

# FY 2013 Specialty Crop Block Grant Program – Farm Bill

New Mexico Department of Agriculture

Final Report

AMS Agreement: 12-25-B-1686

Project Coordinator

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## Project 1: Implementation of Certification Program for New Mexico Grown Chile Peppers

### Project Summary

New Mexico chile is valued by many within the state as a very important symbol of New Mexico. It is perhaps the most common ingredient in New Mexican cuisine and is found in signature dishes such as enchiladas and chile rellenos; and it is often used as an addition to other foods such as cheeseburgers and pizza. U.S. per capita chile consumption has continually increased. Yet, New Mexico chile production has declined from a high of 34,000 acres in the early 1990s (USDA-NASS, 2012) to less than 9,500 acres in 2012. The rise of competition from foreign countries is a significant reason for this decline. The New Mexico chile growers have a difficult time competing in the global market, with foreign countries (e.g. China, Peru, and Mexico) that have lower operating costs, safety standards, and regulation levels. The New Mexico region of production (ROP) certification program was developed as a tool to increase support and encourage growth of the New Mexico chile industry. The New Mexico Chile Association (NMCA) has developed and implemented a certification program and mark; New Mexico Certified Chile™ Program (NMCC). This mark has given consumers a way to easily identify that they are receiving safe, high quality, New Mexico grown and processed chile and chile products. The certification mark is used by registered participants of the NMCC (e.g., growers, processors, retailers etc) that have been verified by the NMCA to ensure that the chile using the Mark is grown in New Mexico.

### Project Approach

Work that was originally proposed included identifying the advisory committee and hiring an administrative consultant to assist the project leader. Many of the program components were defined initially by the advisory committee, project leader and administrative consultant, including but not limited to: defining New Mexico Certified Chile™; defining program rules and requirements; hiring and working with a marketing/advertising expert to research, analyze, and create a logo; hiring and working with a trademark attorney to research existing certification marks and to register the mark that was ultimately agreed upon; working with a website designer to launch a new NMCC program website [www.getnmchile.com](http://www.getnmchile.com); and outreach and registration of participants and issuance of the mark for use by registered stakeholders.

The NMCC Program was officially launched on August 19, 2014 with a launch party held at The Range Cafe in Bernalillo, NM. New Mexico governor, Susana Martinez, and Secretary of Agriculture, Jeff Witte, spoke at the event. The New Mexico Department of Agriculture and their staff helped to coordinate the event and secure the governor's participation. Their assistance contributed greatly to the success of the event, which was covered widely by both local and national media.

Advertising efforts have continued with a campaign during January and February of 2015, ongoing social media and other online efforts have continued throughout, as well as Permitted User efforts in retail stores and restaurants with promotions in conjunction with Licensees. Most recently an outdoor advertising campaign was launched during July, August and September 2016.



### Goals and Outcomes Achieved

The original goal of the project was to increase the overall economic value of the New Mexico chile industry by increasing consumer demand for the high quality product that is verified by the NMCA to ensure honesty and integrity of the product origin. The Project Coordinator hoped to increase the overall demand thereby providing premium increases for New Mexico chile growers, processors and suppliers.

Since November, 2014 NMCC membership has increased from 8 Licensees and over 400 Permitted Users to more than 20 Licensees and more than 500 Permitted Users by the end of the second annual report in 2015; the number of licensees had increased more than the original goal of 25%. Unfortunately NMCC

participation has declined some since the last annual report due to the launch of a publicly funded certification program, New Mexico True Certified. However the NMCC has continued efforts to increase membership within all areas of the NM chile industry.

The number of “likes” on the NMCC Facebook Page has increased significantly from around 1,300 at the time of the first annual report in December 2014 to more than 5,600 in November 2015. The largest increase has occurred both through paid and organic efforts since the 2015 annual report with a dramatic increase to more than 19,200 “likes”. In addition to the increase in consumer awareness and demand, the industry has reported an increase from 2014 to 2015 in planted chile acreage and chile production. Below is a chart from the NMDA on 2015 New Mexico Chile Production.

([https://www.nass.usda.gov/Statistics by State/New Mexico/Publications/Special Interest Reports/NM Chili Production\\_03012016.pdf](https://www.nass.usda.gov/Statistics_by_State/New_Mexico/Publications/Special_Interest_Reports/NM_Chili_Production_03012016.pdf))

<b>Chiles, Fresh and Processed Production &amp; Value</b>					
	<b>Acreage Harvested</b>	<b>Fresh Production</b>	<b>Processed Production</b>	<b>Value of Fresh Production</b>	<b>Value of Processed Production</b>
		-----Tons-----		-----\$1,000-----	
2014 <sup>1/</sup>	7,700	9,000	49,700	6,390	32,305
2015 <sup>2/</sup>	7,700	10,700	56,000	7,490	33,600

<sup>1/</sup> 800 acres were harvested for both green and red, but only counted once in the total.

<sup>2/</sup> 1,200 acres were harvested for both green and red, but only counted once in the total.

### Beneficiaries

Direct beneficiaries of this project include the Licensee and Permitted User members who joined the New Mexico Certified Chile™ Program as a result of the outreach efforts by the NMCA and the Project Coordinator.

### Lessons Learned

The NMCC received feedback from members regarding program requirements and fees and after much consideration, the NMCC made changes to the program based on that feedback by streamlining the renewal requirements for farmers and growers markets and eliminating the fees for farmers. Fees are still required for processors and produce vendors, however the NMCC has offered an additional option in the fee structure allowing processor and produce vendor licensees to pay a set amount annually to use the Mark for unlimited NM Certified Chile and chile products that meet the requirements set forth in the NMCC Program Guidelines. This change in the fee structure was set in an effort to increase membership enrollment in the NMCC program.

The NMCC experienced a decrease in membership renewal in July 2016. The renewal period, which had remained consistent through the duration of the program, was impacted by the introduction of the publically funded certification program, NM True Certified. The NMCC will continue efforts of increasing membership and awareness by using feedback that it receives from NMCC members to promote, grow and strengthen the NM chile industry as a whole.

## Project 2: Engaging New Mexico Youth in Digital Media Promotion of Specialty Crops & Farming Specialty Crop Grant

### Project Summary

This project engaged college youth across the state in creating short, 3-5 minute videos that show what it takes to successfully grow and sell specialty crops direct market to consumers, restaurants and schools in New Mexico. This project was developed to address the problems that new and beginning farmers face—especially those trying to farm full-time—regarding resources, inspiration, and information to help get them on the right path. In an effort to provide leadership and training for young farmers as well as for specialty crop buyers (consumers, restaurants and schools), education is critical. For this reason, this project set out to provide new and beginning farmers with practical information from their peers about what it takes to be successful growing and selling specialty crops in New Mexico. By engaging college youth in issues of specialty crop farming through the creation of these instructional videos, the next generation of farmers will be provided new opportunities to connect with their peers and in an engaging and timely manner. By working with three New Mexico universities and college partners, perspectives from across the state were gathered to engage media arts and horticulture/sustainability students at their individual institutions. Project objectives were to: 1) Educate new & beginning farmers about what it takes to be successful as a specialty crop farmer in New Mexico 2) Create brand loyalty for specialty crops buyers; and 3) Engage the next generation of youth in issues of food, farming and sustainability. University faculty partners at all three institutions were engaged of all phases of the project design. Success stories from a diverse group of specialty crop farmers will provide a range of lessons that will be promoted and used as a resource across the state for years to come.

