WSDA
SPECIALTY CROP BLOCK GRANT PROGRAM
2008
FINAL PERFORMANCE REPORTS

All projects have been completed

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Pear Bureau Northwest

Putting a Face on USA Pears – Washington Pear Growers Short Film Series

PROJECT SUMMARY

Now more than ever, consumers want to know where their food comes from. This is particularly true for fresh fruits and vegetables. To help address this consumer demand, Pear Bureau Northwest produced a series of four short films showcasing pear growers from Washington's renowned pear growing regions. These films are spotlighted on the home page of usapears.org, and have also been distributed via popular social networking sites like YouTube. In addition, the films have been made available to partners like the WSDA, who share in the mission of promoting the producers and products of the bountiful Pacific Northwest. The content of the films spotlights the wide diversity of Washington's growers, depicting growers and grower families of differing ethnicities, genders, ages, and personalities. The films tout the quality and delicious flavor of USA Pears through the interesting stories of these growers, and encourage consumers to look for USA Pears at their local retailer.

PROJECT APPROACH

1. Film raw footage for a series of on-camera interviews and brief orchard tours featuring 3 – 5 Washington pear growers (and their families or operations).

After a careful review process involving three film companies, Pear Bureau Northwest selected and hired documentary filmmaker Jon Beanlands to produce a total of four 4 – 5 minute films featuring Washington pear growers.

The pear growers/growing operations that volunteered and were selected by the Pear Bureau Northwest to participate and be filmed are:

- Eldon Tall, Triple Tall Orchards, Dryden, WA
- The Groff Family, Keystone Ranch Orchard, Entiat, WA
- Ray Schmitten, Schmitten Orchards, Inc., Cashmere, WA
- Andrew Sundquist, Sundquist Fruit, Yakima, WA

Raw footage was captured, including unscripted but directed interviews, where growers told the story of what makes Washington-grown USA Pears special and shared what it is about farming that sustains the growers themselves. Footage of the unique Washington land was captured, including the pears and trees in orchards set among beautiful mountainous landscapes, and the orchard employees carefully picking each pear by hand to ensure the best quality fruit from tree to table.

The footage was filmed in high definition (HD). Techniques include time-lapse photography, close-up images of pears using macro lenses, and wide vistas of the orchards, farms and the surrounding land.

Task/Activity	Who's Responsible	Completed?
Call for pear grower applicants to be featured in films – by hard copy mail and e-mail blast	Cristie Mather	YES
Interview potential growers, and select diverse sampling of growers to feature, ensuring that	Cristie Mather	YES

each of the major Washington state growing regions are represented		
Schedule and conduct filming on location	Cristie Mather, Jon Beanlands Film Crew	YES

2. Edit and produce films and prepare for digital release.
After compiling raw footage and undergoing final storyline edit, color and sound correction, and background music composition, the films were completed. For cohesion purposes, each film begins with an introductory title screen, and concludes with a montage of growers naming the different varieties of Washington-grown USA Pears.

Eldon Tall; http://www.youtube.com/watch?v=LNLoglfZKl0
Triple Tall Orchards, Dryden, WA
Run Time: 5:35

Film Synopsis:
Eldon has been growing pears for 33 years, and his son John is his partner at Triple Tall Orchards in Dryden. He takes great pride in the employees that are involved with his operation, two of whom are brothers, Guillermo and Jose, who have been employed full time with Triple Tall Orchards for more than 20 years.

The Groff Family; http://www.youtube.com/watch?v=8PjMscGf4kQ
Keystone Ranch Orchard, Entiat, WA
Run Time: 5:05

Film Synopsis:
Alan and Mari Groff are second generation pear growers. Alan and Mari met in college on the east coast, and then moved to New York City where they lived for six years before leaving the hustle and bustle in order to return to Mari's idyllic hometown in Washington to join her father in the family business of growing pears. The film features Mari's father, Dale Foreman, as well as the couple's two young daughters, Clara and Ilsa.

Ray Schmitten; http://www.youtube.com/watch?v=aCN7I-8Mydw
Schmitten Orchards, Inc., Cashmere, WA
Run Time: 4:31

Film Synopsis:
Ray Schmitten's family has been farming in Washington since the turn of the century, when they used to haul water by horse and carriage, and packed their own pears in the basement of the house. Today, he has approximately 500 acres of pear orchards that he maintains with the utmost in care, employing the latest advances in agricultural practices to ensure his orchard remains sustainable and produces quality fruit.

Andrew Sundquist; http://www.youtube.com/watch?v=xgjDeDd4xgs
Sundquist Fruit, Yakima, WA
Run Time: 4:56

Film Synopsis:
Andrew Sundquist is a 29 year-old, fifth generation grower in Yakima with a passion for pears. He is proud to carry on his family's legacy of leadership in Washington's agricultural community. His mother cans her own pears every year, and his father still starts every day with a serving of her home-canned Bartlett pears!

Task/Activity	Who's Responsible	Completed?
Edit raw footage and produce final films	Cristie Mather, Jon Beanlands Film Crew	YES

3. Launch films on home page of www.usapears.org and distribute to social networking sites such as www.youtube.com.

The Pear Bureau has undergone a comprehensive redesign of its website at www.usapears.org. While this redesign was completed separately from the project conducted under this grant, the platform by which the Pear Bureau delivers videos to website visitors has changed. The now improved platform allows for easier upload/download of video, and the new design provides a customized page for each individual film under the new "Meet the Growers" section of www.usapears.org.

The redesign of www.usapears.org was expected to be completed in the first quarter of 2009, but due to unexpected site construction delays, the redesigned site was launched and fully functional as of June 11, 2009. Because of this delayed timeline, the upload of films to www.usapears.org was delayed. The films are currently live, and will be spotlighted on the USA Pears website and others for years to come.

The films are also posted on YouTube, and a multi-media press release featuring the grower films will be distributed in conjunction with the 2009 pear harvest. Links to the films are featured on our Facebook page (www.facebook.com/usapears) and are also dispatched regularly via the USA Pears Twitter feed (http://twitter.com/USApears).

GOALS AND OUTCOMES ACHIEVED

1. Raw footage was collected of four Washington pear growers and their families and/or growing operations. Footage contains documentary style interviews and B-roll footage of orchards and growing operations for each participating grower.
2. Films underwent production and editing and a finished short film of each participating grower has been produced and prepared for distribution through multiple channels. There is a single closing credit to each film, which says "Produced by Pear Bureau Northwest and funded in part by the Washington Department of Agriculture."
3. Finished films are live on www.usapears.org and have also been posted on www.youtube.com, Facebook, and Twitter. A multimedia release will be dispatched by the Pear Bureau in mid-August that will draw further attention to the films, while also distributing the grower films to other media outlets, like MySpace, Yahoo video, and more, expanding the viewing audience for the films by millions.

BENEFICIARIES

The United States is the third largest pear producing country in the world, and growers in Washington State, the United States' largest producer of pears, grow nearly 50% of all the pears grown in the U.S. This film series features a group of interesting Washington growers who serve as representatives of the quality operations that are found across the state. The economic impact will be found in increased brand loyalty which will translate to continued or increased consumer purchase and consumption of Washington-grown USA Pears. This will bring good fiscal returns to the state's 1,214 pear growers and 30 pear shippers. A potential secondary beneficiary could be Washington's tourism industry, as the films' sweeping panoramas of pear orchards set among the mountainous hills and meandering rivers that make up the beautiful Washington landscape may inspire tourism of the state's idyllic agricultural regions.

LESSONS LEARNED

Our call for volunteers to participate in these documentary style films went largely unanswered. We dispatched a 'casting call' by e-newsletter, hard-copy mail, and through in-person meetings, including a presentation from the stage at our industry-wide annual meeting held in May 2008. Unfortunately, only the Groff family responded with enthusiasm. We then started phoning growers whom we thought would either volunteer, or could recommend others for us to ask to volunteer. Luckily, that method was successful, as we found that certain growers were repeatedly nominated to participate by other members of the Washington pear community. This outreach method, while unplanned from the outset, was very successful, and it shows in the final films, as the growers depicted share their personal stories with genuine enthusiasm and passion.

CONTACT PERSON

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Washington State Fruit Commission
Consumer Promotions of Washington Apricots in Mexico

PROJECT SUMMARY

The purpose of this agreement was targeted at building consumer demand for Washington apricots, to educate the Mexican consumer about our apricots and to conduct new consumer-focused marketing programs that would create greater preference for Washington State agricultural export food products (Washington apricots) in Mexico.

The 2009 Mexican market had multiple strikes against us in our efforts to develop this market for Washington apricots. First, the peso experienced a 25% devaluation from 2008 and a 17% devaluation from 2007. Second, in March 2009, Washington apricots were assessed a 20% tariff as a result of the NAFTA retaliation.

Although there were more Washington apricots available in 2009 than in 2008 or 2007, our 2009 goals were not met. In 2009, WSFC shippers sent 49,328 boxes (20# equivalents) of apricots to Mexico compared to the 2008 volume of 40,114 and 2007 volume of 63,959 boxes. The original application for this project set the goal of reaching 80,000 boxes by 2010. This may be a realistic goal if the economic conditions in Mexico improve and the NAFTA retaliation situation is resolved.

	2004	2005	2006	2007	2008	% increase over 2007	2009	% increase over 2008
Total Washington Apricot production	537,781	462,485	424,674	575,659	351,236	-39.0%	694,081	97.6%
Total Washington Apricot Exports to World	99,980	100,272	96,549	169,622	114,438	-32.5%	195,935	71.2%
Washington Apricot Exports to Mexico	41,399	31,754	40,862	63,959	40,114	-37.3%	49,328	23.0%
	**All volume is reported in 20# case equivalents*							

(Note: the application for this grant was made in the middle of the 2008 apricot season and was therefore using 2007 apricot data. For this report purpose, WSFC will reflect the 2007 comparison and the 2008 comparison.)

PROJECT APPROACH

Our promotional strategies to increase consumer awareness of Washington apricots and to grow this market included in-store demonstrations and merchandising, consumer educational leaflets, and point of sale materials.

GOALS AND OUTCOMES ACHIEVED

The goal was to stimulate sales of fresh apricots from $634,000 in 2007 to $784,000 in 2009 across Mexico. While WSFC had anticipated growing the Mexican market from 63,959 boxes in 2007 to 70,000 boxes in 2009, we fell short of our goal. Our final volume to Mexico in 2009 was 49,328 boxes.

The following measures were used to determine the success of our project:

Branding:

	2007 Baseline	2008 Goal	2008 Actual	2009 Goal	2009 Actual
% of targeted consumers who are aware of our product origin	N/A	5%	Est. 5%	12%	10%

*Data is derived from the 2009 In-store Demo and Merchandising Reports.

*Because the application was written in 2008, the "actual" value for 2008 is our in-country representative estimate.

Conversion:

	2007 Baseline	2008 Goal	2008 Actual	2009 Goal	2009 Actual
% of targeted consumers who actually purchase our apricots	N/A	5%	Est. 5%	10%	5%

*Data is derived from the 2009 In-store Demo and Merchandising Reports.

*Because the application was written in 2008, the "actual" value for 2008 is our in-country representative estimate.

Volume increase:

	2007 Baseline	2008 Goal	2008 Actual	2009 Goal	2009 Actual
Actual volume (20# equiv. cases) of Washington apricots exported to Mexico	63,959	60,000	40,114	70,000	49,328

*Actual volume data is derived from the Washington State Fruit Commission assessment reports.

Value increase:

	2007 Baseline	2008 Goal	2008 Actual	2009 Goal	2009 Actual
Actual value of Washington apricots exported to Mexico	$634,000	$590,000	$630,000	$784,000	$888,000

*2007 *v*alues were derived from the USDA NASS "Agricultural Prices 2007 Summary" Report.

*2008 *v*alues were derived from the USDA NASS "Agricultural Prices 2008 Summary" Report.

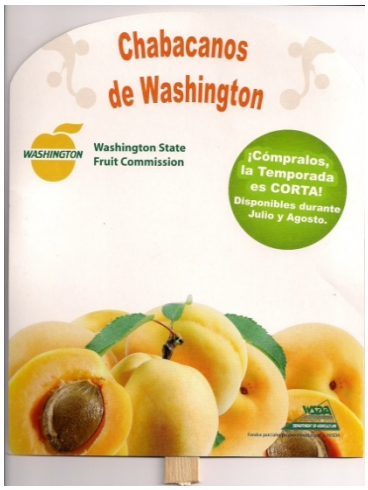
*2009 *v*alues were derived from the AMS weekly shipping reports – USDA NASS "Agricultural prices 2009 Summary" not available.

Our deliverables for this grant included:

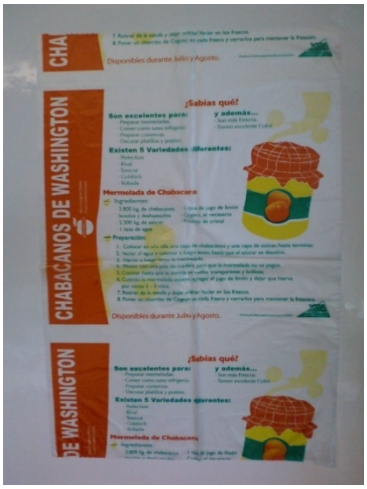
1. Providing Point of Sale Materials (POS) to the Trade.

   a. WSFC created an educational poster in Spanish that was distributed to the wholesalers/importers and the retailers. The poster included the following information about apricots: varieties, seasonal timing, care & handling tips, and nutritional information. This piece was distributed prior to our season.

   b. WSFC provided price tags for retail and wholesale use that would draw the attention of the consumer.



   c. WSFC provided rolls of logo polibags with recipes for use in the produce departments for the consumer to put his/her produce in.



d. WSFC placed ads/information in the in-store circulars that are available at the retailer checkout stands. Below is an ad that WSFC was able to run in Wal-Mart/Superama's Siempre en Familia magazine.

e. WSFC merchandisers placed the POS materials in Mexico City, Guadalajara and Monterrey retail stores, wholesale markets, municipal and street markets. POS materials were distributed among key importers and wholesalers who then in turn gave them to their wholesale clients of the traditional markets permeating the materials to other cities like Aguascalientes, Zacatecas, Morelia, Pueble, Talxcala and others.

2. The creation of a consumer leaflet for distribution during the in-store demos. The Spanish leaflet explained when our apricots are available, their nutritional value and provided a recipe for delicious apricot marmalade. WSFC's strategy to providing a recipe was to increase individual purchasing quantities.

3. Providing in-store merchandising services and in-store demonstrations during the 2009 season.

   a. Merchandising services are a very important element of success in the Mexico market as retailers are hesitant to purchase or stock any volume of product to avoid waste. Our merchandisers helped the produce employees build/keep an attractive and sizeable display of apricots and would call the buyers if the store they were servicing was out of apricots which resulted in a constant supply of product for the consumer. Our merchandisers are also very instrumental in securing placement of the POS materials.

   b. In-store demos were run with major retail chains in Mexico City, Guadalajara and Monterrey during the 2009 apricot season. Running demos assured the stores would have product available and resulted in increased shelf space.

BENEFICIARIES

The Washington State apricot growers are the beneficiaries of this project. Building demand by creating awareness in export markets gives our growers a market for their premium fruit. The domestic demand for Washington apricots is dwarfed by the massive volume of apricots and other stone fruits grown in California that are also available during the front end of our harvest. The unique climatic conditions that bless our state dictate that the timing of the Washington State crop is unique to that of its sister industry in California providing excellent late season opportunities for some of the best fruit on the market.

