmers, ag professionals, and scientists for commercial specialty crops and niche livestock producers engaged in direct market or wholesale and organic, biological, or low input systems; PLUS sessions for small acreage non-commercial producers

Registration: opens online in early December and costs \$45 for one day or \$70 for two days.

For more program info:

www.coloradoagriculturebigandsmall.com

2011 info will be posted soon. Contact Adrian Card with questions acard@bouldercounty.org

Common Forage Grasses

March 10, 2011
Noon-12:30 pm Webinar

Learn identification, use, and key characteristics of common dryland and irrigated grasses in Colorado. Presented by Joe Brummer, Extension Forage Specialist and Associate Professor at CSU
A webinar is an online seminar. You can partici-

pate from any computer with internet access.

Email jennifer.cook@colostate.edu for more information and to register. It's a free and easy way to learn.

To keep updated on events in your area, visit **CSU Small Acreage Management website** www.ext.colostate.edu/sam/



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.