### RESULTS

- 9 videos produced by students
- 54 farmers said they increased their knowledge “somewhat or quite a bit” about farming opportunities and resources in NM due to videos and information delivered
- Website traffic: New visitors, time spent visiting website, users, and average session duration all INCREASED. The bounce rate dropped.
  - For data collected in 2015: 87% of site visitors were new visitors, 13% were returning visitors.
  - During the same time period in 2016: 70% of site visitors were new, and 30% were returning (this indicates both a growing audience, and an increase in the number of new visitors over 13% the previous year).
  - Time Spent Visiting Website (Sessions): Increased 25%
  - Users (People who have initiated at least one session during the date range): Increased 12%
  - Pageviews (Pageviews is the total number of pages viewed. Repeated views of a single page are counted): Increased 167%
  - Average Session Duration: (The average length of a session) Increased 56%
  - Bounce Rate (The percentage of single-page sessions in which there was no interaction with the page. A bounced session has a duration of 0 seconds...a higher number is better because it means more time spent on the site): Decreased 91%, so more people were spending more time looking around the site.
- 40 students engaged
- 3 higher education facilities engaged and connected to specialty crop project work with youth

- 6 faculty members engaged, all of who learned from the project and say they will incorporate lessons learned about specialty crops and farming in their region into future curricula.
- 4 retractable banners, 6 outdoor sails produced
- 8 farmer interviews and photos
- Hundreds of farmers have seen the videos about farming at the 2016 NM Organic Conference.
- Thousands of consumers viewed the banners and sails at the 2016 NM State Fair and NM True Fest.

Prior to this reporting period, students completed 8 videos. During this reporting period, one more student-produced video was completed. Additionally, all digital media was collected from students and professors so that videos could be archived and shared. Staff changes during 2015 made it difficult to keep the project moving in 2015. Two of the three university professors also requested extensions. However, during 2016, staff completed final aspects of video project as well as the final phase of gathering farmer stories.

Also during this period, one camera was purchased to replace a broken NMFMA camera so that staff could take photos of farmers to fill in some of the gaps not sufficiently covered by the final videos. Photos were taken at markets across the state and were presented at the NM Organic Conference in 2016. These photos will also be used in many other venues to support promotion of specialty crops and education about farming. Impacts (so far):

During this reporting period, we displayed the student videos from a monitor at our display table at the NM Organic Conference on February 19 and 20th. We played the videos during the workshop that Denise Miller presented to growers at the Organic Conference. The projector was purchased and will be used to show video and stills of farmer interviews during farmer trainings, health care trainings and promotional events across the state. A second camera was purchased so that multiple staff members had access to cameras. The second camera is also much smaller and thus has been much less intimidating for taking portrait photos of farmers.

Promotional banners (retractable) and sails (outdoor) were purchased and displayed at the NM True Fest and the NM State Fair to promote specialty crops. They will continue to be used to promote specialty crops across the state at various events and activities. 8 farmer interviews including recipes and photos have taken place and written up. They will be posted on the NMFMA's website by the end of January 2016.

## Project Approach

### Tasks Performed

- Hosted a meeting in Albuquerque with all program partners to discuss the project and its goals and to develop a timeline for project implementation on August 9, 2013
- Met individually with faculty supervisors in Las Cruces and Farmington to discuss progress and concerns in September and October 2014
- Hosted a follow-up meeting with all faculty supervisors to review completed videos, provide feedback and redirect student activities on February 15, 2014
- Organized 2 workshops with professional documentary filmmaker to encourage storytelling from perspective of farmers and to refine story arcs of films for highest effectiveness, completed in April 2014
- Held a follow-up conference call in October 2014 to check on progress of video production and discuss the requests of 2 faculty supervisors for a project extension

- Reviewed 8 student video submissions.
- Collected extra B-roll and uncut interview footage of New Mexico farmers for future videos.
- Collected final student video in 2015.
- Extended type of storytelling to also include farmer interviews and photos.
- Collected 8 farmer interviews and photos in 2016
- Displayed videos at the 2016 NM Organic Farming Conference
- Produced banners and sails for promoting Specialty Crop
- Displayed banners and sails at the NM True Fest and NM State Fair in September 2016
- Collected anecdotal evidence that farmers enjoyed seeing the videos at the organic conference

Goals	Benchmark	Performance Measure	Targets
Increase exposure and knowledge of new and beginning farmers about resources needed to be successful in direct-market specialty crop farming.	No such tool currently exists. At least 10 videos will be created and distributed.	Comments and viewership numbers will be collected from Google Analytics, Facebook and personal surveys.	Within six months at least 15 new or beginning farmers will have reported an increase in their knowledge of said resources.
Increase consumer exposure and knowledge of specialty crop farming in New Mexico by promoting video viewing.	No such tool exists. At least 100 messages will be sent via Facebook, e-mail and through various events to promote video viewership.	Data will be collected from Facebook, Google Analytics and surveys to determine levels of video viewership  A survey will distributed to select specialty crop buyers at restaurants and schools.	Target #1: Within 6 months, website traffic will increase by 10%, and Facebook activity connected with the videos will increase by 5%.  Target #2: Within one year, other direct-market specialty crop customers (restaurants and schools) will have reported an increase in their knowledge of specialty crop farming practices
College programs will continue to use digital media to educate and engage students in specialty crop farming issues.	No current benchmark exists.	Academic partners will be surveyed to determine their level of satisfaction with the project. Within one year after the grant, academic partners will be surveyed again to see if they plan to continue using digital storytelling in the classroom for enhancing specialty crop knowledge.	Target #1: 100% of partner institutions will “very satisfied” with program outcomes. Target #2: Within one year after the grant, at least one new specialty crop video will be produced.

### Goals and Outcomes Achieved

Please see results at the beginning of this report

Project Activity	Project Completion Date	Actual Completion Date	Notes
Completed 1 more videos	5/2015	Complete	No new videos produced during the final period. One new video was completed during the time frame of the second reporting period. Faculty found it difficult to coordinate students and to keep them accountable on work—stipends

			did not prove enough incentive to motivate students to communicate or to achieve goals in a timely manner. The school calendar also conflicted with New Mexico's harvest calendar, so it was difficult to document the farmers' complete season within the time frame we had originally projected. As of December 2015 students have completed 9 of the 10 expected videos. Additional work completed during the final grant period included 8n farmer interviews and photos, plus the production of retractable banners and sales.
NMFMA films portions of "the making of the project"	Did not happen	Did not happen	Nothing new on this during the final period. Same notes apply. Part of reason we request a slight change in spending. The NMFMA has had limited opportunities to connect with the students in order to complete this activity due to distance, staffing limitations and difficulty communicating with students through faculty supervisors. The NMFMA did not expect it to be a principle outcome of the grant but will have ample documentation of the filmmaking process with the uncut footage provided by students after videos are complete.
Promote videos with use of social media, events and more	2/16/2015	Complete	This was completed on February 19 and 20, 2016. We displayed the videos at our table during the New Mexico Organic Farming Conference in February. In addition, the videos were shown to the attendees of Denise's workshop on Friday during the NM Organic Conference. They were also shown at the Biodynamic Conference and the Quivara Conference, both in November, 2016.
Analyze project outcomes via market sales data, etc.	11/2016	March 2017	Farmer surveys were distributed and collected during August/September 2016. Data included: <ul style="list-style-type: none"> <li>• 54 farmers said they increased their knowledge "somewhat or quite a bit" about farming opportunities and resources due to videos and information provided</li> </ul> Google Analytics shows website traffic increased. Specifically: <ul style="list-style-type: none"> <li>• For data collected in 2015: 87% of site visitors were new visitors, 13% were returning visitors.</li> <li>• During the same time period in 2016: 70% of site visitors were new, and 30% were returning (this indicates both a growing audience, and an increase in the number of new visitors over 13% the previous year).</li> <li>• Time Spent Visiting Website (Sessions): Increased 25%</li> <li>• Users (People who have initiated at least one session during the date range): Increased 12%</li> <li>• Pageviews (Pageviews is the total number of pages viewed. Repeated views of a single page are counted): Increased 167%</li> <li>• Average Session Duration: (The average length of a</li> </ul>

			<p>Session) Increased 56%</p> <ul style="list-style-type: none"> <li>• Bounce Rate (The percentage of single-page sessions in which there was no interaction with the page. A bounced session has a duration of 0 seconds...a higher number is better because it means more time spent on the site): Decreased 91%, so more people were spending more time looking around the site.</li> </ul>
Write final report summarizing findings	12/2016	This report is to serve as final report on activities other than market sales outcomes.	Findings on the above activities that will primarily take place between 12/2016- 3/2017.

