

Yellow Jacket Fruit Tree and Vineyard Research and Demonstration Project: 2018 Report

- Gus Westerman** - Colorado State University Extension, Dolores County Director, Project Lead
Tom Hooten - Colorado State University Extension, Montezuma Agriculture Agent
Kathleen Russell - Colorado State University Southwestern Colorado Research Center Manager
Kacey Riedel - Colorado State University Extension, Montezuma County Director

Figure 1. Community members enjoy the Peach U-Pick at the Yellow Jacket Fruit Tree and Vineyard Research and Demonstration Project at the SW Colorado Research Center.



Project Background

The Fruit Tree and Vineyard Research and Demonstration Project was implemented in April 1991, and is a cooperative effort among Montezuma County Extension, Dolores County Extension, Natural Resources and Conservation Service in Dolores County, and the Colorado State University Southwest Colorado Research Center at Yellow Jacket, Colorado. The completion of the Dolores Irrigation Project resulted in

a substantial number of new client requests for local research based information/data on fruit tree and vineyard varieties, equipment usage, and cultural practices. Prior to this project, all fruit tree information originated from the Grand Junction area Experiment Stations which have a considerably different growing environment. Presently, the Team is evaluating 75 different fruit tree varieties including 21 field apples, 43 trellised apple varieties, 2 apple varieties planted in a “super high density,” 5 peach varieties, 4 pear varieties, and 3 plum varieties. The Team is also studying 1 raspberry variety, and 14 grass varieties. The only remaining original grape variety is Lemberger. Interest has been expressed in planting modern hybrid grapes to evaluate performance however this has not been undertaken as the focus has shifted to heritage varieties and varieties conducive for cider production. In 2017 the High Altitude Fruit Tree Project partnered with the Montezuma Orchard Restoration Project or MORP. MORP has been working to locate, identify, and propagate rare and endangered heritage apple varieties in the Four Corners Region. In 2017 26 varieties with a total of 100 trees, procured from MORP were planted on heavily dwarf rootstock continuing the high density trellised planting. An additional 30 trees and 5 new varieties from MORP were planted in 2018. The goal is to study how these varieties perform on modern rootstock and in a modern commercial setting. The High Altitude Fruit Tree Project will trial these varieties in a modern commercial setting and evaluate their performance. In the spring of 2019 70 more trees from MORP will be planted. These will include both trellised dwarf trees and full size field trees. The focus for this planting is on the newly emerging cider market in the Four Corners Region. The partnership between CSU Extension and MORP continues to strengthen and provide additional benefit to both organizations.

Orchard management practices such as irrigation techniques, frost and freeze management, high-density apple planting, trellised apple planting, fruit thinning, tree pruning, and integrated pest (insect, disease, weed, and wildlife) management have been tested and demonstrated. Thirteen grass species or varieties and one legume were planted between fruit tree and grape rows in 1993 and 1995 to control soil erosion and suppress weeds and continue to thrive. Popular fruit tree pruning workshops, fruit tree grafting workshops, and fruit tree planting workshops are held every year. The proceeds from the sale of the fruit during an annual “U-Pick” help fund the operation of the orchard. The annual “U-Pick” attracts hundreds of people and is also used as an educational opportunity to inform the public of different fruit varieties and their uses, fruit processing and preservation, as well as proper long-term storage of fruit. The fruit tree and vineyard demonstration project is managed by the Extension personnel of Dolores and Montezuma Counties. It has generated considerable interest and attracts a large number of visitors throughout the year, including students from Fort Lewis College in Durango and San Juan College in New Mexico, elementary students and teachers from area elementary schools, and visitors from the Ute Mountain Ute Senior Center. Volunteer labor, which is essential, from the Master Gardener Program continues to meet the needs of high labor requirements that could not be met with Extension personnel alone. Dolores County furnished a seasonal employee to work during the summer months to complete grounds maintenance and other tasks as needed. Dolores County Extension office staff also spent considerable time assisting with the project over the season.

Highlights of the 2018 Season

The 2018 season rendered an excellent crop of all types of fruit and all varieties produced very well. Freezing temperatures were nearly non-existent during bloom of all varieties rendering a heavy fruit set. This necessitated 2 subsequent chemical thinning operations after fruit set. These thinning operations were moderately successful however the fruit load was still far too heavy on many apple varieties, especially Scarlet Gala. Despite the heavy fruit load, fruit size was good and crop protection was successful.

