Colorado Small Acreage Management Newsletter

COLORADO STATE UNIVERSITY EXTENSION

USDA United States Department of Agriculture
Natural Resources Conservation Service

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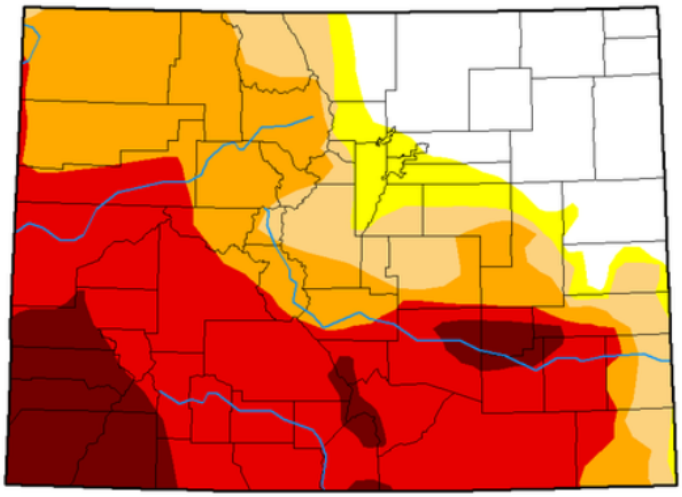
Inside this Drought Issue:

Colorado Drought Conditions

US Drought Monitor– Colorado

Abnormal dryness or drought are currently affecting approximately 3,990,000 people in Colorado, which is about 79% of the state's population.



None
D0 (Abnormally Dry)
D1 (Moderate Drought)
D2 (Severe Drought)
D3 (Extreme Drought)
D4 (Exceptional Drought)

Colorado Sustainable Small Acreage News is published and edited by Jennifer Cook,
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Wildfire Livestock Health Management

Colorado Livestock Association

As you are aware, wildfires are currently burning across many areas of Colorado. The impacts of these wildfires are wide-reaching and they include impacts to agriculture and livestock. To see a map of the current wildfires in Colorado, please visit: www.colorado.gov/dfpc/current-wildfires

If you have deceased livestock, please contact the Colorado Department of Agriculture State Veterinarian's Office at 303-869-9130. We will provide guidance on carcass disposal and coordinate with public health. Wildfire injuries in livestock should be addressed by a veterinarian. Please contact our office if you are unable to locate a veterinarian in your area.

Common trauma to animals include:

- Burned eyes, feet, udders, sheaths, and testicles
- Smoke inhalation with lung inflammation and edema
- Trauma can lead to secondary infections

Assessment for Livestock

It can be challenging to assess a burned animal because the depth and severity of the burn may be difficult to ascertain; the animal may not appear distressed or in pain. It may take days to two weeks for burns to become apparent, especially those on the hooves. Reassess on a daily basis! The severity of the burn and the compromise in the health of animals will become apparent. It is difficult to judge burned animals initially, but the burned areas of skin become leather-like and slough in 5-14 days, while systemic signs may worsen. Animals which go off-feed require careful examination for complications.

Livestock triage:

- Emergency euthanasia for severely burned animals that are in shock and have a large percentage of burn trauma
    - Emergency euthanasia includes captive bolt gun, gunshot by firearm, and barbiturate overdose (licensed veterinarian only). See the AVMA Guidelines on the Euthanasia of Animals for species-specific guidelines.
- Burn shock is treated by intravenous fluids, balanced electrolytes, and possibly plasma
- Smoke inhalation may lead to cough, labored breathing, and pulmonary edema
- Inhalation of hot gases may cause a cough with frothy material discharge from the nose
- Burns may be treated topically with silver

Continued on page 3

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Wildfire Livestock Health Management continued from page 2

sulfadiazine; desitin may be an alternative

- Treatment of pain with approved pain medications, such as anti-inflammatories
- Antibiotic treatment may be beneficial for deep burns with or without contamination
- Keep the wounds as clean as possible; debridement or trimming is difficult with large numbers of affected animals and no sterile hospital setting
- Burn injuries will continue to progress and may worsen for up to six weeks following the initial injury. Debride dead tissue, treat, and protect exposed areas during healing. Protect the wounds from fly strike with appropriate repellants.
- Lack of appetite or inability to chew along with impaction or other disorders of gastrointestinal tract can be seen when the head and face are burned. Soaking feed with water allows for easier eating.