### Beneficiaries

The project beneficiaries were:

- 60 college students (30 at San Juan College, 20 at New Mexico State University in Las Cruces, and 10 at University of New Mexico)
- 10 farmers who were interviewed and worked with students (only 9 videos were produced)
- 5 University faculty who received training and resources for student filmmaking
- 75 farmers who attended a workshop at the NM Organic Conference who watched the videos
- 50 farmers who watched the videos at the Biodynamic Conference and Quivara Conference
- Hundreds of additional farmers saw the video on the screen at the NMFMA’s table at the Organic Conference
- Hundreds of consumers who will continue to view the videos on YouTube
- Thousands of consumers who saw the banners and sails at the New Mexico State Fair and the NM True event in 2016
- Clips from the videos will be re-edited and shown to farmers during 2017 farmer trainings.
- Videos will also be shown to restaurant, school and institutional buyers as opportunities arise.
- Economic impact of the project is hard to determine.

The project focused on creating relationships between New Mexico college attendees, specialty crop farmers, and consumers. The videos helped build communication and foster relationships between the growers and college students who created the videos. Consumers then created closer ties with the specialty crop farmers through the connections created by the videos.

### Lessons Learned

While we were close to achieving our projected goal of 10 videos (we received 9), this project presented significant challenges. In general, the NMFMA has learned that it is very difficult to promise certain outcomes that are dependent on the work of students with whom the NMFMA does not have direct contact. While the University faculty did their best to direct the work of the students, it became evident by the end of the project perhaps many of the students didn’t have enough vested interest in the project outcome. While the students at one institution received credit for the project as part of a class, the other two Universities approached the project as an extra credit type of project. They did not seem to have enough control over the student’s work and work ethics. Following are the specific challenges and how the NMFMA addressed the challenges over the course of the project:

- After receiving the rough cuts of the first two videos, it became apparent to the NMFMA that the students needed more assistance with the art of storytelling. We addressed this by contracting with a

professional documentary filmmaker who works with community groups and teaches how to tell stories. The workshop was conducted in Albuquerque and Farmington, but the Las Cruces faculty member responsible for the film students was on extended leave for medical reasons. The workshops were very useful, and the professors who attended found them educational. However, when final videos were turned in, there were still challenges with the quality of the story telling as well as technical challenges such as picture and sound quality. Overall, the end products were very inconsistent and generally of a lower quality than we anticipated and would have preferred.

- Project partners were essential in identifying and recruiting students for filming and they facilitated the communication between the NMFMA and the students. Faculty provided accountability for the students, facilitated identification of and communication with farmer subjects, and encouraged student participation in the storytelling workshops. We were very pleased with faculty participation
- The NMFMA's expected measurable outcomes were dependent upon completion and distribution of the farmer videos. As the close of 2014, two of the University partners had requested project extensions, so timing was extended. Students were difficult to coordinate (by their faculty advisors), and they did not take direction on the content or quality of video particularly well. Farmers had busy schedules that were difficult to coordinate with the project. Also, the student calendar conflicted with the harvest calendar, which presented challenges in telling the full story of the farmers' work, from sowing to harvest. The time extension helped to better align these calendars and allow time to gather more footage during the fall harvest months.
- Professors enjoyed the project and the way it helped put the students in the community to observe farmers and document real world issues. One faculty member said, "Because of this project, I think our college programs will continue to use digital media to educate and engage students in specialty crop farming issues." Feedback from other faculty supervisors delivered through phone and email conversations relayed that the supervisors were satisfied with the work of the NMFMA on this project and intend to incorporate digital storytelling techniques learned during the workshops in future classes.
- The NMFMA's original goal to film the making of the project was not possible given the removal of the NMFMA from the student filmmakers and the difficulty in coordinating times to film them working. The project's work has been captured in other ways, and the uncut footage provided by the students provides ample documentation of the process behind the filmmaking.
- In order to round out the project, the NMFMA decided to complete collect interviews with eight additional farmers and photograph them. Their stories will be posted on the NMFMA's website in early 2017. Additionally, retractable banners and outdoor sails that promote specialty crops were purchased to promote the sales of specialty crops at consumer events.

#### Contact Person

Denise Miller, Executive Director, 505-699-2064, dmiller@farmersmarketsnm.org

## Project 3: Wine Trail Signage and Tourism Promotion Project

### Project Summary

2012 Project Objective: To promote the NM Wine Industry by improving signage for trails as well as improving awareness to tourists and residents. The problem statement dealt with insufficient signage to promote wineries outside of the existing customer base. The purpose of the project was to help the wine industry grow and be viewed as a significant tourism and economic sector in New Mexico.

2014 Amended Project Objective: Due to complications with the original Project Objective, and the new restructuring and merging of New Mexico Wine Growers and New Mexico Wine Country into one organization, the Board requested a change in strategy. Funding would be allocated to rebranding this new organization as New Mexico Wine & Grape Growers Association (NMWGGA) with a focus on broad distribution of the successful New Mexico Wine Country Brochure that includes the award winning wines coming from New Mexico. Billboard signage would augment this messaging and re-branding effort to drive traffic to festivals, the website and individual wineries and vineyards.

### Project Approach

2012 Workplan: NMWGA would simultaneously develop a consumer mobile App and a TOD highway signage with highway billboards to augment the impact of the program.

2014 Amended Workplan: NMWGA requested the remainder of grant funds be appropriated to funding towards winery participation in the Finger Lakes competition, new trade show equipment, a wine trail brochure and billboards.

### Goals and Outcomes Achieved

2012 Goals and Outcomes: To see an increase in walk-in traffic and subsequent revenues for all wineries. Targeting drivers with highway signage and wine trail signs to lead them to wineries. An online app would target smart-phone users and a “check-in” option would help us track the usage of the NM Wine Trail App. Both of these marketing goals were not attained and the project was somewhat of a failure (see Lessons Learned).

2014 Amended Goals and Outcomes: 100,000 copies of NM Wine Country Brochure would be printed and a professional distribution company would be retained to ensure statewide coverage at hotels, CVB’s, visitor centers and tourist info centers. 10 Billboards would be commissioned to promote the industry and its events. NMWGGA would subsidize over 100 entries for the Finger Lakes International Wine Competition to encourage wineries to submit their best vintages. The resulting medals that were awarded would play a key role in marketing the industry and award winners. New tradeshow materials would help elevate NMWGGA’s presence at trade shows, conferences, and New Mexico True events.

### *Increased traffic to website by 15%*

New Mexico Wine Growers Association (NMWGA) successfully met grant deliverable because of a merger with New Mexico Wine Country, a similar, but separate, non-profit organization that focused on marketing New Mexico’s wine industry. In 2014 both Boards of Directors agreed to initiate the merger of assets, relationships, grants, partnerships, marketing and their long-standing events. This merger was a major step forward for the industry and has allowed us to make significant progress in our approach to marketing, advertising and building a sustainable wine industry in New Mexico.

The newly unified association will be rebranded as 'New Mexico Wine' in 2017.

