

June 11, 2013

Ben Wade Office of Water Conservation and Drought Planning Colorado Water Conservation Board 1313 Sherman Street, Room 721 Denver, CO 80203

Dear Mr. Wade,

Final Report for Green Industries of Colorado's Drought Educational Materials Grant Routing #13000000098 / CMS #55259

As of June 5, 2013, the Green Industries of Colorado's (GreenCO) has completed all of the tasks outlined in the grant's Scope of Work.

With your help, GreenCO has successfully completed a series of educational "how-to" videos and fact sheets designed to provide the public with practical outdoor water use information for the drought of 2013 and beyond. GreenCO and its partners believe it is important to provide the public hands-on, easy-to-follow guidelines on how they can save water by using the proper design, installation and maintenance practices.

GreenCO's Best Management Practices (BMPs) for the Conservation and Protection of Water Resources in Colorado ~ *Moving Towards Sustainability* were used as the scientific basis for all written and produced content to help reduce outdoor water use, while insuring the overall health and value of the landscape during dry weather conditions. The drought educational series includes the following:

"How-To" Video Messaging

- 1. Helping Your Yard Weather Drought Conditions http://youtu.be/xsG8YsTfW7c
- 2. Xeriscape is a System, Not a Garden <u>http://youtu.be/knpuK6nKvkQ</u>
- Sprinkler Tips to Save Water <u>http://youtu.be/oMKq-vyjITM</u>
- Protecting Your Trees In A Drought <u>http://youtu.be/05p7TAX8Wy4</u>

Educational Fact Sheets (attached)

1. Help Your Yard Survive the Drought

- 2. How Your Sprinkler System Can Save Water and Money
- 3. Water Conserving Tips for HOAs and Large Commercial Properties
- 4. When and How to Water Your Yard
- 5. Xeriscape is Not a Garden, It's a System (additional fact sheet developed as in-kind donation)

100% Grant Completion – Final Report

All of the drought educational materials are complete and can be viewed on GreenCO's website at http://www.greenco.org/resources.html.

The drought educational materials have been shared and promoted to green industry professionals, water providers, government agencies, cities and municipalities, non-profits, and other stakeholders. In its launch correspondence to stakeholders, GreenCO strongly encouraged partner usage and widespread distribution. As a collaborative messaging approach, GreenCO extended an offer to all stakeholders to co-brand the fact sheets using individualized logos. At the time of this report, several entities have opted to co-brand the fact sheets for distribution to their respective customers. A press release was distributed to all media outlets in early June to announce the launch of GreenCO's educational drought series.

Task Completion Report

Task 1 – Develop and deliver outdoor water use "fact sheets" for mass publication and distribution.

- Assemble small group of GreenCO members to vet useful and pertinent BMPs complete
- Select BMPs complete
- Write and edit 2-sided fact sheets complete
- Circulate fact sheets for review by key group of stakeholders and incorporate changes complete
- Design fact sheets to include photos and graphics *complete*
- Deliver final fact sheets in a PDF format complete

Task 2 – Produce and deliver how-to videos for mass electronic distribution

- Secure production company to create videos complete
- Craft messaging and write scripts for each video *complete*
- Recruit industry experts to conduct videos *complete*
- Begin video shooting on location, review still photos to use in videos complete
- Edit video production *complete*
- Distribute draft for review with a pre-selected group of stakeholders *complete*
- Incorporate feedback *complete*
- Finalize production and post to You Tube –*complete*
- Deliver and share videos via links *complete*

Conclusion

GreenCO is extremely pleased with the outcome of this project. GreenCO believes that it has built resources that its stakeholders want, what they need, and what they will use as reference material for many years to come. Since the project was launched, GreenCO has received multiple requests for co-branding of fact sheets, witnessed videos going viral on YouTube, and active tweets on Twitter.

On behalf of GreenCO, I wish to thank you for the on-going support you have provided, and helping to move this project from an idea into a reality. As always, GreenCO will be happy to answer any questions you may have regarding this report and final invoice.