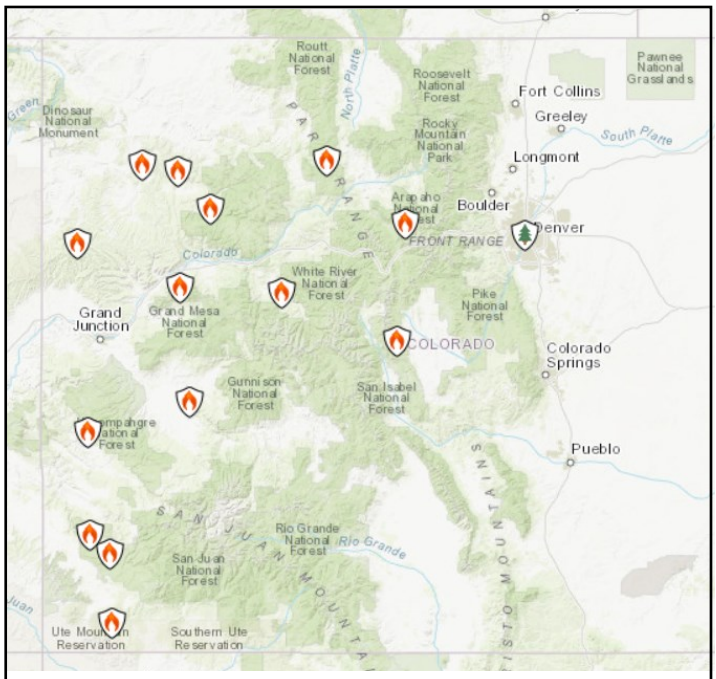
Livestock handling:

- Only experienced livestock handlers should be handling animals during highly stressful events.
- Livestock reactions can range from nervousness to panic to aggressive attempts to escape anyone and anything.
- Traumatic events often leave animals in a heightened state of awareness beyond the time frame of the actual incident.
- Normal handling techniques may be ineffective with livestock that are still traumatized from a recent wildfire; this can be especially true if the wildfires have passed but are still burning within the sensory range of the animal.

Protection and treatment of livestock from smoke particulates:

- Limit stress during movement if smoke is visible. Don't force livestock to perform activities or exertion that increase the airflow in and out of the lungs. This can trigger bronchoconstriction.
- Provide plenty of fresh water near feeding areas. The consumption of easily accessible water keeps the airways moist and facilitates clearance of inhaled particulate matter. This allows the trachea, bronchi, and bronchioles to remove inhaled particulate material in smoke.
- Limit dust exposure by feeding low or dust-free feeds and sprinkling or misting the livestock holding area. This reduces the particles in dust such as mold, fungi, pollens, and bacteria.
- If livestock is coughing or having difficulty breathing, an examination by a veterinarian is warranted to determine if it is a reactive airway from smoke and dust versus bacterial infection and pneumonia.
- Airway damage resulting from smoke-induced insult may take 4 to 6 weeks to heal. Plan to give livestock enough time to recuperate after the air quality returns to normal. Attempting to move and handle cattle may aggravate the condition, delay the healing process, and compromise the performance of livestock.

This information was provide to the Colorado Livestock Association by the Colorado State Veterinarian's office. If you have questions, please contact their office at 303-869-9130.



Fires burning in Colorado as of 8/8/18. Source—https://inciweb.nwcg.gov/?state=08

Tomorrow's Cover Crops for Today's Drought

By Jerry Allen, Irrigation Water Management Specialist

Many farmers and ranchers in the Shavano Conservation District are being hit now with water cutbacks in their irrigation supply. The drought-induced cutbacks are currently at 70% of normal delivery for irrigators on the UVWUA. Irrigators in Norwood, Ridgway, Paradox, and other systems are either done irrigating or will be out of water shortly. Some of those locations might water later, if late monsoon rains replenish some of the creeks and reservoirs.