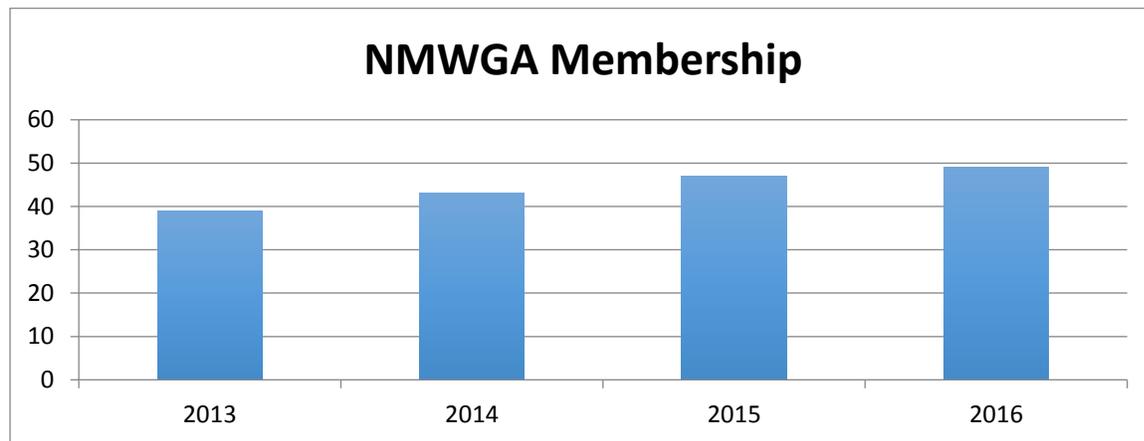
In 2016 we migrated to a single website and were the beneficiary of the combined power of two established websites that already had a following. This merger immediately boosted our traffic by 50%. We also funneled all of our advance ticket sales for five major festivals through our new singular website. In 2016 we sold over 20,000 advance tickets for our core events. Festivals will continue to be a strong feature of our new website and we anticipate continued growth in online traffic due to special events.

Our social media engagement has also grown dramatically. We currently manage five Facebook accounts (one for the Association and 4 event accounts). They range from 3,000 to 10,000 followers and have increased between 35% and 250% since 2014.

The most important factor moving forward will be the complete integration of assets, history and association culture into the website. New Mexico Wine has retained PixelMark, a web team in El Paso, to rebuild our site with optimal functionality, mobile integration and customer engagement. This integrated website will be the primary tool for communicating with consumers and integrated into all future marketing and advertising.

*Increased number of participating wineries by 20%*

NMWGA membership has grown by 25% since January of 2013. This includes a small number of winery closings (3) in the midst of new wineries and vineyards opening (13).



2013 - 39 Members      2014 - 43 Members      2015 - 47 Members      2016 - 49 Members

Over this same period of time, member wineries have opened six new off-site tasting room locations around the state. A winery is allowed to operate up to four locations per license and we have seen the number of secondary tasting rooms grow in the past three years with more in the works. We counted a total of 62 locations (wineries and tasting rooms combined) at the end of 2016. This means the industry has grown 30% since 2013 in terms of the total number of locations.

In 2014 NMWGA made a concerted effort to begin incorporating the cider industry into our membership, because they are licensed by the state of New Mexico as a winegrower. Four cider producers have joined the association since then and we are working on producing our very first Hard Cider Festival in 2017.

### *Increase attendance at Albuquerque area wine festivals by 10%*

New Mexico Wine, the newly merged organization, produces large-scale annual festivals in Albuquerque on Memorial Day and Labor Day Weekends. These two events make up 50% of the core annual budget and have been hallmark events for the New Mexico wine industry. We have had two very different experiences in Albuquerque with these signature annual events

From 2014 to 2016 the Albuquerque Wine Festival (Memorial Day weekend) has grown by 37% in attendance and 122% in net profit. In years past the largest wine festivals always took place in Las Cruces or Bernalillo, with the Albuquerque event in 3<sup>rd</sup> place. This grant allowed the association to significantly ramp up our advertising and our festival experience what has turned this event into the largest wine event in New Mexico.

We already have 25 wineries registered for the 2017 Albuquerque Wine Festival and over \$30,000 in advance tickets sold for the event.

In 2014 the association terminated a 28-year relationship with the Town of Bernalillo and ended the New Mexico Wine Festival. In 2015 the association launched a brand new Labor Day event at Isleta Casino called the New Mexico Wine & Jazz Festival. Over five thousand people attended the two-day event and it was a hit with jazz and wine enthusiasts, but ultimately it was not profitable in its first year. Using grant funding and keeping a close eye on our expense, we broke even in 2016 and attracted 6,500 customers to the second year event, which was an 18% increase in attendance. This festival is gaining momentum and has found a new home in 2016 at EXPO New Mexico.

### Beneficiaries

**2012 Beneficiaries:** All wineries would be included in the App and those who applied for TOD signage would benefit from the Wine Trails. It was hoped that wineries would see a 10% - 30% increase in revenue and 15% growth in foot traffic.

**2014 Amended Beneficiaries:** All wineries, cideries, vineyards, meaderies and tasting rooms throughout the state with all industry partners now under one umbrella organization.

### Lessons Learned

**2012 Lessons Learned:** NMWGA quickly learned the complexities of working with State and Federal transportation authorities and the rigorous signage protocol that both upheld. All applications for road signage were denied by NMDOT. While State legislators all agreed to the benefits of road signage for the industry, the project was never formally approved and passing legislation proved harder than expected. Additionally NMWGA had limited success in getting consumers to download the Wine Trail App due to a lack in advertising the promoting the App to mobile users. Less than 1,000 people downloaded the app in the first year.

**2014 Amended Lessons Learned:** Having brought the two competing organizations under one roof, NMWGA is experiencing success in marketing the wine industry as a whole. The brochure continues to be one of the best marketing outlets to drive new traffic to wineries, vineyards and tasting rooms. One major hurdle has been educating the membership on the unified goals and benefits from our marketing and events.

The Finger Lakes International Wine Competition delivered a record 88 medals and played a significant role in the marketing and advertising strategy for 2016, with ads running in multiple publications outlining the many winners.

**Contact Person** - Christopher Goblet - [execdirector@nmwine.com](mailto:execdirector@nmwine.com) - (575) 649-8994

### Additional Information

Please take into consideration that this grant was administered by three different executive directors. In addition, the original proposal experienced significant roadblocks from DOT and the Legislature, which was not anticipated when applying for these funds and severely impacted the success. The lack in continuity only exacerbated the problems that were faced in fulfilling the intent of this grant.

## Project 4: Representing and Promoting New Mexico Specialty Crops to the Food and Beverage Industry Associations, Purchasing Groups, and Distribution Groups

### Project Summary

The project was a new and important step for the representation and promotion of New Mexico specialty crops. Through the project, the New Mexico Department of Agriculture (NMDA) was able to reach out to national food and beverage associations which promoted awareness, availability, and education of New Mexico (NM) specialty crops. NMDA was able to represent growers and processors of NM specialty crops to national purchasing and distribution groups.

The project complimented and expanded upon prior promotional projects funded through SCBGP, thus, increasing the competitiveness of NM specialty crops. The timeline of the project was important to enhance and expand NM promotion and representation of specialty crops.

The project represented and promoted NM specialty crops. Specifically: green and red chile, grapes, pecans, onions, potatoes, pistachios, apples, watermelon, seasonal berries, pumpkins, seasonal vegetables, tomatoes, and honey. Seasonal fruits and vegetables were primarily promoted at farmer's markets and COOP grocers. NM chile, our signature specialty crop, was represented across all food and beverage venues. Pecans, our largest specialty crop, was represented and promoted at larger US and International trade shows. Our grape industry continues to grow and NM wines are now distributed in 48 US states.

The project achieved its goal in increasing awareness and purchases of New Mexico specialty crops (including value added products) throughout the food and beverage industry associations, purchasing groups and distribution groups.