Respectfully submitted,

frenda O'frien

Brenda O'Brien GreenCO Project Manager

Cc: GreenCO Board of Directors GreenCO Association Executives



Help Your Yard Survive the Drought

Our yards provide an enjoyable place to relax and play, and represent a significant investment. Enhanced quality of life, environmental benefits and preserving property values make our landscapes worth protecting – especially in a drought year. It is possible to keep your yard healthy during a drought and still do your part to conserve water. Following are easy, practical tips provided by plant and landscape experts to help your yard survive the drought.

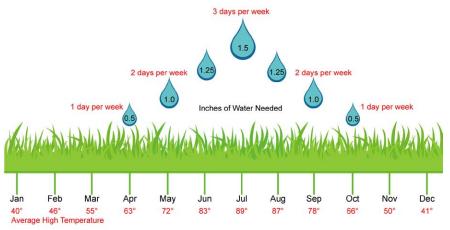
Tip #1: Water only if your plants need it

If you live in a community enacting mandatory or voluntary watering restrictions, it's tempting to use all the water you can on your designated days. However, it is important to water only if the plants need it.

Spring is a good time to apply supplemental water to encourage deep root growth for lawns. The best way to do that is to soak the grass well and then wait a few days – even up to a week – before you water again.

Deep, infrequent watering will train the plants' roots to grow deeper, and more robust, and it helps them survive the hotter temperatures in July and August. Frequent watering, on the other hand, should be avoided as it keeps roots near the top of the soil, where they will dry out more quickly in the heat.

In July and August, it is best to water in 3-4 cycles for about 5 minutes each, allowing 15 minutes in between cycles for soils to absorb the water. Watering times vary by sprinkler type, so be sure you are applying the proper amount. Refer to the chart below to determine how long you should water based on your sprinkler type.



Most spray heads disseminate approximately 2 inches of water per hour. Most rotor sprinklers disseminate approximately 1/3 of an inch per hour.

Most importantly, check your soil before you water. An easy way to check soil moisture is by inserting a screwdriver in the soil. If it is easy to push in, do not water (note: with sandy soil you may still need to water even if the screwdriver inserts easily). If the screwdriver is hard to push in, water according to the seasonal requirements following your water provider's guidelines.

Tip #2: Learn how to program your sprinkler timer



Become familiar with the programming feature of your sprinkler system or hire a professional to help you program it. Setting the system once for the entire season is not recommended. Settings should be adjusted and reset throughout the season to mirror warmer and cooler weather patterns. To avoid watering during a rainstorm, install a rain sensor that will automatically shut off the system.

If you are redesigning your yard, rethink your existing sprinkler system to better meet your plants' needs and reduce water usage. If you are installing a new system, design it right from the start. The system should water lawns and shrub/ perennial beds separately. Drip irrigation systems are the most effective and efficient way to water trees, shrubs, flowerbeds and gardens. Whenever possible, take advantage of new water-efficient sprinkler technology. It is also very important to conduct ongoing maintenance of the system to repair leaks, broken heads and nozzles.

Tip #3: Amend soil and add mulch

Healthy, productive soil more readily absorbs moisture. Improve sandy or clay soils prior to planting with 3-5 cubic yards of organic matter (compost, not topsoil) per 1,000 square feet of an area to be seeded, planted or sodded. Till the compost to a depth of 4-6 inches. Apply mulch, such as wood chips or bark, 3-4 inches deep on top of flowerbeds, gardens and around trees.



Tip #4: Aerate and mow wisely

Aerate in the spring or fall with a core-aerating machine. Aeration opens up the soil so it can take in the moisture and nutrients that keep lawns healthy.

Mow traditional turf grass to a height of 3 inches, and never cut off more than one-third of the total height of the grass. Keeping grass at optimal length allows it to retain moisture so you can water less. Leaving clippings on the grass can improve the soil and lawn health.