The Washington State Fruit Commission promotes fresh Washington apricots on behalf of the more than 475 apricot growers. There are currently 950 acres in production harvesting a five year average of 56700 tons with an estimated value of $5.7 million.

LESSONS LEARNED

In 2009, in-store demos averaged a lift in sales of 109% at retail stores compared to non demo days, with the lowest lift of 55% in Wal-Mart stores and the highest lift of 131% in Soriana Stores. Demos do help drive sales as well as give the consumers the opportunity to try a fruit that they may not have had the opportunity to taste before. Building consumer awareness will translate into increased sales volumes that will lead to long-term market growth. Because most of the trade thinks our apricots are the same as the California apricots, we must work to educate the trade of the timing of our fruit, the willingness of the consumer to try our fruit during the demos and make impulse purchases and the ability to grow their stone fruit category by extending the season.

CONTACT PERSON

A hard copy of the final report is attached. The WSFC contacts for this project are B.J. Thurlby, President bj@wastatefruit.com, and Teresa Baggarley, International Program Manager teresa@wastatefruit.com, or via telephone at (509) 453-4837.

Pacific Coast Cranberry Research Foundation

Assuring Washington cranberry growers access to genetically pure and uniform germplasm

PROJECT SUMMARY

The Washington cranberry industry has been plagued by low-producing beds, caused in large part by growing cranberry varieties that have not been true to type. These off-type selections of major varieties have contaminated the entire Washington cranberry industry. Growers propagating from these beds cause further increases in off-types and reduced production. To assess which, if any, Pilgrim beds are clean enough to propagate from, we sampled DNA of all major Pilgrim beds in the state. A few of the original plantings were clean enough (85%) that if mowed would be a good vine source. Most beds, however, were not. This was remedied by establishing propagation beds of pure Stevens and Pilgrim. These will serve as a source for growers to obtain cutting vines of pure Pilgrim and Stevens to use and establish their own propagation beds.

PROJECT APPROACH

Goal 1: Assessing the genetic variability and trueness to type of Washington Pilgrim beds.

Procedures: 122 vine samples were collected by WSU researchers from 17 grower beds that were indentified, based on yield and source, as likely Pilgrim germplasm. Additional criteria for bed selection included a) determining the purity of the source vines for the original Pilgrim beds planted in the state, b) assessing if runners on Pilgrim beds are likely to be off-type, hence with subsequent plantings of pruning's resulting in non- "Pilgrim" beds, and c) following the change in beds planted from pruning's with each subsequent planting. Following the collections, samples were sent to Rutgers University for DNA identification.

Results: DNA analysis of Pilgrim purity is presented in Tables 1 to 3. None of the original plantings of Pilgrims was pure (Table 1). The highest level of purity was 85% and the lowest was 0%. The earlier 1980 plantings were the most contaminated.

Table 1. Purity of the original Pilgrim sources for cranberry plantings in Washington*

Grower	Location	Bed	Type of sample	# of samples tested	Source of vines	Date planted	% Pilgrim
Jubilee	Long Beach	c40	uprights	4	WI or BC	1980's	50%
Jubilee	Long Beach	c40	runners	4	WI or BC	1980's	0%
Allan	Grayland	b	uprights	4	Dillon, BC	1980	0%
William	Grayland	Larkin	uprights	3	Dillon, BC	1982	0%
Brewe	Long Beach	a1	uprights	3	Dillon, BC	1991	66%
Whannell	Long Beach	a10	uprights	20	Dillon, BC	1991	85%
McPhail	Long Beach	q3	uprights	20	Dillon, BC	1991	85%
Gray	Chinook	g8	uprights	9	Scott, WI	2000	88%

* Sites with obvious off-type Pilgrim were not sample

Six Pilgrim beds that contained significant runner density were sampled to determine if these runners were off-types compared to uprights (Table 2). In four of the beds where upright purity ranged from 25% to 100%, none of the runners were Pilgrim. One bed contained no Pilgrim in its runner or upright populations, in one bed both samples were mixed.

Table 2. Comparative purity of Pilgrim uprights and runners off the same bed				
			Pilgrim Purity (%)	
Owner	**Bed**	**Type and number of samples**	**Uprights**	**Runners**
Whannell	a11	grouped uprights 4 samples; grouped runners 1 sample	100%	0%
Whannell	a4	grouped uprights 4 samples; grouped runners 1 sample	0%	0%
Whannell	a5	grouped uprights 3 samples; grouped runners 2 samples	33%	50%
McPhail	s1	grouped uprights 4 samples; grouped runners 1 sample	25%	0%
Gray	g1	grouped uprights 1 sample; grouped runners 1 sample	100%	0%
Jubilee	c40	grouped uprights 4 samples; grouped runners 4 samples	50%	0%

Pilgrim purity was sampled from four of the original plantings in order to assess the change in purity over time, with each subsequent planting (Table 3). In almost every situation, purity declined significantly with subsequent plantings of pruning's from the original source. There were, however, numerous sample anomalies, where purity increased over the original level (McPhail q3 to Wood), or where it went to zero and then increased (McPhail q3 to j/k to s1 to a8; Whannell a11 to a4 to a5). It is difficult to explain these results other than being caused by chance and the fact that only a few very random uprights or runners from a bed were sampled. A typical cranberry bed has over 10 million uprights per acre. Because of cost, only a few uprights per bed can be sampled and analyzed. By only taking a few samples there is a likelihood that the results will be non-representative.

Table 3. Change in Pilgrim purity with sequential planting of pruning's			
McPhail q3, 1991 Uprights 85% Pilgrim	McPhail j/k, 1997 0% Pilgrim	McPhail s1, 1998 Uprights 25% Pilgrim, Runners 0% Pilgrim	McPhail a8, 2000 Uprights 20% Pilgrim
	Sacks, 1998, Upright 40% Pilgrim		
	Wood, 1998, Upright 100% Pilgrim		
Jubilee c40, 1980's Uprights 50% Pilgrim Runners 0% Pilgrim	Jubilee c36, 2008 0% upright		
Whannell a10, 1991 Uprights 85% Pilgrim	Whannell a11, 1994 Uprights 100% Pilgrim, Runners 0% Pilgrim	Whannell a4, 2002 Uprights and Runners 0% Pilgrim	Whannell a5, 2007 Uprights 33% Pilgrim Runners 50 % Pilgrim
Allan b-1980 Uprights 0% Pilgrim	Williams 1982 Uprights 0% Pilgrim		

<u>Goal 2</u>: Establishment of genetically pure propagation beds

<u>Procedures</u>:

- A 1.5 acre producing cranberry bed at the Pacific Coast Cranberry Research Foundation farm was scalped, sanded, and treated with Basamid to kill residue perennial weed propagules.

- Growers and researchers throughout the US and Canada were contacted regarding finding, testing and procuring DNA-pure germplasm of Stevens and Pilgrim. Numerous sources were tested for purity. Two sources were found and germplasm obtained.
- DNA-certified pure Stevens and Pilgrim were propagated and planted within discrete sections of new beds at PCCRF.
- These DNA germplasm beds were fertilized, weeded, irrigated and maintained to maximize their growth and vigor. They will be ready for harvest for propagules for the industry by as early as winter 2010.
- These DNA germplasm beds were featured during WSU 2009 Cranberry Field Day.

GOALS AND OUTCOMES ACHIEVED

Goal 1: Assessing the genetic variability and trueness to type of Washington Pilgrim beds.

Goal 1 was accomplished. These results indicate very few grower beds are safe to propagate from. They indicate that there is a strong risk of ending up with off-types with poor production when using pruning's, and that mowed vines would be a much more prudent choice. They further suggest that the farther down the planting sequence the less likely you are to obtain reasonably pure vines. The results, however, don't always indicate that off-type Pilgrim will be poor producers. Some beds with low purity were excellent producers. However, beds with high purity always had excellent production.

Goal 2: Establishment of genetically pure propagation beds.

Goal 2 was accomplished. Beds of pure Stevens and Pilgrim were established and will be maintained by PCCRF. These will be used as propagation beds to help the industry avoid the significant problems of off-types that has plagued its past. This in turn will improve the economic viability of the Washington industry for years to come.

BENEFICIARIES

This project will benefit the long term viability of the cranberry growers in Washington. In the short term, growers will benefit from being able to make more informed choices on what beds are not pure enough to use for propagation and that they should minimize the use of pruning's for new plantings. The long term benefit is that, over time, growers will have a source of vines that they can use to establish and maintain their own propagation beds and be assured of high-producing genetically pure cranberry varieties. Over the next 20 years, this will help assure the industry will remain competitive.

This information was provided in detail in the newsletter "The Cranberry Vine" Dec 2009- circulation 400 (attached). It was also provided in detail at a talk at the Annual Cranberry Grower Winter Workshop January 2010 (presentation slides attached)- attending 90% industry (90 growers). It was also emailed to all growers that requested the full report (about 2 dozen).

LESSONS LEARNED

- It would have been very wise to assess the purity of our cultivars 15 years ago when this technology first became available and before the industry invested in a lot in renovation with off-type vines.
- Beds that look and performed like Pilgrim beds may not be.
- The use of pruning's for establishing a new planting is a big risk, even on fairly pure beds.
- Each grower and the industry at large need a long-term plan to assure a source of good vines for the future.

CONTACT PERSON

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Kim Patten (pattenk@wsu.edu)

ADDITIONAL INFORMATION

Plans are being made to release the results of the Pilgrim DNA assessment study in the next edition of WSU's cranberry newsletter "December 2009 Cranberry Vine". Propagation material from our DNA-certified germplasm beds will likely be available for use by the industry within 1 to 2 years.

Washington State Fruit Commission

Consumer Promotions of Washington Cherries in Mexico

PROJECT SUMMARY

The purpose of this project was targeted at acquiring more Washington state representation and to conduct consumer-focused marketing programs that will create greater preference for Washington agricultural export food products, Washington cherries, in Mexico. Cooperatively pooling the resources of the WSFC and the WSDA will leverage both groups' budgets in implementing an effective consumer-focused marketing program in Mexico. These efforts will translate to actual sales volume increases and will drive near-term success that will lead to the long-term market growth that Washington cherry producers will need to meet their expanding production. Developing this market for Washington cherries will create opportunities to increase sales of other agricultural products such as peaches, nectarines, prunes, plums, apricots, etc., through increased awareness of Washington State brands.

Geographically, Mexico is the second closest export market for NWCG trailing Canada. This market is being looked upon as a growth market by our growers because of the less expensive freight costs than freight to our overseas markets and less stress on the cherries themselves. After a market closure in 2004, NWCG has continually experienced record numbers of shipments to this market. Increased promotional activities funded by industry funds, Specialty Crop Grants and Market Access Program dollars is the major contributor to this growth.

The majority of the Mexican NW cherry consumers are located in the 3 largest cities of Mexico: Mexico City, Guadalajara and Monterrey; other cities like Leon, San Luis Potosi, Puebla, Querétaro also have potential clients, but are not considered prime cherry destinations by the retail stores. 90% of our target consumers can be located in the first 3 of this list.

Our next target destinations for cherries are Cancun and Puerto Vallarta, Mexico's prime tourist destinations. The food service industry in these areas is mostly managed by Costco and Soriana, each with a HRI sales division which provides service to these areas.

Our target consumer is women aged 20 to 65 in the upper middle-income class. They mainly shop at retail stores and select municipal and street markets. Consumers don't know when to expect our cherries - they often confuse our season with that of the Chilean (Nov-Jan) and California (April-May) cherry seasons. NWCG has developed an integrated trade/consumer program to create awareness of our season (July – August) and amplify excitement and expectation for NW cherries.

In a difficult 2008, our NW cherry crop was down 34%, and the overall global export volume was down symmetrically, Mexico was one of only three markets that experienced positive growth for cherry consumption, +10.6%. In response to the 2009 record volume crop, a turmoil global economy, a 25% devaluation in the Mexican peso from 2008, and a 20% tax tariff imposed in March 2009 by the Mexican government in retaliation to US policy on Mexican trucks not entering the USA, the Mexican market again grew 63%.

	2004	2005	2006	2007	2008	% increase over 2007	2009	% increase over 2008
Total NWC production	11,033,444	11,733,886	14,777,432	14,721,863	9,708,809	-34.1%	20,459,269	110.7%
Total NWC Exports to World	2,879,729	3,245,170	3,722,099	4,139,272	2,680,259	-35.2%	5,636,838	110.3%
NWC Exports to Mexico	-	23,840	50,560	66,888	73,968	10.6%	120,739	63.2%
	**All volume is reported in 20# case equivalents*							

Our sustainability in this market has been put to the test multiple times, but with an aggressive marketing/educational campaign, the opportunity for continued market growth is reassuring to our stakeholders. As our total crop production continues to increase annually, it is imperative that export markets, like Mexico, are developed and mature markets are maintained to accommodate the volume and maintain the monetary value that creates opportunity for the highest possible returns for our growers, and assures/supports the long-term viability of the industry.

PROJECT APPROACH Our promotional strategies to grow this market included consumer educational leaflets, point of sale materials and in-store demonstrations and merchandising.

GOALS AND OUTCOMES ACHIEVED The overall goal of this project was to promote Washington cherries in Mexico by educating the consumer and stimulating sales. Specifically, to determine the success of this project, the following measures were used:

		2007 actual	2008 actual	2009 goal	2009 actual
Branding	% of targeted consumers who were aware of our product origin	7%	15%	20%	30%
Conversion	% of targeted consumers who actually purchase our cherries	8%	12%	25%	50%
Volume	Actual volume (20 # equivalents) of cherries exported to Mexico	66,888	73,968	90,000	120,739
Value	Actual value (FOB plant) of cherries exported to Mexico	$2,807,203	$3,567,274	$3,767,400	$3,415,891

Source Data for the first 2 measures: 2009 study by PP&CC Group, S.A. de C.V. "Northwest Cherries Market Evaluation in Mexico, 2009".
Source data for the last 2 measures: 2009 Foreign Statistical Report generated from the Washington State Fruit Commission.

Our deliverables for this grant included:

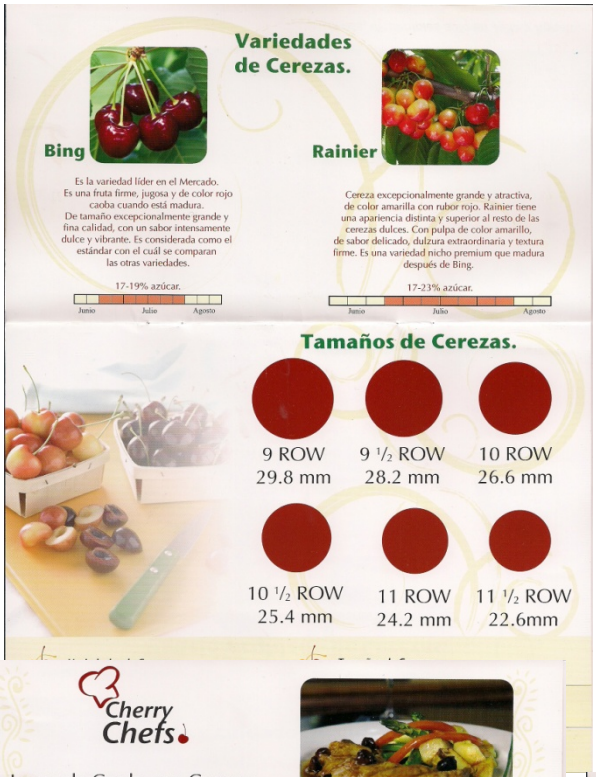
1) Providing Point of Sale Materials (POS) and Educational Leaflets.

   a. WSFC created a consumer leaflet for distribution during the 2009 in-store demos. The 3-fold Spanish leaflets explained when our cherries are available, handling tips for the consumer, three mouth watering recipes and the NWCG and the WSDA logos.

