

Technical Report

TR11-04



# *Ag*ricultural *Experiment Station*

College of  
Agricultural Sciences

Department of  
Soil and Crop Sciences

Southwestern Colorado  
Research Center

Extension

## Southwestern Colorado Research Center

### 2010 Research Report



**Colorado State University**  
**Agricultural Experiment Station**  
**Southwestern Colorado Research Center**

**2010 Field Crops Research Results**  
**&**  
**Fruit Tree Evaluation**

Editor: Abdel F. Berrada

Colorado State University  
Southwestern Colorado Research Center  
Yellow Jacket, Colorado

**Acknowledgments**

The work presented in this report would not have been possible without the able assistance of Jerry Mahaffey, Research Technician; Amin Berrada, Temporary Research Associate; and Daniel Cole and Jordan Lestina, Non-Student Hourly.

**Disclaimer**

Mention of a trademark or proprietary product does not constitute endorsement by the Colorado Agricultural Experiment Station.

Colorado State University is an equal opportunity/affirmative action institution and complies with all Federal and Colorado State laws, regulations, and executive orders regarding affirmative action requirements in all programs. The Office of Equal Opportunity is located in 101 Student Services. In order to assist Colorado State University in meeting its affirmative action responsibilities, ethnic minorities, women, and other protected class members are encouraged to apply and to so identify themselves.

# Table of Content

A brief history of the Southwestern Colorado Research Center	1
2010 Advisory Board Meeting Minutes	2
Soil and Climate at the Southwestern Colorado Research Center	7
Field Crop Variety Performance Trials	10
2010 Camelina Planting Date by Variety Trial at Yellow Jacket, CO	30
Boosting Sunflower Production in SW Colorado with Supplemental Irrigation—2010 Results	32
Evaluation of Sunflower in Dryland Crop Rotations—2010 Results	35
Fruit Tree & Vineyard Project 2010 Growing Season	36
Apple varieties descriptions, evaluations and ratings	36
Pear varieties descriptions, evaluations and ratings	44
Peach varieties descriptions, evaluations and ratings	46
Plum varieties descriptions, evaluations and ratings	48

## List of Figures

Figure 1. 2010 and long-term (1962-2002) monthly precipitation at Yellow Jacket	7
Figure 2. Daily minimum and maximum temperatures at Yellow Jacket, CO from March through October 2010	8

## List of Tables

Table 1. Weather data at Yellow Jacket, CO	8
Table 2. Reported sunflower acreage and seed yield in SW Colorado	10
Table 3. 2010 Dryland Winter Wheat Variety Trial at Yellow Jacket, CO	13
Table 4. 2008-2010 Dryland Winter Wheat Variety Trial Results	15
Table 5. 2010 Irrigated Spring Wheat Variety Trial at Yellow Jacket, CO	16
Table 6. 2010 Dryland Dry Bean Variety Trial at Yellow Jacket, CO	18
Table 7. 2010 Irrigated Dry Bean Variety Trial	18
Table 8. 2008 & 2010 Dryland Dry Bean Variety Trials at Yellow Jacket, CO	19
Table 9. 2009-2010 National Winter Canola Variety Trial at Yellow Jacket, CO	20
Table 10. 2010 Dryland Safflower Variety Trial at Yellow Jacket, CO	22
Table 11. 2008-2010 Dryland Safflower Variety Trials at Yellow Jacket, CO	23
Table 12. 2010 Dryland Sunflower Hybrid Performance Trial at Yellow Jacket, CO	24
Table 13. 2005-2010 Dryland Sunflower Hybrid Performance Trials at Yellow Jacket, CO	26
Table 14. Seed yield of camelina planted on 16 April 2010	30
Table 15. 2010 sunflower plant population, seed and oil yields, and plant height	33
Table 16. Irrigation depth	34
Table 17. 2010 crop information and yield	35

# A brief history of the Southwestern Colorado Research Center

Abdel Berrada<sup>1</sup> and Mark Stack<sup>2</sup>

<sup>1</sup>Research Scientist/Manager, <sup>2</sup>Former manager, Southwestern Colorado Research Center

Agricultural research in southwestern Colorado began at the San Juan Basin Research Center near Hesperus in 1921. The major emphasis was to identify crop species and varieties adapted to the high altitudes of southwestern Colorado under dryland and irrigated conditions. Crops tested included clovers (*Trifolium*), alfalfa (*Medicago sativa*), field peas (*Pisum sativum*), corn (*Zea mays*), potatoes (*Solanum tuberosum*), dry beans (*Phaseolus vulgaris*), sugar beets (*Beta vulgaris*), grass (graminoids) including small grains, and vegetables.

By the mid-1940's, the dry lands of southwestern Colorado had developed into a major pinto bean-producing area. A comprehensive edible dry bean research program was initiated during this period. The pinto bean variety 'San Juan Select' was developed and released in 1946. A Yellow Jacket unit of the San Juan Basin Research Center was opened in 1962 to study management of dryland soils and crops. Major emphasis was on the production of pinto beans, winter wheat, and soil and water conservation practices. Additional crops studied at Yellow Jacket under dryland conditions included grasses, alfalfa, sunflowers, oats, barley, safflower, and sorghum.

The soil and crop sciences section of the San Juan Basin Research Center separated from animal science in 1971 and leased a farm 10 miles northwest of Cortez in the Arriola area. The need for a research facility in the Cortez area was catalyzed by plans to construct the Dolores Project, a Bureau of Reclamation irrigation, municipal, industrial, and recreation project. The Colorado Legislature, the Bureau of Reclamation, the Four Corners Regional Commission, and the Soil Conservation Service provided the funding to lease and operate the 300-acre farm. Surface and sprinkler irrigation systems were studied utilizing furrow, flood, gated pipe, sideroll, center pivot, end-tow, and traveling gun. The economic impact of converting from dryland farming to irrigated agriculture was assessed. An adjacent 20-acre dryland site was added in 1976 for research on plant-water relationships, erosion control, dryland cultural practices, fertilizer use, and bean root rot control. The lease on the Arriola farm expired and research at the San Juan Basin Research Center-Cortez Unit ceased in 1983.

The present 158-acre farm located 15 miles north of Cortez on County Road Z was purchased by the State Board of Agriculture (now Board of Governors of the Colorado State University System) in 1981. An office, shop, equipment shed, and later a hay storage facility were constructed. A 650 ft. length (32-acre) center pivot was donated by Valmont Industries with the help of Jarmon Irrigation and erected in 1986. Water from the Dolores Project was delivered to the research center for the first time in June 1987. The Dolores Water Conservancy District and the Southwestern Water Conservation District contributed funds for the development of the research center. The name 'Southwestern Colorado Research Center' (SWCRC) was officially given to this research facility in 1984. In 1988, 30 acres one-half mile north of the research center was leased to conduct research on dryland cropping systems.

The SWCRC conducts research and demonstration on fruit trees, field crops, and more recently native grasses and forbs. It has an advisory committee that meets annually to discuss current and future

research and demonstration projects. The advisory committee is made up of farmers, agri-business and agency representatives, and extension personnel.

## 2010 Advisory Board Meeting Minutes

*December 15, 2010  
Pleasant View Fire Station*

### **Meeting Opening**

*David McCart*

Chairman David McCart called the meeting to order then everyone in the room introduced themselves. Minutes from the 2009 Advisory Board meeting were approved without dissent. A request for nominations for a new chairman was made, but no nominations were forthcoming so David McCart agreed to be chairman for another year.

### **Research Center Accomplishments and Future Plans**

*Abdel Berrada*

#### **Weather of the previous year**

Precipitation was lower than normal most months and wetter than normal during a few months with August, 2010 being particularly wet. Winter precipitation measurements are probably not very accurate. Spring-planted crops did better than fall-planted crops.

#### **2009-2010 national winter canola variety trial**

Yield averaged about 1,500 pounds per acre with supplemental irrigation.

#### **2010 dryland winter wheat variety trial**

Winter wheat at the Southwestern Colorado Research Center (SWCRC) and elsewhere in the area didn't do well this year and some varieties had poor stand establishment. However, the 3-year average yield was still good at 41 bushels/acre.

#### **2010 irrigated spring wheat variety trial**

The average yield was 100 bushel/acre and entries from Idaho did well. A premium is paid for spring wheat if protein content is greater than 14%.

#### **2010 bean trials**

The beans looked very good this year. However, things changed after the beans were cut in preparation for harvest. Hail storms several days in a row caused substantial shattering. Abdel estimated a loss of 40% or more. The irrigated beans had a substandard yield.

Beans are an important crop in this area. There are upright varieties that can be harvested without first being cut.

An audience member remarked that she and other area farmers are concerned about the quality of dryland bean seed. Farmers have been saving seed year after year, but the quality of the plants from the saved seed has been deteriorating. Gary Peterson suggested getting Mark Brick (CSU's bean breeder) to come to the next field day to talk with local farmers about this and other issues.

### **2010 dryland safflower variety trial**

Safflower yields have been consistent over the years.

### **2010 sunflower trials**

The sunflower seed oil content averaged 37.9% compared to 44.6% in 2009. In contrast seed yields were much higher in 2010 than in 2009. The reason for the relatively low oil content in 2010 is not clear. Oil content varies with hybrid, soil fertility (e.g., N availability), water availability, planting date, climatic conditions, etc. We had cooler and drier conditions early in the season and above average precipitation during seed formation.

One audience member said that he had trouble this year with cutworms damaging sunflowers. Some plants as large as three feet tall were cut down by cutworms. One of his neighbors had cutworms that caused a lot of damage to an organic sunflower field, but not so much damage to a field planted with treated seed.

### ***2010 sunflower planting date x seeding rate x hybrid trial***

The plant population at harvest was much lower than the seeding rate. This may have been due to problems with the Monosem vacuum planter or the sunflowers may have had difficulty emerging from the soil after germination.

To get the highest seed and oil yields and it is best to plant by early June.

### ***2010 sunflower limited irrigation trial***

This trial had a number of different irrigation treatments ranging from only pre-planting irrigation to full irrigation. The full irrigation treatment had the highest yield. Irrigation treatments that got less water had higher yields than was predicted using a formula developed in eastern Colorado. No economic study was done so it is not known whether the extra yield in the full irrigation treatment more than paid for the additional water that was used.

### **Dryland cropping systems study**

2010 can be considered the establishment year for this crop rotation study. It will take 4 to 5 years or more to complete the study.

Some of the plots were planted to what is called an opportunity crop. The opportunity crop is chosen based on what is likely to be successful based on weather and/or market conditions. This year's opportunity crop was camelina. However, it didn't do very well because of damage caused by hail and birds.

### **Native seed production project**

A goal of this project is to find native species that 'grow like weeds' that would be used to protect bare soil from erosion. Several species are being studied at CSU's Southwestern Colorado Research Center and by Southwest Seeds, Inc. Establishing a good stand may be a challenge with some of the species. Ron Godin is the Principal Investigator for this project. Funding for the project is provided by the San Juan National Forest.

### **Comments on oilseed crops**

There were a lot of birds this year, but they didn't cause too much damage.

### **Other comments**

An audience member expressed concern about the decline of organic matter in the soil over the years. Gary Peterson mentioned some things that could be done to increase organic matter including adding manure, growing alfalfa, and growing cover crops. Cindy Dvergsten suggested rotating cropland with livestock grazing.

Recent improvements at the SWCRC include the purchase of a rod weeder, which will be used to lift dry beans before threshing them. The Giddings probe was mounted on a used tractor that was acquired from Hesperus in late summer. The Giddings probe will be used to take soil samples to a greater depth that would be possible with hand probes. A weighing box was fitted to the bin to the JD 4420 combine. It will speed up harvest of sunflower trials.

Abdel acknowledged the people and organizations that have helped the SWCRC.

### **Orchard Update**

*Dan Fernandez and Tom Hooten*

The high elevation of the orchard means cold air drainage away from the site which results in less damage caused by frost. The orchard at the SWCRC was one of the few in the area that was successful this year.

There has been a lot of interest about the orchard from people in the area. About 70 people attended the annual pruning workshop. Later in the year, the u-pick day was very successful. Around 500 people came and almost every fruit was sold.

The Fuji apple variety has been problematic because of freezing and low production. Some of the trees may be replaced with other varieties in the future. There were a lot of coddling moths.

The next pruning workshop will be held on March 3, 2011.

### **College of Agricultural Sciences Update**

*Craig Beyrouthy*

#### **Strategic initiatives**

The strategic initiatives evolved from the 2005 strategic plan, which identified 13 areas of strength and examined where financial and administrative support was needed. The strategic initiatives focus on the following:

#### ***Enhancing the food system***

This means enhancing food safety and quality with the aim of improving human health. The Crops for Health program is working to achieve this aim. One strategy of the Crops for Health program is doing research on foods that fight chronic disease.

#### ***Enhancing our environment***

Enhancing the environment includes: developing profitable and environmentally sound beef and dairy production systems, developing land use systems for sustainable agricultural and urban environments, and utilizing limited water resources in an efficient way.



### **Other Comments**

There have been several changes in departmental leadership.

## **Agriculture in Montezuma County: Historical and Current Trends**

*Cindy Dvergsten*

Cindy gave her speech during the lunch hour and discussed how the production of different agricultural commodities in the county has varied over time. Her presentation included statistics on the quantity and monetary value of those agricultural commodities.