Production from all varieties of apples, pears, peaches, and plums totaled 37,400 pounds marking the 2018 season a record breaking year for the project surpassing the 2016 yield of 33,570 lbs. for the 3 acre project. Approximately 10,000 pounds of fruit was sold over the 3 U-Picks that were held in 2018 generating a total of \$9,626.50 of funding for the project. This was needed as the project realized no income in 2017 due to a total crop loss due to late spring freezes. 5,500 pound of fruit was harvested by volunteers and was given to food banks located in Durango, Cortez, Mancos, and the Navajo Nation. 1500 pounds was also harvested by the LaPlata County Extension Office to support the Annual Apple Days Event. The remaining fruit was collected by livestock owners or remained in the project.

In 2018 30 trees procured from the Montezuma Orchard Restoration Project were planted in a high density trellised setting. No new trees were lost giving an overall 100% survival rate of newly planted trees as of November 2018. Due to the lack of winter snow, pruning operations began the last week of January and were completed the second week of March. Personnel from the Western Colorado Research Center at Orchard Mesa spent 4 days assisting with pruning operations therefore the previous expense to hire skilled labor was not needed. This was important as the project had no income in 2017 due the crop loss. Prunings were cleared by the 2nd week in April. A dormant oil and micronutrient application was conducted in early April. The 2018 spring was warm early on which allowed the trees to break dormancy in late March. Early varieties of peaches, pears, and plums bloomed in the first week of April. Full bloom on most varieties hit the second and third weeks of April. By mid-May no freezing temperatures were experienced rendering an excellent crop on all varieties. Chemical insect control targeting Coddling Moth was completed by alternating Altacor and Delegate insecticides. Applications were timed to begin through the use of monitoring moth flights with pheromone traps. Application intervals were timed as directed on the insecticide product labels and extreme care was taken to comply with pre-harvest intervals. The 2018 Coddling Moth population was significantly lower than preceding years therefore applications began later in the season than usual and fewer applications were needed for successful Coddling Moth control. Bird control was conducted through the use of Flash Tape that was applied to all trees beginning in early July. Weed management was accomplished through timely application of glyphosate and was very successful. Outbreaks of powdery mildew began as soon as temperatures came up in June and were managed throughout the season with timely fungicide applications. Topsin fungicide was the only chemical available due to the fact the Bayleton is no longer to be used due to label restrictions. New products will be incorporated in 2019 to combat chemical resistance. There were dire concerns as we moved into the late fall of 2017. Temperatures were unseasonably warm for the fall of 2017 and blooms were observed on several apple varieties during the 3rd week in November along with significant bud swell on many apple trees. Some trees were observed

to be breaking dormancy severely reducing cold hardiness into January of 2018. Tree damage from freezing temperatures was assessed in the spring of 2018. Damage was not limited any fruit type or variety. Several apple trees showed signs of extreme stress and 1 Improved Duarte Plum experienced extreme damage and was lost. Workshops for the 2018 season include the Pruning Workshop, Grafting Workshop, and Tree Planting Workshop.

Variety Testing Results to Date

Apples – The 2018 season was exceptional with a total of 29,400 pounds of apples from the 31 currently producing varieties. Trees planted within the previous 2 years were not allowed to produce to ensure strong establishment. The apples have performed exceptionally well since they began producing. With the exception of six seasons (freezing temperatures in 2001, 2014, 2015, and 2017; hail in 1995, 2003, 2004, and 2015), the orchard has experienced consistent production. Even with the hail damage in 2004, over 7,000 pounds of fruit were sold. Ten trees were lost in the trellis due to herbicide drift in 2010. They were replaced in 2011 with Improved Golden Delicious and four new varieties: Scarlet Spur, Spartan, Ruby Mac, and Schlect Spur which have come into production and are producing well. With the exception of varieties on the wrong rootstock for field or trellis applications, additional varieties that are questionable for our area include Honey Crisp, Improved Red Delicious, and possibly Idared however all of these did exceptionally well in 2018. All varieties produced well in 2018.

Peaches – The 2018 season was very good with 3,000 pounds from the 5 current varieties: J.H. Hale Flamin’Fury PF#15A, Starfire FA11, and Suncrest. The severe hail of 2004 damaged the upper surface of branches that led to infection with perennial canker which persists currently on many trees. Many of the peach trees exhibit gradual decline and branch death since then. Perennial canker continued to develop in 2014 leading to infection and death of larger branches and persisted in 2018.