Ranchers, meanwhile, are struggling with limited range feed and water. Many who had grazing permits were only allowed to bring 75% or fewer of their cattle onto permits from the dire, dry conditions, which go back to a deficiency for over a year now. Others are hauling water daily to their cattle on their grazing allotments. Many are scrambling to find enough feed to keep their herds and many ranchers have already thinned their herds, taking a hit at the sale barn.

The last few years, and in the last drought cycle of 2012 to 2014, some ranchers planted some warm season and mixed cool season cover crops with their last few irrigations to be able to have fall pasture for cattle coming off early from the Forest permits. Some continued with those covers for the last several years, as a way of supplementing feed for their cattle, along with improving both soil organic matter and reducing erosion on their fields.

During 2011 to 2018, the number of acres of cover crops in the valley increased from about 663 acres to over 5,000 acres. These covers varied from single species to multi-species, but the common theme was to diversify grazing and grow winter feed. In many cases, the spring cover crops rebounded with the first April irrigation and gave either good spring feed, or a great hay crop in June if triticale or rye were included.

The cover crop of choice at that time and during most drought times in Colorado remains sorghum sudan, both standard sugar varieties and brown mid-rib varieties. Sorghum sudan is a tolerant tropical crop that can be planted in the heat of July and August and thrive, often with only two or three irrigations. As long as a six-inch stubble height is maintained, it can be cut once for hay and still provide a great fall and/or winter pasture.

Sorghum sudan is a drought tolerant cover crop.

The main limitation with sorghum sudan is fertility management, as it still needs nutrients somewhat comparable to corn. Also, sorghum sudan should be fenced off from grazing for about a month after the killing freeze to prevent prussic acid poisoning to cattle.

Besides sorghum sudan there are more choices of cover crops to use that increase dry matter, palatability, and protein available for cattle. Shavano Conservation District and Montrose Field Office of the NRCS served as a task force that measured the feed quality and quantity of 17 cover crop fields in 2015, and 23 fields in 2016. The outcomes of these farmer-led projects were presented at the Soil Health Conferences from 2016 to 2018 in Delta.

Continued on page 5

Cover Crops continued from page 4

Common to all the fall planted cover crop trials were these take home points:

1. Triticale was the most planted cover species, because of the large bio-mass that it provides in either a monoculture or a mixed cover species. Typical clipped field samples ranged from 3500 lbs/acre to well over 6,000 lbs/acre. Best seeded in August or September, the crop gives good winter pasture and will re-grow in April with an early irrigation. Beardless varieties have become more popular with several area farmers, now growing the triticale for seed, due to higher palatability.
2. The most popular 6-way mix of multi-species covers evolved over 3 years of testing. The "cowboy cover crop" of choice for this area includes: Nitro radishes and Purple Top turnips (2 lbs/acre each), triticale, sorghum sudan (15 to 20 lb/acre each) and the legumes of winter peas and hairy vetch (1 to 3 lb/acre each). Many other mixes were successfully used and Shavano Conservation District can provide more detailed information of which tested mixes worked best in which situation.
3. In each case, the value of the forage (at 70 cents per day) more than paid for the seed and establishment cost. In several situations, the net return exceeded $30 per acre just in feed value. The feed value in the cowboy mix typically exceeded 20% protein and over 60% TDN. The cover crop seed cost from seed companies (Producers CO-OP, Cropworx or Greencoverseed.com) averages about $50 per acre. Another alternative if you cannot afford the $50 figure and have some combine-harvested wheat, spelt or triticale stubble- mark it and irrigate it once. You can expect about 2500 lb/acre of great fall pasture (dry matter basis)! Compared to $300/ton grass or alfalfa hay, this is a bargain!

Tree Watering Necessary During Drought Conditions

Colorado Forest Service

Persistent drought conditions have parched the soil over southern Colorado, stressing even irrigated lawns and larger landscape trees. During these periods of drought, homeowners should consider supplemental watering to keep their trees healthy.

"Adequately watering your trees is the best way to ensure optimum growth and vigor during the summer months," said Donna Davis, CSFS community forestry program specialist for the Colorado State Forest Service. "Dry trees become susceptible to root and branch die-back and subsequent insect and disease problems."