## **Agricultural Experiment Station Update**

*Lee Sommers*

### **Funding sources for the experiment stations**

The experiment stations have a total annual budget of \$40.1 million of which 73% comes from the Colorado state legislature through funding for higher education. The other 27% is federally sourced from the USDA through the Farm Bill. This includes competitive grants and special grants which are also known as earmarks

### **Budget reductions**

The following budget reductions have been made in recent years:

FY (fiscal year) 03-04: -18%

FY 09: -2%

FY 10: -5%

FY 11: -4.8%

Sum: -27.8%

The San Juan Basin Research Center was closed on June, 30 2010. The WCRC at Rogers Mesa will be closed on June, 30, 2011. These closures will stabilize the budgets of the other Research Centers.

### **Economic benefit of research stations**

The research stations have an annual economic impact of about \$76 million.

## **Department of Soil and Crop Sciences Update**

*Gary Peterson*

### **Students**

There has been an increase in the number of students at the Department of Soil and Crop Sciences. There are now 111 undergraduate majors and 48 graduate students. The Department of Soil and Crop Sciences has a promising future.

### **Budget**

The budget of the department will be reduced by approximately \$216,000 from FY 09-11. The success of the faculty at getting grand funds has made the budget situation better than it otherwise would have been.

**Retirement**

Gary Peterson will be retiring soon.

**Final Business**

*David McCart*

**Discussion**

The possibility was discussed of bringing a small scale oilseed crusher here for a demonstration.

**Closing**

David McCart adjourned the meeting.

# Soil and Climate at the Southwestern Colorado Research Center

Abdel Berrada

The principal soil type at the Southwestern Colorado Research Center is Wetherill loam (fine-silty, mixed, superactive, mesic Aridic Haplustalfs). The Wetherill series is generally made up of deep, well drained soils located on mesas and hills (Ramsey, 1997). These soils were formed from sandstone material transported by wind from the Southwest (Price et al., 1988). They tend to be reddish on the surface and generally have low organic matter (around 1.0%). Their water holding capacity ranges from approximately 1.8 to 2.0 inches/ft. Soil pH at the Research Center is around 7.5. The terrain in southwestern Colorado is generally rolling with slopes ranging from 1 to 12%. It is prone to wind and water erosion, particularly if the soil is bare. The elevation ranges from less than 6,000 ft to above 7,000 ft.

The long-term weather records (1962-2002) from NOAA station at Yellow Jacket show an annual precipitation mean of 15.6 inches (Table 1). The average annual snowfall is 68.1 inches. June is the driest month. The mean annual temperature is 48.0°F. The frost-free period is 100 to 120 days. The Research Center lies at an elevation of 6900 ft., latitude 37°32' N and longitude 108°44' W. The yearly precipitation data is from the Coagmet (Colorado Agricultural Meteorology) station at the SWCRC. It may not account for all the moisture from snow since the station uses a simple tipping bucket rain gauge to measure precipitation. Precipitation was about normal in 2010, with August and December exceeding the 1962-2002 average while May, June, and November were below average (Fig. 1). The first fall killing frost occurred on 25 October (Fig. 2), which was three to four weeks later than normal. Spring temperatures were below normal.

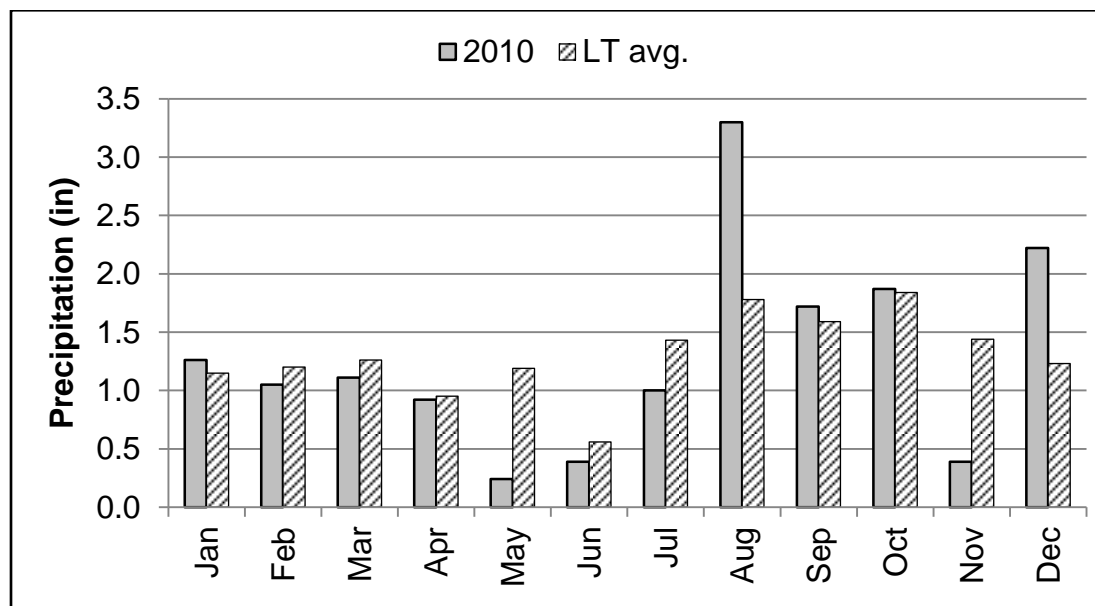


Figure 1. 2010 and long-term (1962-2002) monthly precipitation at Yellow Jacket

Table 1. Weather data at Yellow Jacket, CO

	Average precipitation and temperature from 5/12/62 through 12/31/02 <sup>1</sup>				Annual precipitation <sup>2</sup>					
	Precipitation (in)	Snowfall (in)	Max. Temp. (F)	Min. Temp. (F)	2005	2006	2007	2008	2009	2010
January	1.2	15.0	37.9	14.5	2.9	0.3	0.4	1.1	0.4	1.3
February	1.2	14.1	42.7	18.8	3.2	0.0	1.0	1.5	0.4	1.1
March	1.3	10.6	49.5	24.8	1.5	1.5	0.7	0.1	0.2	1.1
April	1.0	4.5	59.1	31.1	1.6	1.0	1.6	0.7	0.9	0.9
May	1.2	0.9	69.7	39.7	0.3	0.2	1.5	0.7	1.5	0.2
June	0.6	0.0	81.0	47.9	0.6	0.3	0.1	0.5	0.7	0.4
July	1.4	0.0	86.8	54.6	1.1	1.0	1.7	0.7	0.4	1.0
August	1.8	0.0	84.0	53.3	0.7	1.4	1.4	2.2	0.8	3.3
September	1.6	0.1	76.0	46.4	1.8	1.7	1.9	0.4	1.1	1.7
October	1.8	1.6	63.7	36.8	1.6	4.1	0.4	1.2	0.4	1.9
November	1.4	7.2	48.9	25.5	0.3	0.3	1.1	1.1	0.5	0.4
December	1.2	14.1	39.5	17.0	0.1	0.4	2.7	1.2	0.6	2.2
<b>Annual</b>	<b>15.6</b>	<b>68.1</b>	<b>61.6</b>	<b>34.2</b>	<b>15.7</b>	<b>12.2</b>	<b>14.5</b>	<b>11.4</b>	<b>7.6</b>	<b>15.5</b>

<sup>1</sup> Source: Western Regional Climate Center, wrcc@dri.edu

<sup>2</sup> Data from the Coagmet station at Yellow Jacket. Precipitation from snow may not be accurate.  
<http://ccc.atmos.colostate.edu/~coagmet/>

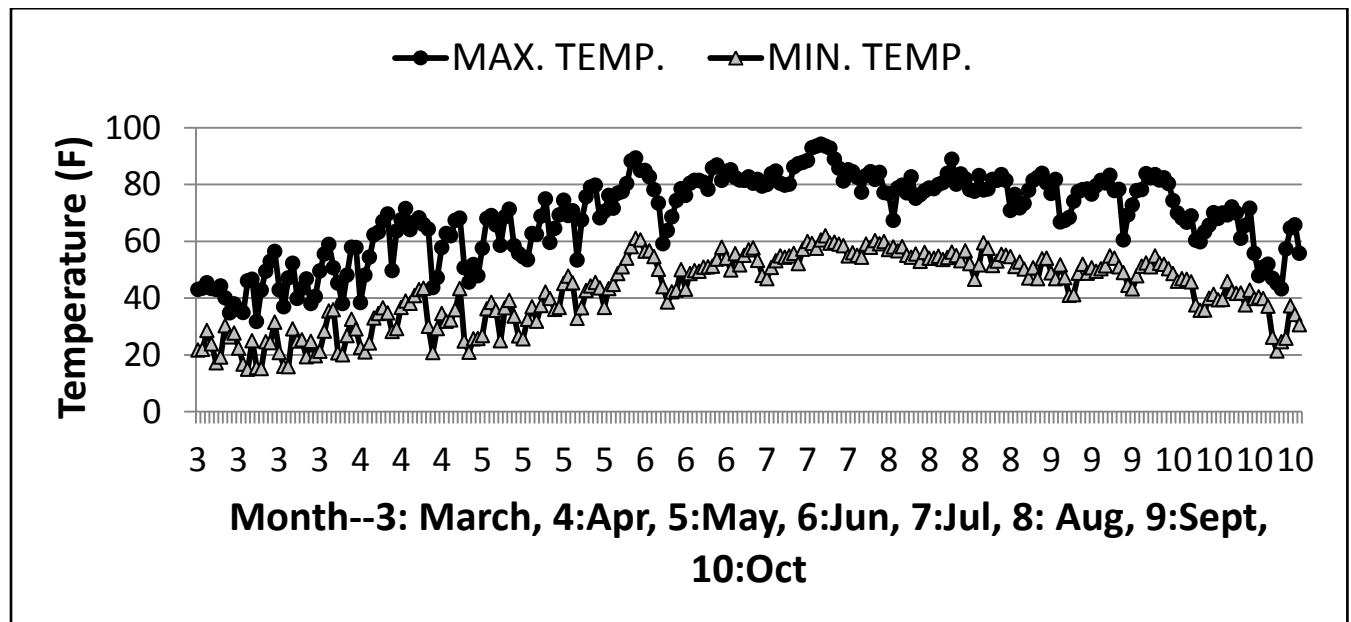


Figure 2. Daily minimum and maximum temperatures at Yellow Jacket, CO from March through October 2010

## **References**

Price, A.B., W.D. Nettleton, G.A. Bowman, and V.L. Clay. 1988. Selected Properties, Distribution, Source, and Age of Eolian Deposits and Soils of Southwest Colorado. *Soil Sci. Soc. Am. J.* 52:450-455.

Ramsey, D.K. 1997. Soil Survey of Cortez Area, Colorado, Parts of Dolores and Montezuma Counties. USDA, NRCS.

# Field Crop Variety Performance Trials

Abdel Berrada<sup>1</sup>, Scott Haley<sup>2</sup>, Mark Brick<sup>3</sup>, and Jerry Johnson<sup>4</sup>

<sup>1</sup>Research Scientist, Southwestern Colorado Research Center, <sup>2</sup>Wheat Breeder, <sup>3</sup>Bean Breeder, <sup>4</sup>Crops Testing Coordinator, Department of Soil and Crop Sciences, Colorado State University

Crops tested in 2010 were: camelina (*Camelina sativa* L.), canola (*Brassica nap*a L.), dry bean (*Phaseolus vulgaris* L.), safflower (*Carthamus tinctorius* L.), spring wheat (*Triticum aestivum* L.), sunflower (*Helianthus annuus* L.), and winter wheat (*Triticum aestivum* L.). Entries in each trial were assigned at random to complete blocs with two (dry bean), three (camelina, canola, and sunflower), or four (safflower, winter wheat, and spring wheat) replications. Plot width was 6.0 ft for solid-seeded crops (camelina, canola, wheat, and safflower) and 10 ft (four 30-in spaced rows) for row crops (dry bean and sunflower). Plot length ranged from 30 ft to over 100 ft.

Oilseed crops have been tested at the Southwestern Colorado Research Center for the last several years in response to local and national interest in renewable energy and to diversify cropping systems in SW Colorado. Emphasis has been on sunflower due to the creation of the San Juan biodiesel Cooperative (later renamed San Juan Bioenergy) in 2005. San Juan Bioenergy built a plant in Dove Creek in 2008 to extract oil from safflower and primarily from sunflower seed. The goal was to produce biodiesel using oil from these and other oilseed crops but that hasn't happened for economic reasons. In 2009 and part of 2010, the plant produced crude oil and sold it to refineries in California, Colorado, or Kansas. The byproduct from the seed oil extrusion was marketed as feed meal. Future plans included the conversion of sunflower seed hulls and sunflower and safflower leaves and stems (dockage) to syngas to generate heat and electricity for the plant. Unfortunately the plant ceased operation in the summer of 2010 for various reasons. Sunflower acreage peaked at 9,800 acres in 2007 (Table 2). Most of the sunflower is grown in Dolores County. Some of it is organic. There appears to be a good market for sunflower grown in SW Colorado. Preference is for the high-oleic type.

Several thousands of acres of safflower are grown in Dolores County, CO and especially Eastland in Utah (east of Dolores County). There appear to be a good market for organic safflower. Safflower production statistics are hard to come by.

Table 2. Reported sunflower acreage and seed yield in SW Colorado

	2006	2007	2008	2009
<b>Planted acres in SW CO</b>	2,300	9,800	8,635	4,800
<b>Seed yield (lb/acre)</b>	770	907	700	660
<b>Colorado acreage</b>	80,000	105,000	170,000	70,000
<b>Seed yield (lb/acre)</b>	1,100	1,150	900	1,320

Sources: USDA-NASS and USDA-FSA

In general, spring-planted crops fared better than fall-planted ones partly due to precipitation amount and distribution (Table 1 and Figure 1). Precipitation in the fall of 2009 and in May and June 2010 was below average. Precipitation was average in January through April 2010 and above average in August through October 2010. Soil moisture at spring planting was near field capacity.