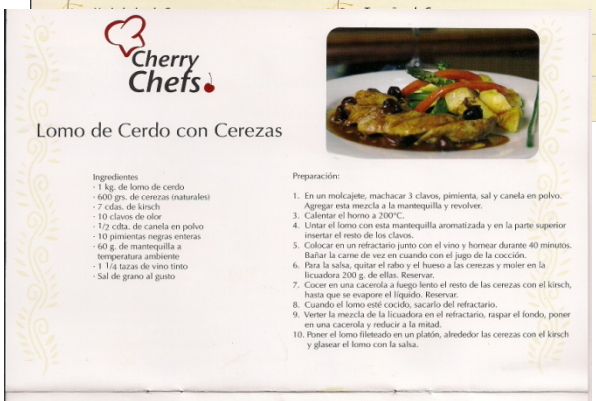
b. Standing out from our competitors, Costco gave us permission to distribute handouts during their in-store demos of cherries. WSFC designed and printed 40,000 flyers that included our Logo, the WSDA logo, a recipe and handling instructions to best prolong the life of a cherry once they are in the hands of the consumer.

c. During the second half of June 2009, our representative Juan Carlos Moreira teamed up with Jorge Audirac, Costco's Food service sales manager in Cancun, to visit the executive chefs and purchasing managers of the main Cancun and Riviera Maya hotel chains to offer NW cherries. WSFC created a food service brochure that included information on care & handling, recipes and freezing techniques. To aid in the success of our food service promotion with Costco, Costco introduced NW cherries in the list of items offered by their food service division in Cancun with excellent results for the first season. Costco is strongly considering expanding this strategy to Puerto Vallarta and Los Cabos in 2010.

¡Crea los mejores platillos gourmet con cerezas!
Cerezas del Noroeste
Fondos parciales proporcionados por la WSDA.
Disfrútalas, disponibles sólo en Julio y Agosto.
Variedades de Cerezas.
Tamaños de Cerezas.
Manejo y cuidado de Cerezas.
Salud y Cómo congelar Cerezas.
Lomo de Cerdo con Cerezas.
Costalitos Sorpresa de Cerezas.


Variedades de Cerezas.
Bing
Es la variedad líder en el Mercado. Es una fruta firme, jugosa y de color rojo caoba cuando está madura. De tamaño excepcionalmente grande y fina calidad, con un sabor intensamente dulce y vibrante. Es considerada como el estándar con el cuál se comparan las otras variedades.
17-19% azúcar.
Junio Julio Agosto
Rainier
Cereza excepcionalmente grande y atractiva, de color amarilla con rubor rojo. Rainier tiene una apariencia distinta y superior al resto de las cerezas dulces. Con pulpa de color amarillo, de sabor delicado, dulzura extraordinaria y textura firme. Es una variedad nicho premium que madura después de Bing.
17-23% azúcar.
Junio Julio Agosto
Tamaños de Cerezas.
9 ROW 29.8 mm
9 1/2 ROW 28.2 mm
10 ROW 26.6 mm
10 1/2 ROW 25.4 mm
11 ROW 24.2 mm
11 1/2 ROW 22.6mm

Manejo y cuidado de Cerezas.
1 Mantener las cerezas fuera de la luz solar.
A mayor temperatura, menor vida de las cerezas y el tallo pierde su color verde.
2 No rociar las cerezas.
Las cerezas absorben el agua a través de la piel y éstas pueden llegar a partirse.
Una cereza pierde más calidad en una hora a 20° C que en 20 hrs. a 0° C.
0° C
32° F
IMPORTANTE: Mantenga las cerezas refrigeradas para proteger su textura y sabor ante las altas temperaturas.
Exhibir las cerezas del Noroeste a granel.
Sugerencia: Utilizar en restaurantes y hoteles, colocar fuentes de hielo con cerezas para el buffet.
Remover las cerezas defectuosas con frecuencia.
Mantener las cerezas frías.
Mantener secas las cerezas, no mojarlas.
Refrigerar las cerezas en la noche.
Pedir cantidades suficientes con anticipación.
Salud.
De acuerdo a investigaciones recientes, se ha encontrado que las cerezas dulces contienen fitonutrientes los cuales podrían influir benéficamente en:
La salud cardiovascular.
Favorecen la protección contra el cáncer.
Mejorar los patrones del sueño.
Disminución del proceso de envejecimiento del cuerpo y cerebro.
Propiedades anti-inflamatorias.
Cómo congelar cerezas...
1 Enjuague las Cerezas maduras y firmes en agua fría, escurra perfectamente.
2 Empaque las Cerezas en bolsas o recipientes para congelar.
3 Elimine el exceso de aire; cierre y congele.
Manejo y cuidado de Cerezas.
Salud y Cómo congelar Cerezas.
Lomo de Cerdo con Cerezas.
Costalitos Sorpresa de Cerezas.


Cherry Chefs
Lomo de Cerdo con Cerezas
Ingredientes
· 1 kg. de lomo de cerdo
· 600 grs. de cerezas (naturales)
· 7 cdas. de kirsch
· 10 clavos de olor
· 1/2 cdta. de canela en polvo
· 10 pimientas negras enteras
· 60 g. de mantequilla a temperatura ambiente
· 1 1/4 tazas de vino tinto
· Sal de grano al gusto
Preparación:
1. En un molcajete, machacar 3 clavos, pimienta, sal y canela en polvo. Agregar esta mezcla a la mantequilla y revolver.
3. Calentar el horno a 200°C.
4. Untar el lomo con esta mantequilla aromatizada y en la parte superior insertar el resto de los clavos.
5. Colocar en un refractario junto con el vino y hornear durante 40 minutos. Bañar la carne de vez en cuando con el jugo de la cocción.
6. Para la salsa, quitar el rabo y el hueso a las cerezas y moler en la licuadora 200 g. de ellas. Reservar.
7. Cocer en una cacerola a fuego lento el resto de las cerezas con el kirsch, hasta que se evapore el líquido. Reservar.
8. Cuando el lomo esté cocido, sacarlo del refractario.
9. Verter la mezcla de la licuadora en el refractario, raspar el fondo, poner en una cacerola y reducir a la mitad.
10. Poner el lomo fileteado en un platón, alrededor las cerezas con el kirsch y glasear el lomo con la salsa.

Cherry Chefs
Costalitos Sorpresa de Cerezas
Ingredientes:
· 2 tazas de cerezas deshuesadas y en mitades
· 1/4 de taza de azúcar
· 2 tazas de harina o almidón de maíz
· 1 cda. de jugo de limón
· 1 cdta. de ralladura de limón
· 1/2 cdta. de canela
· 24 láminas de pasta Filo
· 2 cdas. de mantequilla derretida
· 6 cdas. de queso crema batido
· 1 cda. de leche
3 cerezas a la mitad
Preparación:
1. Combinar cerezas, azúcar, harina o almidón de maíz, jugo de limón, ralladura del limón y canela; revolver bien.
2. Cortar las láminas de la pasta Filo en cuadros de 20 cm. y mantenerlos cubiertos con papel encerado y una servilleta húmeda.
3. Para formar un costalito, barnizar con mantequilla derretida cuatro hojas de pasta y acomodar una sobre otra.
4. Colocar una cucharada de queso crema en el centro de la pasta y cubrir con 1/3 de taza de la mezcla de cerezas.
5. Barnizar con leche la pasta alrededor del relleno, unir las esquinas y presionar firmemente para cerrar el costalito. Colocar media cereza en la parte superior.
6. Acomodar los costalitos en una charola para hornear ligeramente engrasada.
7. Hornear a 190 °C por 20 min. o hasta que dore.

Cerezas del Noroeste
Fondos Parciales Proporcionados por la WSDA.
www.cerezasnw.com
Representante en México: Ing. Juan Carlos Moreira.
e-mail: jcmets1234@gmail.com
Tel. 01 (442) 218.10.97

2. Providing in-store merchandising services and in-store demonstrations during the 2009 season.
    a. Merchandising services are a very important element of success in the Mexico market as retailers are hesitant to purchase or stock any volume of our highly perishable and expensive product to avoid waste. Our merchandisers helped the produce employees build/keep an attractive and sizeable display of cherries and would call the buyers if the store they were servicing was out of cherries which resulted in a constant supply of product for the consumer. Our merchandisers are also very instrumental in securing placement of the POS materials. Below-left is a picture from the 2008 season which was the normal display in 2007 and 2008 at retail stores. In this picture the space devoted to NW Cherries is so small that without the pop-up mini hangers and other POS materials, consumers would not be aware of the presence of cherries on the display. The picture on the below-right is a display organized by our merchandising teams in 2009. Our teams were highly effective in choosing a prime location in the store, highlighting the presence of cherries and promoting impulse purchases.

Combining funds from this grant to our existing MAP & grower dollar budget for merchandising in Mexico, NW Cherries was able to provide our merchandising services to an additional 204 stores in Monterrey, Mexico City and Guadalajara to a total of 258 stores, a 378% increase. NWCG was also able to increase our total merchandising visits by 279 visits to a new season total of 418 visits, a 200% increase. Large quantities of fruit are sold through the street and municipal markets in Mexico City and Guadalajara. It is common to find larger sizes of our cherries here and the consumer is willing to pay a higher price for the quality they can get at the street markets. Merchandising efforts were made at these traditional market venues in order to highlight the presence of NW cherries and increase the impulse purchases. Without the use of POS materials, cherries run a high risk of being over shadowed by volumes of strawberries and other tropical fruits.

Mexico 2009 Season:

Invoiced Merchandising:

Retailer	NWCG/MAP Total # of merchandising visits	NWCG/MAP Total number of stores	WSDA Total # of merchandising visits	WSDA Total number of stores	Total # of merchandising visits	Total number of stores	% increase of total merchandising visits with WSDA $
Chedraui	8	1	20	10	28	11	250%
Co-Mex	16	2	34	34	50	36	212%
Costco	32	29	2	2	34	31	6%
HEB	18	6	0	0	18	6	0%
Soriana	28	7	50	50	78	57	178%
WalMart	32	4	46	46	78	50	143%
Street/Terminal	5	5	127	62	132	67	2540%
Total Merchandising	139	54	279	204	418	258	200%

    b. In-store demos were run in select outlets of major retail chains in Mexico City, Guadalajara and Monterrey during the 2009 cherry season; but, in-store demos ran nationwide with all of the Costco stores. Running demos assured the stores would have product available and resulted in increased shelf space. With the help of WSDA grant funds, we multiplied our volume of demos to include:

Mexico 2009 Season:							
	Invoiced In-Store Demos:						
Retailer	NWCG/MAP Total # of demos	NWCG/MAP Total number of stores	WSDA Total # of demos	WSDA Total number of stores	Total # of demos	Total number of stores	% increase of total demos with WSDA $
Chedrahui	0	0	23	6	23	6	100%
Costco	0	0	160	31	160	31	100%
CoMex	12	2	50	10	62	12	416%
HEB	57	7	0	0	57	7	0%
Soriana	85	9	70	14	155	23	82%
WalMart	30	13	72	11	102	24	240%
Street/Terminal	7	1	0	0	7	1	0%
Total In-Store Demos	191	32	375	72	566	104	196%

Costco is the best client for Northwest Cherries, this season NWCG ran in-store demos and sampling in all 31 stores nationwide, the program covered 3 weekends in July 11 & 12, July 18 & 19 and July 25th with a total of 160 demo days. These demos resulted in a 25% immediate increase in units (clamshells) sold during the demo weekends. Costco experienced an overall 15% increase in clamshells for the season for reds and a 200% increase for the yellow rainier cherry.

The Soriana consumer base best fits our identified target market that would most likely purchase our expensive product. Second only to Costco, Soriana is the largest retailer for NW cherries in Mexico. During the in-store promotions, we experienced a 400% lift in sales which resulted in a 15% overall increase in sales for the 2009 season with Soriana.

BENEFICIARIES

The fresh sweet cherry growers of Washington State are the beneficiary of this project. Building demand by creating awareness in export markets will give our growers a market for their premium fruit. The Northwest Cherry Growers promotes fresh sweet Northwest cherries on behalf of the more that 2,500 sweet cherry growers. The grower split is 80% Washington, 18% Oregon, 2% Idaho-Utah-Montana. There are currently 50,000 acres in production with a growth expectancy to be 60,000 acres by 2012.

LESSONS LEARNED

Because our cherries are out of the market for nine months a year, it is important that the retailer makes our product highly visible. Our targeted Mexican consumers will purchase cherries when they are available and they can easily find them in the store. At store level, when the cherries are visible, in clamshells and the price does not exceed US$5.00 per clamshell, the cherries will fly off the shelves. If cherries are not well identified in the store, they can remain on the shelves until they go bad resulting in a high shrink percentage and lost profit margins. This is a very important message that we have been communicating to the retail produce buyers and managers along with data to back this statement.

CONTACT PERSON

The WSFC contacts for this project are B.J. Thurlby, President bj@wastatefruit.com, and Teresa Baggarley, International Program Manager teresa@wastatefruit.com, or via telephone at (509) 453-4837.

Northwest Agriculture Business Center

Greenbank Community Supported Agriculture Learning Center Project

PROJECT SUMMARY

This project provides "hands on" education on an historic and publically-owned island farm to encourage and train new farmers, increase food capacity, supply community food banks and emergency feeding centers, and deepen the relationships of local agricultural groups to enhance the food system. The funding from the WSDA Specialty Crop Block Grant allowed us to initiate this project.

The Specialty Crop list on the grant guidelines includes organic fruits and vegetables. Our list of produce included potatoes, garlic, sweet corn, and herbs and a wide variety of vegetables and loganberry fruit jam made from loganberry fruit. We did not grow anything that was not a specialty crop and listed in the guidelines. The project had 5 organic acres that were cultivated and recertified along with additional organic acres at Greenbank Farm during our project timeline.

The project improved nutrition by providing food to local food banks and their clients. Five food share boxes were provided weekly to the Good Cheer Food Bank for 20 weeks, improving nutrition of low income residents. Additionally, the project donated over 350 pounds of food from the final field gleaning in October to the Coupeville Food bank. The project provided education about food, nutrition, recipes about how to prepare and cook food, and buying local in weekly newsletters to 56 CSA shareholders over 20 weeks. The project promoted and educated 6 new farmers in how to grow and market organic vegetables and trained them in how to make them available at a local Farmers Market.

The actual end date established for the project was October 4, 2009, instead of September 30th, 2009. NABC received an extension as an Amendment to our contract. The CSA Training Center project and the farmer-trainees concluded the program by participating in the local Whidbey Island Farm Tour event on October 3rd and 4th and in a last harvest and gleaning by CSA shareholders on October 16th.

The CSA Training Center brought many community collaborators together for the first time to work together to teach new farmer-trainees; farmer-trainees were recruited, the land was prepared for growing; and CSA shares were sold to the community to help support the CSA Training Center program. The project administrators and students dealt with normal farming problems like weather, soil fertility and equipment problems. On-going evaluations were conducted by the CSA Coordinator throughout the program and a final evaluation was conducted at the end of the program in October. The work plan was well thought out and served well for the project as the outline and guide for activities, goals, and new farmer training.

