

Project Title: Implementation of a bilingual extension program for Cosmic Crisp®

Report Type: Final Project Report

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Project Duration:, 2-Year

Total Project Request for Year 1 Funding: \$ 11000

Total Project Request for Year 2 Funding: \$ 11000

WTFRC Collaborative Costs: None

Budget 1

Organization Name: Washington State University
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Item	2021	2022
Salaries		
Benefits		
Wages		
Benefits		
RCA Room Rental		
Shipping		
Supplies	\$4,000.00	\$4,000.00
Travel	\$3,000.00	\$3,000.00
Plot Fees		
Miscellaneous	\$4,000.00	\$4,000.00
Total	\$11,000.00	\$11,000.00

Footnotes: Supplies includes printing materials (\$2000), expenses for the development of graphics and illustration (\$2000)
Travel section includes Bolivar and Sallato travel expenses to visit orchards, conduct field days and shoot videos (1725 miles @ 0.575 per mile. Miscellaneous covers part of the expenses in the video production and edition costs. Other part of the costs will be covered by our collaboration with the Good Fruit Grower. (\$110 per minute of media production, x 10-minute video = \$1100. Estimated number of videos/year = 6 x \$1100= \$6600)

Recap original objectives and significant findings:

1. Translate existing WA 38 and Cosmic Crisp® Extension publications from English to Spanish. Topics include horticultural management, harvest management and post-harvest handling. The information will be accessible in different formats to reach more effectively the Hispanic community (website short articles, pamphlets, infographics, audiovisual resources). *Completed*
 - A survey was designed and distributed to the Spanish speaking community in the WA tree fruit industry. From 37 respondents, 90% were interested in getting access to the information in Spanish, and more than 50% in participating in field days.
 - A section called *Recursos en español* (Resources in Spanish) was created in the WSU tree fruit website. 29 resources for apples, cherries and orchard management have been uploaded.
 - 19 written resources for WA 38 were produced and shared with the Spanish speaking community. From them, 15 were published in *Fruit Matters* newsletter, and uploaded into the *Recursos en español* section. These resources cover different aspects of the WA 38 horticulture, orchard management, pre and post-harvest recommendations.
 - Different formats were used to produce the bilingual (English-Spanish) extension resources and covered the designed and production of flow charts, infographics, starch index cards, a booklet for fruit defects, an a video in Spanish. In addition, summary articles were translated and linked to their corresponding original version in English.
 - The WA 38 Fruit defect guide html document previously published in the WSU Tree Fruit Website, was translated, published and uploaded to the Spanish section. Based on it, a bilingual booklet for fruit defects was designed, printed and distributed to the apple industry across the state.
 - All the resources produced, excepting the summary articles were printed y distributed from July 2021 and December 2022.
2. Develop and deliver interactive WA 38 Extension programs in Spanish to Hispanic workforce to disseminate and demonstrate timely information on pruning, crop load management, irrigation, and maturity/harvest management. Programs will include field trips, workshops, and discussion groups, among others. *Completed*
 - A QR code was created and distributed in the Spanish community participating in field days to facilitate access to the *Recursos en español* section.
 - A total of eight field days were organized across the growing seasons of 2021 and 2022. Three of them were offered in 2021 and five in 2022.
 - 80% of field days attendees expressed an increase of knowledge at the end of each event, and about 50% of the participants in field days related to pollination and nutrition were interested in changing practices
 - 95% of the participants reported that the organization of the field days and the information provided were of high quality.
 - Despite the positive feedback, the participation in field days gradually declined as the growing and harvest season progressed.
3. Establish an Advisory Committee with Spanish native speakers in the apple industry who will help in the identification of priorities in the translation of the information and the delivery of Extension programs. This committee will also identify needs for future programs directed to the Hispanic community. *Completed*

- A Spanish advisory committee was formed by 5 members. The committee met, collaborated and identified priorities and future directions.
- 45 extension resources on WA 38 were compiled, categorized into topics, and prioritized by the advisory group for translation. This process was done once per year.
- 7 topics for field days, and time during the year to offer them, were identified and suggested by the committee.

Results and Discussion

In this final report, the results of the activities carried out from July 1st, 2021 to November 14, 2022 are described.