### Project Approach

The project approach to promote and represent New Mexico specialty crops to food and beverage industry associations, purchasing groups, and distribution groups was a great next step to enhance the competitiveness of New Mexico specialty crops.

The project accomplished the task of creating awareness, education, and promotion on a national scale. The work plan laid out important food and beverage industry events at which to promote and represent growers and processors (New Mexico companies) of New Mexico specialty crops. National association exposure to and for our New Mexico companies created many important contacts and sales leads.

Attendance and exhibiting at the association and distribution trade shows expanded NM specialty crop awareness and product credibility and availability.

### Goals and Outcomes Achieved

Represent and promote NM specialty crops to food and beverage industry	Goals Established	Actual Accomplishments
	8 associations	Represented and promoted to 13+ associations.
	6 states	Represented and promoted to 8 U.S. states.

associations, purchasing groups and distribution groups.	5 trade shows	Represented and promoted to 7 trade shows.
	6 promotional events	Represented and promoted 8 major promotional events.
	10 growers, 8 processors	Represented and promoted 12 plus growers and 12 + processors.

The project accomplished the outcome expectation of at least 5% or more of the leads gained requesting additional services from NMDA following events.

NMDA was able to provide additional services to the leads such as: helping them source New Mexico specialty crops; providing educational materials, collateral materials, and nutritional information; enhanced accessibility and market presence; making market introductions; distributor coordination; and coordinating further demonstrations and sampling.

NMDA also provided additional services to the leads by helping growers and processors stay connected with distributors and operators through follow up and coordination of further meetings.

*Activity Highlights* - A summary of the successful accomplishments with food and beverage industry associations and distributor/purchasing groups:

*Produce Marketing Association- Fresh Summit Atlanta, GA*

Represented and promoted six New Mexico growers to this international show that is attended by over 20,000. Company relationships were strengthened and companies made 30 solid contacts and at least 10 key sales leads. (Please note that project funding was only used to cover the food service specialist’s travel and not any other expense related to the show as some of these expenses were covered under another SCBGP project, and no duplication of funding occurred.)

PMA Food Service Conference promoted processed/value-added green chile to top US food service professionals: School Nutrition Association, New Mexico Farmers’ Market Association, New Mexico Wine Growers Association, Texas Restaurant Association, and other key associations.

*National Restaurant Association-Chicago*

NMDA promoted two large-scale New Mexico food service processors at the Country’s largest and most attended food and beverage industry trade show. Product sampling and chef demonstrations also took place. The companies combined gained more than 100 contacts and 30 key sales leads.

*Natural Products Expo-Anaheim*

Represented and promoted two (2) large-scale New Mexico retail processors at one of the largest specialty (value-added) food shows in the US. The show had over 30,000 attendees. Major grocery chains and retail distributors were among the attendees.

*Distributor/Purchasing Groups*

NMDA represented New Mexico specialty crops at: the Global Gaming Conference and SYSCO food service distributor pavilion in Las Vegas, NV; a series of Shamrock food service distributor trade shows in southern CA, Phoenix, and Colorado that featured celebrity chef demos; Orlando Wine and Spirits Show (New Mexico wine is now in 48 states); and the KeHe distributor show in Chicago (a major retail show that opened markets in the Midwest). NMDA worked with major food service distributors such as SYSCO, LaBatt, US Foods, and Ben E. Keith.

*Promotional Events* - Some of the highlights of promotional events where New Mexico specialty crops were represented and promoted are:

- Various New Mexico green chile roasting events at the University of New Mexico, New Mexico Alumni Associations, and chain restaurants.
- International Farm to Table-“Chef’s Taste Challenge Event” featured New Mexico green chile, pecans, and onions prepared by 10 top US chefs.
- Over 70 value-added food and beverage items containing New Mexico specialty crops were represented and promoted at the New Mexico State Fair in NMDA’s NEW MEXICO—Taste the Tradition® Country Store. Various cooking and sampling demos at the Agriculture Building were conducted. Over the course of the 10 day event, thousands of people from across New Mexico and beyond visited the Country Store to sample and purchase New Mexico grown and made products.
- NMDA’s expertise in the food and beverage industry, along with the promotion and representation of New Mexico specialty crops, (through the use of SCBGP funding) was critical to the success of the project. The project funds were used solely to enhance the competitiveness of specialty crops.

### Beneficiaries

The beneficiaries of the project were the growers and processors of New Mexico specialty crops. They benefited from the project efforts in many ways: national exposure, market research and development, new business contacts, and immediate and future sales leads.

Over twenty-four (24) New Mexico growers and processors were represented and promoted through the project. The growers’ and processors’ exposure to food and beverage industry associations enabled them to gain exposure and credibility. They now have a much larger network of contacts to help them grow business and market share. Their participation with purchasing and distribution groups helped position them as capable and competitive within their industry.

### Lessons Learned

NMDA learned that the project was useful in helping New Mexico growers and processors of specialty crops grow exposure and business, thus strengthening their competitiveness. The project helped them gain increased exposure to industry associations, purchasing groups, and distributors thanks to the different promoting and event opportunities attached to the work plan. Feedback from the promotions has been positive on the side of the participants and the new vendors and distributors they met.

We also learned that it is good to use the allotted time for project completion. Using the full allotment of time enabled NMDA to monitor and tailor the work plan. NMDA was able to include New Mexico companies in the activities as the companies were ready, so if one company missed a particular activity one year, they were able to participate the next year.

NMDA also learned that the project really helped reinforce the credibility of New Mexico specialty crop companies and the added exposure to the groups was very important. Funding for the project was greatly appreciated by the beneficiaries and was critical for their participation in the project activities.

There continues to be a great need for support through NMDA and the Specialty Crop Block Grant funding for New Mexico processors and growers of specialty crops. The goals of the project were exceeded.

## Project 5: Fresh Market Green Chile Market Development and Promotion-Exploring New Strategies in Green Chile Market Development and Promotion

### Project Summary and Project Approach

The initial purpose for this project was to increase market share of New Mexico Green Chile by creating additional demand at the retail level through tried-and-true strategies of targeting ex-pats and implementing alumni roasting events, in partnership with alumni chapters from various New Mexico universities, in strategic markets across the United States.

While the strategies are not new to this project (this is a continuation project from 2012-2015 SCBGP funds), some of the target markets were, and going back to existing markets only helped realize some of the potential that exists as there were major increases in the volume of chile sold in comparison to the previous chile season. One example, is a retailer in Alexandria, Virginia. Through the New Mexico State University Alumni Association chile roast, the store sold an additional 250 cases of chile through this single event.

### Goals and Outcome Achieved

Success was not only realized in the fresh market but in frozen as well as one New Mexico chile shipper was successful in getting a growing fast-food chain to incorporate “Hatch Green Chile” into the menu of 327 of their locations in the Southwest (CO, AZ, NM, NV, and TX). Through this grant, NMDA was able to offer the shipper funding assistance for menu development for this restaurant chain with hopes that broadening awareness will eventually lead to additional regions and restaurants following suit.

Performance Measure	2014 Target	2014 Actual
New Markets	5	3
Number of New Stores	25	Approximately 80
Number of Gourmet Restaurants	6	1 Chain (327 locations)
Additional Number of Cases Sold	16,000	Estimated at 6,000 additional cases
Number of Alumni Activities	5	4

A summary of results as compared to the targets set are as follows:

Staffing continued to be a challenge for NMDA in meeting all the requests for training and promotional support from shippers and retailers, therefore energy was focused on the activities that staff felt were most critical to the overall success of the program which included:

1. One Chile Boot Camp 101 in Des Moines, IA
2. Alumni Events in:
  - Alexandria, VA
  - San Francisco, CA
  - San Diego, CA
  - Phoenix, AZ

Aside from menu development, funds were primarily used for travel in order to conduct and support these events and “Get Your Fix” aprons for the retailers so that consumers could easily determine who to approach regarding questions and orders for New Mexico green chile.