The CSFS offers the following tips to keep trees healthy during summer drought:

⇒ **Mulch**. Mulch is an inexpensive solution to retain soil moisture and save water. Apply 4 inches of organic mulch onto bare soil outward 2 to 3 feet from the base of the trunk (removing any grass first, if necessary). Do not allow the mulch to directly contact the trunk.

⇒ **Water a wide area**. Tree root systems, unlike carrots, typically don't dive downward but instead go outward – spreading two to three times wider than the height of the tree – and most absorbing roots are in the top foot of soil. Apply water to soak the entire area underneath the full span of a tree's branches. **Continued on page 6**

Tree watering from page 5

- ⇒ **Water slowly**. To ensure soil penetration, use a deep root fork (inserted 8 inches or less), soaker hose on low setting or soft spray wand to apply water gradually to the full area.
- ⇒ **Keep the yard green**. Trees located in irrigated lawns generally do not require additional water, as long as the area surrounding the tree receives adequate moisture. Conversely, a dry, yellow yard means the roots of any trees present are also dry.
- ⇒ **Focus on smaller and non-irrigated trees.** Trees that do not receive water from sprinkler systems or irrigation require additional water. Every week, apply 10 gallons of water for each inch of tree trunk diameter. Water small and newly planted trees even more frequently, as they have less extensive root systems.

Visit csfs.colostate.edu for more tips on tree watering, planting and general care.

Sustainable Landscaping

In times of drought, it's important to remember that sustainable landscaping can save 40% or more of a home's water use according to a study in Colorado Springs. See for yourself the benefits of sustainable landscaping using natives by checking out this **new 2-minute video**.

Due to popular demand there will be another **DIY Landscaping With Natives** class on **September 9, 2018** in Littleton, CO.

Underused Dryland Native Plants

Irene Shonle, CSU Extension in Gilpin County

Native plants are becoming more and more popular in landscaping, as people seek to reduce water use, increase habitat for pollinators, and create more of a sense of place. Unfortunately, there's only a limited palette of plants in nurseries to choose from (hint, talk to your favorite nursery and ask them to carry more native species). The ones that are out there (such as Penstemons, blanket flower, cacti, serviceberry, currants, and more) are great, but there are many deserving plants that I rarely see offered for sale. This needs to change!

Here are some underused (and possibly hard to find) native plants for dry, sunny situations in Colorado:

Cliffrose (*Purshia stansburiana)*

Cliffrose (*Purshia stansburiana)* is a shrub native to the western slope. It has a profusion of creamy yellow flowers, and they smell delightful. When I was hiking around Grand Junction during bloom (typically May-June), the air was sweet, and pollinators buzzed. After they are done blooming, they develop a fun fuzzy seed head reminiscent of Apache plume. **Continued on page 7**

Dryland Native Plants from page 6

Cliffrose are also very drought-tolerant — these should be used way more often in our water-limited gardens. Alas, they do not do well at elevation, but mountain folks like me can make do with a tough (but slightly less showy) relative called Antelope bitterbrush *(Purshia tridentata).*

Side bells or Orchid Penstemon *(Penstemon secundiflorus)* is a spring-blooming penstemon with a gorgeous, large flower that is somewhere between purple and pink. The flowers all bloom from one side of the plant (hence the name side-bells), but the flowers are large and exotic enough that I think the alternate common name, orchid penstemon, captures the essence of them better. I have seen everything from bumblebees to swallowtails pollinating them. Even out of bloom, the bluish foliage still looks good in the garden. For a real treat, pair with showy locoweed, *(Oxytropis lambertii).*

Orchid Penstemon *(Penstemon secundiflorus)*

Plains zinnia *(Zinnia grandiflora)* is a tough ground cover-like flower. It loves the heat, and will bloom from mid-late summer in any dry soil, including dry clay. It covers itself with golden flowers for a long period – and the fact that it blooms in late summer when many other flowers have called it quits give it bonus points. It looks great with other late summer flowers or grasses. It prefers full sun but can take some afternoon shade. There is a Plant Select selection called "Gold on Blue" that has a rhizomatous growth habit and a bluer foliage.

