Green Industries of Colorado Partners with the Colorado WaterWise Council

International Irrigation Show
San Antonio, Texas – November 7, 2006
Technical Session Overview

~ Partners in Delivering Water Conservation and Water Quality Protection Education

• Introduction to Green Industries of Colorado
  – GreenCO’s BMP Training and Certificate Program

• Introduction to Colorado Water Wise Council
  – How the partnership was formed

• Introduction to Town of Castle Rock
  – Landscape Rules and Regulations

• Program accomplishments and testimonials

• Q & A
An Introduction to the Green Industries of Colorado (GreenCO)

- GreenCO Overview
- GreenCO’s Conservation Goals
- History of Best Management Practices (BMP) Development
- Overview of GreenCO BMPs
- A Snapshot of the BMP Training Program
Who is GreenCO?

Represents over 2,000 Member Companies

35,000+ Employees throughout Colorado

An alliance of seven organizations representing the common interests of landscape-related trades.
What is GreenCO?

• Unified organization preserving Colorado’s built landscapes.

• Represents urban agriculture, providing a variety of goods and services in both wholesale and retail markets statewide.

• Voice for more than 2,000 small, medium and large wholesale, retail and agri-business member companies and their 35,000 employees in Colorado.

• Contributes nearly $2 billion to Colorado’s economy.
Why Does Water Conservation Matter to the Green Industry?

• Water is a limited resource.

• Water use increases with population growth.

• Improving urban water use efficiency aids in meeting increased demand.

• Water conservation: “Using less water to satisfy a particular purpose” - does not mean eliminating attractive landscapes.

• Sustainable growth is critical to the green industry.

(Less Water - LESS WORK - Less business)
Why Does Water Quality Matter to the Green Industry?

Reduce non-point source pollution by:

• Reducing runoff
• Encouraging vegetative buffers use
• Applying chemicals more efficiently
• Educating the end-user about water quality

Reduce pollution at the source rather than correcting the impacts.
GreenCO’s Water Program

Mission:
“To inform, encourage, and instill the practice of sound water use across Colorado and ensure that built landscapes remain an essential foundation of Colorado’s quality of life, economic health and public image.”
GreenCO’s Water Program

As the most visible user of outdoor water, our goal is to provide industry-driven leadership to help address water issues proactively and identify solutions to landscape water waste and pollution.

Development and application of Green Industry “Best Management Practices” helps the industry respond to challenges posed by water shortages caused by population growth and drought.
Creating BMPs
First Step to Meet Goals

How?

- “Get our house in order”
- Inventory, evaluate and adopt industry-wide standards
- Integrate BMPs into training programs and public outreach
- Develop recognition for training
What are BMPs?

• For our purposes, Best Management Practices are:

  “Voluntary activities undertaken to reduce water consumption and protect water quality.”

• Term is widely used by many local, state and government agencies.
GreenCO Developed these BMPs Because We Realize:

- Healthy landscapes enhance water quality and the environment.
- Over-irrigation is the primary source of water waste in landscaping.
- Preventing or reducing pollution at its source is easier than correcting its impacts.
- Improved water quality and conservation are dependent on behavior changes.
Practicing and promoting water conservation is essential for the success of the Green Industry!
Colorado Governor Bill Owens issued a Green Industry “BMP” Proclamation December 9, 2005