Washington State University - Island County Extension Acting Director, Judy Feldman, conducted the evaluation process at the end of the project, interviewing all of the farmer trainees and the CSA Coordinator. Some of the information gained from these interviews was transferred into interview questions for the new CSA Coordinator, which was very helpful.

The students worked hard to establish the CSA Training Center at Greenbank Farm. The project has received support from the USDA Farmers Market Promotion Program for 2010. It took a committed community effort and 58 CSA shareholders to move this new farming project forward. We are excited to move the project into a second year.

The Farmers Market Promotion program grant included criteria to create new farmers, which allowed the Community Supported Agriculture project at Greenbank Farm to qualify and to be supported. This project is for 2010 not 2009 and did not overlap with the Specialty Crop Block Grant. It allows for continuity while work is underway to create financial sustainability. The FMPG includes funds for speakers at the Farmers Market so more people will attend the market, funds for agricultural equipment, and housing stipends for the students. Grant funds increased to train more students (9 in 2010) and increase organic

acres under cultivation from 5 to 10 acres. Additionally, organic seed trials and a contract with a local grocery store have been added to the curriculum as opportunities for students to acquire more skills. A new relationship is being forged in 2010 with Skagit Valley Community College for Continuing Education Unit credits for students in the program.

A farming foundation is established

- A CSA office was opened at Greenbank Farm - with a phone & computer services in the Jim Davis House at Greenbank Farm
- A 20 x 36 foot hoop house was constructed
- A food washing station was constructed
- An irrigation system was established for the site
- Hand tools and wheelbarrows were purchased
- A garlic crop was planted and harvested
- $500 stipends were given to 6 CSA students each month from February through October 1, 2009
- 60 CSA membership shares were sold to the community
- Soil samples were taken and amendments added
- Organic Certification was renewed on the CSA field site
- Organic Manure was added to the field site
- Rows were created in the field site
- Seed crops were selected, germinated and planted in rows
- A working relationship was established with the Greenbank Management Group & staff
- Working relationships were established with the Port of Coupeville & South Whidbey Tilth
- Community relationships with other collaborators deepened because of the CSA project
- More organic local food was produced
- 6 farmer-trainees finished the CSA Training Program
- A new Farmers Market booth was added at the Sunday Greenbank Farmer Market
- Deer fencing was installed
- A CSA Celebration was planned by the CSA advisory committee for the CSA shareholders and farmer trainees on September 22nd, 2009.
- CSA Project was added to the Whidbey Island Farm Map and Whidbey Island Farm Tour.
- CSA farmer trainees and NABC staff participated in the annual Whidbey Island Farm Tour, October 3rd & 4th, 2009.

Greenbank CSA Report

The Northwest Agriculture Business Center hired the CSA Coordinator from one of the collaborator groups involved in the development of the CSA project. Anza Muenchow, Education Director of the South Whidbey Tilth and co-owner of MAHA CSA Farm in Clinton, was selected to coordinate the classes and training and field preparation required for the project. Her contract completed on September 25th, 2009.

From 16 applications, eight farmers were accepted. Six new farmer trainees began their 2009 internship at Greenbank Farm at the end of January with a Hoop House building Project. Each of these farmer-trainees signed a working agreement between themselves and the Northwest Agriculture Business Center. Two more applicants were offered the position, but were unable to commit to the project because they needed to find affordable housing on Whidbey Island. Since original interviews in the winter of 2008, we added and dropped a person and finished with 6 farmer-trainees.

Two of our collaborator's contact people changed. Virginia Bloom replaced the previous Manager Cheryl Sagmeister as the new interim Greenbank Farm Manager. Also, Olivia Forte-Gardner, WSU Extension, had her position eliminated. All WSU Learning Centers were closed due to budget reductions, so the CSA Training Center will not have the opportunity to become a WSU Learning Center. NABC's office

manager recorded all CSA membership shares sales in the NABC database. CSA marketing flyers and a poster were designed to assist in CSA subscription sales.

Curriculum & Training: *The Training Guide for the new Prospective CSA Grower* produced by the CSA at Michigan State University was used as the primary guide for the 2009 program. The 11 classroom training sessions that took place in February and March were designed by the CSA Coordinator and the farmer-mentors from the South Whidbey Tilth, along with oversight from the CSA Project Manager from NABC. Next year, classroom information will include some of Washington State University's 'Cultivating Success' curriculum combined with what was learned from the field site in 2008-09. The South Whidbey Tilth series will also continue as a public opportunity that includes the farmer-trainees. This past year, the series included about 40 small farm business people for each of the 11 sessions:

- **#1 Mon. Feb. 9th Everything you need to know about Seeds** (Instructors: Molly and John Petersons)
- **#2 Wed. Feb. 11th Garden sites, crop requirements, crop rotations, and irrigation design** (Instructors: Eric Conn and Anza Muenchow)
- **#3 Mon. Feb. 16th (yes, President's Day) All about soil** (Instructors: Marc Wilson and Michael Seraphinoff)
- **#4 Wed. Feb. 18th Season extension and appropriate tools for the small farm** (Instructor: Linda Bartlett)
- **#5 Mon. Feb. 23rd Growing greens and early season crops** (Instructors: Molly and John Petersons)
- **#6 Wed. Feb. 25th Perennial crops, berries and tree fruits** (Instructors: Eric Conn and Michael Seraphinoff)
- **#7 Mon. Mar. 2nd All about warm season crops** (Instructors: Marc Wilson and Anza Muenchow)
- **#8 Wed. Mar. 4th Weed and pest management** (Instructors: Gary Ingram and Anza Muenchow)
- **#9 Mon. Mar. 9th Cover cropping/green manures and animal manures and Compost!** (Instructors: Eric Conn and Gary Ingram)
- **#10 Mon. Mar. 11th Harvesting: When, where and how. (**Instructor: Anza Muenchow)
- **#11 Mon. March 16 Year round food growing on Whidbey.** (Instructor: Linda Bartlett)

Education & Workshops

Joel Salatin, Polyface Farm, provided a day-long seminar devoted to sustainable agriculture and pastured-based livestock systems. The event, sponsored by the Northwest Agriculture Business Center and Skagit Farmers Supply, offered morning and afternoon workshops for farmers, ranchers, and others interested in pasture-raised livestock and sustainable agriculture, included the CSA farmer-trainees. Over 120 farmers from throughout the region attended one of the workshops during the day.

In cooperation with the Port of Coupeville and the Greenbank Management Team, the CSA project designed an irrigation system for the CSA field and a washing station for prepping vegetables for market. Both of these were built and implemented by the CSA farmer-trainees.

Two film screenings of special interest to our trainees were provided: "Growing Awareness" and "Good Food." Film producers Melissa Young and Mark Dworkin are Whidbey Island residents and were available at the Good Food film screening. These two events were organized by the CSA Advisory Group and opened to the public, as well as, the farmer-trainees. About 75 people attended the two movies, including the farmer-trainees.

The CSA farmer-trainees toured several local farms, such as the Petersons Farm, a CSA farm in Langley and Rose Hip Farm, a CSA farm in Coupeville, and an apple orchard up the road from the CSA Training Center. They learned about the history and practices of these three farms and the importance of record

keeping. Linda Bartlett, owner of Rose Hip Farm, is a farmer and one of the classroom instructors. Linda served as a mentor for some of the trainees. The other Tilth instructors also served as mentors to farmers. For example, Gary Ingram is a skill arborist and worked with one of the farmer-trainees on fruit tree pruning.

Jake Fowler, an NABC Project Manager, provided a series of four classes to instruct students on business planning. Business planning for year one included a business plan for the Greenbank CSA – using the current program as a model to instruct students about the 'how' and 'whys' of business planning. The NABC business plan template was used for financial planning. Originally, the project had envisioned helping each of the farmer-trainees to write their own business plan, but we found that their plans had not developed sufficiently to provide any meaningful assistance beyond learning how to write a general plan. In the future, we will provide the general business planning information earlier and assistance at the end of the project, after the food has been harvested. The funding for the project also interrupted the normal flow of the seasonality of the program, as it ended at the end of September with one full month of growing. We did organize a gleaning event for the CSA subscribers on October 17th and harvested as much as we could, with the extra going to the local food bank. Next year, activities like this will be within the timeline of the funding.

Setting up the Field and Project

The Port of Coupeville granted 8 acres of public lands for the CSA project. A farmer was hired to plow the field. A 20x36 foot CSA hoop house was constructed on the upper part of the field in late January, 2009 as the first group project. Raised beds were constructed by hand and planting garlic was the second group project.

The Port of Coupeville also donated and installed an irrigation system for the project; however, contractor installation occurred later than anticipated. Once installed, it had to be repaired twice, and finally became fully operational in early April. Because of the delay in the installation of the water system, farmer-trainees had to haul water up the hill to the CSA field 2-3 times a week in huge barrels by truck to facilitate watering of seedlings by hand so they would not be lost. The CSA project purchased drip irrigation for the field and the greenhouse and the farmer-trainees installed it. The un-amended soil required irrigation. Farmed by Christiansen Seed Company until last year, the soil was not amended with organic matter to retain moisture and for the last 15 years. The soil will require continued improvement as the project continues to utilize this land.

Organic manure was purchased and put on the field rows prior to February 15th - per organic regulations. Additional organic compost and fertilizer was purchased. The soil has been the biggest challenge of the project and will require on-going attention as the project moves forward.

Additionally, one of the field organizing strategies was for each farmer-trainee to have their own individual plots of land up to ½ acre per student. This goal had to be abandoned for year-one because the field was too wet to be worked at the bottom of the slop. The soil quality also varied so greatly it would have put some of the new farmers at a disadvantage. In order to get the seedlings into the ground in a timely manner, it was decided to plant together as a group and to work together on all of the rows and crops. Individual choice was considered during seed purchases for each of the farmer-trainees. This change made a difference in the student's overall relationship to the land and to their ownership of the crops. We intend to work harder at making individual parcels a priority in year two for beginning farmer-trainees.

The design of the field was planned and laid out in raised bed rows for planting, and divided into sections. More than 200 trays of seedlings were started at the Au Sable greenhouse, an organic greenhouse located in Coupeville. They were moved during April and May to the Farm and transplanted into the raised beds. Mentor farmers, Molly and John Petersons also provided space in their greenhouses for classes teaching how to begin plant starts with the farmer-trainees. Seedlings were also germinated in the Petersons'

greenhouses. The spring was unusually cold on Whidbey Island and this particular site is windy most of the year, so it was too cold to utilize the new hoop house constructed by the students in the early part of the year. Offsite greenhouses were used in February, March and April because they had access to electricity and warming blankets for heat. Electricity is not available at the CSA site currently, but we hope to add it during 2009-2010.

A new produce washing area was built in the lower section of the field. It consists of a recycled double stainless sink and a newly constructed 10X10 foot roof with extended awning (also recycled). It was considered a "temporary structure" by the Greenbank Management Group and is not a permitted building. It is a very sturdy post and beam covered building that provides shade and rain protection. A potable water line was attached to the sink. Salad mixes and other produce was washed and prepped in this area before bagging it for the CSA customers. The location of the washing station provided easy access for CSA vehicles to park and load for deliveries to the customer pick up sites.

Fencing was an on-going concern, but deer and rabbit were not a problem until late July. Deer fencing and posts were purchased to discourage their presence in the upper field in late July. Tall grasses beyond the upper field allowed deer to enter our field from the woods without being seen. By the time we realized this was a problem, the tractors, owned by the Greenbank Farm, were not able to mow this grass down. Although this was an unbudgeted expense, we felt there was no choice but to get the fencing up to discourage the deer. Fencing will be an on-going problem and is under discussion with the Greenbank Management Team.

Organic Certification Inspection (Greenbank Farm Renewal)
Much of the field information and seed orders are in the organic certification notebook which remains at Greenbank Farm and must remain available for inspectors whenever they occur (announced or not announced).

On June 24th, 2009, the WSDA organic certification inspection took place at the Greenbank Farm. In the past, this has been managed and facilitated by the Greenbank Management Group. This year, because the land use changed from the Christiansen Seed Company to the CSA Training Center, the CSA Coordinator facilitated the major part of the inspection. Also in attendance was: the executive director of the Port of Coupeville, one of the port commissioners and the director of the Greenbank Farm Management Group. This group met with the inspector to review practices and records to meet the standards for organic certification. After several hours of reviewing records, discussing practices and walking the farm grounds, the CSA Training Center project met all the standards and passed all aspects of the inspection.

Food Shares & Customers
The community purchased 58 CSA shares by May 30th, with 6 of these going to the Good Cheer Food Bank. CSA Shares were closed in mid-June and a waiting list was started for 2010. The weekly harvest for CSA boxes began May 26th. The produce was harvested from the field and prepared in the boxes on Tuesdays and Fridays. There were 6 pick-up locations for the customers: Oak harbor (at Home Place), Coupeville (Burks's residence), Greenbank Farm (on Jim Davis porch), Freeland (Island Athletic Club), Bay view (Tilth market), Clinton (Pickles Deli). After much discussion about boxes and bags, the CSA purchased 100 wax-lined boxes for customer shares. NABC provided the accounting and record-keeping support.

The CSA Training Center also participated in Sunday Markets at the Greenbank farm and sales averaged about $100 each Sunday.

A GMail account was established to send emails to the CSA customers. The contents of the boxes were recorded in most of those emails, though the first few boxes weren't described very well. CSA harvests began the week of May 26th, and then occurred every Tuesday and Friday until Oct. 2nd. That included 19

weeks of boxes for each customer. CSA Farmer-trainees harvested three times a week: for CSA members on Tuesdays and Fridays and the Sunday Market on Sunday morning. Greenbank Sunday market began May 3rd and the CSA students sold at about 50% of these markets. Most regular CSA shareholder boxes contained a selection of 7-9 items. Our early season products consisted of green onions, garlic scapes, bok choy, romaine, gai lan (Chinese broccoli), arugula, spinach, kale, radishes, mustard, peas and rapini. Bok Choy was the best, with very large crisp heads with minimal insect damage. We had no slug damage and minimal leaf insect damage.

Later produce included cabbage, carrots, broccoli, kohlrabi, fennel, and fava beans. The garlic was prolific but the onions never produced well. The beets were almost a complete failure. We always had some sort of salad mix, usually lettuce but also assorted baby greens and New Zealand spinach. Carrots were a great crop, sweet, straight and lots of them. We started giving small ones as we thinned the patch, but later they were quite large. Bush beans were short lived, only 3 weeks of deliveries but were of good quality. A later variety of pole beans provided a later crop of beans. The summer squash was prolific, as well as the cucumbers. Some tomatillos were delivered in September and the ground cherries were enjoyed at the Harvest banquet. Lots of tomatoes ripened in the hoop house and some in the outside beds too. We had a few peppers, but only enough for a week or two of the CSA boxes. Pumpkins and winter squash were plentiful but didn't come in until the very end of the deliveries.

Most customers reported enjoying the diverse crops and some had email conversations via the CSA email. The CSA offered a weekly email newsletter that went out on pick up days with recipes, a brief report on the field practices, and growing conditions for the next harvest. This went out on Tuesdays and Fridays of each week.

Garlic varieties were harvested and the Greenbank Management Group provided space in Barn B to hang and dry the garlic. This is a good example of how the Greenbank Management Group became more flexible to the CSA facility needs and found space for our production needs as the year progressed.