Cushion buckwheat *(Eriogonum ovalifolium).* I fell in love with this little buckwheat on that same hike I referenced above with the cliffrose. It is simply stunning – the perfect little puffballs of flowers look like they are out of a Dr. Seuss book – and they often fade from pinkish to pink as they age. This would be awesome in a dry rock garden setting, or in the front of the border. I have my doubts as to how hardy it would be in the higher elevations, but I would grow it now if I could find the right conditions for it.

Cushion buckwheat *(Eriogonum ovalifolium)*

Pasque flower (*Pulsatilla (Anemone) patens*)

And can anyone explain why it is so hard to find plants of our native pasque flower (*Pulsatilla (Anemone) patens*), whereas the European ones are relatively easy to find? I don't think they have very different germination protocols, but perhaps I'm wrong on that. It's such a fantastic early bloomer (early pollinators love it!) and is very tough.

Effects of Drought on Water Quality

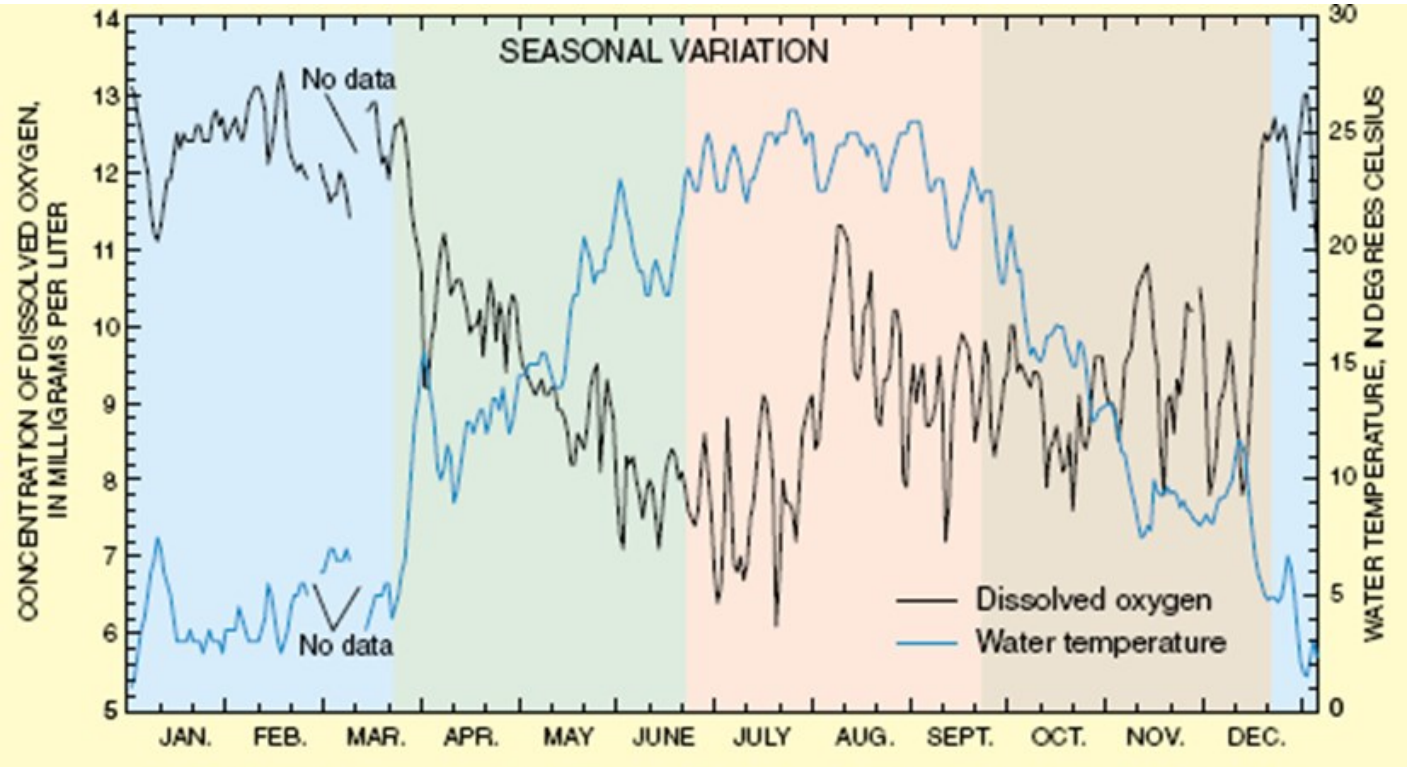
Blake Osborn, Water Resources Specialist, Colorado Water Institute and CSU Extension