“BMP Awareness Week” December 12-16, 2005

Honorary Proclamation

BILL OWENS
GOVERNOR

GREEN INDUSTRY BEST MANAGEMENT PRACTICES AWARENESS WEEK
December 12 – 16, 2005
WHEREAS, the issue of water management and conservation is of the utmost concern and priority for the state of Colorado, to ensure our quality of life and economic viability; and
WHEREAS, Colorado’s ability to recognize and implement management practices for water users that utilize the best of technology, design, and material use – based on Colorado’s climate and soil conditions to conserve and manage water use in our environment – is highly advantageous; and
WHEREAS, the Green Industries of Colorado, in conjunction with representatives from Colorado State University Cooperative Extension, Colorado State University Department of Horticulture and Landscape Architecture, Colorado Water Resources Institute, Denver Water, and the Northern Colorado Water Conservancy District, have developed practices – through both the science and practical application of landscape or outdoor urban water use – that provide both efficiency and flexibility for planning agencies at the local and state level, as well as individual property owners, to maximize water use while preserving viable landscape options; and
WHEREAS, these best management practices (BMPs) are an evolving set of guidelines and standards, which will take advantage of future technological developments and future refined water practices, that can be adapted by local, county, and state agencies as a goal for water management and conservation; and
WHEREAS, BMPs are state-of-the-art practices for water conservation and water quality protection that help to ensure the future viability of our great state;

Now Therefore, I, Bill Owens, Governor of the State of Colorado, do hereby proclaim December 12 – 16, 2005,

GREEN INDUSTRY BEST MANAGEMENT PRACTICES AWARENESS WEEK
in the State of Colorado.

GIVEN under my hand and the Executive Seal of the State of Colorado, this first day of December, 2005.

Bill Owens
Governor
GreenCO’s 31 BMP Fact Sheets
Basis of BMP Training

- Drought Practices for Landscapes
- Drought Practices for Nurseries, Greenhouses and Growers
- Education of Employees
- Education of the Public
- Fertilizer Application
- Herbaceous Plant Care
- Irrigation Efficiency (General) Irrigation System Design
- Irrigation System Installation
- Irrigation System Maintenance
- Landscape Design
- Landscape Installation and Erosion and Sediment Control
- Landscape Maintenance
- Lawn Aeration
- Lawn Waste Disposal/Composting
- Mowing
- Park, Golf Course and Other Large Landscape Design/Management
- Pesticide/Herbicide Application
- Pesticide/Fertilizer/Chemical Storage, Handling and Disposal
- Plant Selection and Placement
- Production Practices for Nurseries, Greenhouses and Growers
- Regulatory Awareness/Compliance
- Retail Practices for Nurseries, Greenhouses and Garden Centers
- Revegetation of Drainageways
- Riparian Buffer Preservation
- Soil Amendment/Ground Preparation
- Turf Management
- Water Budgeting
- Woody Plant Care
- Xeriscape
BMP Workflow

1. Nursery/Grower/Retail Practices
2. Xeriscape Principles
4. Education

Planning and design
- Soil improvement
- Hydrozoning
- Practical turf areas
- Efficient irrigation
- Mulching
- Appropriate maintenance

Misc. Practices
- Mowing
- Aeration
- Lawn Waste Disposal
- Herb. Plant Care
- Fertilizer/Pest./Chemicals
- Drought Practices
Water Conservation Practices Starts with Nurseries, Greenhouses & Growers

1. Reduce wasted water/runoff
   - Hydrozoning

2. Examine/improve irrigation system efficiency
   - Irrigation technology (e.g., drip, subirrigation)

3. Collect and reuse/recycle irrigation water
   - Increase attention to disease prevention practices and salt/nutrient build-up
Properly Use Technology to Maximize Irrigation Efficiency

Photo Source: Little Valley Wholesale Nursery.
Overview of Pollution Prevention in Greenhouses/Nurseries

• Manage irrigation systems to reduce transport of chemicals.
• Use IPM/PHC in pest control decisions.
• Apply pesticides only when needed.
• Maintain records of pesticide use.
• Protect groundwater/surface water from leaks/spills.
• Protect wellheads from contamination.
Seven Principles of Xeriscape™

1. Planning and design
2. Soil improvement
3. Hydrozoning
4. Practical turf areas
5. Efficient irrigation
6. Mulching
7. Appropriate maintenance

*Xeriscape is a term copyrighted by Denver Water in 1981. Permission to use granted.
Planning and Design
(Xeriscape Principle 1)

• Select the right plants
• Place in the right spot
• Group by water need
• Space properly to avoid excessive water use.