In 2015, the remaining funds were used to continue and complete the project. As previously mentioned, it was identified that additional trainings needed to take place. Due to the retirement of the previous project administrator in 2014, trainings had to be postponed until 2015, when a new project administrator was hired and trained to provide oversight to the project.

In 2015, chile roasting events were conducted in Los Angeles, CA (Superior Grocers); Pittsburgh, PA (Giant Eagle); Cleveland, OH (Giant Eagle); and Columbus, OH (Kroger). Alumni roasting events were conducted in Alexandria, VA; San Francisco, CA; Phoenix, AZ; and Denver, CO. The roasting events continue to see an annual increase in the number of cases roasted. As an example, the Alexandria event increased from 250 cases in 2014 to 400 cases in 2015.

In 2015, as a result of the trainings, approximately 65 stores were added. It is estimated an additional 6,000 cases were sold at these store events.

### Beneficiaries

The direct beneficiaries of this project were approximately 15 additional retail stores across the United States and their customers which included, but were not limited to, the ex-pats and alumni groups that were targeted. Other direct beneficiaries include the growing fast-food chain that now has "Hatch Green Chile" on their menu year-round as well as 5 major chile shippers and the many growers they represent.

### Lessons Learned

Currently, staff has plans to meet with shippers and retailers early in the spring in order to determine what trainings and events may be on tap for the upcoming season. Additional, and potentially new promotional materials may also be purchased with 2014-2017 SCBGP funds in order to generate new excitement amongst retailers and consumers alike.

Website enhancements for the [www.newmexicotradition.com](http://www.newmexicotradition.com) website are also in the works in hopes that any promotional materials ordered can direct retailers and consumers to additional chile-related resources that will reside on this site.

As previously mentioned, staffing continued to be an issue. However, the new marketing specialist hired to take over the green chile promotion program was able to experience some events first-hand and is now ready to take on the challenge of further growing the program. Additional NMDA staff from outside the Marketing and Development Division was also utilized during the alumni events and will be an option if needed in the future as well.

NMDA staff, with the new marketing specialist as the lead, will continue planning for the upcoming season by talking with shippers, alumni groups, retailers, and restaurants between now and early summer.

Also, if NMDA's [www.newmexicotradition.com](http://www.newmexicotradition.com) website can be enhanced between now and the 2016 chile season, additional online resources will be incorporated into the program offerings. Social media will also become a critical piece in promoting roasting and alumni events across the country and an additional staff member is prepared to take on this role.

### Contact Person

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### Additional Information

See Appendix.

## Project 6: Mitigation of Alternate Bearing in New Mexico Pecans

### Project Partner Organizations

NMSU Department of Entomology, Plant Pathology, and Weed Sciences; Department of Plant and Environmental Sciences; and Department of Extension Plant Sciences; Dr. Randall, [jrandall@nmsu.edu](mailto:jrandall@nmsu.edu); Dr. Heerema, [rjheerem@nmsu.edu](mailto:rjheerem@nmsu.edu)

### Project Summary

#### Project Purpose

Pecans are among the largest economic contributors to New Mexico's agricultural economy with production exceeding \$60 million annually. **One of the most important horticultural constraints for profitable pecan production in New Mexico is alternate bearing**, which is the annual cycling of pecan trees between heavy and light crop load. The mechanism behind alternate bearing is the year-to-year variation in formation and development of female flowers (Wood, 1990).

#### Goal

The transition to flowering in pecan cannot be visualized until bloom but the "decision" to become a flower takes place prior to bloom. Neither the timing nor location of the source for the genetic signal for a shoot meristem to transition from vegetative to floral is known in pecan. Therefore, a practical approach to address this problem is to utilize genetic techniques to determine how flowering occurs in pecan. This will allow better resolution for timing of such alternate bearing mitigation approaches such as mechanical hedge pruning, fruit thinning, and plant growth regulator applications. These genetic studies are necessary in understanding how flower induction in pecan occurs giving the growers an invaluable tool to use with their horticultural practices for mitigating alternate bearing in pecan.

### Project Approach

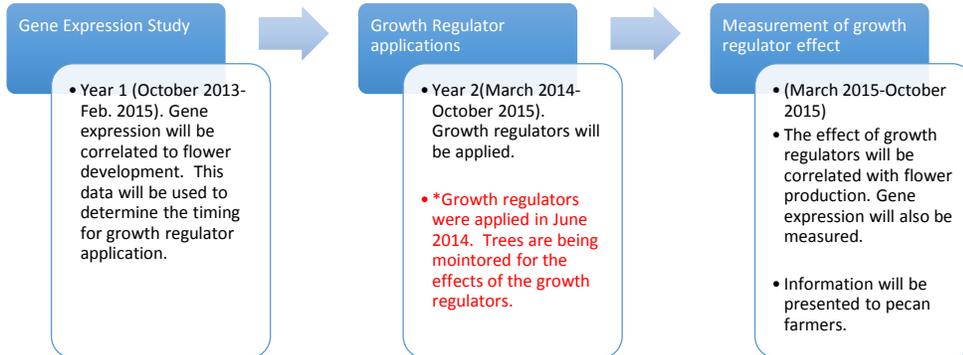
#### Activities Performed

1. The LFY promoter and LFY gene in pecan was characterized using bio-informatics programs.
2. Gene expression data for the flowering gene LFY was completed for pecan leaf samples that were collected from the 2011-2012 growing season (April-October) of mature alternate bearing Wichita trees.
3. Based on the expression data generated from the LFY, growth regulators were sprayed selected shoots of trees. These shoots are labeled and will be monitored in the spring for their flowering/fruitletting ability.
4. Treated shoots were assessed for their subsequent flowering and fruitletting.
5. Differences in gene expression were assessed on shoots treated with growth regulators.

#### Work Plan

The characterization of pecan flowering genes was directed by Dr. Jennifer Randall and performed by graduate students and post-doctoral fellow in year 1 of the grant. Leaflet tissue samples from fruit-bearing and vegetative shoots of mature alternate bearing 'Wichita' pecan trees were collected monthly during the 2011 and 2012 growing seasons (April to October) and stored at -80°C. Nucleic acid was isolated (RNA) from these samples and measurement of gene expression was accomplished using a technique called quantitative reverse transcription PCR and correlated to the presence of female flowers. The application of growth regulators was directed by Dr. Richard Heerema and performed by graduate students in year 1 of the grant. This application was originally planned for spring of 2015 but using the data we obtained from the gene expression study we accelerated our research and applied

the growth regulators June of 2014. The effect of flower production was measured and correlated to the application of growth regulators in the spring of 2015. Preliminary gene expression changes were measured and correlated.



## Goals and Outcomes

Results obtained during October 2013 – October 2015

### Gene Expression Study:

The LFY gene is one of the master genes involved in flower regulation. The LFY gene and the promoter sequence that controls the timing of expression were analyzed using bio-informatics programs.

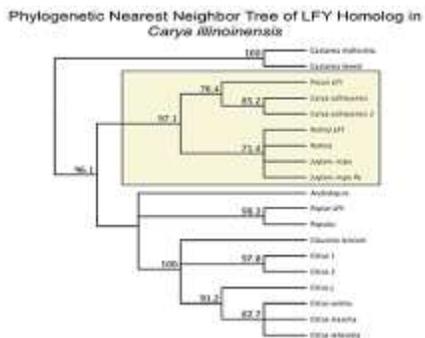


Figure 1. Nearest neighbor tree of LFY gene homolog isolated from *Carya illinoensis*: The tree was constructed in Geneious 6.0.1 using the HKY algorithm, bootstrapped 1000X with 70% consensus threshold. **This tree represents the relatedness of the LFY gene in pecan to LFY genes in other plant species. This is the first time the LFY gene from pecan has been analyzed.**

Table 1. Specific motifs common LFY promoter sequences found in the Pecan LFY promoter. The sequences were analyzed using Genomatix MatInspector database. This information is important as it gives us a glimpse of environmental cues that may be involved in regulation of the LFY promoter for the formation of flowering.