Pears – The 2018 pear crop was excellent with a total of 2,500 pounds from the 4 current varieties. The four varieties planted; Max Red Bartlet, Du Comice, D’Anjou, and Bronze Beauty have all developed well with minor problems. They do require considerable limb training and are highly susceptible to the pear slug and pear psylla. A small outbreak of Fire Blight occurred 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. No evidence of the disease has been observed to date (2018). Pears take time to produce with the Max Red and Du Comice (planted in 1996) producing their first crop in 2001. All trees are now in production and have produced generously with the exception of 2013, Bronze Beauty in 2014, and all varieties with total losses on 2017.

Plums – The 2018 plum crop was excellent with 2,100 pounds from the current 3 varieties. Production was consistent across the three varieties however the fruit on the President trees did not reach an edible state until after our harvests were complete late in the season. These three varieties of plum are on Myro rootstocks (Empress, Improved Duarte, and President) and were planted in 2008 in three row-groups of five trees each. Initial growth was very good. However, in 2010 President suffered significant die-back to the main scaffold limbs due to freezing temperatures. The damaged trees required substantial reconstructive pruning. Recovery has been very good. Observations will continue. The first

significant crop of 1,000 lbs. was produced in 2012. Production was 2,000 lbs. in 2013 and only 500 lbs. in 2014. 2015 and 2017 production was almost non-existent due to spring frosts during bloom. An Improved Duarte tree was lost in 2018 due to extreme frost damage due to the tree leaving dormancy over the preceding winter rendering the tree nearly split in half.

Grapes - Of the original 8 varieties planted in 1994, Seyval Blanc, Pinot Noir, and White Riesling were removed in 1998. These varieties require a longer growing season than what is “normal” for the location of the vineyard. In their place, Cayuga White, DeChaunac, Edelweiss, and Chardonnay were planted in 1999. The performance of these four varieties has been extremely disappointing. The year 2001 was the third growing season and the vines have not performed any better. The reason for this poor performance is baffling as these vines received the same treatment as the more mature plantings. In 2000, there was a 100% infestation of crown gall in the Foch, Gewurztraminer, Merlot, and Chardonnay vines. When the infestation of 2000 occurred in all of the 4 above named varieties, they were removed.

The only remaining original planting is Lemberger. This red variety has produced crops from the third season until present. Shoot thinning and cluster removal prior to veraison are methods used to promote fruit development and maturation. This is continuing, though labor for the tasks is limited. Elimination of the grape trial due to poor performance is currently under way to make room for new dwarf apple trees.

Grasses - Thirteen different grasses along with one legume were planted between the fruit tree rows in the demonstration orchard between April 1993 and November 1995 to evaluate their erosion control potential. These were dryland plantings with no supplemental water given.

Irrigation

The team is currently evaluating a variety of irrigation systems including various types of drip emitters, several types of maxi and mini sprinklers, pulsators, and surface drip tubing. We currently use a 50-mesh filtration system due to very good irrigation water quality. Plugging of the filter screens has not been a problem, though they do need occasional cleaning. Our only significant problem has been with the maxi and mini sprinklers that have moving parts. A slight buildup of calcium carbonate causes the spinners to jam and spray only in one direction. These were removed and replaced with static sprinkler heads with a 360-degree spray pattern. Another issue recently emerged as ground squirrels took up residence near the orchard. Their persistent damage to the irrigation systems has increased the labor for maintenance.

Additional Investigations

Work continues on frost protection management for the fruit trees and grapes, bird control, and integrated pest management of insects and diseases. Workshops on pruning and fruit management are conducted every year in cooperation with the Colorado Master Gardener program. Volunteers from the program are instrumental in maintaining the viability of the orchard project.

Strong emphasis continues to be placed on demonstrating, evaluating, and testing varieties, irrigation equipment, orchard equipment, and cultural practices that are cost effective, user friendly, and available through local suppliers.

The team continues to investigate marketing opportunities as well as “Home-Based Business” opportunities as they relate to fruit and vineyard product utilization, i.e. fruit by-products. In addition, there has recently been interest from landowners to begin to rejuvenate some of the old, neglected apple orchards in Montezuma County. This may be due to the surging interest in local food production that has been burgeoning in SW Colorado over the last several years. Another result of this growing interest is the creation of the non-profit Montezuma Orchard Restoration Project (MORP). One activity of MORP is the grafting of historic, heritage apple varieties found in SW Colorado onto modern rootstocks to preserve the variety in a cultural setting. Some of these heritage varieties were planted at the Extension Fruit Tree Project at the SWCRC in the spring of 2017 as well as some classical cider apple varieties. The Fruit Tree and Vineyard Research and Demonstration Project will continue to attract interest and visitors as it remains relevant to the needs of the stakeholders in Southwest Colorado.