In times of drought, most of our questions center on the quantity of water: How much water will I get? How much water do I need? Is my water right secure? Will my city impose watering restrictions? Will the fish survive the low river levels?

These questions are asked for good reason. Water limitations imposed on many "water tight" systems creates anxiety about the availability of our most precious, and necessary, resource: water. However, just as water quantity is a concern during drought, we should also be examining water quality during times of drought.

We have all heard the phrase: "the solution to pollution is dilution". Good, bad, or otherwise, this phrase has scientific underpinnings that have real implications for water quality. In Colorado, the most common water quality impairments take three forms: 1) elevated concentrations of pollutants (i.e iron or cadmium), 2) elevated water temperatures, and 3) low levels of dissolved oxygen. All three of these impairments can potentially harm living organisms, including us. First, let's take examine dissolved pollutants.

When most people think of poor water quality, they assume the water contains harmful chemicals or elements. Acid mine drainage is a classic example of elevated levels of harmful metals such as iron, zinc, and mercury or other harmful pollutants such as sulfates. Most waters in Colorado contain these elements in some concentration, but what makes acid mine drainage a problem is the *high* concentrations of these pollutants. Essentially, more of the pollutant is ending up in the water than can be supported by the stream, creek, or river. So not only do we have a problem with too much pollutant in **Continued on page 9**



An example of the mean daily dissolved oxygen concentration and water temperature of a river. The concentration of dissolved oxygen in surface water is controlled by temperature and has both a seasonal and a daily cycle. Cold water can hold more dissolved oxygen than warm water.
Source—https://water.usgs.gov/edu/dissolvedoxygen.html

Water Quality continued from page 8

the water, we also have a lack of available "flushing flows" that can dilute the pollutant to concentrations that are not harmful to life.
In times of drought, some constituents (like iron in the example above, but including many other pollutants) become elevated because the amount of pollutant entering the river/lake is the same, but the amount of water in the river/lake is lower. It is also important to note that not all pollutants entering water bodies are from man-made sources. Many (and in some cases most) of the natural pollutants enter the water bodies from the natural environment such as alluvial groundwater, storm water runoff, or atmospheric deposition.

A common example would be an increase in total dissolved solids (i.e. salts) because pure water is evaporated while the remaining water contains a higher concentration of salts due to evapoconcentration. None-the-less, it is important to consider water quality testing if you suspect a water quality constituent is elevated due to drought-limited water sources.

The second type of impairment, which is not exclusive to drought conditions but is often exacerbated by it, is elevated water temperatures. Nearly all water bodies in Colorado warm up in the summer, but lower water levels due to drought can cause temperatures to rise dramatically.

Increases in water temperature create two distinct water quality impairments. First, warmer water can increase *dissolution* (dissolving) of chemicals. Second, the temperature of the water can have negative effects on aquatic life, including fish. Some species of fish can better tolerate temperature fluctuations, but it is not necessarily the total temperature change but rather the *rate of change*. The rapid heating of water places great stress on the entire aquatic food web, from invertebrates to fish and birds.

The increase in water temperatures and drought conditions are both factors contributing to dissolved oxygen in water. Dissolved oxygen in water is used by all forms of aquatic life and the "health" of a water body can be assessed by dissolved oxygen levels. In rivers and creeks, low flows can reduce the aerating effects of boulder and cobble-strewn rivers. After all, white-water rivers are so-named because of the increased presence of air (oxygen) from turbulent river flows. The second limiting factor to dissolved oxygen in rivers and streams is from increases in water temperature and, in some cases, increase in aquatic vegetation or algae. This is most common in still waters such as ponds or lakes. Decomposition of dead matter, including algae and aquatic vegetation, consumes oxygen.