Tip #5: Plant the right plants in the right place

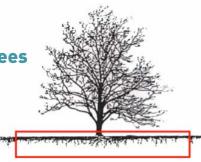


When you select plants, choose the right plant for the right place. Plants with low water requirements that are suited for Colorado's climate will do better in drought years. Many nurseries carry Plant Select[®] and X-rated, which are chosen for their ability to thrive in the unique conditions of Rocky Mountain gardens. Ask the nursery or garden staff for advice.

When you plant, cluster plants together with similar sunlight and watering requirements and avoid overplanting as it leads to water waste. Healthy plants will better weather the drought and be more resistant to pests.

Tip #6: Remember to water your trees

Trees are one of the most valuable assets in a landscape. A tree's roots grow horizontally and can spread 2-4 times wider than the height of the tree, and wider than the tree's canopy. Water should be applied within the entire canopy of the tree. Water



Red indicates area under the canopy to water.

deeply and slowly to many locations under the canopy. To assure the survival of a tree, apply 10 gallons of water for each inch of the tree's diameter per watering. Apply mulch within the canopy at a depth of 3-4 inches, leaving 6 inches between the mulch and trunk.



For more information:

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Plant Select – <u>www.plantselect.org</u> Water-wise plants suitable for the Rocky Mountain region

CWCB Drought Response Portal – <u>www.coh2o.co</u> Drought conditions and state-wide watering restrictions



How Your Sprinkler System Can Save Water and Money

During a drought, many Colorado communities enact mandatory or voluntary outdoor watering restrictions that limit watering to specific days during the week. Don't feel compelled to water just because it's your designated watering day. Over watering is wasteful and can actually harm plants.

Following these simple guidelines from plant and landscape experts can help you apply the right amount of water to your yard, at the right time, to keep your landscape healthy. While it's important to follow restrictions if they apply, these tips can help you use water wisely every year, wet or dry.

Tip #1: Perform proper system maintenance

When you first turn on your system and throughout the watering season, check for leaks and broken sprinkler heads and nozzles, and repair promptly. Ensure heads are at ground level, not too high or low, straight and not leaning or being blocked by tall grasses or plants, which can deflect and waste water.

Spray heads that mist or fog indicate the water pressure is too high and the system is wasting water. Installing pressure-regulating devices will save water and help apply water directly to the plants.

Replacing mismatched nozzles and installing higher-efficiency nozzles is an inexpensive way to save water. Many water providers offer rebates on highefficiency and rotating nozzles, so check your water provider's website for rebate guidelines.



Tip #2: Program your system the right way

Never set the timer and forget it. Adjust the amount of water you deliver based on the time of year, natural precipitation and plant needs. A shady area will require less water than a hot, sunny area. Spring and fall seasons require less water than the hot summer months. Also, readjust the clock when plants become established, as they require less water then, too. Check your soil before you water by inserting a screwdriver in the soil. If it is easy to push in, do not water (note: with sandy soil you may still need to water even if the screwdriver inserts easily). If the screwdriver is hard to push in, water according to the seasonal requirements following your water provider's guidelines.

The amount of water you apply should not exceed the soil's ability to absorb it. In the summer heat, set your timer to cycle and soak. Professionals recommend a cycle-and-soak watering method to maximize absorption and minimize runoff.

For example, a pop-up spray head requires three short cycles in place of one long cycle with 15-30 minute intervals. An automatic rotating sprinkler head, or oscillating type, will typically require three times more run time to complete its cycle since it is rotating and not stationary. Cluster plants together that have similar water needs so you can water accordingly.

Tip #3: Consider 'smart' technology that does the thinking for you

Smart controllers including evapotranspiration (ET) technology can help save water by using weather data to help determine when to water. ET helps take human error out of the equation and determines the amount of water that needs



to be applied based on scientific information, making it more precise for those operating the system.

Rain sensors, another technology, help avoid watering the yard during and after a rainstorm. Many water providers offer rebates on smart controllers and shut-off devices so check their websites for guidelines.

