

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Natural Resources

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	20%		20%	
111	Conservation and Efficient Use of Water	20%		60%	
205	Plant Management Systems	25%		20%	
216	Integrated Pest Management Systems	15%		0%	
307	Animal Management Systems	20%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Paid	17.1	0.0	10.4	0.0
Actual Volunteer	0.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
234150	0	229211	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
234150	0	229211	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
609318	0	13425734	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

CSU Extension uses eight common outputs for planning and reporting purposes. They include group educational events, individual education (one-on-one), meetings convened and/or facilitated; kits, research/assessment projects; peer-reviewed publications, media releases, and on line posts. Definitions at <http://www.ext.colostate.edu/staffres/program/outputdefinitions.html> .

2. Brief description of the target audience

Adult and youth

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	409063	0	15615	41925

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	1012	37	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Classes, trainings, workshops, demonstrations, field days, technical assistance, etc. conducted

Year	Actual
2014	1349

Output #2

Output Measure

- One-on-one direct client contacts by site visit, office drop-in, e-mail, telephone, Ask an eXpert, etc.

Year	Actual
2014	5508

Output #3

Output Measure

- Meetings convened and /or facilitated

Year	Actual
2014	203

Output #4

Output Measure

- Kits or similar resources loaned or provided

Year	Actual
2014	416

Output #5

Output Measure

- Extension-related research and assessment projects

Year	Actual
2014	9

Output #6

Output Measure

- Web hits

Year	Actual
2014	313229

Output #7

Output Measure

- Indirect contacts through Media releases/appearances, newsletters, blog posts, or other non-peer reviewed publications

Year	Actual
2014	5508

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	NR 1.1) Participants report implementation or intent to implement actions relating to water quality and quantity issues (such as well and septic system management, CO Water Law and regulations, water rights, best irrigation practices, stream quality issues, and/or drought tolerant landscaping).
2	NR 1.2) Participants report implementation or intent to implement animal/wildlife-related conservation practices (such as improved manure management, livestock emergency preparedness, attracting pollinators, enhancing wildlife habitat, and/or deterring unwanted wildlife).
3	NR 1.3) Participants report implementation or intent to implement soil-related conservation practices (such as soil health, soil fertility, soil testing, erosion control, cover crops, composting, or soil compaction).
4	NR 1.4) Participants report implementation or intent to implement plant-related conservation practices (such as active weed management, pasture management techniques, grass stand establishment, planting windbreaks, planting native plants, and/or active forest management).
5	NR 1.5) Participants improve or intend to improve their practices, decisions and skills in action through timely access to pest management resources and/or pest identification and IPM implementation.
6	NR 1.6) The number of acres reported that are impacted (by weed management, planting natives, fire mitigation, pasture grasses, etc.)
7	NR 1.7) Dollars saved by best management practices.
8	NR 1.8) Grant dollars awarded towards work in natural resources.
9	NR 1.9) User fees from programming.
10	Determining the consumptive use of crops in Colorado for efficient irrigation

Outcome #1

1. Outcome Measures

NR 1.1) Participants report implementation or intent to implement actions relating to water quality and quantity issues (such as well and septic system management, CO Water Law and regulations, water rights, best irrigation practices, stream quality issues, and/or drought tolerant landscaping).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	789

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Colorado Water plan was a joint effort to provide and ascertain input to future water use in Western Colorado.

What has been done

The initial meeting in Meeker had 55 participants. The topic covered potential movement and conservation practices that might be used to develop future water movement. The information was then shared to assist in the development of the Governor-s proposals to shape water usage. Additionally CSU agent Bill Ekstrom presented "Irrigation Scheduling" for field crops.

Results

It was requested by several entities that we do a water awareness educational event the spring of 2016. It was also requested that CSU agent repeat the Irrigation Scheduling workshop and also conduct a home owner's lawn irrigation management and calibration workshop.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #2

1. Outcome Measures

NR 1.2) Participants report implementation or intent to implement animal/wildlife-related conservation practices (such as improved manure management, livestock emergency preparedness, attracting pollinators, enhancing wildlife habitat, and/or deterring unwanted wildlife).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	588

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

NRCS CIG Learning from the Land Project: Twin Buttes Range ?- Specifically looking at interactions with (wild horses, cattle and wildlife).