The Farmers-trainees

The project began and finished with 6 farmer-trainees. Five of the six who completed the program were the same five people, who were accepted in December and began in January, 2009. The sixth person slot changed several times and a seventh student returned after a medical absence on a reduced schedule. Four of the students were college graduates and three had some college. All who finished were residents or had family on Whidbey Island. Ages varied from 22 to 56 with four men and two women. None of the students knew each other prior to the program and ended as a group. I am confident that they will find ways to support each other's agricultural endeavors in the future.

After harvests began, student time and attention turned to the field. At the beginning of each week, farmer-trainees walked through the planted rows and evaluated each plant and row, deciding on what was to be harvested that week, what needed to be weeded, what else could be planted. The 30 hour farmer-trainee commitment went by quickly during these weeks. The CSA Coordinator addressed what was or was not happening with each plant row and what must happen for the plant to be harvested. A list was made of priorities (from 1 to 3) of work that was needed. Each week a different student was in charge of the priority list and required to transfer that list to the white board in the CSA greenhouse. The priority list dictated what the students needed to accomplish in between harvests. This list was used by volunteers, as well, to address field weeding priorities.

The CSA Training Project produced a new color poster designed by local artist, David Iles, to promote the project and 50 copies are displayed on Whidbey Island to attract more CSA sales. To communicate better with our customers, a new free email service through Gmail was established: Greenbankcsa@gmail.com . An E-NEWSLETTER to CSA customers started in July to inform subscribers of progress.

The farmer trainees worked as a team in the field Monday through Friday, 10am to 5pm and on Sunday to provide coverage for the Farmers Market booth. Three weekly harvests took time away from the field for planting and weeding. The group of six farmer-trainees learned to work hard as a group and that priorities were critical to the group's success. They also ate lunch together three times per week, which helped bring the group closer together, and making meals from food harvested in the CSA field.

The Farmer-Trainees:
Todd Peterson of Clinton, WA has been gardening and keeping bees on Whidbey Island for 30 years. He completed the WSU Master Gardener training in 2009. Todd is a member of the board of directors of the Whidbey-Camano Land Trust. He holds a Bachelor's degree from Dartmouth College and a Master's degree from Stanford University.

John Burks of Coupeville, WA was raised in Southeastern Oklahoma and attended the University of Oklahoma where he received a BS in Chemistry. He obtained a PhD in Organic Chemistry at Indiana University in Bloomington and spent three years doing postdoctoral research at the University of Wisconsin in Madison and University of Washington in Seattle. John worked as a process development chemist with Eli Lilly and Company, and retired at the end of 2007 with the intention of pursuing viticulture and winemaking.

Katie Shapiro of Freeland, WA was born and raised on Whidbey Island and recently returned from Seattle to begin farming on Whidbey Island

Aracely Knox of Greenbank, WA moved here from the San Francisco Bay Area, with the intention of starting a sustainable family lifestyle. She trained in Culinary Arts at a city college after graduating from high school. Under the tutelage of an Austrian chef, Aracely was encouraged to travel to learn culinary approaches in Europe.

Erik Swanson of Clinton, WA was born and raised on Whidbey Island and after a brief college experience in 08/09, he decided he wanted to try his hand at farming.

Daniel Werner of Clinton, WA came to Whidbey Island from Oregon and plans to re-locate on Whidbey Island.

Of the six students who finished, three were under 30 and three were over 40; two were women and four were men.

Collaborators & Volunteers
The core collaborators were: The Port of Coupeville, The Greenbank Management Group and the South Whidbey Tilth, Good Cheer Food Bank, and the Unitarian Church. WSU lost personnel attached to this project during the state budget cuts and were unable to contribute, except for the final CSA evaluation in late September.

A new collaborative relationship was established with AuSable Institute, a non-profit located up the road in Coupeville. Farmer trainees used the AuSable organic greenhouse for organic 'starts.' This greenhouse along with the new CSA hoop house provided trainees with greenhouse space to extend the growing season, especially important at the beginning of the season. The CSA trainees planted many tray seeds at AuSable. Also, Farmer/mentors Molly and John Petersons donated organic space in their greenhouse for demonstrations and growing of seedlings.

Thousands of seeds were planted and trainees ordered thousands more to plant in the late spring. Parks Seed provided a discount on orders and Skagit Farmers Supply provided discount's on the purchase of organic fertilizer.

Twenty-five 8th graders from a private school in Seattle worked for 4 hours transplanting, weeding, planting potatoes and preparing beds for seeding. Another worker from juvenile detention worked with us on June 7th.
The staff from Edmonds Community College came out to consider us for a service learning site. WSU provided the Small Farms Team with a tour of the project.

David Bauermeister, Director of NABC, met and spoke with the students in June to check-in with them and review the program progress, responsibilities, and commitments of administrators, partners and students.
The CSA Advisory Committee was created and served to support outreach efforts of the CSA. It planned and supported the movie series and the Harvest Fest event for CSA food share members and farmer-trainees as a concluding event for this year's famer trainees on Tuesday, September 22nd. They also made other recommendations for volunteer help and for student housing in year two.

Skagit Farmer Supply donated reduced fertilizer and co-hosted a workshop also several seed companies donated seeds or reduced prices for seeds. All of these new relationships will be built on in year two. The Washington State Department of Agriculture Specialty Crop Block grant donated $40,700 to initiate the project. A donation for the CSA Project was received from the Langley Rotary Club for $775. The Freeland Unitarian Church devoted two educational sessions for their parishioners on local food system issues and the Greenbank CSA donated two CSA shares ($1,000) to the local food bank. The Port of Coupeville donated one $500 share to the Good Cheer Food Bank. Additionally, the Port of Coupeville assisted by providing the land and irrigation for the project with the office space for the program at the Greenbank Farm. NABC provided the support for supplies, electricity and office equipment at the Greenbank Farm.

The USDA Farmers Market Promotion Program has funded this program with a grant of $68,000 for 2009/2010. The Northwest Agriculture Business Center has supported the project with staff and funds for the CSA Coordinator and part-time field supervisor in its 2009-2010 approved annual budget. The in-kind collaborators will be supporting the project into 2010. We are hiring an additional part-time field supervisor, based on feed-back from the farmer trainees.

I don't think we experienced any problems out of the ordinary for a year-one start up project and we were able to over-come all of them with good humor and a can-do spirit. We experienced growing pains with collaborators as each of the groups played their roles and became responsible for pieces of the project. Those experiences helped develop the platform for deep relationships between the groups. The CSA shareholders were happy with how the year went and supportive for our plans to have the CSA function next year. Early on in the project, the lack of housing for students discouraged off-Island participants and two exceptional applicants turned us down for lack of housing. The housing hurdle has been crossed by including the WISH Foundation in the application process for 2009-2010. This Whidbey Island non-profit assists in matching people who need housing with suitable living arrangements on Whidbey Island.

Our first CSA Coordinator, Anza Muenchow, will be returning to her own farm in Clinton, although she will assist in some teaching in 2009-1010. Anza put in a great year and wished to return to her farm in 2010.

We interviewed 5 excellent candidates and hired a new CSA Coordinator in the beginning of October, 2009. Sebastian Aguilar, our first choice candidate, is an organic farmer from Port Townsend. We would like to have more funds in reserve in the future so we have sufficient funding for the project to continue through the end of December, instead of late October. This would make the transition smoother from one year into the next.

GOALS AND OUTCOMES ACHIEVED

The Greenbank Farm CSA Training Center is envisioned as a long-term project, although funding received was for one year only. Farmer-trainees were trained and mentored on how to produce food using the Community Supported Agriculture (CSA) model - based on direct marketing and relationships with consumers. Participants were exposed to a diversified cropping system while growing a variety of fruits and vegetables. Eight farmers were selected and 6 completed the training - the first-of-its-kind CSA Training Center in Western Washington. The program and the farmer-trainees achieved the following:

1. **We constructed one hoop house for the project**, which allowed us to grow a variety of vegetables requiring more heat, such as tomatoes.
2. **CSA shares were sold to 58 subscribers, not the 80 that was our original goal**. Diversified vegetables and fruits for CSA memberships included low income families through 6 food shares delivered to the Good Cheer Food Bank. This did not meet our goal of 80 subscribers but we felt this was sufficient to provide students the experience they needed, while producing sufficient quantities of food for subscribers. In hind sight, our goal of 80 subscribers was too ambitious and would have put too much pressure on the farmer-trainees. **Six CSA shares went to the Food bank in Langley, not 25**. The reason for this was that the Good Cheer Food Bank established a community Garden last year and they were producing vast amounts of fresh produce for their clients, so food shares from the CSA were not needed.
3. Because of their Community garden and 6 CSA food shares, our food bank partner increased their volume of local food distribution to their clients during the 19 weeks of the CSA and Farmers' Market Season (May - October).
4. Surplus food grown by the CSA farmer trainees was sold at the Greenbank Farmers Market on Sundays, but the total number of farmer's market consumers was low.
5. The farmer trainees provided a new source of local foods to people who had never been members of a CSA. Over 90% of our subscribers had never participated in a CSA.
6. The farmer trainee increased the number of acres used for growing fruits and vegetables on Whidbey Island.
7. New farmer trainees established relationships with local farmers and the agricultural community.
8. The CSA project was not able to become a WSU learning center site, because budget cutbacks cut WSU learning sites.
9. Farmer trainees and others involved with the CSA Training Center provided talks and information for the community at meetings and churches, Farmers Markets, etc., establishing connectivity between public and private groups who support a local food system.
10. This central Island CSA project has established a new direction for Greenbank Farm and is strategically positioned to become an important future link in an Island food distribution system.
11. The Loganberry patch (1/2 acre) at Greenbank Farm was maintained and enhanced by CSA farmer trainee volunteers during 2008-09.
12. The Whidbey Island Food system is more secure because there are more farmers to produce local fruits and vegetables. **The program graduated 6 new farmers**.
13. **We conducted over 12 educational workshops dealing with CSA and small farm issues, open to the public, well beyond the goal of 4-6 workshops**.
14. We did not develop our own CSA Manual but used *The Training Guide for the new Prospective CSA Grower* produced by the CSA at Michigan State University.
15. **We had 7-8 collaborator meetings, more than the (3) three planned**. Most of these were dealing with issues that came up along the way and required conversation and decision-making. Some of these were attended by our CSA Advisory Committee. They served to deepen the relationship between the collaborators.

BENEFICIARIES

The direct beneficiaries consist of the 6 farmer trainees, the consumers who were the CSA shareholders and their families. The 6 farmers learned the skills required to be CSA farmers or fruit and vegetable farmers. All 6 graduating farmers live and own land on Whidbey Island. Indirectly, the Whidbey Island

food system benefited by having time, interest and money directed to re-establishing food system building blocks at a central Whidbey location. The collaborators became more knowledgeable about CSAs and food system issues, and ultimately the consumers from all income groups on Whidbey Island benefited by having more local fresh food choices.

LESSONS LEARNED

I don't think we experienced any problems out of the ordinary for a year-one start up project and we were able to over-come all of them with good humor and a can-do spirit. We experienced growing pains with collaborators as each of the groups played their roles and became responsible for pieces of the project. Those experiences helped develop the platform for deepening relationships between the groups. The CSA shareholders were happy with how the year went, as reported in their evaluations, and supportive for our plans to have the CSA function next year.

We have hired a new CSA Coordinator to replace Anza Muenchow. His name is Sebastian Aguilar and he has been an organic farmer for the past 13 years. Anza put in a great year and wished to return to her farm in 2010. She will most likely take part in some of the training classes in the 2010 schedule.

Another lesson we learned is that we need an invested farmer at the Training Center, who can be paid for teaching and also be able to have agricultural projects that provide additional income to the resident farmer. All of the outside activities may have educational opportunities for students, but we now believe that it is important that the CSA Training Center farmer be a part of and perhaps be a leader of the local agricultural community.

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Washington Apple Commission

Retail Layout Design, Merchandising and Handling Techniques for WA State Fruits in India

PROJECT SUMMARY

The retail infrastructure for fresh produce in India at present is quite poor. Most of the sales still happen from wet markets and small street side vendors. However, the retail landscape in India is undergoing a revolution and a number of large Indian companies are setting up organized retail chains and new supermarkets can be seen across the country. The smaller and medium cities are now getting the first imprints of modern retailing. However, counter sales staff of the newly developed supermarkets greatly lack in knowledge about handling a high value perishable produce like Washington Apples. The on-going trade education efforts of the merchandisers have focused on creating awareness about variety and health attributes of Washington Apples. That training has been felt to be insufficient for the long term although it helps the retailers on the spot for a short-term education on handling, display, storage and other technical aspects associated with Washington Apples. A requirement has been identified to impart technical training to produce handling personnel and management of retail outlets and wholesalers on how to handle, display, store high value perishable products in general and Washington Apples in particular and also make additional revenue by promoting it to the consumers.

It is envisaged that the training will also benefit a complimentary product from the State like USA Pears.

PROJECT APPROACH

New retailers have limited exposure to the design layout and merchandising ideas of US fresh produce in their stores. Most of the fresh produce sections in these outlets are not designed to maximize sales. In addition, produce handling and training need to be intensified at the store level since most retail produce staff lack proper handling and merchandising skills. Modern retailers are increasing their share of fresh produce sales (currently about 10%) at the expense of traditional wet markets (currently 90%). Improved produce handling and display will accelerate this process. High quality U.S. fresh fruits and vegetables will be a major beneficiary of market share growth by the modern retail sector with our longer shelf life, better appearance, timely delivery versus our primary competitor, China.

GOALS AND OUTCOMES ACHIEVED

The overarching goal is to increase sales of Washington apples in the Indian market by creating strong partnerships with emerging retailers. WAC hopes to convince at least one of the six modern retail chains of the profitability of renovating their produce section and to adopt model design proposed by PMA consultant and WAC representative.

Baseline *2008: Number of Modern Retail Outlets renovating fresh produce section: 0*
2009: Number of Modern Retail Outlets renovating fresh produce section: 3
2010: Number of Modern Retail Outlets renovating fresh produce section: 6
2011: Number of Modern Retail Outlets renovating fresh produce section: 8

Baseline: 2006: Total imports of Washington Apples amounted to $12.6 million
2007: Total imports of Washington Apples increased to $24.8 million
2008: Total imports of Washington Apples will increase by 10% to $27.2 million
2009: Total imports of Washington Apples will increase by 15% to $31.4 million
2010: Total imports of Washington Apples will increase by 15% to $36 million

Project Purpose/Description

The rationale of the trade training program will be to work with retailers and produce handling personnel with a long-term aim of educating them on how to undertake ongoing training program internally with counter sales personnel. The objective of the training program will also be to brief the small retailer about the long term profit opportunities that retailing Washington Apples provides. It would enable all levels of

trade to be better equipped and self-sufficient to merchandise, display, handle and reduce spoilage to create trade confidence in handling and storage of larger volumes and varieties of Washington Apples.

The Commission, through its Marketing Associates, will develop and conduct formal apple handling, storage and display training campaigns and workshops for the entire wholesale and retail trade levels in the five most important markets of India – New Delhi, Mumbai, Chennai, Hyderabad and Bangalore. The program will be designed to improve trade's knowledge on handling techniques for all aspects of Washington Apples. The plan is to conduct one-day formal trade education workshops in these five cities and in addition continue season long campaigns. The five cities also act as regional hubs for the organized retailers and it is envisaged that retail personnel from the neighboring small and medium cities where the chains are establishing their outlets will also participate in this training program.