Objective 1. Translate existing WA 38 and Cosmic Crisp® Extension publications from English to Spanish. Topics include horticultural management, harvest management and post-harvest handling.

Survey

Prior to the translation of documents, and once the project started (July, 2021), we created a community survey to get a better understanding of the priorities for translation of extension resources related to WA 38 that the Spanish speaking community recognizes. The survey was posted in the WSU tree fruit site (<http://treefruit.wsu.edu/wa-38-survey-encuesta/>). It was also given at the end of field days in 2021, and at presentations in grower meeting sessions in 2021 dedicated to the tree fruit Spanish speaking workforce. To facilitate the prioritization for the translation of documents previously published in the WSU Tree Fruit website, we classified the documents in 6 categories: General WA38 characteristics, horticultural management (crop load, pruning, production systems), nutrition, fruit quality, packing and marketing. In addition, we also asked about the format that they prefer to get the resources (infographics, articles, field days, videos, etc).

From the responses collected from the survey posted online (via Qualtrics), and in the field days, we found that most of the participants (more than 90%) were interested in getting information of WA 38 in Spanish. In addition, more than 50% of them were interested in participating in field days in Spanish.

Although the number of votes per category varied, and in some cases were scarce, the participants were interested in all the categories, excepting packing and marketing (Figure 1A). The time of the release of the information was based on the season. Spring and summer times had the higher ranking to be preferred to release information related to WA38 characteristics, while winter alone or in combination with spring or summer were preferred for the remaining topics. Fall was the least preferred season to release the information (Figure 1B), which could be related with the busy apple harvesting season, and therefore less time to consult the resources.

Related to the format for delivering the information, most of the participants that answer the question preferred short videos to get information about horticultural management, while they preferred articles for fruit quality topics. For the remaining topics there were no preference related with the format (Figure 1C).

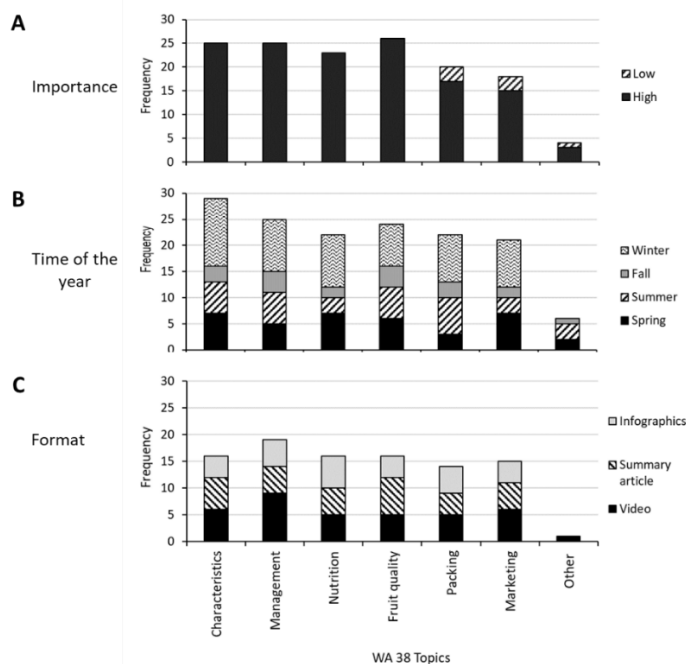


Figure 1. Summary of the results of the 2021 survey to publish extension resources for WA 38. Y axis represent the frequency (votes per category), and X axis WA 38 topics. **A.** Importance of topics for translation (high and low). **B.** Time of the year (Spring, Summer, Fall, Winter) preferred to access the information per topic. **C.** Format preferred to access the information (Video, article, infographics). (n= 51).

Prioritization of resources to be produced in Spanish

The advisory committee classified the WA38 resources already available in English in the WSU tree fruit Website, in three priority categories for translation: high, medium and low (Table 1). The topics related to horticulture, quality standards, harvest criteria, nutrition, pollination, green spot and fruit defects were ranked as high priority. The fruit defects guide that has already been published in the WSU tree fruit website (<http://treefruit.wsu.edu/wa-38-defects-guide>) was considered important to be translated, and they agreed that the production of a booklet with this information would be a useful resource to have on hand in field conditions. As for the WTFRC continuing reports available at the website, the committee considered them as low priority, and were more interested in the final projects. The optimization of light interception document was considered in between medium priority, and it was suggested to design infographics based on sub-topics within the article.