Photo Source: Valerian, llc and Engle Homes 2003
Examples of Industry Tools to Aid in Plant Selection

PUT SOME EXCITEMENT IN YOUR YARD!
A Guide to Xeriscape™ Gardening

ANNUAL & PERENNIAL PLANT GUIDE

Look for the X-Rated Xhale™
Gardening logo above. It's your sign to
successful gardening.

"Xhale is a trademark of Denver Water.
Denver, Colorado and is used with permission."
ALCC Award-Winning Xeriscape Landscape Designs

Source: Alpine Gardens, Williams Residence.

Source: Viriditas, Garden of the Aerie
Xeriscape™

IS....

IS NOT....

Source: Xeriscape™ Colorado
Soil Amendment and Ground Preparation
(Xeriscape Principle 2)

• Test soils to identify needed improvements (e.g., texture, nutrients, salts, pH)
• Proper soil preparation is critical to landscapes
  – 3-5 c.y. (1-2 inches) organic matter per 1,000 sq. ft., tilled 4-6 inches
• Preserve topsoil for reuse.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Amendment Level</th>
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<tr>
<td></td>
<td>Worst: No amendment/no tilling</td>
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<tr>
<td></td>
<td>Bad: Amendment/no tilling</td>
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<tr>
<td></td>
<td>Good: Amendment/ tilling 4-6&quot;</td>
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Soil Properties Affect Irrigation Requirements

• Organic matter improves the aeration of clay and the water-holding capacity of sand.

Graphic Source: Stephen Smith, Aqua Engineering.
Hydrozoning
(Xeriscape Principle 3)

• Group plants with like water needs
• Place low-water ground covers in difficult maintenance areas (steep slopes, narrow strips)
• Place low-water plants at top of slopes

Photo Source: www.xratedgardening.com
Water Budgeting

Knowing how much water you need +
Knowing how much water you use =
Knowing WHEN & HOW to adjust your system

• Not as complicated as it sounds
• Irrigating according to plant needs
• Need to understand ET
  – Water lost from soil/plant surfaces (evaporation)
  – Water used by plants (transpiration)
How Much Water Do Plants Really Need?
Hardy Boy Bedding Plant Annuals Top 20 Water Efficiency Study
(Welby Gardens and CSU 2003)

100%  75%  50%  25%  0%

Antirrhinum majus ‘Sonnet Yellow’ (Snapdragon)
Begonia x semperflorens ‘Vodka’
Catharanthus roseus ‘Peppermint Cooler’ (Vinca)
Dianthus hybrida ‘First Love’
Create Practical Turf Areas
(Xeriscape Principle 4)

• Value of turf:
  – Provides recreational benefit, good for high-use areas
  – Reduces wind and water erosion.
  – Provides cooling effect.
  – Filters and infiltrates runoff.
  – Aesthetics.

• Consider alternatives for narrow strips, hard-to-water and hard-to-maintain areas (steep slopes).

Photo Source: Valerian, llc and Engle Homes 2003
Irrigation Efficiency
(Xeriscape Principle 5)

1. Assure the overall quality of the system.
2. Design the system for the efficient and uniform distribution of water.
3. Install the system to meet design criteria.
4. Maintain the system for optimum performance.
5. Manage the irrigation system to respond to the changing need for water.

Source of Recommendations: The Irrigation Association
Efficient Irrigation Design

- Hydrozones
- Head-head spacing
- Drip emitters for beds
- Pop-ups for turf
- No overspray

Example Design Source: Valerian, llc and Engle Homes 2003
Irrigation System Design

Proper head spacing/configuration and operating pressures are critical for uniform water distribution.