Tip #4: Update your system or design a smart one from the start

Design the irrigation system so it distributes water uniformly across your yard. Design irrigation systems based on a direct knowledge and comprehensive understanding of site conditions including:

- soil type and infiltration rate
- plant type, treatment and placement
- climate
- grading
- slopes
- exposure to wind and sun
- water availability
- · size of irrigated area
- construction budget

Consider installing drip irrigation or underground watering systems to limit evaporation and to apply water to plants' roots more efficiently. Drip irrigation is recommended for watering trees, shrubs and veggie and flower gardens. Design the system to include separate watering zones for trees, flowerbeds, gardens and lawns. You do not want to have your lawn and flowerbeds watered together, since their water requirements differ. If you are watering two different plant materials together, one is likely to be over-watered while the other is under-watered. Watering separately helps save water and improves the health of the plant.

Tip #5: Check for watering restrictions/guidelines

During a drought, water providers may have mandatory or voluntary watering restrictions. Check in with your local provider to find out what restrictions apply to you.

Landscape experts recommend against watering during the heat of the day. Avoid watering from 10 a.m. to 6 p.m. and while it is rainy or windy. Adjust your timer to follow these guidelines. If your timer technology is old, you may want to update it to manage water more efficiently.

Tip #7: If you don't know, hire a pro

Tip #6: Get an irrigation evaluation

Irrigation professionals can conduct an evaluation to help you determine a sprinkler system's efficiency and identify how to correct problems. Many water providers also offer irrigation audits, and in some cases, at no cost. Check your water provider's website for guidelines and availability.



If you don't have the time or expertise to maintain and program your system, or install and learn new technologies, hire a professional irrigation specialist. When interviewing contractors, ask for water-saving data from similar-sized properties to determine the best contractor and approach. Hire a contractor with expertise in irrigation installation and maintenance, and ask if he or she is Landscape Industry Certified. This certification is a rigorous testing program that indicates the landscape technician is proficient in the latest technologies.





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Water Conserving Tips for HOAs and Large Commercial Properties

The challenge of watering Homeowners Associations (HOAs) and other large commercial properties during a drought can be greatly reduced by using proven maintenance practices, integrating irrigation technology designed to water more efficiently and incorporating Xeriscape principles. Following are practical tips provided by landscape experts to help large properties keep landscapes healthy while using less water.

Tip #1: Determine the best water plan

In communities where mandatory water restrictions have been enacted, large properties are typically faced with two irrigation options: watering on assigned days or participating in a designated water budget program. Because many commercial properties with large landscapes need more flexibility to deliver water to all their irrigation zones, property managers may elect to use a water budget. Water budgets determine a certain number of inches per year, gallons per square foot, or percentage reduction of water use based on evapotranspiration (ET). If using a water budget, the property can normally be watered any day of the week, but is limited to a prescribed amount of water. Irrigation professionals can help develop a program that is best for the property.



A healthy and attractive property doesn't just happen – it begins with good irrigation design that delivers adequate water efficiently.

Tip #2: Perform proper irrigation maintenance

Improving irrigation system efficiency is one of the best ways to save water and money not only in a drought year, but every year. At system start-up and throughout the watering season, the system should be checked for leaks and broken heads and repaired promptly. Heads should be straight and not obstructed by tall grasses or plants.

Spray heads that mist or fog are indicators that the water pressure is too high and wasting water. Installing pressure-regulating devices will save water and help apply water directly to the plants.

Replacing mismatched nozzles and installing higher efficiency nozzles also save water. Many water providers offer rebates on high-efficiency nozzles, so be sure to check rebate qualifications online or ask your

landscape contractor.

Drip irrigation is recommended for watering trees, shrubs and flower gardens. Drip irrigation systems are water efficient because they are not as susceptible to water loss due to evaporation, wind or surface runoff.