What has been done

To advance the education program an initial family meeting was held which prompted the formation of a local on-sight team training composed of (NRCS, CDOW, CSU and other local interest) the purpose of this training was to identify the major areas of concern or interest.

Results

The next step was to proceed with data collection initiated for range sites associated with sage communities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #3

1. Outcome Measures

NR 1.3) Participants report implementation or intent to implement soil-related conservation practices (such as soil health, soil fertility, soil testing, erosion control, cover crops, composting, or soil compaction).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	652

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With PLT and WSARE funding, nine on-farm workshops were held for land managers in Delta, Larimer, Boulder, Eagle, Pitkin, Adams, Jefferson, Routt, and Montezuma Counties. The program was administered by Jennifer Cook and involved cross-state and cross-agency cooperation. Partners included USDA-NRCS, local Conservation Districts, CO State Forest Service, Denver Water, and local farmers. The program highlighted successful multi-state cooperation with Steve Fransen, Extension Forage Crop Specialist from Washington State University and Glenn Shewmaker, Extension Forage Specialist from University of Idaho Twin Falls Research and Extension Center

What has been done

The hands-on workshops addressed key soil and plant issues which are targeted in the Natural Resources POW. At on-site soil pits, participants learned about soil properties and soil health. Grass seeding and reseeding techniques were taught to participants during an on-site grass drill demonstration. Tree planting and grazing techniques were also discussed while participants were able to see the result of management practices. One participant noted in the evaluation, "It was very helpful to get hands-on knowledge and to see others who have addressed issues similar to the ones we face."

As a prerequisite, participants were asked to watch recorded webinars prior to farm tours. The webinars provided essential background information and allowed for a more in-depth learning experience.

The program allowed for county agents to work with their communities and local partners to

develop a farm tour appropriate for their location. In total, these educational workshops impacted 220 land managers. Evaluations revealed that as a result, participants expect to save a total of \$81,400 over the next 10 years.

Results

The results of the project also contributed to environmental sustainability. Soil erosion by wind and water has serious environmental and economic impacts in Colorado. This program demonstrated how to implement sustainable soil erosion reduction practices such as proper grazing techniques, tree planting, cover crops, and grass seeding. Participants were asked on their evaluations to "list any actions you plan on taking on your property as a result of the farm tour." Answers included, "Less watering?", "Manage weeds, manage grazing, get soil tested?", and "I think incorporating better management practices will help us increase our yields and potential." One participant summed up the intent of the farm tours by noting, "My expectations were met. We had in depth conversation on the science and experience of ag practices, and on a gorgeous day."

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #4

1. Outcome Measures

NR 1.4) Participants report implementation or intent to implement plant-related conservation practices (such as active weed management, pasture management techniques, grass stand establishment, planting windbreaks, planting native plants, and/or active forest management).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1475

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With PLT and WSARE funding, nine on-farm workshops were held for land managers in Delta, Larimer, Boulder, Eagle, Pitkin, Adams, Jefferson, Routt, and Montezuma Counties. The program

was administered by Jennifer Cook and involved cross-state and cross-agency cooperation. Partners included USDA-NRCS, local Conservation Districts, CO State Forest Service, Denver Water, and local farmers. The program highlighted successful multi-state cooperation with Steve Fransen, Extension Forage Crop Specialist from Washington State University and Glenn Shewmaker, Extension Forage Specialist from University of Idaho Twin Falls Research and Extension Center.

What has been done

Grass seeding and reseeding techniques were taught to participants during an on-site grass drill demonstration. Tree planting and grazing techniques were also discussed while participants were able to see the result of management practices. One participant noted in the evaluation, Quote: It was very helpful to get hands-on knowledge and to see others who have addressed issues similar to the ones we face.

Results

The results of the project also contributed to environmental sustainability. Soil erosion by wind and water has serious environmental and economic impacts in Colorado. This program demonstrated how to implement sustainable soil erosion reduction practices such as proper grazing techniques, tree planting, cover crops, and grass seeding. Participants were asked on their evaluations to "list any actions you plan on taking on your property as a result of the farm tour." Answers included, "Less watering?", "Manage weeds, manage grazing, get soil tested?", and "I think incorporating better management practices will help us increase our yields and potential." One participant summed up the intent of the farm tours by noting, "My expectations were met. We had in depth conversation on the science and experience of ag practices, and on a gorgeous day."