Graphic Source: Stephen Smith, Aqua Engineering.
Drip Irrigation for Trees/Shrubs

Graphic Source: Stephen Smith, Aqua Engineering.
Irrigation System
Installation/Retrofitting

• Properly install equipment
• Install according to design specs.
• Install water conserving equipment
• Ensure owner knows how to operate

Graphic Sources: 1) Northern Colorado Water Conservancy District; 2) Aquacraft, WeatherTRAK

Soil Moisture Sensors

ET Controller
Irrigation Maintenance

• Check, adjust and repair irrigation equipment
• Shut off when damaged
• Reset automatic controllers to meet plant needs

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Regularly Adjust Irrigation System

Mulching
(Xeriscape Principle 6)

- Reduces water loss
- Reduces soil loss
- Suppresses weeds
- Promotes uniform temperature
- Promotes soil micro-organism activity
- Aesthetic amenity

Photo Source: Denver Water
Appropriate Landscape Maintenance
“There’s More to It than Just Water”
(Xeriscape Principle 7)

- Check, adjust and repair irrigation system
- Develop/Follow Site Water Budget
- Reset irrigation controller
- Aerate turf
- Replenish mulch
- Apply fertilizer, as needed
- Properly prune
- Pesticide/herbicide as needed, following label
- Mow at proper height
- Maintain equipment
- Monitor & keep records
Additional BMP Topics

- Herbaceous and Woody Plant Care
- Turf Management
- Mowing, Lawn Waste Disposal & Composting
- Fertilizer, Pesticide and Herbicide Application, Handling & Disposal
- IPM/PHC
- Material Safety Data Sheets (MSDS)
- Role of Landscaping in Engineered Drainage
- Riparian Buffer Zone Preservation
- Parks, Golf Courses and Other Large Landscapes
Regulatory Awareness and Compliance

- Pesticides
- Riparian (streamside) setbacks
- Wetlands
- Stormwater management
- Erosion/sediment control
- Groundwater
- Noxious Weeds
- Water rights
- Landscape ordinances
- Back-flow prevention
- Cross-connection controls
- Fire
- Wildlife
- Utilities
Appendices of GreenCO BMP Manual

- Erosion and Sediment Control BMPs
- Permanent Stormwater BMPs
- Regulatory Matrix
- Water Budget Calculator (also on website)
Educate the Public!

• **You** set the example!
• GreenCO website brochures
• Educate public on topics such as:
  – Irrigation system maintenance
  – Appropriate turf water use
  – Pesticide/fertilizer application
  – Ground preparation
  – Xeriscape
  – Water budgeting
Education of Employees

• Provide educational materials (field use, bilingual)
• Maintain professional credentials
• Make water conservation a priority
• Emphasize following labels
• Require compliance with relevant permits, local ordinances and regulations
Certification Programs to Consider

- Associated Landscape Contractors of CO
  - Certified Landscape Technician (CLT)
  - Certified Irrigation Technician (CIT)
  - Certified Landscape Professional (CLP)
- Colorado Nursery Association: CO. Certified Nursery Professional
- Colorado Greenhouse Growers Association: Certified Greenhouse Professional
- International Society of Arboriculture: Certified Arborist
- Irrigation Association: Certified Irrigation Auditor (among others)
- Colorado Department of Agriculture: Licensed Commercial Pesticide Applicator
- Green School Certificate
- Professional Gardener
GreenCO BMP Training Course

– Offered in English and Spanish
– 1½ hour BMP overview
– Class based on GreenCO BMP Manual
– Test on manual (100 questions, open book with 2-hour time limit, 75% passing score)
– Certificate of completion – “Seal of Knowledge”
– Recognition on GreenCO website with links to municipalities and others
Colorado WaterWise Council (CWWC)

• The “Voice” of the Colorado’s water efficiency community

• Shares information, technical resources, and water management strategies.
Town of Castle Rock

“Creating a community culture that embraces water conservation and smart landscaping techniques, saving the Town and ratepayers millions of dollars in infrastructure, stabilizing rates, protecting property investments, and extending the life of the Town’s aquifers.”