Water quality issues such as low dissolved oxygen, increased temperature, and higher concentrations of dissolved pollutants can all increase during drought conditions. The combination of less water and (commonly) slower flows increase the chances of stagnation. The impacts of poor water quality on all life, aquatic or non-aquatic, should not be ignored as drought could provide another stress point for tipping the water quality balance towards "concerning."

Most of the occurrences described in this article apply to surface water sources, little is known on the effects of drought on groundwater resources. If you would like more information on water quality, including how to take water samples and where to send them, please visit the CSU Extension Water Team waterquality.colostate.edu for more information.

Homeowners Can Address Wildfire Risk

Colorado State Forest Service

With wildfires burning homes and causing evacuations throughout Colorado and with much of southern Colorado under extreme drought conditions – the Colorado State Forest Service wants to remind homeowners living in the wildland-urban interface to prepare for wildfires before they arrive.

While there is no guarantee firefighters will be able to save a home from a wildfire, the odds increase if homeowners and communities take proactive steps to reduce their fire risk, says Lisa Mason, CSFS forestry education specialist. "Fire risk reduction efforts are much more effective when neighbors work together to reduce hazardous fuels around their homes and throughout the community," Mason said.

The CSFS offers numerous resources to help private landowners reduce wildfire risk, with specific recommendations including:

- ◊ Remove all flammable vegetation within at least 15 feet of any part of a home or other structure, including decks.
- ◊ Reduce the density of standing trees within 100-200 feet of all structures.
- ◊ Ensure adequate access for fire and emergency equipment and be sure that the house number is posted and easily visible to emergency responders.
- ◊ Keep grasses and weeds surrounding the home mowed to a height of less than six inches, through regular and ongoing maintenance.
- ◊ Regularly clear pine needles and leaves from gutters and decks, and trim overhanging branches.
- ◊ Stack firewood and locate propane tanks at least 30 feet from and uphill of structures.
- ◊ Have an evacuation plan and a designated meeting place that all family members are familiar with.
- ◊ Prepare a "grab and go" disaster kit with necessary family/pet items including important documents/photos, clothing, medications, food/water, phone charger, etc. so you are ready for immediate departure.
- ◊ Contact your county sheriff's office and ensure that your telephone number appears in the Reverse 911 or other emergency notification database.

"Remember that addressing wildfire risk is not a one-time effort, and that flammable vegetation grows back over time," Mason said.

For more information and resources on protecting homes and communities from wildfire, including how to become a Firewise Community, visit csfs.colostate.edu/wildfire-mitigation or call a local CSFS field office.

Follow @Colorado Stewardship
on
Instagram and Facebook

Upcoming focus -

Drought Impacts

Drought Forces Difficult Business Decisions

Farmers and ranchers are being forced to make many drought-related decisions such as whether to sell cows, buy feed, or alter production schemes.

It is important to understand the production, financial, and tax implications of these decisions. Tax related resources are available at www.ruraltax.org. "Rural Tax" is for farms, ranches, and small businesses to gain valuable knowledge and useful tools pertaining to the tax code. All the materials are peer reviewed, and the list of topics continues to grow.

The ABM web site (www.wr.colostate.edu/ABM) also has myriad resources. There are a number of "decision tools" related to beef cattle. Some of the resources on both web sites may be a few years old, but the information and outputs remain valid.

Follow @Colorado Stewardship on Instagram and Facebook

Upcoming focus -

Drought Impacts

Colorado Small Acreage Services Database

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

http://sam.ext.colostate.edu

Need help with weed control?
Have a small pasture seeding project?
Search the site today to find a local contractor!

Contractors—Advertise your services here!

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

For a list of upcoming events in your area visit CSU Extension Small Acreage Management website sam.extension.colostate.edu/

Do you have a question about managing your small acreage?

Contact CSU Extension /NRCS Small Acreage Coordinators:

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COLORADO Small Acreage Management

COLORADO STATE UNIVERSITY EXTENSION

USDA United States Department of Agriculture
Natural Resources Conservation Service