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #5

1. Outcome Measures

NR 1.5) Participants improve or intend to improve their practices, decisions and skills in action through timely access to pest management resources and/or pest identification and IPM implementation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	338

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

EPA's Current Agricultural Worker Protection Standard (WPS) is a regulation published in 1992 that is aimed at reducing the risk of pesticide poisoning and injury among agricultural workers and pesticide handlers. The current WPS offers occupational protections to over 2 million agricultural workers (people involved in the production of agricultural plants) and pesticide handlers (people who mix, load, or apply crop pesticides) that work at over 600,000 agricultural establishments (farms, forests, nurseries and greenhouses). The WPS requires that owners and employers on agricultural establishments provide protections to workers and handlers from potential pesticide exposure, train them about pesticide safety, and provide mitigation in case exposures may occur. (US EPA statement.)

What has been done

we held a class on Worker Protection Standards. The class was taught by Thia Walker, Extension Specialist and program manager for the Colorado Environmental Pesticide Education Program (CEPEP) at Colorado State University. This class is designed for agriculture producers and employers who utilize pesticides in their workplace. We discussed changes in the requirements to comply with worker safety as well as how to properly train and protect those workers that will be using or are likely to come in contact with pesticides as they perform their duties.

Results

Vegetable farmers, grain farmers as well as Parks and Recreation departments all benefited from this class.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

NR 1.6) The number of acres reported that are impacted (by weed management, planting natives, fire mitigation, pasture grasses, etc.)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	378558

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #7

1. Outcome Measures

NR 1.7) Dollars saved by best management practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	230166

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
307	Animal Management Systems

Outcome #8

1. Outcome Measures

NR 1.8) Grant dollars awarded towards work in natural resources.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	389940

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems

216 Integrated Pest Management Systems
307 Animal Management Systems

Outcome #9

1. Outcome Measures

NR 1.9) User fees from programming.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	26486

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems
216	Integrated Pest Management Systems
307	Animal Management Systems

Outcome #10

1. Outcome Measures

Determining the consumptive use of crops in Colorado for efficient irrigation

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water transfers from agriculture to growing municipalities, well shutdowns, tighter regulations for compact compliance in major river basins, and droughts have reduced the availability of water for irrigation. Among the Western states, Colorado is one of the hardest hit. These pressures on irrigation water supplies require increased efficiency of irrigation. The application of correct amounts of irrigation water, based on knowledge of local crop evapotranspiration (ETc) rates, is essential for increasing irrigation application efficiency.

What has been done

Evaluate the performance of the American Society of Civil Engineers (ASCE) standardized reference ET equation for calculating alfalfa reference evapotranspiration (ET) in major agricultural regions of Colorado. The expected outputs of this project include (1) information on seasonal consumptive water use of crops commonly grown in major agricultural regions of Colorado, (2) locally-derived crop coefficient curves for use with the ASCE standardized reference ET equation already being used in CoAgMet.

Results

This project developed local seasonal crop coefficient (Kc) curves for the two most widely irrigated crops in Colorado: alfalfa hay and grain corn. Seasonal consumptive water use (total ET) for those two crops were measured during several growing seasons. A seasonal Kc curve for sugar beets was also developed. The Kc curves can be used to convert daily alfalfa reference crop ET into equivalent alfalfa hay, corn, or sugar beet crop ET. The Kc curves have been incorporated in an online irrigation scheduling tool that can be used by Colorado irrigators to determine the amount (inches of water) and timing (date) of irrigations required to avoid water stress or over-irrigation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Natural Resource PRU outcomes are dependent on the needs and engagement levels of all landowners. Their needs and level of interest in change can be affected by weather, public policy, economy, and population changes. Also, what benefits one segment may impact another segment.

Weather conditions such as drought, flooding, hail, fires, moisture/temperature trends influencing pathogen and pest life cycles, in addition to abiotic stress effects, which will require short/medium/long term redirection of effort to accommodate program needs for pest diagnostics and management strategies

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Native Plant Master program has surveyed participants to learn what they have learned and how they have used information they learned from the courses -- in their work, volunteer, and/or personal activities.

Key Items of Evaluation

Please see impact report posted at
http://www.ext.colostate.edu/impact/nativeplantmaster_2013.pdf.