#### **Winter wheat:**

Seed yield averaged 18.7 bu/acre with the newly released hard red variety 'SRG' topping the lot (Table 3). SRG was tested at Yellow Jacket as 'IDO656' in 2009 and 2010. It averaged 42.4 bu/acre over the two years (Table 4). It is reported to have good dwarf bunt (*Tilletia controversa* Kuhn) resistance. Dwarf bunt is a concern in years when snow covers unfrozen ground for a long time (months?). Dwarf bunt has not been observed at the Research Center to any significant extent for several years (Berrada and Stack, 2010).

Entries that were tested in 2008 through 2010 average 41.2 bu/acre (Table 4). The top performing varieties were CSU releases such as 'Ripper', 'Thunder CL', and 'Bill Brown'. Most were developed for eastern Colorado where dwarf bunt is not a concern. 'Fairview', which does have dwarf resistance and is widely grown in southwestern Colorado, averaged 17.6 bu/acre in 2010 and 41.5 bu/acre in 2008-2010.

#### **Spring wheat:**

Irrigated spring wheat averaged 100 bu/acre in 2010 (Table 5). Entries from Idaho performed well as did 'Sylvan' which was released in 1996 by CSU. Sylvan seeds have not been renewed (e.g., certified seeds are not available) partly due to lack of interest among growers and partly due to non-uniform plant height. An attempt to produce breeder seeds from head rows in 2010 failed. Substitutes for Sylvan include 'Jerome', which is a Utah release. Jerome averaged 99 bu/acre and 12.8% protein content in 2010. 'Kelse', another hard red spring wheat, also averaged 99 bu/acre but had the highest protein content (15.1%) of all the entries. Kelse was released in 2008 by USDA-ARS, WSU, and UI. It has not been grown in southwestern Colorado.

#### **Dry bean:**

Seed yields were below expectation due to late planting and hail damage, among other factors. Twelve entries averaged 655 lb/acre with approximately 2.4 in (gross) of pre-plant irrigation only (Table 6). The irrigated trial averaged 1120 lb/acre with four irrigation applications during the growing season (Table 7). The experimental entry '432' produced 1040 lb/acre with pre-irrigation while the varieties Cahone and Fisher were at the bottom of the ranking with 540 and 533 lb/acre, respectively. Entry '432' also did well in 2008 (Table 8) as did most of the other entries, with the exception of Cahone, which averaged only 363 lb/acre, probably due to low-quality seeds.

#### **Winter canola:**

Winter canola averaged 1522 lb/acre of seeds and 40.2 % protein concentration (Table 9) with limited irrigation. This was substantially less than the 3640 lb/acre produced in 2009 on average (Berrada and Stack, 2010). Reasons may include later seeding date in 2009-2010, late harvest, and below average fall 2009 and late spring 2010 precipitation. Seed oil concentration was similar in 2009 and 2010. Winter survival of most of the entries was  $\geq 90\%$  in 2008-2009 and 2009-2010.

**Safflower:**

Thirteen entries were tested in 2010. They averaged 1075 lb/acre and 38.7% oil content (Table 10), which is consistent with the results of the 2009 and 2008 trials (Berrada & Stack, 2010). Safflower has been grown in southwestern Colorado and to a greater extent in San Juan County, UT for over 10 years.

**Sunflower:**

Dryland sunflower averaged 1816 lb/acre (Table 12), which was the best performance since 2005 when sunflower was first tested at the Research Center. Mycogen 8N453 DM had the highest seed yield (2209 lb/acre), oil content (42.3%), and test weight (33 lb/bu). The average seed yield in 2005-2010 (no dryland sunflower trial was conducted in 2007) was 1242 lb/acre (Table 13), which is greater than the reported yields for southwestern Colorado (Table 2).

The combination of timely planting, adequate water and nitrogen availability, and good weed control probably explains the exceptional sunflower performance in 2010. Sunflower was planted on May 28, 2010 in a field that had been in irrigated crop production from the late 1980s up to August 2009 when it was converted to dryland. The 2009 crop was oat hay. It is likely that more water was available in the soil profile at sunflower planting than would be the case if the field had not been irrigated. Additional moisture from above average winter snowfall carried the sunflower crop through the dry period that extended from late April through July 23, 2010. This was followed by above average rainfall in August and September, which coincided with the most water-sensitive growth period (flowering through seed formation). Approximately 78 lb N/acre were available in the top 2 ft of soil at planting, from residual N and fertilizer application. More nitrogen may have been available below 2 ft from the previous 2000-2008 alfalfa crop.

**Camelina:**

Camelina planted on 16 April 2010 averaged 605 lb/acre (Table 14). Seed yield was adjusted to 8.5% moisture. The varieties 'BSX G74' and 'Cheyenne' had 20.8 and 24.0% seed moisture at harvest, respectively. 'Ligena' had the highest seed yield of 778 lb/acre, which was not significantly different than that of 'Yellow Stone' (620 lb/acre) at  $P=0.10$ . 'Suneson' was the least productive with 409 lb/acre.

The only other year, 2009, when camelina was tested at the Research Center with no supplemental irrigation, seed yield averaged 531 lb/acre (Berrada and Stack, 2010). Of all the seed crops (camelina, canola, safflower, and sunflower) tested in 2009, camelina had the lowest seed oil concentration (33.8% with irrigation and 31.2% without). The 2010 results indicate that camelina and canola have greater test weights than sunflower. Currently, only safflower and sunflower are grown commercially in southwestern Colorado.

**Reference:**

Berrada, A., and M. Stack. 2010. Southwestern Colorado Research Center Report (2005–2009 Results). Agric. Exp. Stn. Tech. Rep. TR10-06, Colorado State Univ., Ft. Collins, CO.



Table 3. 2010 Dryland Winter Wheat Variety Trial at Yellow Jacket, CO<sup>1</sup>

Entry <sup>2</sup>	Type <sup>3</sup>	Grain yield <sup>4</sup> (bu/acre)	Grain protein <sup>5</sup> (%)	Test weight (lb/bu)	50% Heading date	Plant Height (in)
IDO656 (SRG) <sup>6</sup>	HR	24.6	13.5	58.3	22-Jun	26.0
Curlew	HR	24.3	12.6	58.9	19-Jun	25.3
Ripper	HR	22.9	11.1	56.5	13-Jun	21.7
IDO658 (UI Silver)	HW	22.1	11.7	60.3	22-Jun	24.7
Jagalene	HR	21.4	13.2	58.3	19-Jun	23.0
IDO651 <sup>7</sup> CL (UICF Grace)	HW	21.3	12.5	58.6	20-Jun	29.7
IDO871	HW	21.2	11.2	60.1	22-Jun	24.0
Deloris	HR	21.1	12.6	60.1	21-Jun	26.3
UI Darwin	HW	20.5	12.8	60.3	21-Jun	25.0
Winterhawk	HR	20.0	11.4	58.8	14-Jun	22.0
Snowmass	HW	19.5	11.3	57.3	17-Jun	22.0
Hatcher	HR	18.9	11.6	57.1	16-Jun	18.7
Hayden	HR	18.0	13.1	60.8	22-Jun	28.0
Gary	HW	17.9	11.3	59.7	24-Jun	22.7
Fairview	HR	17.6	12.0	59.3	22-Jun	24.0
IDO660	HW	17.6	13.1	56.6	20-Jun	21.3
Keota	HR	17.6	12.0	58.4	14-Jun	21.3
Hawken	HR	17.5	12.9	58.0	14-Jun	19.3
TAM 112	HR	17.5	12.3	58.5	17-Jun	19.7
NuDakota	HW	17.5	11.7	55.4	18-Jun	17.7
Thunder CL	HW	17.5	11.7	56.7	15-Jun	20.7
Bond CL	HR	17.5	11.5	57.0	15-Jun	21.3
Golden Spike	HW	17.4	12.1	58.7	24-Jun	24.7
Above CL	HR	17.0	11.2	56.8	14-Jun	20.3
Bill Brown	HR	16.7	11.3	58.1	13-Jun	18.7
IDO870	HW	16.3	12.2	56.9	24-Jun	21.7
Danby	HW	15.0	13.1	60.6	20-Jun	23.0
Avalanche	HW	14.9	12.3	57.5	16-Jun	18.3
IDO9120	HW	11.4	13.8	57.5	20-Jun	21.3
Average		18.7	12.2	58.3	-	22.5
CV (%)		17.1	3.9	-	-	5.7
LSD <sub>.05</sub>		4.5	1.0	0.7	-	2.1

<sup>1</sup> The trial was conducted at CSU's Southwestern Colorado Research Center.

<sup>2</sup> CL: Clearfield (resistant to 'Beyond' herbicide)

<sup>3</sup> HR: Hard Red; HW: Hard White

<sup>4</sup> Grain yield adjusted to 12% moisture and 60 lb/bu test weight

<sup>5</sup> Protein at 12% moisture

<sup>6</sup> Newly released 'SRG' has good dwarf bunt resistance.

### **Trial information**

Seeded on 9/22/09 and harvested on 8/17/10

Fertilizer: 41 lb N + 21 lb P<sub>2</sub>O<sub>5</sub>/acre on 9/1/09

Previous crop: Fallow

Rainfall (seeding - harvest): 9.5 in. Winter precipitation measurement may not be accurate.

### **Comments**

Summer and fall 2009 precipitation was substantially below average resulting in poor wheat stand. Winter precipitation was above average but the spring of 2010 was unusually dry and cool, which negatively impacted grain formation. Seed yields were further depressed by competition from volunteer sunflower, Russian thistle, pigweed, and other weeds whose growth was favored by the poor wheat stand. Hand weeding was performed late in the season.

Table 4. 2008-2010 Dryland Winter Wheat Variety Trial Results<sup>1</sup>

Variety <sup>2</sup>	Type <sup>3</sup>	Grain yield <sup>4</sup>		Test weight	
		2008-2010 (bu/acre)	2009-2010 (bu/acre)	2008-2010 (lb/bu)	2009-2010 (lb/bu)
Ripper	HR	48.2	47.0	55.8	56.1
NuDakota	HW	44.5	43.4	55.3	55.9
Thunder CL	HW	NA	43.4	NA	58.3
Winterhawk	HR	NA	43.1	NA	59.2
SRG	HR	NA	42.4	NA	56.8
Keota	HR	43.0	41.7	58.8	59.2
UI Silver	HW	NA	41.0	NA	59.4
Bill Brown	HR	42.6	40.5	57.2	57.7
TAM 112	HR	42.0	40.2	57.7	57.7
Jagalene	HR	42.0	42.6	59.1	59.8
Deloris	HR	41.7	40.9	57.7	58.7
Fairview	HR	41.5	40.8	56.8	57.8
Above CL	HR	41.0	40.6	56.5	56.7
Snowmass	HW	NA	39.9	NA	57.0
Hawken	HR	40.6	39.6	56.9	57.7
Hatcher	HR	40.2	39.4	56.8	57.2
UI Darwin	HW	40.1	38.8	59.6	59.7
Golden Spike	HW	NA	36.9	NA	57.7
Bond CL	HR	39.5	36.0	56.0	57.0
UICF Grace	HW	39.0	38.3	55.3	56.9
Danby	HW	38.9	37.4	60.0	60.6
Avalanche	HW	37.3	37.8	57.7	58.4
Gary	HW	34.7	34.7	58.0	58.3
Hayden	HR	NA	33.4	NA	59.9
Mean		41.2	40.1	57.4	58.1
CV (%)		8.8	7.9	1.8	1.1
LSD <sub>.05</sub>		2.9	3.2	0.8	0.6

<sup>1</sup> Trials conducted at CSU's Southwestern Colorado Research Center

<sup>2</sup> CL: Clearfield (resistant to 'Beyond' herbicide)

<sup>3</sup> HR: Hard Red; HW: Hard White

<sup>4</sup> Grain yield adjusted to 12% moisture and 60 lb/bu test weight

<sup>5</sup> Protein at 12% moisture

Table 5. 2010 Irrigated Spring Wheat Variety Trial at Yellow Jacket, CO<sup>1</sup>

Entry	Type	Grain yield <sup>2</sup> (bu/acre)	Grain protein <sup>3</sup> (%)	Grain moisture (%)	Test weight (lb/bu)	50% Heading (date)	Plant Height (in)
IDO669	Soft white	114.6	11.5	9.8	59.1	7/5	33.3
ID377S	Hard white	113.9	14.7	10.0	60.6	7/2	27.7
IDO686	Soft white	111.3	10.6	10.2	60.1	7/4	32.3
IDO644	Soft white	106.8	12.1	9.6	57.0	6/30	27.7
IDO665	Hard red	105.4	14.1	9.3	59.0	6/30	29.3
Sylvan	Hard red	105.2	11.4	10.4	60.9	7/8	32.0
IDO599	Soft white	104.7	11.7	10.2	58.5	6/30	26.7
Alturas	Soft white	103.1	10.4	9.7	58.3	7/6	29.3
IDO668	Soft white	102.7	12.5	9.8	58.1	7/2	28.0
IDO671	Soft white	102.7	12.0	10.0	57.7	7/4	29.3
IDO687	Soft white	100.6	11.3	9.8	59.3	7/5	31.0
Cataldo	Soft white	100.1	12.5	9.4	57.3	6/30	27.7
WA008106	Soft white	99.0	12.3	10.3	60.4	6/30	32.3
Kelse	Hard red	98.9	15.1	9.2	58.8	7/2	33.3
Jerome	Hard red	98.7	12.8	9.6	59.9	7/1	29.3
Lolo	Hard white	98.4	11.5	10.1	61.5	7/4	31.0
IDO667	Hard red	98.3	13.1	9.8	61.0	7/2	27.3
IDO702	Hard red	96.5	12.6	9.9	60.2	7/2	29.0
Kuntz	Hard red	93.6	13.7	9.3	59.2	7/2	30.0
SD4011	Hard red	93.1	13.2	9.2	59.2	6/30	31.3
UI Winchester	Hard red	89.6	14.1	9.5	59.6	7/1	26.7
01S0263-28	Hard red	86.9	14.5	9.3	59.8	7/2	26.3
SD4181	Hard red	80.9	14.7	9.6	60.2	6/28	36.0
Mean		100.2	12.7	9.7	59.4		29.9
CV (%)		9.7	7.4	3.0	0.7		4.8
LSD <sub>.05</sub>		13.8	1.9	0.4	0.6		2.3

<sup>1</sup> The trial was conducted at CSU's Southwestern Colorado Research Center.