Table 1. Prioritization for translation to Spanish of WA 38 resources found in the WSU Tree Fruit Website

Priority level (high, medium, low)	Topic	Original Format	Suggested Format in Spanish
High	Quality Standards	Article	Article (1page)
	Harvest criterio	Article	Article (1page)
	WA 38 Fruit Defects guide	Web document	Web document and booklet

	Nutrient differences- green spot	Video (9 min)	Infographics
	Rootstock differences in WA 38	Video (13:23 min)	Infographics
	WA 38 Horticulture: Characteristics	Article	Article
	Pollination, flower biology and fruit development in ‘WA38’ (2020)	Article	Infographics
	WA 38: understanding green spot origin, timeline, and development (2022)	Article	Summary article or Infographics
	Optimizing harvest time for WA38 (2019)	Article	Infographics
Medium	optimization of light interception, leaf area and yield in “wa38”:	Article	Infographics per topic: - Training systems - Rootstocks - Pruning techniques
Low/no needed	Respiration rate and low oxygen limit	Article	Summary article
	Stem punctures in packout (2017-2018)	Article	Summary article
	Marketing and royalty (2020-2021)	8 videos (15min – 1hr:45min)	Summary article
	Fruit quality (2014-2019)	8 videos (1- 32 min)	Summary article
	WA 38 FAQs and information for growers	Article	Article
	WA 38 Size distribution profile in pre-commercial plantings 2020 (box sizes quincy and prosser data 2010- 2016)	Article	Article
	WA38 demonstration trial block (2019)	Article	Article
	WA38 fruit size and dry matter for fruit quality/consumer preference. (2018)	Article	Infographics
	WA 38 rootstock and systems trial (2013)	Article	Article

In addition, the following topics were selected as important to share in field days in Spanish (Table 2).

Table 2. Field day topics identified by the advisory committee

Field day	When?	Approach
Field day IAREC-la roza- Prosser	Only 2021	- Information about the block. - Research findings.
Field day WTFREC-Sunrise - Wenatchee	Only 2021	- Information about the block. - Research findings.
Evaluation of starch index and harvesting recommendations for WA 38 (Cosmic Crisp®)	Fall 2021 at the Roza. Fall 2022 at the Roza and Sunrise WSU blocks	- Workshop style
Pollination and floral biology	April 2022	In commercial orchards two locations (Central and South areas)

		- Grower experiences - Research findings
Nutrient and Vigor management	June 2022	Research findings- Sunrise and la Roza
Stress management (heat stress)	July 2022	Research findings- Sunrise and la Roza
Green spot	June 2022	Research findings- Sunrise and la Roza

Production, publication and distribution of WA 38 resources in Spanish

The written and audiovisual resources were published in the WSU Tree Fruit Extension team newsletter, *Fruit Matters*. In addition, we created a subsection titled *Recursos en español* (Resources in Spanish) within the WSU Tree fruit website, where all the translated resources have been compiled and are available to consult (Figure 2A). All the written resources created included a link to its respective English version in case the reader wants to compare or learn the terminology in both languages.

In order to make these resources easily accessible to the Spanish speaking community who can have difficulties to navigate the website, we also created a QR code link to this section that bring the user directly to this section (Figure 2B). This QR code was printed and shared with the participants of the field days as well as in presentations of the program. We also explained how to use the code and made sure the participants were able to access and navigate *Recursos en español* section.