The content of the workshop/campaign will include, but is not limited to:

- Educate trade on maintenance of cold-chain and maximize sales; Post-harvest management of apples; Storage and merchandising techniques; Display techniques; Video illustrations covering most of the topics stated above

It is envisaged that the retail chains will provide continued and consistent growth for Washington fresh produce in India. Unfortunately, existing produce departments in most retail chains are not designed to attract customers with displaying multiple varieties. Most retail produce staff lack merchandising and handling skills, which leads to product wastage and lower profitability. Efforts are needed to enhance the ability of the produce departments to generate increased sales through better layouts and handle the fruit better.

Potential Impact

Washington State fruits both apples and pears are the top seller in the Indian market but face severe competition from cheaper Chinese varieties. For apples, competition also exists from the Southern hemisphere suppliers especially during the end of the season. Continued efforts are needed to increase the US market share. US fruits and vegetable marketing system provides a number of characteristics attractive to modern retailers, including longer shelf life when properly handled, consistent quality, and reliable delivery and quality. USDA and industry funded promotional efforts are attractive to modern retailers.

With the U.S. being virtually the only country promoting fruit sales during the winter months from October to February, we have an advantage when stores understand how to promote better and design more attractive promotional displays. As noted above, the retail sector is rapidly growing and the potential exists to double our sales to the country within the next 5 years, particularly if we are able to build those strong retail partnerships through training them on how to effectively handle and merchandise high value Washington apples.

Crop Year	Volume	Average Price	Total FOB Value
2003-04	162,798	$13.28	$2,161,957
2004-05	785,235	$10.31	$8,095,773
2005-06	861,379	$12.35	$10,638,031
2006-07	1,402,695	$14.92	$20,928,209
2007-08*	849,695	$18.63	$15,829,818

*through 7/31/2008

Rationale for requesting WSDA Specialty Crop funding

Most retail chains merchandising staff do not possess international experience in terms of designing layout for the produce section. They are likely to be locally trained and they learn about merchandising techniques from their superiors while on the job. Produce handling trainings that are available in the retail

chains lean toward produce in general and are not U.S. specific. There is a crucial need to educate the rank and file in the retail chains on the different types of fruits available from U.S. and apply different handling techniques for these fruits.

Work Plan

Task/Activity	Who's Responsible	When Completed
Coordinate Training w/ PMA	WAC Wenatchee	September 2008
Initial store checks to measure benchmarks for outcomes	WAC –India	November 2008
Training Design and Translation of Materials	PMA and WAC- India	November 2008
Schedule Training w/Retailers	WAC –India	December 2008
Training	PMA w/ WAC – India	January 2009
Follow up Interview/Store Checks	WAC – India	April 2009
Submit Reports	WAC Wenatchee	As required

Project Commitment

Washington State has earned a high reputation for the quality of our apples (and other produce as well). Retailers are eager to learn new techniques for maximizing their revenue from the produce department and WAC has received several requests from major retail chains to help them with merchandising and display tactics. We anticipate that retailers will support and implement the information they gain from the seminars, especially as it will be from the leading produce industry information source, the Produce Marketing Association. WAC-India will actively assist in planning content as well as attending the seminars, and will have the added benefit of passing along key points to retailers in cities and chains not targeted by the project.

Project Background

The Washington State Department of Agriculture and Washington Apple Commission (WAC) commissioned John Baker of Produce Marketing Australia to deliver a series of retail training programs in January 2009 to representatives from a range of supermarket chains operating in India. The program was based on the implementation of similar workshops conducted for retailers in Malaysia and China in late 2008.

A feature of the India program, compared with earlier workshops, was undertaking one mixed retailer workshop in each of the five main commercial cities in India – Chennai, Bangalore, Hyderabad, Delhi and Mumbai. This meant scheduling some retail visits on the day prior to each workshop and the balance at the end of the workshop.

As a result, this required even more coordination than the earlier series of workshops in Malaysia and China. Assessing and arranging venues, promotion of the workshops to multiple retailers in each location and coordination of logistics (travel, accommodation, sourcing product for the workshops etc) all required greater input from The SCS Group, Washington Apple Commission's representatives in India. Their on-the-ground execution of the program made a significant difference to the success of the workshops, as shown in the evaluation responses from retailers.

Additionally, prior to the workshops, an extensive retail survey/audit/profile report was prepared by The SCS Group. The survey of 10 retail groups was an invaluable resource in preparing and delivering the workshop program.

The Brief

To provide training to at least five hypermarket/supermarket chains, in produce department layout design and produce handling, as set forth below:

1. Conduct store visits prior to the workshops for each of the participating retailers to assess:
    a. Current performance with the participating products, especially apples
    b. General store layout and performance in fresh produce (front and back) - receiving, storage, handling, cold chain, food safety, product range, display, promotions etc
    c. Meet with store staff to determine
        i. Profile of customer base – how often and when (time of day) do they shop for regular items (top up), discretionary products (and what are they) and impulse items. This has implications for where imported products fit, "Fresh @ 5" merchandising if shopping is later in the day etc
        ii. Existing levels of knowledge and information in the areas to be covered.
2. Conduct workshops (half day) customized for each participating retailer (or collectively for smaller retail groups) that will include:
    a. Product and merchandising information that may include the following products: apples (the main emphasis), pears, table grapes, berries, summer fruit, potatoes, carrots and onions
    b. Information on cold chain and food safety requirements; trends in fresh produce; developments in organics
    c. Retail concepts and ideas from other markets (USA, Australia, New Zealand, etc.) that may be applied in India.
3. Follow up with store visits to participating retailers to provide further guidance on practical applications of information from workshops, clarify any issues raised in implementation of the training and provide feedback.
4. Prepare all resource materials and make available to participants: product specific and generic information; store concepts and any other relevant training materials in English, with translations, printing and distribution to be handled by WAC.
5. Provide WAC with a written report at the end of the project with an evaluation of pre and post-project merchandising and handling activities of the participating retailers, with recommendations for follow-up activities for both WAC and participating Agricultural Trade Office staff. Contractor may use participant evaluations to assist in this evaluation, including:
    a. "open book" assessment by attendees at conclusion of each workshop, to reinforce key messages and assess level of knowledge achieved
    b. Participant survey of value and effectiveness of workshops and materials

Workshop format at Chennai (and similar at other venues)

Implementation

The program was based on the development, implementation and evaluation of retail training program conducted for the WAC in Malaysia in September and China in December. The structure for the presentations was developed from John Baker's experience as an Australian-accredited trainer in Workplace Training and Assessment. The SCS Group retail report was extremely useful, in providing

information to guide where the workshop emphasis should be placed – in particular, few of the retailers have back-room cool rooms for storage of perishable products, necessitating developing suggestions on alternative methods to keep product as cool as possible.

The draft workshop content was provided to SCS Group for their review and feedback. The presentation was then submitted to Washington Apple Commission for approval. Some minor changes were made to the Power Point presentation during the evolution of the workshops, reflecting feedback from retailers. A copy of the final presentation in Mumbai is included with the report.

The program consisted of three components:

1. Pre-workshop visits to a cross-section of stores, to undertake element 1 of the brief
2. Deliver half-day workshops (element 2 of the brief) and
3. Undertake follow-up store visits with participants to review and discuss application of the information from the workshop (element 3)

The training schedule was as follows:

Date	Itinerary
Saturday, 17 January 2009	Arrive in Chennai
Sunday, 18 January 2009	Store visits in Chennai
Monday, 19 January 2009	Training Program in Chennai
Tuesday, 20 January 2009	Travel to Bangalore and Store Visits in Bangalore
Wednesday, 21 January 2009	Training Program in Bangalore
Thursday, 22 January 2009	Travel to Hyderabad and Store Visits in Hyderabad
Friday, 23 January 2009	Training Program in Hyderabad/Travel to Delhi
Saturday, 24 January 2009	Store visits in Delhi and Gurgaon
Sunday, 25 January 2009	No scheduled activity
Monday, 26 January 2009	Indian Republic Day – Program review with SCS
Tuesday, 27 January 2009	Training Program in Delhi
Wednesday, 28 January 2009	Travel to Mumbai and Store Visits in Mumbai
Thursday, 29 January 2009	Training Program in Mumbai
Friday, 30 January 2009	Depart for Australia

Workshop Content

The workshop content was structured into five units:

1. Product management, including ordering, receival, storage, temperature, humidity and ethylene management (i.e. primarily back-of-store management).
2. Ticketing, display and promotions (front-of-store)
3. Cleaning and sanitation
4. Product Information, using Washington apples as a case study in implementing units 1 and 2, and also including the other products listed in the brief. In addition, and to make the workshop of more value to participants and US suppliers, additional products were added, including citrus, bananas, mangoes, Asian pears, tomatoes, melons and cabbage
5. Retail trends, developments and concepts, using photographs from a range of retailers in the USA, Australia, New Zealand, Europe, China, Malaysia and Latin America, to highlight developments, such as catering to convenience, organics and diverse retail concepts.

Program Delivery

(1) Pre-workshop visits:

(a) Visits were made to as many of the participating retailers as possible in each city, with the balance visited at the conclusion of the workshops. All retailers were receptive to the visits to their stores, including an inspection of back-room and front-of-store facilities

(b) Highlights from these visits included:
   (i) A lack of back-room refrigeration in most retail formats
   (ii) Only a basic knowledge of the importance of product display and ticketing
   (iii) Small preparation and storage areas
   (iv) A focus on the 'real estate' value of the fruit and vegetable section, and the dollar returns expected, rather than viewing the section as also being a major contributor to attracting customers, creating an overall image for the store etc
   (v) The use of "weighing stations" in produce departments
(c) The SCS Group representatives coordinated and also attended the store visits.

(2) Workshops:
(a) Bound copies in color of the Power Point presentation were made available to participants (4 slides per page)
(b) Participants were advised soft copies of the presentation would be made available on request to SCS Group. There were strong indications most retailers would be seeking copies, primarily to use for training store-level staff. A number of participants also copied the presentation to memory sticks, at the conclusion of each workshop
(c) Samples and examples were used where possible to reinforce key messages in the different workshop units. For example, a range of retail and promotion resources was used to support product information in Unit 4 of the workshop
(d) Sumit Saran and Keith Sunderlal from SCS Group presented the Promotion content for the Washington apple case study in Unit 4. Using the in-country representative, and presenting 'local' information about Washington apples and promotions, worked well and provided variety in the workshop content. It also helped encourage participating retailers to consider and schedule additional promotions for Washington apples
(e) To reinforce the key messages, a quiz (with Washington apple 'give aways') was conducted during each Unit. This proved to be an effective way to encourage participation, as well as highlighting and reinforcing the information presented
(f) At the end of each workshop, participants were asked to complete and return an evaluation form. In the evaluation, they were asked to rate the value of each of the units presented, whether they would make changes in any practices in each of the five units presented, and if so what those changes would be
(g) At the conclusion of the third workshop, Sumit Saran from SCS Group suggested additional questions should be added to the evaluation – focusing on feedback on the best features of the program, plus asking for suggested improvements. These questions were included in the Delhi and Mumbai workshop evaluations
(h) In Delhi, the USDA Agricultural Specialist at the US Embassy Deepa Dhankhar attended the workshop. In addition, Keith Sunderlal hosted a function in Delhi on 24 January, attended by the US Agricultural Attaché and other Embassy staff and the opportunity was taken to provide them with a progress report on the success of the workshops.

(3) Post-workshop store visit: The purpose of the post-workshop visits was to cover the balance of participating retailers and to reinforce the store-level application of the information presented in the workshops. Because of the number of participating retailers and the congested travelling conditions in India, the visits were generally limited to around 30 minutes. Main points of discussion were the use of color, ticketing, promotions and lighting to enhance displays, as well as options for the location of products within the fruit and vegetable section, using Washington apples as the main example.

Results and Evaluation

Almost 150 participants attended the workshops, with each workshop ranging in size from 20 to over 30. Despite the attendance of different retailer representatives at each workshop, there was good interaction from participants. Overall, 124 evaluation forms were completed and returned by participants. The profile of responses was:

Workshop Location	**Participants**	**Responses**
Workshop 1 - Chennai	30	22
Workshop 2 - Bangalore	33	33
Workshop 3 - Hyderabad	36	29
Workshop 4 - Delhi	19	14
Workshop 5 - Mumbai	29	26
Total	**147**	**124**

Comments on Suggested Improvements

1) There are some very good suggestions and, where possible, they are covered in the recommendations of the report e.g. nutrition and health benefits, availability of soft copy of presentation, additional AV aids
2) Quizzes and questionnaire for response by individual participants are more important where workshops contain mixed retailers
3) The Washington apple industry video was shown prior to the start of the workshops and the retail video was used at the end of each workshop.

Two email testimonials were also received from participants, after they had participated in the workshops. There comments were:

> "*Thanks for organizing a very useful training workshop on management of fresh produce at organized retail outlets in the Indian scenario. Thanks all the same for extending the invitation to us. Feedback about the workshop from my regional teams at Chennai, Bangalore and Hyderabad is very good. I specially thank Mr. John Baker for sharing his knowledge and his experience with members of the organized retail in India.*
>
> *Taking a cue from the program we are a planning a very big/never before promotion activity on 'Washington Apples' across all our stores in Chennai, Bangalore and in Hyderabad in February. We need your support on this as we are targeting to double the volumes of these apples from a current base of about 500 kg across all our stores to about 1000 kg per day. I would send you a detailed plan tomorrow and I expect your strong cooperation in making the promotion a big success. Thanks & Regards, Ravindranath, Head – Fruits & Vegetables, Heritage Foods India Ltd*"
>
> *"On behalf of our Heritage Foods (India) Limited, I record hereby our sincere thanks for arranged such a useful training session, which was conducted yesterday at Chennai. Especially, Mr. John has spent his valuable time with us in our T. Nagar Store and suggested so many good*

practices, which we are going to implement with immediate effect. The training session and interaction with Mr. John and Sumit is very useful and worthiness.

I also request you to please conduct such a training session with regular interval (say once in quarterly), so that as an organized retailer, we also updated on F&V knowledge and what is happening outside countries.

Mansi… Thanks for you especially for your all the helps for promo activities as well as you have remembered and send invitation for this training session.

Dear Mr. John…. Our heartfelt thanks for your worthy training session. I requested Mr. Sumit to send PDF file of your presentation materials, so that I can circulate to our Store Managers to take few good practices. Warm Regards, S. Thiyagarajan"

GOALS AND OUTCOMES ACHIEVED

To address technical wax coating education, a media kit and a DVD containing footage of the wax coating process used during the washing, sorting and packaging of Washington apples for consumer market sales. The DVD includes a voiceover explanation and commentary on the process using Indian spokespersons to add national credibility. The materials were produced and distributed in December of 2009. The project was targeted at the Indian market, but can be applicable in other international markets as well with voiceover changes.

BENEFICIARIES

The production of the media kit and DVD provides immediate and insightful information for the media in countries throughout the world, particularly India. Additionally, these materials provide the same information for importers, wholesalers, retailers and other produce trade members who may also not understand the reasons why the wax coatings that may have been applied to Washington apples are safe for human consumption. Ultimately, sales of Washington apples have the potential to increase when the trade and consumer are confident they are consuming a safe product.

LESSONS LEARNED

During a recent trip to India, several importers and retailers brought up the wax issue and potential for damage to Washington apple's image and sales. They also expressed support and appreciation for the new wax education DVD and information that they can distribute to their customers if and when wax becomes an issue.