<sup>2</sup> Grain yield adjusted to 12% moisture and 60 lb/bu test weight

<sup>3</sup> Protein at 12% moisture

### Trial information:

Seeded on 4-May and harvested on 13-Sept.

Fertilizer: 83 lb N + 41 lb P<sub>2</sub>O<sub>5</sub>/acre on 1-Sept, 2009. 55 lb N + 36 lb P<sub>2</sub>O<sub>5</sub>/acre on 2-June, 2010

Herbicide: 1.0 pt/acre of 2,4-D Amine on 14-June

Irrigation with sideroll (8-9 h/move, 6 GPM): 19-May, 1-Jun, 16-Jun, 29-Jun, 12-Jul, 21-Jul, and 12-Aug.  
(5 h)

Previous crop: Fallow

**Comment:** The trial benefitted from good soil water availability at seeding and above average precipitation in August. There was no noticeable disease or insect infestation. Lodging was negligible.

Table 6. 2010 Dryland Dry Bean Variety Trial at Yellow Jacket, CO

Entry	Seed yield (lb/acre)	Seeds/lb	Comments
432	1040	1278	
Montrose	715	1302	
30068	702	1346	
10031	683	1472	Late
30046	673	1483	
30047	672	1353	
438	615	1344	
30048	581	1172	
30052	567	1233	Somewhat upright
Cahone	540	1245	Common blight in rep. 2
Croissant	538	1406	
Fisher	533	1177	
Mean	655	1318	
LSD <sub>.05</sub>	NS	150	

**Trial information:**

Planted: 6/10/10  
 Cut with tractor-mounted knives: 10/04/10  
 Threshed: 10/13/10  
 Fertilizer: 60 lb N/acre + 40 lb P<sub>2</sub>O<sub>5</sub>/acre on 6/02/10  
 Herbicide: Sonalan PPI @ 2.3 pt/acre on 6/02/10  
 Pre-irrigation on 5/19/10 ( $\leq$  2.0 in, gross)  
 Rainfall (June thru September): 6.4 in (normal: 5.3 in)

Table 7. 2010 Irrigated Dry Bean Variety Trial

Entry	Seed yield (lb/acre)	Seeds/lb	Comments
La Paz	1543	1225	Late Upright
Stampede	1500	1266	Late Upright
Montrose	1280	1314	
Bill Z	1079	1307	
CO 24972	1001	1239	Upright
CO 55646	889	1356	
CO 34142	881	1330	Upright
Croissant	787	1439	Upright
Mean	1120	1309	
LSD <sub>.05</sub>	NS	NS	

Planted: 6/10/10  
 Cut with tractor-mounted knives: 10/04/10  
 Threshed: 10/12/10  
 Fertilizer: 69 lb N/acre + 34 lb P<sub>2</sub>O<sub>5</sub>/acre on 5/20/10  
 Pest control: None  
 Sprinkler irrigation: 6/29, 7/14, 8/12, & 8/23/10  
 Location: Yellow Jacket, Colorado

**Comments:**

Seed yields were below expectation due to late planting and hail damage. Hail storms on 4-6 October caused significant pod shattering. Also, more N fertilizer (N rate was based on the adjacent crop, which was sunflower) was added than may have been required by the bean crop. Too much N may have promoted vegetative growth at the expense of seed production. Furthermore, the irrigated ground was deficient in zinc which may have reduced bean yield.

Table 8. 2008 &amp; 2010 Averages

Entry	Seed yield (lb/acre)		
	2008	2010	Mean
432	927	1040	984
30068	1094	702	898
30047	1024	672	848
30046	929	673	801
438	929	615	772
30048	940	581	761
30052	950	567	758
10031	808	683	746
Fisher	884	533	709
Cahone	363	540	451
Mean	885	661	773
Significant difference at P = 0.05 (Pdiff)			
Entry			145
Entry * Year			214

Table 9. 2009-2010 National Winter Canola Variety Trial at Yellow Jacket, CO<sup>1</sup>

Line	Seed yield <sup>2</sup> (lb/acre)	Seed oil (%)	Test weight (lb/bu)	Plant height (in)	Winter survival (%)	50% bloom (date)	Pod shattering (%)
CHHE96	2021	42.7	48.4	48.3	94.3	22-May	2.7
MH06E4	2017	42.8	48.5	50.0	89.0	22-May	2.7
Visby	1866	41.9	45.5	48.3	96.7	20-May	4.3
Kadore	1839	41.6	47.6	43.7	98.0	22-May	1.2
MH06E10	1807	40.0	48.6	50.3	98.0	23-May	7.7
BSX-501	1758	37.8	47.4	49.7	99.0	23-May	0.8
KS3254	1758	39.2	47.8	51.7	100.0	23-May	4.5
Baldur	1746	41.6	49.0	47.3	100.0	20-May	3.7
Sitro	1745	41.7	46.4	47.3	91.0	20-May	1.2
Hybristar	1691	39.2	44.5	47.0	98.0	22-May	2.2
BSX-7127	1653	38.5	47.3	51.0	96.7	24-May	6.3
Hybrisurf	1633	40.7	45.2	46.7	87.7	23-May	2.7
KS4426	1619	43.4	45.8	50.7	97.0	22-May	4.3
KS4158	1588	39.1	44.5	47.7	97.0	23-May	3.2
MH06E11	1522	41.5	48.0	48.7	99.0	21-May	3.0
Dynastie	1507	38.4	44.3	48.3	97.7	22-May	0.8
Safran	1493	41.7	44.0	45.0	90.0	21-May	1.5
BSX-6271	1485	42.0	44.0	46.3	99.0	19-May	2.8
HyClass154W	1480	38.2	45.1	47.0	97.7	22-May	2.2
Flash	1471	39.2	42.8	50.7	96.7	22-May	0.8
Wichita	1465	37.5	46.0	49.0	100.0	20-May	1.2
Dimension	1407	40.6	47.1	47.0	88.0	20-May	10.7
BSX-7019	1375	38.5	43.6	48.7	97.7	23-May	4.7
BSX-7228	1310	41.5	46.0	45.7	96.7	21-May	4.8
Sumner	1286	41.9	43.4	44.7	98.0	19-May	1.8
BSX-7341	1269	39.3	46.0	49.7	94.3	23-May	12.3
MH905492	1040	38.4	42.4	43.3	92.3	21-May	3.0
Virginia	1017	39.5	42.7	40.0	99.0	20-May	1.5
Kiowa	1003	37.5	43.8	49.3	96.7	24-May	4.3
KS4475	802	41.5	44.7	46.0	98.0	24-May	12.7
Mean	<b>1522</b>	40.2	45.7	47.6	96.1	-	3.9
CV (%)	22	7.5	6.5	4.1	4.9	-	-
LSD.05	535	NS	NS	3.2	7.6	-	-

<sup>1</sup>Trial conducted at the Southwestern Colorado Research Center as part of the 'National Winter Canola Trial' managed by Kansas State University

<sup>2</sup>Seed yield adjusted to 9% moisture



**Trial information:**

Planted: 9/3/2009

Harvested: August 12 & 13, 2010

Herbicide: Treflan @ 1.5 pt/acre on 9/01/2009

Fertilizer application: 83 lb N/acre + 41 lb P<sub>2</sub>O<sub>5</sub>/acre on 09/01/2009

Irrigation application: 9/8/2009, 5/12/2010, 5/17/2010, and 5/25/2010

Precipitation amount (from rain & snow) from September 2009 thru July 2010: 8.4 in. Winter Precipitation amounts may not be accurate.

**Comment:** Harvest was delayed by 10-15 days due to rain, which increased pod shattering.

Table 10. 2010 Dryland Safflower Variety Trial at Yellow Jacket, CO<sup>1</sup>

Entry	Company	Primary Oil Type	Seed Yield <sup>2</sup> (lb/acre)	Seed Oil (%)	Test	
					Weight (lb/bu)	50% Bloom Date <sup>3</sup>
3151*	SeedTec	oleic	1231	38.7	41.6	29.0
CW 1221	Cal/West Seeds	linoleic	1223	40.9	41.2	28.0
S-719	SeedTec	linoleic	1142	40.4	43.3	27.5
CW 99OL	Cal/West Seeds	oleic	1127	41.2	40.1	26.5
5241*	SeedTec	linoleic	1109	36.8	44.1	31.0
5255*	SeedTec	oleic	1105	35.9	41.9	32.0
CW 3268-OL	Cal/West Seeds	oleic	1101	39.2	42.8	28.0
CW 88OL	Cal/West Seeds	oleic	1101	39.4	41.2	29.5
S-325*	SeedTec	oleic	992	41.0	41.4	29.0
S-333	SeedTec	oleic	987	40.1	43.5	32.0
S-345	SeedTec	oleic	971	40.4	39.6	30.0
STI 90	STI <sup>4</sup>	oleic	966	32.9	43.2	26.0
STI 01	STI <sup>4</sup>	oleic	918	36.2	41.1	26.5
Average			1075	38.7	41.9	28.8
CV (%)			13	1.3	1.6	6.5
LSD <sub>.10</sub>			167	0.6	0.8	2.2

<sup>1</sup> Trial conducted at Colorado State University's Southwestern Colorado Research Center

<sup>2</sup> Adjusted to 10% moisture

<sup>3</sup> Number of days from (and including) July 1, 2010

<sup>4</sup> Safflower Technologies International, LLC

\* Not available for sale

### **Trial information:**

Seeded: May 6, 2010 @ 25 lb/acre

Harvested: October 14, 2010

Previous crop: Fallow in 2009, alfalfa prior to that

Fertilizer: None

Herbicide: Treflan @ 1.4 pt/acre on 5/5/10

Rainfall (May - Sept.): 6.65 in (normal: 6.63 in)

Table 11. 2008-2010 Dryland Safflower Variety Trials at Yellow Jacket, CO

Entry	Company	Primary Oil Type	Seed Yield <sup>1</sup> (lb/acre)	Seed Oil (%)	Test Weight (lb/bu)	50% Bloom Date <sup>2</sup>	Plant Height (in)
3151 <sup>3</sup>	SeedTec	oleic	1136 (3) <sup>4</sup>	38.1 (3)	41.4 (3)	28.3 (2)	20.6 (3)
CW 88OL	Cal/West Seeds	oleic	1114 (3)	38.9 (3)	40.8 (3)	29.5 (2)	20.7 (3)
5241 <sup>3</sup>	SeedTec	linoleic	1109 (1)	36.8 (1)	44.1 (1)	31.0 (1)	22.0 (1)
MT3538	STI <sup>5</sup>	-	1109 (1)	36.9 (1)	41.7 (1)	29.5 (1)	23.8 (1)
CW 1221	Cal/West Seeds	linoleic	1109 (2)	41.4 (2)	40.5 (2)	27.8 (2)	22.1 (2)
5255 <sup>3</sup>	SeedTec	oleic	1105 (1)	35.9 (1)	41.9 (1)	32.0 (1)	21.0 (1)
CW 3268-OL	Cal/West Seeds	oleic	1101 (1)	39.2 (1)	42.8 (1)	28.0 (1)	23.0 (1)
CW 99OL	Cal/West Seeds	oleic	1100 (3)	39.9 (3)	40.3 (3)	27.3 (2)	23.0 (3)
S-719	SeedTec	linoleic	1084 (2)	38.5 (2)	43.2 (2)	27.5 (1)	20.4 (2)
7313 <sup>3</sup>	SeedTec	oleic	1063 (1)	37.8 (1)	43.4 (1)	31.8 (1)	25.1 (1)
STI 01	STI	oleic	1054 (3)	35.1 (3)	42.0 (3)	26.6 (2)	20.6 (3)
S-541	SeedTec	linoleic	1017 (1)	38.3 (1)	42.0 (1)	-	19.6 (1)
S-345	SeedTec	oleic	993 (3)	39.8 (3)	40.0 (3)	29.3 (2)	22.8 (3)
S-325 <sup>3</sup>	SeedTec	oleic	992 (1)	41.0 (1)	41.4 (1)	29.0 (1)	22.0 (1)
S-333	SeedTec	oleic	987 (1)	40.1 (1)	43.5 (1)	32.0 (1)	22.5 (1)
STI 90	STI	oleic	982 (2)	33.5 (2)	43.2 (2)	26.5 (2)	22.1 (2)
MT7446	STI	-	979 (1)	37.3 (1)	41.5 (1)	28.0 (1)	23.3 (1)
FINCH	MSO <sup>6</sup>	linoleic	934 (1)	33.7 (1)	45.3 (1)	-	18.8 (1)
S-344	SeedTec	oleic	925 (1)	36.3 (1)	41.4 (1)	-	18.1 (1)
STI 50	STI	-	923 (1)	44.6 (1)	35.8 (1)	27.5 (1)	23.6 (1)
3125 <sup>3</sup>	SeedTec	oleic	900 (1)	41.8 (1)	41.8 (1)	29.5 (1)	23.4 (1)
2106 <sup>3</sup>	SeedTec	oleic	876 (2)	40.2 (2)	40.7 (2)	25.5 (1)	20.1 (2)
Average			1040	38.3	41.5	28.5	21.6