Be Water Wise
Town of Castle Rock

• Long Term Water Program Overview
  – Achieve a 75% renewable water program
  – Implement a proactive Water Conservation Program
  – Capital Program
  – Program Cost - $400 million
Capital Program Overview

Distribution of 2055 Water Supply

- 6,940 AF
- 3,300 AF
- 2,650 AF
- 4,410 AF
- 1,400 AF

- Conservation
- Denver Basin Groundwater
- Town Alluvial
- Water Reuse
- Imported Surface Water
Conservation Program Overview

• Reduce average water consumption by 18%
  – 165 to 135 gallons per capita per day
  – For a single family resident the equates to:
    • 117 to 102 gallons per day
    • Summer months – 17,000 to 14,000 gallons per day
    • Winter months – 5,000 to 4,000 gallons per month

• Preserve/enhance Castle Rock landscape architecture

• Water rates for promoting conservation
Conservation Program Overview

• Landscape Professionals Registration
• Rebate Program
• Water Conservation Seminars
Landscape Professionals Registration

• In order to facilitate expeditious plan review, permitting and inspections of landscaping and irrigation systems
  – Landscape designers
  – Irrigation designers
  – Installation and Maintenance Professionals

• Registration is by *individual* not by company

• Must be registered to work within the Town of Castle Rock
Landscape Professionals Class

• Attend an annual seminar

• Participate in and pass a test on the Water Use Management Plan and the Town of Castle Rock Landscape Regulations and Principles
Landscape Professionals Class

• The seminar curriculum includes at a minimum:
  – Program intent and objectives
  – Designation of large irrigated areas
  – Large irrigated schedule parameters
  – Acquire submittal requirements
  – Enforcement parameters
  – Demand management tools and
  – Related Landscape Regulation and Principles components
Landscape Professionals Class

- Nine classes held in 2006
- 300 Registered Landscape Professionals
- Incorporated GreenCO BMP Training and Certificate Program

www.crgov.com
Partners in Education

• In late 2005, GreenCO pitches a BMP Training Roadshow to CWWC.
• Cities’ support and host training sessions in 2005/06
• Town of Castle Rock takes the BMP Training Program to another level:
  – The City adopts GreenCO’s BMPs
  – Mandates that before performing work in the town, you must be registered with the City, attend BMP training and pass the exam.

The Town of Castle Rock is the BMP Implementation Pioneer!

Brenda O’Brien, GreenCO
Accomplishments

• 420+ “Seal of Knowledge” recipients to date
  - field professionals from green industry businesses, municipalities, metro districts, utilities, parks, towns, schools, correctional facilities, churches, hospitals, and home builders have attended.

• Delivered annually at ProGreen EXPO (www.progreenexpo.com)

• Nine sessions held in 2006

• Partnered with CWWC members to sponsor sessions

• GreenCO BMPs incorporated into various city landscape ordinances and Metro Mayors Caucus outdoor BMPs

• BMP certificate required to work in the Town of Castle Rock

View recipients at www.greenco.org
BMP Testimonials

“Water Conservation in Colorado must become a way of life, all the time, not just in times of drought.”
- Green Industries of Colorado (GreenCO) Board of Directors

“We developed short-term and long-term BMP improvements such as, replacing worn heads, using proper pressure, fixing leaks, and hydrozoning for our nursery. When we save on water, we pass the savings on to our customers.”
- John Pinder, Little Valley Wholesale Nursery, Brighton, Colorado

“The cities’ intent in reaching out to GreenCO is to establish the BMPs as the standard for built landscapes in their communities.”
- Stu Feinglas, City of Westminster, Colorado

“The BMPs are a powerful instrument for the industry to follow. The manual puts all the information under one umbrella and keeps us on the same page.”
- Todd Williams, American Civil Constructors, Littleton, Colorado
BMPs Make Their Way Into Ordinances

BMPs are setting the standard for built landscapes in Colorado.

Efficient & Sustainable Landscape

City Adopts BMPs

Design, Install & Maintain per BMPs

Set Ordinance

Bid According to BMPs

BMPs are setting the standard for built landscapes in Colorado.
Is Your Green Industry Working with Water Suppliers’ on Conservation Programs?

As the **most visible user of outdoor water**, the goal is to:

- **Partner with local organizations** to develop outdoor water conservation plans.
- **Utilize BMPs** in conservation planning/ordinances.
- **Provide industry-driven leadership** to help address water issues.
- **Proactively identify solutions** to landscape water waste and pollution.
- **Supply expertise** on green industry related matters.
- **Act as a resource** for scientific research.
Questions?

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