Tip #3: Incorporate water-saving technology

Smart controllers, also known as evapotranspiration (ET) controllers, measure soil type and characteristics, precipitation rates, plant water requirements, and weather to deliver only the amount of water needed. Controller types, features and costs vary, and

some brands allow the entire system to be maintained remotely via the Internet. Another important and inexpensive technology is a rain sensor, which prevents the irrigation system from watering during a rainstorm. Many water utilities offer rebates on water-saving technologies.



Tip <mark>#4:</mark> Xeriscape

Xeriscape is more than a garden style or type of plant. It is a comprehensive approach to landscaping that combines seven landscaping principles to conserve water. The process includes proper design, soil prep, appropriate plant selection, water efficient irrigation, practical turf areas, mulches and appropriate maintenance. Converting all or part of an existing property to Xeriscape is another way to save water.



Tip #5: Schedule watering based on site conditions

Several factors must be considered when setting watering schedules on large properties, including soil, slope, plant types, exposures and existing irrigation technology. To adequately determine frequency and duration of watering, water application rates, soil characteristics, plant needs, weather variation and the capabilities of your irrigation technology must also be considered. For example in May, the controller might be scheduled to apply only 50 percent of the peak water budget that would be applied during the heat of July.

The amount of water applied at any one time should not exceed the infiltration rate of the soil or water will run off. Newer controllers allow for multiple start times so that the cycle- and-soak method can be utilized for better infiltration.

Tip <mark>#6:</mark> Hire a pro

Not all landscape contractors are irrigation efficiency experts. When interviewing contractors, ask for water saving data and case studies from their work on similar-sized properties. It is important to select a contractor who understands the principles of water management and also has the expertise to operate new technology. Providing the contractor the property's water bill will help him better assess how to employ water saving measures.



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When and How to Water Your Yard

During a drought, many Colorado communities enact mandatory or voluntary outdoor watering restrictions that limit watering to specific days during the week. Don't feel compelled to water just because it's your designated watering day. Over watering is wasteful and can actually harm plants.

Following these simple guidelines from plant and landscape experts can help you apply the right amount of water to your yard, at the right time, to keep your landscape healthy. While it's important to follow restrictions if they apply, these tips can help you use water wisely every year, wet or dry.

Tip #1: Check your soil for moisture first

Prior to watering, check the moisture in the soil. An easy way to check soil moisture is by inserting a screwdriver in the soil. If it is easy to push in, do not water (note: with sandy soil you may still need to water even if the screwdriver inserts easily). If the screwdriver is hard to insert, you probably need to water that day or on your next designated watering day.



Tip #2: Look for footprints in the lawn

Beware of signs of dehydration in your lawn. Be concerned if grass has a purplish tint, blades turn steel gray, footprints are left when walked upon, and most serious, when grass blades turn straw color.



Tip #3: Water only if the plants need it

Plants actually do better when they are only watered when they need it. Snow, rain or cooler temperatures might mean you only have to water once a week, or maybe not at all. This applies whether you're watering from a sprinkler system or a hose. When water is needed, water deeply and infrequently to encourage deep root growth and to decrease supplemental water requirements. Drip irrigation (shown below) is one of the best ways to water deeply.



Tip #4: Water lawns wisely

A typical Colorado lawn will require up to 1 inch of supplemental water each week to stay healthy.

Professionals recommend a cycleand-soak watering method to maximize absorption and minimize runoff. For example, pop-up spray heads require three short cycles with 15-30 minute intervals in place of one long cycle. An automatic rotating sprinkler head, or the oscillating



type attached to a hose, will typically require three times more run time to deliver equivalent water since it rotates and is not stationary.

When sod is installed, begin watering to build up sub-soil moisture. This is the most critical time to water. Probe the soil to make sure the moisture has penetrated at least 4 inches. Generally in weeks 3 and 4, transition from frequent water applications per day to an increased number of days between watering. By the end of the establishment period, the grass can go several days between watering and should be ready for routine maintenance. If your community is enacting restrictions, check with the water provider about getting a permit that allows more watering to establish a new landscape.