<sup>1</sup> Adjusted to 10% moisture

<sup>2</sup> Number of days from (and including) July 1

<sup>3</sup> May not be available for sale

<sup>4</sup> The numbers in parentheses represent how many years of data are averaged together to calculate the preceding value

<sup>5</sup> Safflower Technologies International, LLC

<sup>6</sup> Mountain States Oilseeds

Table 12. 2010 Dryland Sunflower Hybrid Performance Trial at Yellow Jacket, CO

Brand	Hybrid <sup>1</sup>	Oil Type	Plants/ac	Seed Yield <sup>2</sup> (lb/acre)	Seed oil content <sup>2</sup> (%)	Test Weight (lb/bu)	Plant Height (in)	50% bloom (date)
Mycogen	8N453 DM	NuSun	12197	2209	42.3	33.0	46.2	30-Jul
Triumph	657	NuSun	9243	2135	38.2	25.8	42.9	1-Aug
Mycogen	8H449 DM	High Oleic	10180	2048	40.6	31.6	48.0	31-Jul
Syngenta	3875 NS	NuSun	9451	2008	36.0	30.8	43.7	30-Jul
Syngenta	3732 NS	NuSun	10346	1967	37.0	29.9	42.4	30-Jul
Pioneer	63M91	NuSun	11756	1949	39.5	30.4	51.8	28-Jul
Syngenta	3845 HO	High Oleic	10102	1917	39.9	29.4	43.2	29-Jul
Triumph	664	NuSun	9728	1890	35.8	26.5	43.6	1-Aug
Triumph	845HO	High Oleic	10987	1826	39.6	26.2	42.9	30-Jul
Triumph	s671	NuSun	11326	1732	37.2	30.7	33.9	3-Aug
Pioneer	63N82	NuSun	10282	1677	37.0	29.1	48.3	30-Jul
Triumph	820HO	High Oleic	12366	1668	40.8	31.4	41.3	25-Jul
Triumph	s655	NuSun	11351	1667	36.4	29.2	32.7	1-Aug
Triumph	TRXs8420	NuSun	10296	1661	38.3	29.5	38.4	3-Aug
Syngenta	4651 NS/DM	NuSun	9855	1631	34.4	24.8	46.7	1-Aug
Pioneer	P63ME70	NuSun	11026	1629	36.1	24.6	48.9	30-Jul
Triumph	s878	High Oleic	9014	1629	36.0	29.1	41.6	3-Aug
Pioneer	P64HE01	High Oleic	12751	1428	37.4	30.0	44.9	28-Jul
Mean			10681	1816	37.9	29.0	43.4	
CV (%)			10	7	4	2	3.2	
LSD <sub>.05</sub>			1739	202	2.5	0.9	2.3	

<sup>1</sup> DM = Downy mildew resistant, NS = NuSun (mid-oleic); HO = High-oleic

<sup>2</sup> Seed and oil yields adjusted to 10% moisture

**Trial Information:**

Plot size: 10 ft. (4 rows) x 100 ft.  
Replications: 3 (RCBD)  
Planted: May 28, 2010  
Harvested: November 5, 2010  
Seeding rate: Target: 15,563 seeds/acre (13.5" seed spacing in 30" rows)  
Previous crop: Irrigated oats  
Soil type: Wetherill silty clay loam  
Fertilizer: 49 lb N/ac + 24 lb P<sub>2</sub>O<sub>5</sub>/acre on 5/20/10  
Soil test (0-10"): Nitrate-N: 21 lb/ac, Mehlich-3 P: 15 ppm, pH: 7.1, OM: 1.4%  
Herbicide: Sonalan @ 2.5 pt/ac PPI on 5/14/10  
Rain (Jun-Oct): 8.3 in (gross amount) or 114% of normal

**Comments:**

Highest dryland sunflower seed yields since 2006, due to above normal and timely precipitation during flowering and grain filling. Water content in the root zone at planting was near field capacity due to excellent winter precipitation. Some available water may have been left from the 2009 irrigation season. No irrigation water was applied in 2010. There was minor bird or deer damage and no lodging. Hail storms in early October caused some defoliation.

Table 13. 2005-2010 Dryland Sunflower Hybrid Performance Trials at Yellow Jacket, CO

Brand	Hybrid*	Seed Yield (lb/acre)**	Years of Yield Data	Yield Rating (%)***	Seed Oil Content (%)**	Test Weight (lb/bu)	Plant Height (in)	50% Bloom Date****	Oil Type
Syngenta	3875 NS	2008	(1)	91	36.0	30.8	43.7	7/30	NuSun
Syngenta	3732 NS	1967	(1)	89	37.0	29.9	42.4	7/30	NuSun
Syngenta	3845 HO	1917	(1)	87	39.9	29.4	43.2	7/29	High Oleic
Monsanto	MH7633	1873	(1)	100	37.5	32.5	53.5	8/11	NuSun
Triumph	R657	1843	(1)	98	40.5	28.3	55.5	8/13	NuSun
Garst	4596HO	1741	(1)	93	36.2	32.7	54.5	8/13	High Oleic
DeKalb	DKF 4-33 NS/DM	1726	(1)	92	40.9	32.6	49.5	8/13	NuSun
Triumph	657	1691	(2)	93	42.4	27.5	46.2	8/6	NuSun
Triumph	TRXs8420	1661	(1)	75	38.3	29.5	38.4	8/3	NuSun
Pioneer	P63ME70	1629	(1)	74	36.1	24.6	48.9	7/30	NuSun
DeKalb	DKF38-45 NS	1628	(1)	87	40.5	31.8	50.0	8/13	NuSun
Mycogen	8H449 DM	1602	(3)	88	42.3	33.0	49.3	8/7	High Oleic
Pioneer	63M91	1586	(3)	88	41.1	32.3	52.9	2/3	NuSun
Garst	521	1549	(1)	83	35.7	31.0	48.5	8/9	NuSun
Croplan	3080 DMR, NS	1545	(1)	82	39.8	31.2	47.0	8/9	NuSun
Mycogen	8N453 DM	1533	(3)	84	43.5	33.9	46.2	8/6	NuSun
DeKalb	DKF29-30 NS/DM	1525	(1)	81	37.9	28.8	52.0	8/9	NuSun
Triumph	664	1525	(2)	85	40.1	28.2	45.8	8/6	NuSun
Pioneer	63N82	1505	(2)	74	37.2	30.0	52.4	8/5	NuSun
Mycogen	8H350DM	1481	(1)	79	38.7	31.0	51.5	8/11	High Oleic
Mycogen	8N358CL	1458	(1)	78	39.4	31.3	46.5	8/13	NuSun
Garst	454	1457	(1)	78	38.5	31.9	54.5	8/13	NuSun
Triumph	658	1455	(1)	78	37.9	27.9	53.5	8/13	NuSun
Pioneer	P64HE01	1428	(1)	65	37.4	30.0	44.9	7/28	High Oleic

Brand	Hybrid*	Seed Yield (lb/acre)**	Years of Yield Data	Yield Rating (%)***	Seed Oil Content (%)**	Test Weight (lb/bu)	Plant Height (in)	50% Bloom Date****	Oil Type
Triumph	s878	1400	(2)	79	40.0	30.4	39.3	8/8	High Oleic
Triumph	s678	1392	(1)	74	39.0	32.8	40.5	8/18	NuSun
Croplan	369 DMR,NS	1388	(1)	74	40.1	30.3	51.0	8/13	NuSun
Triumph	s671	1380	(2)	76	41.2	31.6	32.4	8/8	NuSun
Mycogen	8N337DM	1375	(1)	73	41.9	32.6	49.5	8/11	NuSun
Garst	450	1374	(1)	73	39.1	32.0	42.5	8/13	NuSun
Monsanto	MH6640	1337	(2)	83	42.0	31.6	45.2	8/11	NuSun
Pioneer	63M80	1334	(1)	71	39.4	31.4	56.5	8/9	NuSun
Monsanto	MH6643	1334	(1)	71	38.3	30.1	52.5	8/11	NuSun
Mycogen	8N510	1329	(2)	82	39.5	30.4	43.8	8/12	NuSun
DeKalb	DKF39-80 CL	1305	(1)	70	35.2	29.1	55.5	8/13	NuSun
Triumph	s672	1301	(1)	69	38.8	33.6	32.8	8/13	NuSun
Seeds 2000	Blazer CL	1282	(1)	68	35.7	31.4	50.5	8/13	NuSun
Mycogen	8N270	1281	(1)	68	37.1	29.8	41.5	8/9	NuSun
Advanta	F30294 NS, Rust	1245	(1)	66	37.4	30.9	54.5	8/13	NuSun
Triumph	845HO	1235	(3)	67	40.8	27.8	44.5	8/7	High Oleic
Seeds 2000	Sierra	1198	(1)	64	31.4	27.8	48.0	8/15	High Oleic
DeKalb	DKF34-80 NS/DM	1164	(1)	62	37.6	28.9	52.5	8/11	NuSun
Dekalb	37-31	1154	(1)	83	44.1	31.8	46.2	8/10	NuSun
Triumph	820HO	1152	(4)	76	40.8	31.9	42.9	8/2	High Oleic
Triumph	s655	1152	(2)	61	40.3	30.3	32.5	8/7	NuSun
Triumph	s675	1149	(1)	61	39.0	34.0	32.8	8/14	NuSun
Triumph	859CL	1127	(1)	60	34.6	30.7	54.5	8/18	High Oleic
Dekalb	IS 7120 HO/DM	1122	(1)	60	37.2	29.9	50.5	8/11	High Oleic
Mycogen	8N187	1099	(1)	79	42.4	29.9	38.9	8/9	NuSun
Mycogen	8N433DM	1098	(1)	79	45.8	29.8	43.7	8/8	NuSun

Brand	Hybrid*	Seed Yield (lb/acre)**	Years of Yield Data	Yield Rating (%)***	Seed Oil Content (%)**	Test Weight (lb/bu)	Plant Height (in)	50% Bloom Date****	Oil Type
Advanta	F30008 NS, CL	1089	(1)	58	34.7	29.3	51.0	8/13	NuSun
Garst	4651 NS/DM	1077	(3)	71	36.2	28.3	45.1	8/7	Mid Oleic
Dekalb	DKF37-31 NS	1071	(2)	82	38.3	32.4	40.0	8/11	Mid Oleic
Pioneer	64H41	1068	(2)	67	39.4	31.5	53.4	8/11	High Oleic
Advanta	F10046 HO	1032	(1)	55	36.3	30.6	50.5	8/13	High Oleic
Mycogen	8H419CL	1002	(1)	72	42.6	29.3	41.4	8/10	High Oleic
Mycogen	8H288CLDM	952	(1)	69	44.8	31.0	43.4	8/6	High Oleic
Croplan	378 DMR, HO	853	(2)	74	35.3	28.5	41.8	8/11	High Oleic
Triumph	636	832	(2)	75	40.2	29.7	39.5	8/11	Mid Oleic
Garst	4704 NS	696	(2)	60	35.0	29.4	39.5	8/7	Mid Oleic
Garst	4668 NS/CL	619	(2)	58	35.4	30.3	42.8	8/11	Mid Oleic
Hysun	454	544	(1)	100	38.4	34.3	41.0	8/10	NuSun
Garst	4420NS	519	(1)	95	39.3	32.5	35.0	8/9	Mid Oleic
Dekalb	DKF35-10 NS	473	(1)	87	34.5	31.0	34.0	8/3	Mid Oleic
Dekalb	DKF38-30 NS	459	(1)	84	37.1	32.5	32.0	8/9	Mid Oleic
Croplan	356NS	458	(1)	84	41.3	33.0	30.0	8/6	Mid Oleic
Garst	521	447	(1)	82	37.9	33.0	34.0	8/3	Mid Oleic
Triumph	545A	432	(1)	79	41.5	33.0	30.0	8/6	Traditional
Garst	4665HO	405	(1)	74	34.8	33.0	31.0	8/3	High Oleic
Croplan	308NS	381	(1)	70	40.3	34.0	32.0	8/3	Mid Oleic
Triumph	540	-	-	-	35.4	29.0	54.0	8/22	Traditional
Triumph	567DW	-	-	-	34.3	27.0	54.0	8/16	Traditional
Triumph	620 CL	-	-	-	33.5	31.5	46.0	8/5	NuSun
Triumph	645	-	-	-	37.7	31.0	42.0	8/12	NuSun
AgriPro	AP 2098	-	-	-	34.1	27.0	48.0	8/18	Traditional
Average		1242		77	38.9	30.8	44.7		



\* IS = Interstate; NS = NuSun (mid-oleic); CL = Clearfield; DM or DMR = Downy mildew resistant; HO = High-oleic

\*\* Includes only data that was adjusted to 10% seed moisture

\*\*\* Most varieties weren't planted in every trial from 2005-2010 so the yield rating gives you an idea how of how well each variety did compared to other varieties during the years they were planted.