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Washington State University

Development of a food safety microbial assessment of risk and food safety education for the fresh apple industry.

PROJECT SUMMARY

Addressing food safety risks in produce items, including fresh apples, requires efforts throughout the farm-to-table continuum. Therefore, it is critical to understand the risk of pathogen contamination and proliferation at each point in the food chain in order to develop an appropriate risk management plan spanning the food chain. Moreover, it is vital that growers, packers, processors, distributors, retailers and consumers appreciate their role in minimizing risk associated with produce food safety. The purpose of this study was to engage the Washington apple industry in assessing microbial food safety risks, collect appropriate microbiological data to contribute to risk assessment and conduct educational outreach. This project is important and timely as specific produce commodities need information on food safety risks as highlighted by recent produce-related food borne outbreaks. The information provided will increase competitiveness by assisting growers and packers to meet customer food safety requirements. Moreover, the project includes an educational component to increase stakeholder understanding of food safety issues associated with whole, fresh apples.

Based on a review of scientific literature and communication with industry partners, the research focus of the project validated microbial methods to examine fresh, whole apple packing food safety interventions. Several factors were examined to select recommended methods for microbial validation studies. The results from this work are important for future studies investigating the ability of antimicrobial interventions commonly used in apple packing to reduce microbial levels on apples. It is imperative that studies using consistent methodology to yield accurate results be utilized.

An educational outreach program, "Safety of Northwest Produce" was held with over 100 participants, primarily from the tree fruit industry, to provide an overview on food safety and regulatory issues. In program evaluations, participants strongly agreed that the information provided would be useful to them in communication about food safety and that knowledge was gained about several topics related to industry food safety issues.

PROJECT APPROACH

Food safety is a challenging issue for the produce industry, requiring cooperation between growers, packers, distributors and retailers. Understanding consumer perception of food safety issues and increasing consumer education is also critical. Moreover, it is vital that supporting groups and institutions, such as trade associations, commodity groups and universities, interact and work together with the industry to provide accurate and useful information to reduce food safety risks. Our project team worked to identify food safety risks specific to the fresh, whole apple industry in Washington and perform food safety educational outreach to the tree fruit industry.

GOALS AND OUTCOMES ACHIEVED

The overall goal of the project is to work with the Washington apple industry to increase food safety awareness and collect accurate information to perform a risk assessment for fresh, whole apples.

Goal 1. To expand knowledge of microbial risks through validation studies and risk assessment. Industry partners will be identified, and initial data collection will be performed. A review of literature on pathogen survival and growth for whole, fresh apples will be conducted.

Outcomes: The following outcomes were achieved:

1) A literature review was performed to determine the state of knowledge for current and potential food safety antimicrobial interventions for apple packing. Activities included collecting and summarizing published literature regarding fresh, whole apples. To perform a risk assessment for whole, fresh apples,

it would be ideal to have a body of literature assessing microbial risks in the following areas: pre-harvest, storage, packing and transportation, retail and potential influences of injured/wounded apple tissue on pathogen survival. The review of literature indicated that peer-reviewed studies for fresh, whole apples were relatively limited. Examples of literature that was examined included: 1) studies of the survival of pathogenic *Escherichia coli* (*E. coli* O157:H7) and *Salmonella* on apples and other produce items after treatment with chlorine dioxide, 2) studies of the survival of pathogenic *E. coli* O157:H7 and *Listeria monocytogenes* on apples and other produce after treatment with ozone, chlorine dioxide and peroxyacetic acid, and 3) studies on the survival of *E. coli* O157:H7 on wounded and stored apples. For studies that examined the effectiveness of antimicrobial interventions, currently available scientific literature varied widely in methodology making comparison and interpretation of results between studies challenging.

2) Industry partners provided information on antimicrobial interventions currently utilized in apple packing and common exposure duration times for the interventions. Communication with industry partners indicated that currently available literature often did not utilize concentrations or exposure durations that are relevant to current industry practices.

3) Microbial experiments to identify the most appropriate methodology for microbial validation studies on fresh, whole apples were performed. For the microbial research portion of this project, a literature review indicated that knowledge gaps exist regarding food safety risks at several points along the food chain for fresh, whole apples. Given the breadth of food safety information needed, it was decided that the most appropriate place to focus initial attention for data collection was at apple packing, where food safety interventions to reduce microbial levels exist. To perform an accurate risk assessment, accurate microbiological data is needed. It was determined that in order to perform microbial studies to examine the effectiveness of current apple packing food safety interventions, initial studies to validate appropriate methodology were necessary. Our microbial studies on appropriate methodology for antimicrobial validation indicated that apples should be unwaxed and at least rinsed in water prior to inoculation. The most effective method of microbial inoculation was by immersing and massaging the apples in an inoculation solution for 10 minutes rather than a spot inoculation at the stem end. The review of literature indicated that apples in validation studies were inoculated with microbial levels ranging from 1 million – 100 million cells and our microbial studies indicated that when apples were immersed in 10 million cells that final microbial counts on the apples averaged 100,000 cells.

Summary: The activities for this goal successfully established the state of knowledge and knowledge gaps for microbial risks associated with whole, fresh apples and identified current industry practices and relevance of current literature to these practices. This information is critical to assist in establishing and directing food safety priorities for the apple industry. Moreover, the completed research established recommended practices for conducting laboratory validation studies on whole, fresh apple antimicrobial interventions. The results from this work are important for future studies investigating the ability of antimicrobial interventions commonly used in apple packing to reduce microbial levels on apples. It is imperative that consistent methodology be utilized to yield accurate results.

Our project team has received funding to perform validation studies for fresh, whole apple packing food safety interventions utilizing the methodologies identified by this study. Specifically, we are examining the ability of three antimicrobial interventions (chlorine, chlorine dioxide and peroxyacetic acid) utilized in fresh, whole apple packing and their ability to reduce pathogens at concentrations and exposure durations relevant to current apple packing practices.

Goal 2. Food safety educational programs targeting producers of fresh apples will be developed and engage the tree fruit industry by conducting state-of-the-industry meetings involving industry representatives, commodity groups, and scientific experts. Industry needs for food safety educational materials will be assessed and development of materials will be initiated, integrating new materials with current food safety educational programs.

Outcomes: The following outcomes were achieved:

1) An educational, one-day outreach program, "Safety of Northwest Produce" was held in Wenatchee, Washington with over 100 participants.

The topics addressed at the workshop were:

- Legal food safety perspectives, delivered by an attorney representing a firm that specializes in food borne illness cases
- Customer food safety perspectives and expectations, delivered by a representative of a large, regional retail/wholesale company
- Current regulatory perspectives and recommendations related to produce, delivered by a regional FDA food safety specialist
- Trade association perspectives on food safety and recent produce outbreaks, delivered by the Senior Vice President of a national produce trade association
- Orchard level microbial concerns and food safety opportunities, delivered by a Washington State University food science faculty member
- Storage and packing microbial concerns and food safety opportunities, delivered by a Washington State University food science faculty member

At the food safety educational outreach workshop, "Safety of Northwest Produce," participants strongly agreed that the information provided would be useful in communicating about food safety in their operations and with other groups. Furthermore, in program evaluations, participants strongly agreed that the information provided would be useful for conducting food safety training in their operations. A retrospective pre-post evaluation completed by participants documented knowledge gain in the following areas: climate surrounding produce food safety, legal aspects of food safety, orchard level food safety issues, customer and regulatory food safety perspectives, food safety issues during packing and storage as well as overall food safety knowledge. Participant industry experience ranged from 1-50 years. Workshop attendees included growers, packers, processors, suppliers, sales and marketing representatives, laboratory technical staff, trade association representatives, consultants and extension personnel.

2) Several collaborative meetings were conducted by industry groups to discuss and prioritize food safety research and outreach goals for the Washington tree fruit industry involving growers and packers as well as commodity groups, trade associations and university representatives.

BENEFICIARIES

Beneficiaries include all sectors of the Pacific Northwest tree fruit industry, particularly 3500 growers and approximately 60 packers as well as consumers, distributors, retailers, suppliers, trade associations, commodity groups, scientists and extension personnel. Participants at the "Safety of Northwest Produce" food safety educational outreach program included growers, packers, processors, suppliers, sales and marketing representatives, laboratory technical staff, trade association representatives, consultants and extension personnel. Participants strongly agreed that the goal of the workshop was achieved, to provide an overview of produce food safety and clarification on regulatory issues.

LESSONS LEARNED

Combining information from a literature review and information provided by industry partners, it was determined that particularly for fresh, whole apples, knowledge gaps existed regarding probability of food safety risks and effectiveness of currently used antimicrobial interventions in the apple packing industry. Given the extent of the knowledge gaps, determining priority areas for research and risk assessment was difficult to establish among a diverse group involving growers and packers as well as trade association, commodity group and university representatives. This project initiated a vital dialogue among these representatives that will continue in order to develop food safety priorities. Furthermore, our project team has initiated research to provide information to fill some of the identified knowledge gaps (see Goal 1 summary above).

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ADDITIONAL INFORMATION

At the food safety educational outreach workshop, "Safety of Northwest Produce", participants strongly agreed that the information provided would be useful in communicating about food safety in their operations and with other groups. Furthermore, in program evaluations, participants strongly agreed that the information provided would be useful for conducting food safety training in their operations. A retrospective pre-post evaluation completed by participants documented knowledge gain in the following areas: climate surrounding produce food safety, legal aspects of food safety, orchard level food safety issues, customer and regulatory food safety perspectives, food safety issues during packing and storage as well as overall food safety knowledge. Participant industry experience ranged from 1-50 years. Workshop attendees included growers, packers, processors, suppliers, sales and marketing representatives, laboratory technical staff, trade association representatives, consultants and extension personnel.

For the microbial research portion of this project, a literature review indicated that knowledge gaps exist regarding food safety risks at several points along the food chain for fresh, whole apples. Given the breadth of food safety information needed, it was decided that the most appropriate place to focus initial attention for data collection was at apple packing, where food safety interventions to reduce microbial levels exist. To perform an accurate risk assessment, accurate microbiological data is needed. However, for fresh apple packing food safety interventions, currently available scientific literature varies widely in methodology making comparison and interpretation of results between studies difficult. Moreover, it should be noted that the number of peer-reviewed studies on this topic are relatively limited. Communication with industry partners also indicated that currently available literature often did not utilize concentrations or exposure durations that are relevant to current industry practices. It was determined that in order to perform microbial studies to examine the effectiveness of current apple packing food safety interventions, initial studies to validate appropriate methodology were necessary.

Microbial studies on appropriate methodology for antimicrobial validation indicated that apples should be unwaxed and at least rinsed in water prior to inoculation. The most effective method of microbial inoculation was by immersing and massaging the apples in an inoculation solution for 10 minutes rather than a spot inoculation at the stem end. The review of literature indicated that apples in validation studies were inoculated with microbial levels ranging from 1 million – 100 million cells and our microbial studies indicated that when apples were immersed in 10 million cells that final microbial counts on the apples averaged 100,000 cells. The results from this work are important for future studies investigating the ability of antimicrobial interventions commonly used in apple packing to reduce microbial levels on apples. It is imperative that consistent methodology to yield accurate results be utilized.

Our project team has initiated validation studies for fresh, whole apple packing food safety interventions utilizing the methodologies identified by this study.

Washington State University

Sustainable Biological Disease Management to Replace Methyl Bromide Fumigation in Washington's Christmas Tree Seedling Industry

PROJECT SUMMARY

Nursery production of Douglas-fir *(Pseudotsugo menziesii)* seedlings is heavily reliant on methyl bromide fumigation to mitigate the detrimental effects of soil-borne fungal diseases. Without fumigation, up to 50% of harvested seedling must be culled due to disease effects, while only 10% of seedlings are culled from methyl bromide-treated fields. Increasing pressure to discontinue use of methyl bromide means new methods for disease control are urgently required. The use of plant and seed materials from various plants in the mustard family offer potential to solve this problem. In greenhouse trials, we found that the use of *Brassica juncea* seedmeal at a rate equal to 2 dry tons per acre produced similar tree biomass and levels of infection by *Pythium*, *Cylindrocarpon*, and *Fusarium* that were similar to levels seen in seedlings grown in sterilized soil. Levels of *Trichoderma*, a beneficial fungus, were greater in the seedlings treated with most of the mustard materials, as compared to in seedlings grown in control (untreated) or sterilized soils. This gives added credence to the hypothesis that biological treatments can provide a "1-2 punch" to both reduce pathogens and increase protective beneficial soil organisms. Current data and research status was provided to approximately 60 people in the nursery industry through an industry conference presentation.

PROJECT APPROACH

Our project approach was to isolate, quantify, and treat Douglas-fir fungal pathogens *Fusarium oxysporum and Pythium ultimum* using materials from mustard plants (*Brassica spp.* and *Sinapis spp.*).

1. Isolate resident *Fusarium oxysporum and Pythium ultimum* from heavily infested Webster Nursery soils. Develop and confirm methodology to track major fungal pathogens, *Fusarium oxysporum and Pythium ultimum.*

2a. Treat batches of field soil-sand mix with:

1) *Brassica juncea* seed meal (SM)
2) *Brassica juncea* chopped green manure
3) *Sinapis alba* SM
4) *Sinapis alba* chopped green manure
5) *Brassica napus* SM
6) *Brassica napus* chopped green manure
7) Eko compost
8) Yelm vermicompost
9) methyl bromide + chloropicrin
10) autoclaved (steam-sterilized)
12) untreated control.

2b. Incubate the soil batches for 1, 2 and 4 weeks. At each of the time intervals, remove an aliquot from each treated soil, and transplant greenhouse-grown Douglas fir seedlings into it.

2c. Monitor seedling growth and populations of *Fusarium oxysporum and Pythium ultimum.* Monitor seedling response in morphological characteristics (height, shoot and root volumes and ratio, base caliper).

3. Assess indicator spp. Trial 5 conifer spp. Including Douglas-fir against positive and negative soil treatments. Monitor for early indications of vigor or disease. Describe quick-test protocol.

4. Extend results of field trials and screening protocols to other nurseries in the Intermountain Container Seedling Growers Assoc., Western Forest and Conservation Nursery Assoc., and Intertribal Nursery Council.

GOALS AND OUTCOMES ACHIEVED

Our stated goals were:
Goal 1: Maintain viability of the Douglas-fir seedling industry in a post methyl bromide environment.
Goal 2: To improve the health and growth of Douglas-fir seedling transplants in non fumigated soil sufficiently to reduce culling loss by 50%.
Goal 3: To expand and clarify the knowledge base regarding *Brassica* spp. effects on conifer replant disease. Soil fumigation effects of brassicas have been observed for over 30 years, but crop response depends on crop sp., brassicaceous sp., and native soil microbiology.
Goal 4: To identify indicator sp. and develop a protocol for short-term screening of biological control methods for disease reduction in the greenhouse using the soil: crop: microbial system that will be found under field conditions.
Goal 5: Host at least one regional outreach event to transfer research results to other conifer seedling nurseries.

We have accomplished or made significant progress toward all goals.

Goal 1 is a long-term goal which we have made progress toward by addressing Goal 2. The use of *Brassica juncea* seedmeal at a rate equal to 2 dry tons per acre produced similar tree biomass and levels of infection by *Pythium*, *Cylindrocarpon*, and *Fusarium* that were similar to levels seen in seedlings grown in sterilized soil. Success equal to this in field conditions will reduce culling loss by at least 50%.