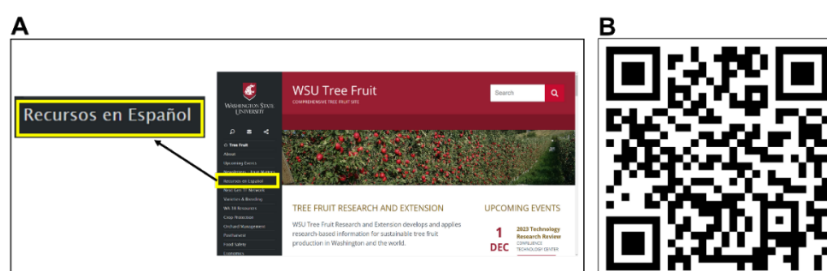


Figure 2. “*Recursos en Español*” (Resources in Spanish) subsection within the WSU Tree Fruit Website where all the WA 38 resources in Spanish are located (A). QR code generated and distributed in the field days to facilitate the access to the subsection (B)

The following documents have produced in Spanish and shared with the Tree fruit industry (Table 3).

Table 3. WA 38 resources in Spanish created in this project.

Title/ Author	Format	Published/shared
<i>Decisiones a tener en cuenta durante la cosecha de WA 38.</i> / Jenny Bolivar-Medina, Carolina Torres, Ines Hanrahan (Harvest decisions)	Flow chart	- Shared on Starch index field days. - To be published on December, 2022. http://treefruit.wsu.edu/recursos-en-espanol/decisiones-a-tener-en-cuenta-durante-la-cosecha-de-wa-38/
<i>Aspectos a considerar durante la cosecha de WA 38.</i> / Jenny Bolivar-Medina, Carolina Torres, Ines Hanrahan (Things to consider when harvesting WA 38 fruit)	Flow chart	- Shared on Starch index field days. - To be published on December, 2022. http://treefruit.wsu.edu/recursos-en-espanol/aspectos-a-considerar-durante-la-cosecha-de-wa-38/
<i>Guía de defectos en WA 38.</i> Translation, / Jenny Bolivar-Medina, Carolina Torres, Ines Hanrahan (WA	Article	Published on July 11, 2022 http://treefruit.wsu.edu/guia-de-defectos-en-wa-38/
	Booklet	Designed ended on September, 2022.

38 Common Defects and Unique Characteristics Near Harvest and During Storage)		Printing and distribution October-December, 2022
<i>Escala de almidón para WA 38. / Jenny Bolivar-Medina, Good Fruit Grower Magazine (WA 38 starch scale).</i>	Video	(https://www.youtube.com/watch?v=t2KWuSY3DYs . August, 2022
<i>Información actualizada del sistema de apoyo en la toman de decisiones de AWN para el manejo de estrés. / Lav Khot (AWN updates on decision-tool for heat stress management)</i>	Infographics	Shared in Nutrition, vigor and heat stress field day. Roza, IAREC. July 05, 2022.
<i>Características y Horticultura de WA 38. Translation / Jenny Bolivar-Medina, (WA 38 Characteristics and Horticulture)</i>	Article	Published on April 11, 2022 http://treefruit.wsu.edu/caracteristicas-y-horticultura-de-wa-38/
<i>Mejora de la cuaja en 'WA 38'./ Bernardita Sallato, Juan Munguia, Poliana Francescato, Matthew Whitting. (Improving fruit set in 'WA 38').</i>	Infographics	Shared in Pollination and fruit set field days. April 19 and 21, 2022.
<i>El desarrollo de green spot en WA 38 se ve afectado por desequilibrio nutricional y portainjerto. / Bernardita Sallato, Matt Whiting, Juan Munguia (Rootstock and Nutrient Imbalance Leads to "Green Spot" Development in 'WA 38' Apples)</i>	Summary Article	Published on December, 2021 http://treefruit.wsu.edu/article/el-desarrollo-de-green-spot-en-wa-38-se-ve-afectado-por-desequilibrio-nutricional-y-portainjerto/
<i>Recomendaciones de cosecha y almacenamiento de WA38- 202./ Jenny Bolivar-Medina, Carolina Torres, Ines Hanrahan (Commercial harvest and storage criteria for WA 38- 2021)</i>	Article	Published on October 11, 2021 http://treefruit.wsu.edu/recursos-en-espanol/http-s3-us-west-2-amazonaws-com-treefruit-wsu-edu-wp-content-uploads-2021-10-05173433-commercial_wa38_storage_harvest-espanol-1-docx/ Shared in WA 38 field day in Spanish-Starch Index. September 22, 2021.
<i>Escala de almidón para Cosmic Crisp® cv. WA38. Translation / Jenny Bolivar-Medina, Carolina Torres, Ines Hanrahan (Cosmic Crisp® cv. WA38 starch scale)</i>	Starch scale cards uploaded and printed	Published on October 11, 2021 http://treefruit.wsu.edu/recursos-en-espanol/escala-de-almidon-para-cosmic-crisp-cv-wa-38/ Shared in Starch Index field days. September 22, 2021; September 20 and 22, 2022.
<i>Perfil de maduración de WA38 en dos portainjertos y tres sistemas de producción- Año 2020./ Jenny Bolivar-Medina, Bernardita Sallato. (WA38 maturation profile on three production systems and 2 rootstock types- Ayear 2020)</i>	Infographics	Shared in WA38 Field Day in Spanish – Roza, IAREC. September 22, 2021.
<i>Recomendaciones para la cosecha de WA 38- 2021. / Carolina Torres, (Recommendation for WA 38 harvest)</i>	Infographics	Published on September 7, 2021 http://treefruit.wsu.edu/recursos-en-espanol/recomendaciones-para-la-cosecha-de-wa-38/ Shared in field days August 4 and September 22, 2021; September 20 and 22, 2022.