100 = this variety had the highest yield every year it was in a trial

50 = this variety had 50% of the highest yield (on average) every year it was in a trial

\*\*\*\* Some of the trials collected this data as '50% Heading Date'

## 2010 Camelina Planting Date by Variety Trial at Yellow Jacket, CO

Table 14. Seed yield of camelina planted on 16 April 2010

Variety	Seed Yield (lb./acre) <sup>1</sup>	Seed Moisture <sup>2</sup> (%)	Test Weight lb/bu
Ligena	778	9.5	46.7
Celine	737	9.4	50.2
Blaine Creek	679	10.6	46.2
Yellow Stone	620	10.3	45.4
Cheyenne	569	24.0	44.6
BSX G74	530	20.8	42.2
BSX G22	517	15.4	47.5
Suneson	409	12.4	48.6
Average	605	14.1	46.4
CV (%)	20	67.1 <sup>2</sup>	6.0
LSD <sub>.05</sub>	217	NS	NS
LSD <sub>.10</sub>	178	NS	4.0

<sup>1</sup> Seed yield is adjusted to 8.5% moisture

<sup>2</sup> Moisture of some of samples exceeded the machine's upper limit.

### Trial information:

Operation	Type	Date
<b>Tillage</b>	Field cultivator	May 5, 2010 (PD#2)
<b>Planting</b>	PD#1	11/11/2009. Reseeded on 6/1/2010
	PD#2	4/16/2010
	PD#3	5/7/2010
<b>Fertilizer</b>	41 lb N + 21 lb P <sub>2</sub> O <sub>5</sub> /acre	9/1/2009
<b>Herbicide</b>	Treflan @ 1.5 pt/acre, incorporated with field cultivator the same day	9/1/2009
<b>Insecticide</b>	Lorsban 1.6 pt/acre	6/2/2010
<b>Cultivation</b>	None	
<b>Irrigation</b>	None	
<b>Harvest</b>		8/18/2010 (PD#2)

### Comment:

Only camelina planted on 16 April was harvested. Varieties Cheyenne and BSX G74 may have been harvested too early given the high seed moisture content. Camelina appears to have indeterminate growth habit. It would have been difficult to harvest each variety separately with the Hege or any other combine, given the plot layout. Camelina planted on 7 May sustained extensive hail damage/pod shattering. Camelina that was planted on 11 November 2009 (PD#3) had a poor stand (all varieties). It

started snowing 1-2 days after camelina was planted. Snow accumulation was substantial (above average) in November 2009 through early spring 2010. It is not known what percentage of the seeds germinated while snow covered the ground but there were dead seedlings after snow melted. PD#3 plots were reseeded on 1 June 2010 with little success due to dry conditions in June.

# Boosting Sunflower Production in SW Colorado with Supplemental Irrigation—2010 Results

Abdel Berrada and Joel Schneekloth

The project objectives were to:

1. Determine the response of sunflower to limited irrigation at two seeding rates and two nitrogen fertilizer rates.
2. Develop guidelines to optimize sunflower oil production in SW Colorado with supplemental irrigation.

In order to accomplish objective 1, a field trial was conducted at the Southwestern Colorado Research Center at Yellow Jacket, CO in 2010. High-oleic sunflower hybrid 'Mycogen 8H449 DM' was planted on June 4, 2010 with a 4-row Monosem planter at two seeding rates: 15488 and 22082 seeds/acre in 30-inch rows. Sixty pounds of N/acre plus 41 lb/acre of P<sub>2</sub>O<sub>5</sub> were applied to the whole plot area on June 2, 2010. An additional 60 lb N/acre was broadcast on July 2, 2010 on designated plots. Thus, N fertilizer rates were: 60 lbN/acre and 120 lb N/acre. The N source was Urea and 11-52-0 and P source was 11-52-0. The main treatment though was irrigation scheduling. The whole plot area received approximately 1.8 in. of net irrigation amount prior to planting sunflowers. A subsurface drip irrigation system was set up afterwards to deliver water to each treatment. Irrigation treatments and amounts are shown in Table 1. Treatment I-5 emulates irrigation of sunflower with a linear-move sprinkler irrigation system, also known as sideroll. Siderolls represent the most common irrigation water-delivery system in SW Colorado. Irrigation treatments were assigned (at random) to the main plots, seeding rates to the split plots, and N rate to the split-split plots. Each treatment was replicated four times. Plot size (N rate) was 10 ft. (4 rows) by 50 ft. Sonalan HFP was applied at 2.3 pt/acre on 2 June to control pigweed, kochia, nightshade, foxtail, and other common weeds in SW Colorado. Additional weeding was done by hand as need be.

## **Main results:**

Irrigation scheduling had a significant impact on seed yield, oil yield, and plant height (Table 1). The full irrigation treatment (I-2) produced the highest seed yield of approximately 3000 lb/acre while I-1 (pre-plant irrigation only) produced the lowest yield of 2334 lb/acre. I-3 and I-4 received a total of 3.1 and 2.6 in. of net irrigation amount (in addition to pre-plant irrigation), respectively, which is about half the amount (6.6 in) received by I-5 and yet, all three treatments had a similar yield of approximately 2600 lb/acre. I-5 received most of the irrigation water during the mid-vegetative to early reproductive growth stages or until sunflower plants were too tall to irrigate with the sideroll. Generally, sunflower production in 2010 was enhanced by good water availability at planting and timely and above average rainfall during the reproductive growth stages (Fig. 1, p. 7).

Increasing seeding rate from 15488 to 22082 seeds/acre increased seed yield by only 121 lb/acre on average (Table 1). A larger increase (454 lb/acre) was observed at I-4. On average, plant population at harvest was 78% of the target number of seeds/acre at the low seeding rate and 67% at the higher

seeding rate. The large discrepancy between seeding rate and final plant population cannot be explained at this time.

Doubling N rate from 60 to 120 lb/acre did not impact seed yield significantly (Table 1). There was a slight but significant decrease in oil yield at the low seeding rate due to the increase in N rate. Soil N test prior to N fertilizer application averaged 27 lb of NO<sub>3</sub>-N /acre in the top 2 ft. The addition of 60 N/acre should, in theory, produce 1338 lb of sunflower seeds/acre (High Plains Sunflower Production Handbook, April 2009 Edition). The higher N rate (120 lb N/acre) should produce 2,262 lb/acre [(27 + 120 lb N/ac)/(0.065 lb N/lb of yield)], assuming no N contribution from the previous crop which was spring wheat. Much higher seed yields were achieved with both N rates (Table 1). Some of the applied N (as Urea) may have been lost by volatilization, particularly since the Urea applied on 2-Jul was not incorporated to the soil. However, this was not quantified. N contribution from irrigation water is believed to be negligible, but this has not been quantified either. Similarly, post-harvest soil N data has not been analyzed yet. Changes to N rate and N application method will be made in 2011 based on these preliminary results and further data analysis.

This study will be continued for at least one more year to confirm the 2010 results and address objective no. 2 (Develop guidelines to optimize sunflower oil production in SW Colorado with supplemental irrigation).

Table 15. 2010 sunflower plant population, seed and oil yields, and plant height

	Plant population	Seed yield <sup>1</sup>	See oil yield <sup>1</sup>	Plant Height
Irrigation treatment	(plants/acre)	(lb/acre)	(lb/acre)	(in.)
I-1 (Pre-Plant Irrigation, PP)	<b>13297</b>	<b>2334 C<sup>2</sup></b>	<b>946 C</b>	<b>55.3 C</b>
	12093	2309 a	899 a	
	14501	2358 a	993 a	
I-2 (PP + Full Irrigation)	<b>12904</b>	<b>2965 A</b>	<b>1240 A</b>	<b>63.6 A</b>
	11446	2860 a	1237 a	
	14363	3070 a	1242 a	
I-3 (PP + Irrigation @ R-1 to R-6)	<b>13513</b>	<b>2619 B</b>	<b>1069 B</b>	<b>57.7 B</b>
	12475	2613 a	1064 a	
	14552	2626 a	1075 a	
I-4 (PP + Irrigation @ R-4 + R-6)	<b>14321</b>	<b>2591 B</b>	<b>1050 B</b>	<b>54.5 C</b>
	11807	2364 a	916 b	
	16835	2818 b	1183 a	
I-5 (PP + Irrigation thru 28-Jul)	<b>13515</b>	<b>2588 B</b>	<b>1036 B</b>	<b>63.9 A</b>
	12976	2647 a	1048 a	
	14053	2529 a	1024 a	
<b>Seeding rate (seeds/acre)/N rate (lb/acre)</b>				
15488	<b>12159</b>	<b>2559 B</b>	<b>1033 B</b>	<b>58.7 A</b>
60	12505	2605 a	1068 a	

	Plant population	Seed yield <sup>1</sup>	See oil yield <sup>1</sup>	Plant Height
Irrigation treatment	(plants/acre)	(lb/acre)	(lb/acre)	(in.)
120	11814	2513 a	997 b	
22082	<b>14861</b>	<b>2680 A</b>	<b>1103 A</b>	<b>59.3 A</b>
60	14759	2633 a	1076 a	
120	14962	2727 a	1130 a	
<b>N rate (lb/acre)</b>				
60 (N1)	13632	2619 A	1072 A	59.1 A
120 (N2)	13388	2620 A	1064 A	58.9 A

<sup>1</sup>Seed and oil yields were adjusted to 10% seed moisture.

<sup>2</sup>Means followed by the same letter are not significantly different at P = 0.05

Table 16. Irrigation depth

Treatment	I-1	I-2	I-3	I-4	I-5
Pre-plant irrigation (in, net)	1.8	1.8	1.8	1.8	1.8
Post-planting irrigation (in, net)	0.0	11.4	3.1	2.6	6.6
Irrigation timing <sup>2</sup>	5/21	7/4 - 9/30	7/27-8/31	8/15-8/31	7/5-7/28
Rainfall (6/4 – 10/07), in	7.1				
Reference ET (6/4-10/07), in	30.1				
Crop ET (6/4-10/07), in	19.8				

<sup>2</sup>R-1 was reached on or about 19-Jul, R-4 on 6-Aug, R-6 on 24-Aug, and R-9 on 1-Oct.

Acknowledgment: This project was funded in part by the National Sunflower Association.

# Evaluation of Sunflower in Dryland Crop Rotations—2010 Results

Abdel Berrada

(co-PIs: Daniel Fernandez & Rodney Sharp)

The main objective of the crop rotation project is to test the effects of sunflower on soil and crop productivity in three crop rotations: Winter wheat–Sunflower-Fallow, Winter wheat–Dry bean-Sunflower-Fallow, and Winter wheat–Opportunity crop-Sunflower-Opportunity crop. Three other crop rotations commonly practiced in SW Colorado or SE Utah (Winter wheat-fallow, winter wheat-safflower-fallow, and winter wheat-dry bean-dry bean-fallow) are included for comparison purposes. Each phase of each crop rotation is present every year. The opportunity crop in 2010 was camelina [*Camelina sativa* (L.) Crantz].

Table 17. 2010 crop information and yield

Crop	Variety	Planting date	Planting rate	Average seed yield (lb/acre) <sup>1</sup>	Oil content (%)
Camelina	Cheyenne	5/17/2010	6 lb/acre	Not harvested	-
Safflower	CW 99OL	5/17/2010	25 lb/acre	1761	41.2
Sunflower	Triumph 657	5/27/2010	15,488 seeds/acre	1799	39.7
Dry bean	Cahone	6/08/2010	23,232 seeds/acre	893	-
Winter wheat	Fairview	9/13/2010	50 lb/acre	NA	-

<sup>1</sup> Seed yield of sunflower was adjusted to 10% moisture and that of safflower to 9% moisture.

Spring crops' seed yields were above average for this area with the exception of camelina (Table 1), which sustained extensive hail damage. Soil moisture at planting was near field capacity due to excellent winter precipitation. Rainfall was below average in May and June and above average in August and September (Fig. 1, p. 7). Good weed control was achieved with timely applications of labeled herbicides or with tillage. There was no noticeable infestation of diseases or insects.

No fertilizer was added in the spring of 2010. Seventy pounds/acre of P<sub>2</sub>O<sub>5</sub> plus 15 lb N/acre (as 11-52-0) were applied to the plots to be planted to winter wheat on 2-Sept. Soil test averaged 113 lb N/acre in the top 2 ft. and 12 ppm of mehlich-3 P in the top foot. Soil organic matter averaged 1.4%. The relatively high soil N test level was likely due to nine years of alfalfa (2000-2008). More data will be presented at the 2011 NSA Research Forum.

In summary, favorable weather and soil conditions, low incidence of diseases and insects, and good weed control resulted in excellent crop growth and seed yields in 2010. This is the first year of a long-term experiment with two-, three-, and four-year crop rotations. Therefore, it is premature to draw conclusions as to the impact of sunflower on dryland cropping systems in SW Colorado.

Acknowledgment: This project was funded in part by the National Sunflower Association.

**FRUIT TREE & VINEYARD PROJECT**  
**2010 GROWING SEASON**  
**APPLE VARIETIES**  
**DESCRIPTIONS, EVALUATIONS and RATINGS**

Dan Fernandez, Dolores County Director  
Colorado State University Extension

**SCARLET GALA - EMLA 7:** 1992 planting. \*\*\*\* Rating

Beautiful color with bright red striping over an orange background. Mid-bloom, with moderate to large fruit size and moderate to heavy yields in SW Colorado. Recommend using central leader training to allow good light penetration. Moderate tree development but in the 8th & 9th seasons several trees began leaning requiring support. Root sprouts real issue; requiring two prunings per season. Matures early to mid-September. Very consistent yearly fruiting. Rating dropped ½ point due to tree leaning and sprout problems. 2009 large crop but 2010 spring freezes reduced crop by 40%.