Goal 3 has been addressed by tracking not only tree response, but the populations and infection rates of 3 common pathogens as well as one beneficial fungus (*Trichoderma*). We have found that levels of *Trichoderma* were greater in the seedlings treated with most of the mustard materials, as compared to in seedlings grown in control (untreated) or sterilized soils. This gives added credence to the hypothesis that biological treatments can provide a “1-2 punch” to both reduce pathogens and increase protective beneficial soil organisms.

Goal 4 was addressed by tracking seedling response over time. Plant responses in growth and pathogen infection were similar in relative response at wk 6 versus at wk 12. This indicates that a 6-week greenhouse test prior to a major production period will provide significant information about pathogen pressure and treatment effectiveness. We did not identify a surrogate “indicator species” for testing treatments, but rather suggest using the tree species of interest directly. We have found that the pathogens involved are specific enough that a surrogate species (or even variety) may not react the same as the plant of interest.

Goal 5 was addressed through the 2009 joint meeting of the Western Forest and Conservation Nursery Association, the Intertribal Nursery Council, and the Intermountain Container Seedling Growers’ Association. Current data and research status was provided to approximately 60 people in the nursery industry.

BENEFICIARIES

Primary beneficiaries of this work are nurseries that suffer fungal root pathogens and the neighbors of those nurseries. Many of these nurseries either experience significant financial loss, and/or treat their soils with hazardous materials that put workers and neighbors at risk. The use of mustard materials is much less expensive and much safer than use of soil fumigants.

LESSONS LEARNED

The primary lesson learned is that there is real possibility for managing conifer nursery soil borne disease with brassicaceous plant materials.

CONTACT PERSON

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ADDITIONAL INFORMATION

Findings from this project will be used as preliminary data to secure funding from the USDA Methyl Bromide Transitions program which runs September 2009 – August 2012.

Washington Seed Potato Commission

Stem Number, Tuber Set and Size Distribution Relationships for Specialty Potato Cultivars

PROJECT SUMMARY

Tuber set and size distribution can be optimized for a particular market by manipulating the average number of stems per seedpiece (i.e. the degree of apical dominance) without affecting overall yield (Knowles and Knowles, 2006). The number of stems per seedpiece increases with the physiological age of a seed lot, which in turn increases with the accumulation of degree days during maturation of seed-tubers in the field (post vine kill) and in storage. Since the values of seed, fresh-market and processing potatoes are dictated in part by the specific array of tuber size classes, manipulating tuber size profiles through varying the physiological age of seed lots has the potential to significantly affect returns. The aging responses of seed-tubers to degree days in storage and the target stem number for a particular size distribution are cultivar-dependent. Recommendations for handling and storage of russet skin processing cultivars to produce optimum stem numbers and tuber size distributions were recently determined by researchers at WSU. The industry has indicated a need to complete similar research for specialty potato cultivars important to the fresh market. Accordingly, the research evaluated the responsiveness of seed of selected specialty potato cultivars to a range of storage treatments designed to accelerate aging to increase stem numbers and tuber set for more precise control of tuber size. The ultimate goal is to develop handling and storage protocols and other seed treatments that consistently and predictably affect apical dominance (stem number), tuber set and tuber size distribution of specialty potato cultivars. This will lead to more precise control of tuber size, which will add value to production of potatoes for seed, fresh and processing markets. In short, the research is directed toward developing methods to optimize tuber size distribution and maximize value for selected specialty cultivars of potato.

PROJECT APPROACH

Certified seed-tubers of each cultivar were acquired directly from Bedlington Farms, Lynden, WA in early October 2008. The research requires that we treat the seed to produce a broad range of stem numbers for each cultivar so that the relationships among stem number, tuber set and size distribution can be modeled. Seed-tubers were stored at different temperatures for various periods (Table 1) at the beginning of storage (while the tubers were dormant) to accelerate the aging process. All seed was wound-healed initially at 54°F for 10 days and thus the 80 degree day (DD) seed served as control. Following the accelerated aging treatments, storage temperature was lowered to 39°F for the remainder of a 196-day storage season. These treatments resulted in seven physiological ages of seed-tubers.

Tubers of each age were cut and planted 8 inches deep into replicated 20-foot plots at the WSU Othello Research Unit. Seed was spaced 10 inches apart within a row and rows were spaced 34 inches on center. Five replicates of each treatment were planted (April 14) in a randomized block design for each cultivar. The effects of seed age on stem number and productivity were evaluated separately for each cultivar.

Above ground stem numbers were counted 63-65 days after planting (prior to row closure). Vines were removed with a flail type mower 99 days after planting (DAP) for Yukon Gold and 106 DAP for the other cultivars. Plots were harvested Aug. 13 and 14. Tubers were counted, graded (U.S. #1's, 2's, culls), and weighed. Tuber diameters were measured to model the relationships between diameter and weight for each cultivar. The effects of tuber age on total, U.S. No. 1 and marketable yields were determined.

BENEFICIARIES

The Washington Seed Potato growers, and specialty potato growers. There are six Washington seed potato growers. This project has enabled seed growers to manage seed lots to produce tuber size distributions that have maximum yield and economic return potential for commercial growers. A direct result of the project is increased sales of customized seed lots and the added value inherent in offering a seed lot that will produce a more valuable commercial crop.

LESSONS LEARNED

The specialty cultivars were clearly resistant to increasing stem numbers in response to the aging treatments defined in Table 1 (see full progress report). Modeling the relationships among stem numbers, tuber set, and size distribution requires seed lots with a wider range of stem numbers than that produced in 2009 and reported herein. Therefore, a different approach to reducing apical dominance will be tested for the 2010 growing season. Seed of the five cultivars will be treated with a combination of aging (heat unit accumulation in storage) and growth regulator treatments designed to increase stem numbers.

The degree of apical dominance is largely influenced by the plant hormone, auxin. High levels of auxin produced by the dominant sprout suppress growth of sprouts from other eyes on the tuber. Indeed, apical dominance can be restored in older seed lots, which normally produce a high number of stems, by treating the seed with auxin prior to planting. Disrupting the imposition of apical dominance by auxin may therefore be an effective strategy to increasing stem numbers in the specialty cultivars. Growth regulators that interfere with auxin translocation include triiodobenzoic acid (TIBA) and cyclanilide. Additionally, through other mechanisms, gibberellic acid (GA) has been shown to increase stems when applied to seed potatoes prior to planting. Chemical pinching agents such as 3-nonene-2-one (3N2) have also resulted in increased sprout numbers in potato (Knowles and Knowles, unpublished). These growth regulators will be tested for their ability to increase stem numbers without affecting overall yield in the specialty cultivars in 2010.

CONTACT PERSON

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ADDITIONAL INFORMATION

Cooperation with Dick Bedlington Farms was crucial to project development. Bedlington Farms provided the disease free certified seed potatoes for the test plots and support to conduct the work.

Washington State Potato Commission

Food Safety Program for Washington State Potato Industry

PROJECT SUMMARY

The produce industry has recently attracted a lot of media attention regarding food borne illnesses. This is a very serious matter for the produce industry. Previous food related illnesses have resulted in loss of life, serious hospitalizations, and a decline in consumer confidence in our food supply. Many specific produce industries have suffered tremendous losses as the outbreaks of these illnesses stop all commercial trade until the specific source is located. Food safety needs to be the highest priority for the protection of consumers and the livelihoods of our produce industries.

The Washington State Potato Commission (WSPC) decided to strengthen its already outstanding food safety track record by becoming more proactive in preventing these food borne illnesses at the farm level. This comprehensive program includes farm employee health/hygiene training materials including a video in English and Spanish, a template for standard operating procedures, signage for farm use, step by step instructions on what documentation needs to be in place for becoming USDA Good Agricultural Practices (GAP) certified, funds to partially reimburse growers the cost of a food safety audit, and farmer training workshops and the creation of a specific food safety guidance document for potatoes.

These training materials have been shared with other potato producing states and other agriculture organizations in Washington State. This training program has been praised by state and federal officials as a model for others to follow.

PROJECT APPROACH

The first step taken was to bring together growers, processors, and fresh packing sheds together to discuss ways to strengthen food safety processes. This team decided the best approach was to focus on implementing the USDA GAP at the farm level in Washington State.

The WSPC was tasked with developing materials to help potato producers implement the USDA GAP program. An internal team was formed at the WSPC to work on developing the materials with reviews conducted by the USDA and WSDA. Materials were also borrowed from programs at Cornell University and the University of Maine.

Most of the materials were produced in house utilizing expert reviews on all drafts before finalizing them. The materials were designed to be easily understood by all of our growers. We hosted training seminars to supplement the materials in our training notebooks. The seminars also provided opportunities to answer any specific questions growers had.

The final piece of this program was to create a reimbursement program to cover some of the costs of the GAP audits. We felt that this financial incentive was important to encourage growers to become certified. We will offer reimbursement for the next growing season too but will then phase out the reimbursement as growers will be well

Members of the Commission recently did a review of the program, examining all aspects. All comments were very positive and we have made tremendous gains in elevating the awareness of precautions growers can take to prevent food borne illnesses. We also learned that the USDA has made changes to the program and that many of our training materials will have to be updated prior to the start of the 2010 season.

GOALS AND OUTCOMES ACHIEVED

The WSPC created 6 goals and 4 measurable outcomes for our food safety program. They are listed below as well as the results of the outcomes.

Goals:

1. Create awareness of precautions to take at the farm level to reduce the risk of food borne illnesses.
2. Assist growers in meeting mandatory contract obligations regarding food safety certifications with their processors and fresh packers.
3. To lead Washington agriculture by being the first full commodity group to implement a high standard for food safety. The WSPC will share all of its materials with other Washington commodity groups to ease their transition to food safety compliance.
4. To create public awareness and confidence in the safety of Washington produced potatoes.
5. To incorporate a hazard analysis and risk based preventative control plan into a specific FDA guidance document for potato production.
6. To initially subside the costs of audits to encourage participation and compliance with GAP.

Measurable Outcomes Achieved:

1. USDA GAP certification for 125,000 acres of potatoes

Our original goal was to GAP certify 125,000 acres out of an anticipated crop of 160,000 acres of potatoes in Washington State, which would equal 78% of all potato acres. Our anticipated acres of potatoes planted in 2009 fell short of our projection. Only 145,000 acres were planted. The Washington State Department of Agriculture tracked the number of potato acres that were USDA GAP certified. The total number of potato acres certified in 2009 was 108,503, which equals 75% of the potato crop in Washington State.

We fell 3% short of reaching our goal of certifying 78% of the potato crop in Washington State. According to the USDA, Washington State has the highest percentage of USDA GAP certified potato acres in the United States. We are pleased with this statistic but disappointed we fell 3% shy of our goal.

2. Delivery of 300 packets of training materials to potato growers.

The Washington State Potato Commission developed and distributed over 400 copies of a comprehensive training manuals on how to become USDA GAP certified. We mailed 362 training manuals to growers, packing sheds, and processors in the potato industry. Another 38 were distributed to various commodity groups, state officials, and other state potato organizations in the US.

The training manual consisted of a notebook containing the USDA audit checklist, a guide on what is specifically required for each question in the audit checklist, a model of standard operating procedures for food safety on the farm, various sample forms needed to track and document USDA GAP requirements, an employee "Health and Hygiene" training video with versions in English and Spanish, key hygiene signage for employees and visitors, and a CD containing electronic copies of all the documents in the notebook which could be easily amended to fit the needs of individual farms.

A copy of this notebook is included with this final report.

We exceeded our goal in the distribution of our training materials by 33%.

3. Host 2 GAP training seminars

We originally proposed to host 2 GAP training seminars but expanded that to 3 seminars to accommodate interest in the Western portion of the state. There are approximately 110 potato farming entities in the state. Our training seminars attracted about 1/3 of those farming operations.

Pasco, Washington

This portion of the state is a good mix of fresh and processing potato production. While the majority is for processing, it still has a strong fresh potato presence. The training seminar in Pasco was held on June 1, 2009 and 17 growers were in attendance.

Moses Lake, Washington
This portion of the state is a mix of fresh and processing production but heavily weighted to the processing market. Participation in the USDA GAP program is widely used in this area of the state. Our training seminar was held on May 29, 2009 and attracted 14 growers.

Mt. Vernon, Washington
The potatoes produced in this area are almost exclusively for the fresh potato market. There are only about 15 growers in this area and 5 of them attended this training seminar on June 15, 2009.

4. FDA approval of specific guidance document for potato production
(Currently the FDA does not approve specific guidance documents for individual produce items but will comment on whether the guidance document is scientifically just. Current legislation in Congress may change that and ask the FDA to officially approve specific produce guidance documents.)

We are continuing to work on completion of a specific guidance document for potato production, similar to what has been done for the leafy greens industry. We partnered with the US Potato Board and the National Potato Council in developing this document. Developing these partnerships and gathering industry support took longer than anticipated. This partnership was critical to have if these standards or guidance document are to be accepted by the entire US industry. It could not be perceived as just a standard for Washington State. We have contracted with the risk analysis firm Intertox to complete our risk analysis of our industry. This will be used to create a guidance document specific to the potato industry and it will also identify data or research gaps that need to filled.
The WSPC was awarded another Specialty Crop Block Grant to continue with this program for one more year.

Overall, this program has been recognized by our industry as one of the most beneficial things our organization has ever provided to our industry. It was so successful that we will now be replicating this process and approach to other third party audits such as the McDonald's MAAP audit, the Sysco audit, and Global GAP. It has been a huge success for our industry and beneficial to other specialty crop groups.

BENEFICIARIES
This food safety program had beneficiaries up and down the supply chain. Potato growers, potato processors, fresh potato packers, and the end consumer, are all beneficiaries to our food safety program.

Growers
Our growers were large beneficiaries due to the fact that many of them would not have been able to sell their potatoes unless they were USDA GAP certified. It also created a new awareness of food safety issues and how growers can take actions during the growing season to reduce the risk of food borne illnesses.

Processors
Many of our potato processors in the state of Washington sell finished product to the USDA school lunch program. The USDA imposed a new regulation that stated, to be eligible for the school lunch programs, your products must have be USDA GAP certified at the farm level. Our GAP training program had huge benefits to the potato processing industry as we were able to assist growers in becoming GAP certified. Our potato processors would have had to give up markets in the school lunch program if they were not able to certify their growers.

Fresh Packing Sheds
Fresh Packing Sheds have always been on the front line for food safety issues. Most of our packing facilities participate in various food safety audit programs such as USDA GHP, Primus, and AIB. An

added level of safety is to have the growers USDA GAP certified prior to their potatoes arriving at the packing facility.

Other Specialty Crop Groups

Numerous other specialty crop groups have been beneficiaries of our GAP program. We have shared our materials with my other producer groups as a template to create their own specific programs. We still continue to receive requests for permission to use our materials.

Consumers

The ultimate beneficiaries were the end consumers. Seventy-five percent of the Washington potato crop is now USDA GAP certified and the awareness of food safety in the production community is very high. Consumers benefit for this added emphasis on food safety precautions that have reduced their risk of exposure to food borne illnesses.

LESSONS LEARNED

We underestimated the desire of other agriculture group's interest in our program. We continue to receive emails and phone calls from growers and organizations from around the country. We had to produce an additional 70 copies of our materials for distribution to other specialty crop groups.

We also underestimated the time it would take to conduct a thorough risk analysis of our industry and the creation of an approved guidance document for the potato industry. We are still in the process of completing this portion of the project. The WSPC received another Specialty Crop Block Grant to continue this program for another year.

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