A newly seeded lawn must be kept moist, but not saturated, until the seeds germinate. Depending on the weather and site conditions, this may mean watering for a short time several times a day. As the grass begins to grow, reduce the frequency of watering. After four to six weeks, watering should be reduced to the amount recommended for an established lawn.



Tip #5: Water veggies at the root

A healthy vegetable and annual flower garden can use less or about the same amount of water as a lawn does. Watering by hand or drip irrigation systems will use the least amount of water. Vegetables need deeper watering because their roots are longer. Use the screwdriver test before watering. Apply water close to the plant's root system.



Tip #6:

Give new trees more water until established

Trees and other woody plants typically require additional watering for one to two growing seasons to become established. This includes winter watering, when snow is absent. Tree roots can spread two to four times wider than the height of the tree, and the absorbing feeder roots are located in the top 12-18 inches of the soil. Apply water so it moistens the critical root zone to a depth of 12 inches. Water should be applied at a rate that allows it to soak slowly into the soil. Drip irrigation systems, soaker hoses, watering forks and spray wands allow for slow watering. You can water less after the trees are established. Don't forget to move drippers and soaker hose further away from the trunk as the tree matures.



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Xeriscape Is Not a Garden, It's a System

Denver Water coined the term Xeriscape in 1981 and with the help of plant and landscape experts, developed seven Xeriscape principles. Xeriscape is more than planting low-water plants, such as Yucca, landscaping with rocks or reducing the size of your lawn; it's an entire system of principles that reduces water needs. Approaching Xeriscape as an entire system will help you create not only a water-wise yard, but also a beautiful and sustainable landscape. Some of the most attractive yards in Colorado were planned and planted using these seven principles of Xeriscape.

1. Plan and design landscaping comprehensively

Start with a site inventory and analysis, and note existing conditions such as drainage, exposures, soil types, and existing plants. Think about how your yard will be used, including traffic patterns and access points. Use this information to integrate both plants and hardscapes into the design.

2. Evaluate soil and improve if necessary

Improve soil with organic matter (compost) and other suitable amendments before planting. Soil improvements help plants absorb water and promote proper drainage, which improves plant health.

3. Create practical lawn areas

Include grass where it provides defined functions (i.e., recreation and traffic areas). Grass is best separated from plantings of trees, shrubs, ground covers and flowers so it can be watered separately. Choose the appropriate grass for the desired use. Alternative grasses for some areas may include tall fescue, buffalograss, blue grama and wheat grass. Often, portions of lawn can be replaced with more waterefficient ground covers and mulches.



4. Use appropriate plants and group by water needs

Plants with lower water requirements, such as native species already adapted to Colorado's climate, should be considered. However, other plants can have a place in Xeriscape designs, even if they require larger amounts of water. The key is to use those plants in appropriate locations and not to interplant them with others that have very different, lower water requirements. In effect, the groupings of plants are separated into different zones based on their water requirements, which allows them to be watered more efficiently.

5. Water efficiently with a properly designed sprinkler system

Water according to the condition of the plants, not on a fixed schedule, following your water provider's guidelines. Well-planned sprinkler systems can save water when properly installed, maintained and operated. Apply only as much water as the soil can absorb to avoid runoff waste. Trees, shrubs, flowers and ground covers can be watered more efficiently by hand or drip irrigation. To promote healthier plants, water infrequently, but deeply.





6. Use mulches

Mulch reduces surface evaporation of water and controls weeds. Mulched planting beds are an ideal replacement for expansive turf areas. Mulches cover and reduce temperature extremes in the soil, minimize evaporation, reduce weed growth and slow erosion. Mulches also provide landscape interest. Organic mulches are typically bark chips, wood grindings or pole peelings. Inorganic mulches include rock and various gravel products. Place mulch directly on the soil or on breathable fabric. Do not use impermeable sheet plastic beneath mulched areas.



7. Maintain your landscape

To maximize water savings, prune, weed, mow and fertilize, plus pay attention to the sprinkler system and adjust as needed. Regular maintenance preserves the intended beauty of the landscape, and saves water and money.





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