**NURED JONATHAN - MARK:**

This variety was replaced with an improved version in 2000.

**SWISS GOURMET - EMLA 7:** 1995 planting. \*\*\* Rating

Beautiful color with a bright red over a rich yellow background. Mid-bloom, medium sized fruit that even with light crop loads does not size-up -matures early to mid-September. Excellent tree development on trellis system but may be a little too vigorous for a trellis on EMLA 7. Large Crop in 2005 but minimal crop in 2006 & 2007 due to freezes. Due to excessive growth, half of these trees were removed from the project. Good Crop 2009, but 2010 spring freezes reduced crop by 50%.

**ROYAL EMPIRE - EMLA 7:** 1995 planting. \*\*\*\* Rating

Superior, excellent dark red fruit that colors early. Mid-bloom, medium to large fruit that is fairly resistant to light hail. Matures mid-September. Long shelf life with excellent storage capacity. Excellent tree development on trellis system. Large Crop in 2005 but minimal crop in 2006 & 2007 due to freezes. Good Crop 2008, 2009, but 2010 spring freezes reduced crop by 70%.

**LIBERTY - EMLA 7:** 1995 planting. \*\*\* Rating

Good fruit color with deep red over a slight yellow background, but the fruit has a tendency to be slightly irregular in shape. Mid-bloom, highly resistant to major apple diseases. Excellent tree development on trellis system but vigorous growth on EMLA 7 indicates that a more dwarfing rootstock is required on a trellis system - use EMLA 26. Large fruit size with consistent heavy production. Proper pruning is essential to accommodate heavy fruit load. Thin fruit skin makes this variety highly



susceptible to light hail. Matures a week to 10 days later than Scarlet Gala with late September to early October harvest. Large Crop in 2005 and same in 2006, 2007, 2008 & 2009, but 2010 spring freezes reduced crop by 50%.

**GOLDEN DELICIOUS - EMLA 26:** 1994 planting. \*\*\*\* Rating

Golden apple with an excellent light red blush that develops on sun exposed side. Mid-bloom, early heavy bearer with small to medium fruit; needs early thinning. Alternate bearing a possibility but recently excellent crops with good size even through the adverse weather conditions. Mid to late September harvest. Large Crop in 2005, 2006, 2007, 2008, 2009, but 2010 spring freezes reduced crop by 30%.

**HONEY CRISP - EMLA 7:** 1995 planting. \*\*\*1/2 Rating

Excellent color with a scarlet red over a yellow background. Mid-bloom, large fruit, keeps well in storage-high quality. Good tree development but poor, low yields seem to be a chronic problem early in its development with this variety. 2000 Powdery Mildew outbreak did not affect this variety. Tree also tends to initially grow upright and requires substantial limb training during early development. Mid-September harvest. This was the only variety to have a significant crop in 2002. Large Crop in 2005, 2006, 2007 & 2008 but very inconsistent prior to 2005. Rating raised ½ point in 2008 and another ½ point in 2009. Full crop 2010.

**RED FUJI - EMLA 9:** 1995 planting. \*\*\* Rating

Good color development with red stripe over a yellow-green background - better color than expected for Fuji's grown in Colorado. Mid to late-bloom, late harvest mid-October, very firm apple with excellent storage qualities that is very resistant to light hail. Excellent tree development on trellis system with medium to large fruit. Several seasons of consistent fruiting even through the adverse weather conditions. Heavy crop requires proper thinning to avoid limb breakage. Big market potential. Good crop in 2007 but 2008 crop was lost due to freeze. Again, due to late maturity most of this crop was not harvested. Dropping rating a full point due to continuing bloom and late maturity problems. No crop 2010

**RED JONAGOLD - EMLA 7:** 1994 planting. \*\*\* Rating

Excellent red blush over a slight yellow background that makes a nice pie apple. Mid-bloom with late color development, small to medium fruit, susceptible to mildew but resistant to light hail. Very good tree development with several seasons of fairly consistent, but light, fruiting even through the adverse weather conditions. Large Crop 2005, minimal crop in 2006 and good crop in 2007, 2008, 2009, but 2010 spring freezes reduced crop by 30%.

**LUSTRE ELSTAR - EMLA 26:** 1994 planting. \*\*\* Rating

Beautiful scarlet red blush over a yellow background, mid-bloom, medium fruit size. Good tree development but this variety has been susceptible to limb breakage, especially during the winter. Several seasons of fairly consistent fruiting even through adverse weather conditions. In 2007, lowered

rating ½ point due to continued limb breakage. Large Crop 2005, but minimal crop in 2006 due to May freeze. Moderate crop in 2007, 2008, 2009, but 2010 spring freezes reduced crop by 30%.

**SUPER JON - EMLA 7: 1994 planting. \*\*\* Rating**

Mid-bloom, dark red small to medium fruit good for pies and resistant to light hail. Very good tree development with several seasons of fairly consistent, but light, fruiting even through the adverse weather conditions of spring 1999. The freezes of spring 2000 completely ruined the crop. 2001 crop was again light to moderate at 2.7bu./tree. 2000 Powdery Mildew outbreak did not affect this variety. Mid- to late September harvest. Three freezes in early 2002 eliminated the crop. Hail in 2003 eliminated the crop. Hail in July 2004 damaged the crop. Large Crop 2005 and moderate crop in 2006, 2007, 2008, 2009, but 2010 spring freezes reduced crop by 30%.

**MOR-SPUR McINTOSH - EMLA 7: 1996 planting. \*\*\* Rating**

Bright cherry red blush. Early, reported to be a heavy producer BUT NOT HERE SO FAR. Smaller tree size is good for high density plantings. Tree has a very good natural spread to limb development that requires little limb training. Large Crop 2005, minimal crop in 2006, and good crop in 2007 and moderate in 2008, 2009. For the fourth year in a row we had “unexplained” significant fruit drop prior to harvest but not as bad as 2008 or 2009. This situation is being monitored. Good and relatively stable crop in 2010.

**IMPROVED RED DELICIOUS - EMLA 7: 1996 planting. \*\*\* Rating**

Campbell strain that is highly striped with strong red color. Consistent medium to very large fruit that is mid-bloom. Upright tree growth that initially requires substantial limb training. This tree has had limited tree growth on this rootstock. May be more suited for a high density planting on a trellis system than a field planting. I am also starting to wonder if the stated rootstock from the nursery may have been an error. Rating increased another ½ point in 2004 because of consistent, exceptional large fruit. Large crop in 2005, minimal crop in 2006 and good crop in 2007. Large crop in 2008, 2009, but 2010 spring freezes reduced crop by 50%.

**ROYAL GALA - EMLA 26: 1997 planting. \*\*\*½ Rating**

Produces a beautiful fruit with red stripes over an orange-red undercolor. Medium sized fruit which may exhibit a wide variation of fruit coloration. Very good tree development so far with a moderate crop in the fourth season with excellent color. Powdery Mildew outbreak heavily affected this variety. Large Crop 2005, minimal crop in 2006 and good crop in 2007, 2008, 2009, but 2010 spring freezes reduced crop by 80%.

**MYRA RED FUJI - EMLA 26: 1997 planting. \*\*\* Rating**

Medium to large apple which colors up substantially. The finish color is a pinkish red. Matures 10 days earlier than Red Fuji. Very good tree development. Large crop in 2005, minimal crop in 2006 and good crop in 2007. No crop in 2008 due to freeze and late maturing crop in 2009 was not harvested. Lowering rating ½ point. No crop in 2010.

**GRAVENSTEIN - EMLA 26:** 1997 planting. **\*\* Rating**

Large, red-striped, crisp and juicy. Excellent for cooking and pies. Hardy tree with very good tree development. But it is important to note that this variety does mature up to 3 weeks earlier - last part of August to 1st week in September and is never harvested as part of our regular U-Pick operation. Susceptible to Bitter Pit which is a calcium deficiency. Large crop in 2005, minimal crop in 2006, and good crop in 2007. No crop in 2008. Due to very early maturity which did not fit into our production scheme, all but one of these has been eliminated from the project. Final rating was also lowered one point.

**IDARED - EMLA 26:** 1997 planting. **\*\*½ Rating**

A solid, beautiful bright red apple. Tree development has slowed rapidly as the bud union is starting to swell considerably. This tree on EMLA 26 is better suited to a trellis system. Lowering rating again in 2007 as poor tree development and limited crop does not make this variety very appealing. It really needs a more vigorous rootstock like EMLA 7. Heavy crop in 2008, 2009 and 2010. Raising rating one point in 2010.

**LODI - EMLA 111:** Yellow fruit large in size with very early maturity - mid to late August. On EMLA 111 there is excessive growth on the trellis that is very hard to handle. This variety should be on a more dwarfing rootstock like EMLA 26. Powdery Mildew outbreak moderately affected this variety.

THESE TREES HAVE BEEN REMOVED FROM THE PROJECT.

**RUBINSTAR JONAGOLD - EMLA 26:** 1997 planting. **\*\*\* Rating**

Intense red coloration that is uniform throughout the tree. Tree development has been moderate throughout its development. Matures one week ahead of Jonagold and is less susceptible to sunburn. There are signs of Bitter Pit susceptibility. Good crop in 2005, minimal crop in 2006 and good crop in 2007 & 2008. Heavy crop in 2009 and 2010.

**SUN FUJI - EMLA 7:** 1999 planting. **\*\*\* Rating**

Extremely firm apple with a pinkish/red stripe over yellow-green ground color. The flesh is yellowish-greenish, dense and crisp. Flavor is sweet, fruity, slightly aromatic, sub-acid and very pleasant. High soluble solids. Outstanding keeper. Tree development has been excellent. Large crop in 2005, minimal crop in 2006 and good crop in 2007. No crop 2008 due to freeze and late maturity in 2009 resulted in these trees not being harvested. Lowering rating one point. No crop 2010.

**GALAXY GALA - EMLA 7:** 1999 planting. **\*\*\*\* Rating**

This Gala's big difference to Royal Gala is that it develops an almost complete, bright, cherry red layer under more intense red stripes. The degree of striping is similar to Royal Gala, but the color is more complete. Tree development is excellent. Large Crops 2005, 2006, 2007, 2008, 2009, but 2010 spring freezes reduced crop by 70%.

**IMPROVED GALA (Mitchell Cultivar) - EMLA 7: 1999 planting. \*\*\*\* Rating**

Bright red stripes over yellowish undercolor. Multiple pick apple. Noted for its increased color stability. Medium sized fruit. Outstanding flavor. Tree development is excellent. Large crops in 2005, 2006, 2007, 2008, 2009, but 2010 spring freezes reduced crop by 70%.

**PACIFIC GALA - EMLA 7: 1999 planting. \*\*\*\* Rating**

Ripens 5-7 days ahead of Royal Gala. The coloration of the fruit was observed to be distinctly different than the Tenroy cultivar and the Galaxy Gala, showing much higher color on 90 to 100% of fruit. Tree development is excellent. Large crops in 2005, 2006, 2007, 2008, 2009, but 2010 spring freezes reduced crop by 50%.

**PINOVA - EMLA 7: 1999 planting. \*\*\* Rating**

A medium sized apple with outstanding flavor, similar to Golden. Skin is a bright, florescent pinkish/red; 50 to 80% blush over yellow background. Flesh is firm, fine grained and cream color. Matures with Golden Delicious. Tree has a low to medium vigor. Pinova is cold hardy and very productive. Large crop in 2005, minimal crop in 2006 and good crop in 2007. Good crop in 2008 but it matured in mid-October. Excellent crop in 2009, but 2010 spring freezes reduced crop by 40%.

**CAMEO - EMLA 7: 1999 planting. \*\* Rating**

Cameo is a pleasing bright red stripe over a golden blend with a sweet tart flavor. Prone to excessive suckering which makes pruning difficult. The creamy white flesh shows virtually no browning when cut. Cameo stores and handles well retaining its firmness and dessert qualities for 5 months in regular storage. The tree has growing characteristics similar to a golden delicious. This variety is harvested in mid to late September and in 2001 had a small crop for the third season. Initial tree development is excellent but upright growth and significant suckering continues to require significant limb training and pruning. Fair crop in 2006 & 2007. No crop in 2008 due to the need to perform early spring corrective pruning. Good crop in 2009 due to effects of 2008 corrective pruning. No crop in 2010

**IMPROVED GOLDEN - EMLA 7: 2000 Planting. \*\*\* Rating**

The finish is smoother to the touch in comparison to a regular Golden. Medium to large fruit that is Russet resistant. Initial tree development and fruiting are excellent but limb growth has to be controlled early in its development to avoid congestion. Limited crop in 2005, good crop in 2006, small crop in 2007. Large crops in 2008, 2009 & 2010 but this is a later maturing variety (early October).

**GOLDEN SUPREME - EMLA 7: 2000 Planting. \*\*\* Rating**

Sweet flavor with smooth texture. Preferred as the cooking and eating golden delicious. Soft yellow finish may be touched with a red blush. Superior storage capabilities. Large fruit that is very smooth ready to harvest with the Galas. Russet resistant. Initial tree development and fruiting are excellent but limb growth has to be controlled early in its development to avoid congestion. Good crop in 2006 and

fair in 2007. Large crop in 2008. Good crop in 2009 & 2010 but there has been a noticeable amount of early drop and this is a later maturing variety (early October) – monitoring this situation.