Element	Motif	Function	Reference
Plant TATA Box	TATA	Core promoter element	Hudson & Quail, 2003.
Homeobox Domain	ATGA	Anatomical development	Ohgishi et al., 2000.
CCAAT Binding Factors	CCAAT	Core promoter element	Ibraheem et al., 2010.
Circadian Control Factors	AATC	Flowering time and light mediated development	Fujimori et al., 2004.
DNA Binding with One Finger (DOF)	AAAG	Conserved DNA binding domain.	Umemura et al., 2004.
Plant G-Box/C-Box bZip	ACTG	Response to light or hormones.	Ibraheem et al., 2010; Rose et al., 1999; Siberil et al. 2001.
GT Box Elements	TTAA	Response to light.	Martinez-Hernandez et al., 2002.
Heat Shock Factors	TTTC	Response to heat stress	Ibraheem et al., 2010.
High Mobility Group (HMG)	TATT	Conserved DNA binding functions	Lieu et al., 1999.
I-Box	GATA	Conserved sequence upstream of light-regulated genes	Ibraheem et al., 2010; Rose et al., 1999.
L1-Box	TAAA	Transcription factors with specific L1 layer functions	Abe et al., 2001.
Light Responsive Element (LRE)	ATCT	Light regulated elements in photosynthesis genes	Martinez-Hernandez et al., 2002.
MADS Box	AAAT	Floral organ development	Favaro, et al., 2003.
MYB-like proteins	AGTT	Drought inducible gene expression	Ibraheem et al., 2010; Rose et al., 1999;
MYB with Single Repeat	ATAT	DNA binding transcription factors	Rose et al., 1999.
NAC Transcription Factors	CACG	Drought inducible gene expression	Ibraheem et al., 2010.
Nodulin	AAAA	Cellular transport.	Wallace et al., 2006.
Sweet Potato Binding Factor (SPBF)	TACT	Utilization and storage of sugars during stress or development.	Ibraheem et al., 2010.
Sucrose box	AAAT	Sugar responsive gene expression	Ibraheem et al., 2010.
Secondary Wall NACS	AAAG	Transcription factors promoting secondary wall synthesis.	Zhong et al., 2010.

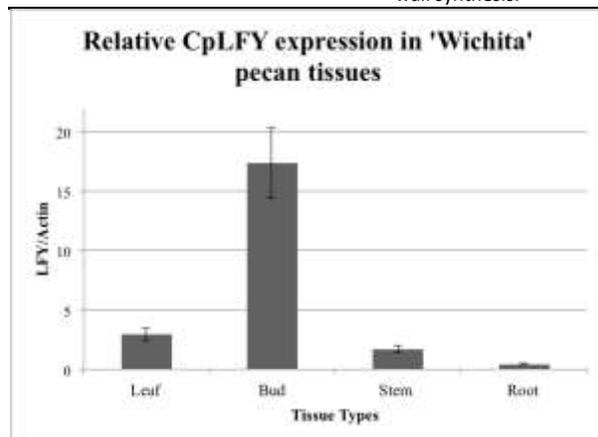


Figure 2. Relative expression of Pecan CpLFY in leaf, bud, stem and root tissue of 'Wichita' Pecan: Actin gene was used as a reference gene. All cDNA samples were included in triplicate in all assays. CpLFY/Actin transcript ratios were calculated using standard qRT equations (Pfaffl,

2001). This figure indicates that the LFY gene is most active in bud tissue followed by leaf tissue in pecan trees.

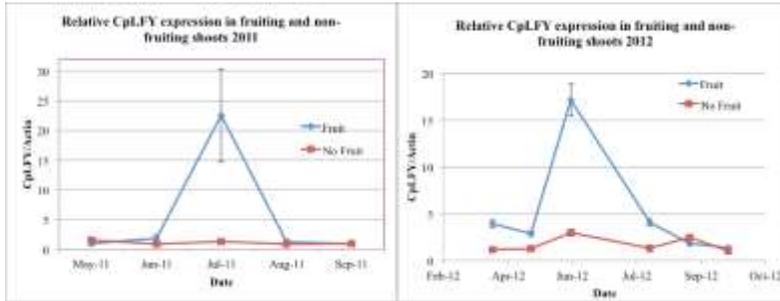


Figure 3. Relative expression of CplLFY in leaf tissue of ‘Wichita’ pecan collected over 2011 and 2012 growing seasons: Actin gene was used as a reference gene. All cDNA samples were included in triplicate in all assays. CplLFY/Actin transcript ratios were calculated using standard qRT equations (Pfaffl, 2001). **This data indicates that LFY expression is highest in shoots that have fruit in the months of June/July.**

Year	Shoot Fruiting Status	Subsequent Season Return Bloom (%)
2011	Fruiting	11%
	Non-fruiting	83%
2012	Fruiting	4.5%
	Non-fruiting	50%

Figure 3b. Fruit status and subsequent season return bloom on 2011 and 2012 Wichita trees used for gene expression studies.

*Growth regulator applications*

Application of growth regulators was accomplished during the June/July months of 2014 and 2015. The timing of the application of the growth regulators was done based on the LFY gene expression analysis and also a previous study that was performed on pecans in Georgia in 2011 (Wood, 2011). Treatments for this experiment included 1) Control (surfactant & water only); 2) "ProGibb 4%" - 50mg a.i./L (plus surfactant and water); 3) "Etephon 2" - 100mg a.i./L (plus surfactant and water). Treatments were done at three experimental sites within the Mesilla Valley during the months of June and July. The treated and control branches were monitored for their fruit production this season and will be monitored for their flower/fruit production for the following season.

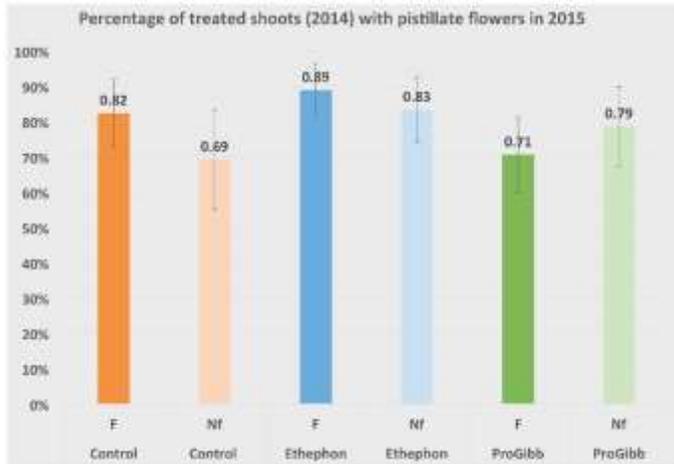


Figure 4. Return bloom of Pecan trees treated with growth regulators. F is for flowering shoots, NF is for non-flowering shoots. The treatments included growth regulators Ethephon and ProGibb as well as non-treated shoots.