**NURED JOHNATHAN SPORT - EMLA 7: 2000 Planting. \*\*½ Rating**

Dark red small fruit that is excellent for cooking. Excellent storage capabilities. Requires heavy thinning and is very cold hardy. Tree development has been good but tends to sucker and requires significant training every season. Small to medium fruit size suited for pie apples. If tree growth and fruiting characteristics do not improve in 2008, the rating will be lowered in 2008. Limited crop in 2005, 2006 & 2007. Lowered rating ½ point in 2008 due to moderate crop and tree training issues. Good crop 2009 & 2010.

**IMPROVED MCINTOSH - EMLA 26: 2002 Planting. \*\*½ Rating**

Early maturing, mid-September with very deep red color. A trellis planting. Tree growth and shape have been excellent. Limited fruit in 2006, 2007 & 2008. Good crop 2009. No crop in 2010

**BUCKEYE GALA - EMLA 7: 2002 Planting. \*\*\*½ Rating**

The fruit is full size with food flavor and quality. Color is a superior deep red with a light yellow stripe. Tree growth and shape have been excellent. These trees were badly damaged in the 2003 hail storm and have fully recovered in 2008. Fair crop in 2007 and a good crop in 2008. With excellent color and taste this rating has been raised one point. Excellent crop in 2009, but 2010 spring freezes reduced crop by 80%.

**SEPTEMBER WONDER FUJI – NIC 29: 2009 Planting.**

Formerly known as Jubilee Fuji is the earliest Fuji on the market today. Reddish blush color with a creamy white flesh with Fuji flavor and keeping qualities similar to Gala's. Planted 18 inches apart as part of our "Super High Density" trial, and initial growth is excellent. No Rating at this time.

**HONEY CRISP – NIC 29: 2009 Planting.**

Excellent color with a scarlet red over a yellow background. Mid-bloom, large fruit, keeps well in storage-high quality.

Planted 18 inches apart as part of our "Super High Density" trial, and initial growth is excellent. No Rating at this time.

**SCARLET SPUR - EMLA 26: 2010 Planting.**

A red delicious "next generation" variety with a dark color, white flesh and a slightly earlier maturation. Trees showed minimal growth in 2010. No Rating at this time.

**RUBY MAC – NIC 29: 2010 Planting.**

A new sport of Red McIntosh features a high, vibrant, blush red color. The fruit develops its blush well ahead of other McIntosh strains with excellent fruit firmness and texture. Trees showed minimal growth in 2010. No Rating at this time.

**IMPROVED GOLDEN - NIC 29:** 2010 Planting.

Smooth finish slight blush and russet resistant. Trees showed minimal growth in 2010. No Rating at this time.

**SPARTAN - NIC 29:** 2010 Planting.

This tree's fruit is small to medium, dark red in color, with purplish blooms. Flesh is crisp and has an excellent flavor. Growth habit is good but heavy fruit bearing requires thinning. Somewhat resistant to both scab and mildew. Trees showed minimal growth in 2010. No Rating at this time.

**SPECIAL NOTES**

RATING SCALE: 5 STARS \*\*\*\*\* EXCELLENT POTENTIAL

4 STARS \*\*\*\* VERY GOOD POTENTIAL

3 STARS \*\*\* GOOD POTENTIAL

2 STARS \*\* POOR POTENTIAL

1 STAR \* FORGET ABOUT IT

Refer to the enclosed production records for specific yield information.

**APPLE ROOTSTOCKS**

NIC 29: Produces a tree that is 35-40% of a standard tree or semi dwarf, does well in heavy soil and wet conditions, does produce a more expansive root system but needs mechanical support throughout the life of the tree, large fruit.

EMLA 9: Similar to NIC 29, produces a tree that is 35-40% of a standard tree or semi dwarf, does well in heavy soil and wet conditions, needs mechanical support throughout the life of the tree, large fruit.

EMLA 26: Produces a tree that is 40-50% of a standard tree, may need mechanical support as the tree develops and begins cropping, though it roots well and is better anchored.

EMLA 7: Produces a tree that is 50-60% of a standard tree. Winter hardy, disease resistant, needs well drained soil. Develops an extensive root system and does not need mechanical support in our soils but we have several cases of 13 year old Scarlet Galas on EMLA 7 that have started to lean requiring support.

EMLA 111: Produces a tree that is 70-75% of a standard tree. Winter hardy, vigorous growth, adaptable to a wide range of soils, tolerant of drought, excellent for spur type cultivars. Because of the limiting dwarfing, this is not suited for use on a trellis system. Does not need mechanical support.

Mark: Not advisable to use in SW Colorado due to bud-union incompatibility.

COMING IN 2011 – 1 new variety: SCHLECT SPUR ON EMLA 26

**FRUIT TREE & VINEYARD PROJECT**  
**2010 GROWING SEASON**  
**PEAR VARIETIES**  
**DESCRIPTIONS, EVALUATIONS and RATINGS**

Dan Fernandez, Dolores County Director  
Colorado State University Extension

**MAX RED BARTLETT:** 1996 planting. **\*\*\* Rating**

Tree growth is satisfactory with a very limited crop in 1999, no fruit in 2000 but a nice crop in 2001 with moderate fruit sizes. 3 freezes in early 2002 did NOT affect this variety. Excellent crop with most fruit harvested before the 2003 hail. Hail in July 2004 damaged the excellent crop. Large Crop in 2005. Late freeze did not affect the large crop in 2006 & 2007. Limited Crop due to 2008 freeze, large crop 2009 & 2010 but late maturing.

**DU COMICE:** 1996 planting. **\*\*\* Rating**

Excellent dessert pear with a rich, juicy flavor. Its flesh is tender, smooth and the fruit is large, color clear yellow. Tree growth is satisfactory and we finally had our first moderate crop in 2001, with medium sizes, but crop was off the tree before data could be collected. Large Crop in 2005 raised rating ½ point in 2005. Late freeze did not affect the large crops in 2006, 2007 & 2008. Large but late maturing crop in 2009 & 2010.

**D'ANJOU:** 1997 planting. **\*\*\* Rating**

Firm, juicy with excellent flavor. Excellent storage capabilities. Tree growth is satisfactory with limited production through the 2004 season. Most fruit was harvested before the 2003 hail. Hail in July 2004 damaged the crop. Large Crop in 2005 and raised rating ½ point. Late freeze did not affect the large crop in 2006 but did reduce the 2007 crop. Good 2008 crop and large 2009 & 2010 crop but late maturing. Raising rating ½ point in 2010 due to good cropping

**BRONZE BEAUTY:** 1997 planting. **\*\*½ Rating**

Fruit is medium to large with a russet that takes on a bronze color when ripe. Tree is vigorous and large, exhibiting a spreading habit. Tree growth is satisfactory. Limited crop in 2001, none in 2002 and small crops in 2003 and 2004. Most fruit was harvested before the 2003 hail. Hail in July 2004 damaged the crop. Large crop in 2005 and 2006 with a moderate crop in 2007. Good 2008 crop and large late maturing crops in 2009 & 2010.



**NOTES:**

In 2009 and 2010, we had a very cool May and June which apparently delayed the maturity of the Pears nearly 4 weeks with a late September harvest for all varieties.

We did have a small outbreak of Fire Blight in 2007, but immediate action of pruning out the infected wood, complete cleanup of leaves and debris and several applications of Streptomycin have apparently taken care of the problem for now. We did not see any evidence of the disease in 2009 and 2010.

All pear varieties are subject to severe attacks from the Pear Slug. Regular pest monitoring and timely sprays must be applied to avoid leaf skeletonization and defoliation.

It is also important to remember that pears take several years to come into production. It may take 6 to 7 years after planting before you see the first significant crop.

**ROOTSTOCKS**

Old Home x Farmingdale rootstock (O.H. x F.): is hardy well-anchored and productive. Produces a semi-dwarf tree.

Old Home x Farmingdale #97 rootstock (O.H. x F.#97):

**SPECIAL NOTES**

RATING SCALE: 5 STARS \*\*\*\*\* EXCELLENT POTENTIAL

4 STARS \*\*\*\* VERY GOOD POTENTIAL

3 STARS \*\*\* GOOD POTENTIAL

2 STARS \*\* POOR POTENTIAL

1 STAR \* FORGET ABOUT IT

Refer to the enclosed production records for specific yield information.

**FRUIT TREE & VINEYARD PROJECT**  
**2010 GROWING SEASON**  
**PEACH VARIETIES**  
**DESCRIPTIONS, EVALUATIONS and RATINGS**

Dan Fernandez, Dolores County Director  
Colorado State University Extension

J.H. Hale: THIS VARIETY HAS BEEN ELIMINATED FROM THE VARIETY TRIAL. FRUIT MATURES TOO LATE FOR SW COLORADO AND THE TREES CONTINUALLY SUFFERED FROM WINTER INJURY. \* RATING

Redskin: THIS VARIETY HAS BEEN ELIMINATED FROM THE VARIETY TRIAL. FRUIT MATURES TOO LATE FOR SW COLORADO AND THE TREES CONTINUALLY SUFFERED FROM WINTER INJURY. \* RATING

**RED GLOBE:** 1996 planting. \*\*\* Rating

Firm yellow flesh with good flavor. Has a bright skin color and is excellent for canning and freezing. Fruit tends to mature in LATE August. Good initial growth but spring 1999 & 2000 freezes eliminated the crop. Good crop in 2001, 2002 and 2003 with excellent size. Most fruit was harvested before the 2003 hail. Hail in July 2004 damaged the excellent crop. Large crops in 2005 & 2006. Limited crop in 2007 and large crop in 2008. Large crop in 2009 but some freeze crop loss in 2010. Late September harvest 2010 – see notes.

**FLAMIN' FURY SERIES PF#15A:** 1996 planting. \*\*\* Rating

Large red fruit that has good flavor and shipping qualities. The trees are very winter hardy and fruit tends to mature in MID August. Good initial growth, but Spring, 1999 & 2000 freezes eliminated the crop. Good crop in 2001, 2002 and 2003 with excellent size. Most fruit was harvested before the 2003 hail. Hail in July 2004 damaged the excellent crop. Large crops in 2005 & 2006. Limited crop in 2007 and large crop in 2008. Large crop in 2009 but late harvest mid-September – see notes. Excellent crop in 2010 but it matured 2 weeks before our other varieties.

**STARFIRE, (FA 11):** 1999 planting. \*\*½ Rating

Very large, solid red peach with clear yellow flesh. Fruit shape is round with a slight tendency for a high shoulder. Shipping and eating quality is reported to be outstanding. Fruit tends to mature in LATE August. Planted in spring 1999, these trees did not fare well with the spring 1999 cold snaps with several trees dying. In 2001, 2002 and 2003 there was a limited crop with good tree development. Most fruit was harvested before the 2003 hail. Hail in July 2004 damaged the excellent crop. Large crops in 2005 & 2006. Limited crop in 2007 and large crop in 2008. Large crop in 2009, but in 2010 a late harvest mid-September – see notes.

**SUNCREST:** 1999 planting. \*\*\* Rating

Fruit is large, round and has a light pubescence. About two thirds of the surface is covered with a bright, red blush over a yellow background color. Yellow flesh, firm but melting, and of good texture and color. Fruit tends to mature in LATE August. All the trees survived the spring 1999 freezes and developed normally for newly planted trees. In 2001, 2002 and 2003 there was a limited crop with good tree development. Most fruit was harvested before the 2003 hail. Hail in July 2004 damaged the excellent crop. Large crops in 2005 & 2006. No Crop in 2007 and large crop in 2008. Large crop in 2009, but in 2010 but late harvest in September – see notes.

**Notes:**

In 2009 & 2010, we had a very cool May and June which apparently delayed the maturity of the Peaches nearly four weeks(except the Flaming Fury in 2010)with a mid-late September harvest.

Also in 2009, we started to see advancing trunk damage on many of the peaches due to Cytospora Canker. This will eventually limit the lifespan of these trees.

Only use ½ inch caliper or less nursery stock for new plantings.

The only rootstock currently being evaluated on all varieties is Certified Peach.

**SPECIAL NOTES**

RATING SCALE: 5 STARS \*\*\*\*\* EXCELLENT POTENTIAL

4 STARS \*\*\*\* VERY GOOD POTENTIAL

3 STARS \*\*\* GOOD POTENTIAL

2 STARS \*\* POOR POTENTIAL

1 STAR \* FORGET ABOUT IT

Refer to the enclosed production records for specific yield information.

FRUIT TREE & VINEYARD PROJECT  
2010 GROWING SEASON  
PLUM VARIETIES  
DESCRIPTIONS, EVALUATIONS and RATINGS

Dan Fernandez, Dolores County Director  
Colorado State University Extension

**EMPRESS – Myro:** 2008 planting.

Large fruit similar to President but a better blue color. Yellow flesh with fine texture and late ripening. Initial growth is very good and still evaluating for a rating.

**IMPROVED DUARTE – Myro:** 2008 planting.

Extra-large fruit, heart shaped with a flesh that is blood red. Initial growth is very good and still evaluating for a rating.

**PRESIDENT – Myro:** 2008 planting.

Large fruit with blue skin and yellow fine textured flesh. \*\*\*In 2010, this variety suffered significant die-back and freeze damage all the way to the main scaffold limbs which required substantial reconstructive pruning. Recovery growth was very good but we have to keep an eye on this one.

**NOTES:** In 2010, we did see a few plums and are expecting a harvestable crop in 2011.