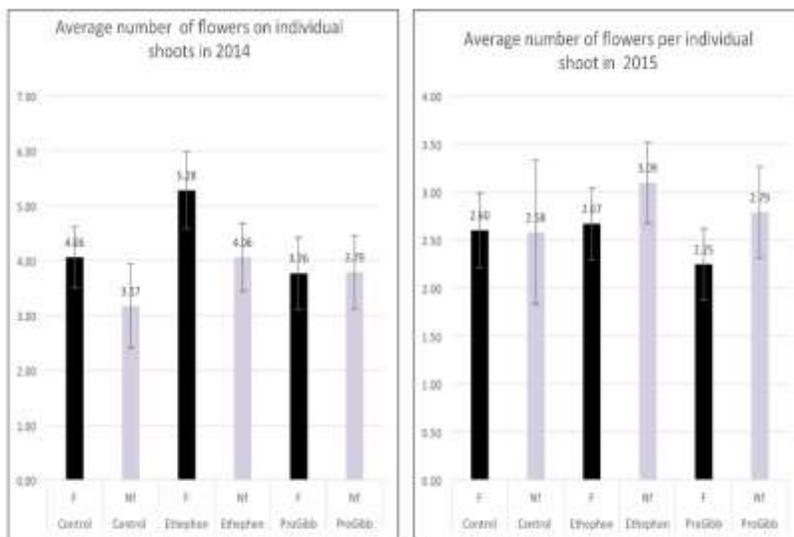


Figure 5. Pistillate flowers observed from 2014 to 2015 following treatment on Western pecan trees.

Data of return bloom from treatment in 2014 in the desert southwest using the Western cultivar indicates that post-bloom application of ProGibb and Ethephon2 may have impacted subsequent year's return bloom at the shoot level as observed in Figure 4. In a mature commercial orchard, Western trees treated with Ethephon2 had a return bloom of approximately 83 percent as compared to the non-treated control of 69 percent when comparing non-flowering shoots. Interestingly, the average number of flowers on individual shoots decreased in the subsequent year with the application of Ethephon2 and ProGibb as compared to the shoots in 2014 (Figure 5). **Growth regulators may potentially be utilized for helping to control alternate bearing in pecan.**

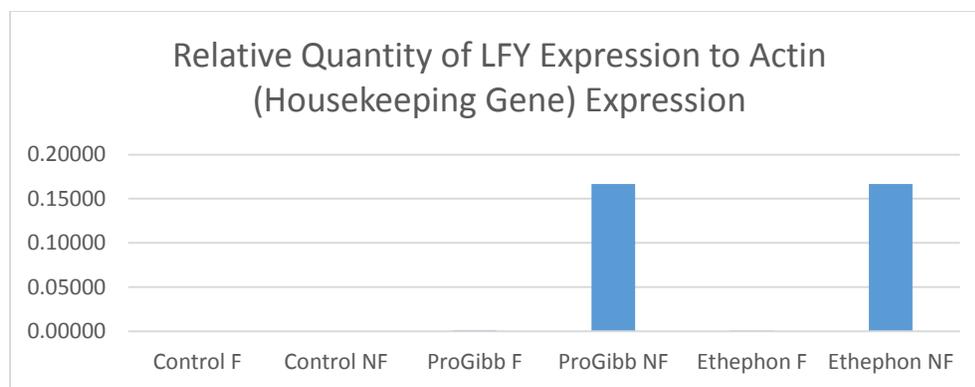


Figure 6. Preliminary gene expression from leaves on shoot growth regulator treatments.

Preliminary results from looking at gene expression from treated and non-treated shoots indicate that there may be a difference in gene expression on Western shoots using growth regulators. During the summer months in the Wichita cultivar expression of the LFY gene was observed in flowering shoots. However, in the preliminary results, the gene expression of LFY is not observed during this time frame in either the control flowering or non-flowering shoots. **However, treatment of the shoots with the growth regulators did seem to affect gene expression in non-flowering shoots.** This further correlates to the fact that we did observe differences in return bloom with treatments of non-flowering and flowering shoots as well. Further experimentation is in progress to test the bud tissue from these treated shoots. **This observation that growth regulators can regulate flower genes is an important step towards understanding and helping to mitigate alternate bearing in pecans.**

Comparison of goals with accomplishments for 2013-2015.

	Goal	Performance Measure	Benchmark	Target	Expected Measurable Outcome
Characterization of flowering gene expression through growing season.	Determine effective timing for aggressive trimming and growth regulator applications for mitigating alternate bearing.	Gene expression data of flowering genes.	No previous gene expression data from flowering genes have been acquired from pecan.	Gene expression data of LFY correlated to timing of flower development.	<b>Completed initial LFY gene expression data and analyzed results.</b>
Plant Growth Regulators (PGRs) on pecan flowering.	Effectiveness of PGRs on flower production.	Flower production changes due to application of PGR. Gene expression changes will also be correlated with application of PGRs.	No previous work on the effectiveness of growth regulators in regard to timing has been accomplished on pecan.	The effect of growth regulators on flower production. Timing for application and optimal concentration of PGRs. Results will be presented and made available to pecan growers.	<b>Plant growth regulators applied in June/July 2014-2015. Affects were monitored through the 2014 season and the 2015 growing season. Analysis of return bloom and gene expression accomplished.</b>

- Adjustments were made to the project. We began applying the plant growth regulators in the 2014-growing season instead of waiting until the 2015-growing season. We monitored the shoots/trees that had the plant growth regulators applied during the 2014 production season

and will be able to determine how these treatments affect the formation of pistillate flowers in the 2015 growing season.

#### Future Project Plans

- The trees treated with the plant growth regulators are being monitored and will continue to be monitored during the spring/summer of 2016 and 2017. The effect of growth regulators will be correlated with flower production. Gene expression will also be measured. The information that results from this project in terms of genetic control of flower production and the use of growth regulators to help mitigate alternate bearing in pecans will be presented to pecan farmers and the pecan industry.

#### Success of Project

1. Flowering genes required for Pecan were identified and characterized for the first time. Promoters and sequences that regulate the genes were analyzed by in-silico analysis.
2. Gene expression was measured for a flowering gene LFY in alternate bearing Wichita trees for two years.
3. In a controlled field experiment, plant growth regulators were sprayed onto trees and the effects of return bloom and gene expression were measured.
4. This basic research indicates that plant growth regulators can be used to help mitigate alternate bearing in pecan trees.

#### Beneficiaries

The project will be continued for two more years (utilizing 2015 SCBGP funds) and the results from these studies will benefit growers and producers. The beneficiaries of this project will eventually be pecan producers and processors. The mitigation of alternate bearing will make for a consistency in the quality and quantity of pecan production and will help stabilize markets that utilize pecans.

#### Lessons Learned

This project allowed for the identification and characterization of genes that control flowering within pecan trees. We observed differential expression in different tissues, i.e. buds more than leaves. The original plan consisted of measuring gene expression within the leaves in close proximity to terminal buds and this worked as a first estimation. In the next two years, gene expression will be determined within the buds of trees to determine the gene expression of these floral signals at the site of flower development.

Our preliminary gene expression data obtained from the growth regulator treatments was unexpected to the researchers. However, the difference in gene expression patterns may be due to the fact that two different cultivars were utilized in the two studies; Wichita in the preliminary gene study and Western in the growth regulator study. The differences in gene expression patterns may also be due to the care of the orchards. The first Wichita orchard had strong alternate bearing patterns and the Western orchard used for the growth regulator study is a commercial orchard and trees have been well maintained. Also, the alternate bearing patterns were less in the Western orchard (see figure 4).

#### Contact Person

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12-25-B-1686 Appendix

Project 4:



Left: Dennis Hogan acting as a judge at a Shamrock Foods Show.

Right: Promotional graphic from Chef's Taste Challenge including NMDA name logo promoting Hatch green chile.



NM Hatch Green Chile featured at Sysco Show in Las Vegas, Nevada.



Top: Display of New Mexico chile products.

Bottom: Hatch Green Chile featured in the Chef's Taste Challenge.



Dennis Hogan and Chef Fabio Viviani at a Sysco event.

Project 5: Green Chile Promotion



Top and Bottom: Pittsburg store training.



Top and Bottom: Cleveland store training.