<i>Presencia de grasitud en plantaciones de pre-comercialización de WA 38. Translation. / Jenny Bolivar-Medina, (WA 38 Greasiness incidence in pre-commercialization plantings)</i>	Article	Published on September 7, 2021 http://treefruit.wsu.edu/article/presencia-de-grasitud-en-plantaciones-de-pre-comercializacion-de-wa-38/
<i>Evaluación de portainjertos para manzano 'WA38'. / Erica Casagrande Biasuz, Victor Blanco, Lee Kalcsits ('WA38' evaluation on 9 different rootstocks)</i>	Infographics	Shared in WA38 Field Day in Spanish – Sunrise, TFREC. August 4, 2021.
<i>Cultivos de WA38 en las huertas experimentales de WSU Sunrise y Roza. / Tom Auvil, and Jenny Bolivar-Medina, (WA 38 plots at Sunrise and Roza WSU farms)</i>	Summary article and Infographics	Published on July 22, 2021 http://treefruit.wsu.edu/cultivos-de-wa38-en-las-huertas-experimentales-de-wsu-sunrise-y-roza/ Shared in WA38 Field Day in Spanish – La Roza, IAREC. July 22, 2021.
<i>Manejo de estrés por calor en Manzana. / Lav Khot (Apple heat stress management)</i>	Infographics	Shared in WA38 Field Day in Spanish – La Roza, IAREC. July 22, 2021, and July 05, 2022
<i>Puntos clave acerca de la biología floral, polinización y cuaja de fruta en WA 38. Translation / Jenny Bolivar-Medina (Floral biology and pollination in WA 38)</i>	Infographics	Published on June 4, 2021 http://treefruit.wsu.edu/wa-38-resources/puntos-claves-acerca-de-la-biologia-floral-polinizacion-y-cuaja-de-fruta-en-wa38/ Shared in Pollination and fruit set field days. April 19 and 21, 2022.

Objective 2: Develop and deliver interactive WA 38 Extension programs in Spanish to Hispanic workforce to disseminate and demonstrate timely information on pruning, crop load management, irrigation, and maturity/harvest management. Programs will include field trips, workshops, and discussion groups, among others

Field days and workshops

Our target audience were Spanish speaking growers and workforce in the Washington apple industry that were interested in learning about WA38. A total of eight field days were organized, three of them in 2021 and the remaining five were given in 2022 (Figure 6). In all the field days we provided folders that included the agenda of the day as well as the summaries of the presentations in infographics format in English and Spanish. We also distributed an evaluation form for the field day, and a sticker with the QR presented in Objective 1 (Figure 3A).



Figure 3. Examples of written bilingual resources produced and shared with the tree fruit industry. **A.** Folder showing the materials provided in field days. **B.** Starch Index translated, re-designed and printed. **C.** Fruit defects booklet. Left: front page in Spanish. Right: Content in English- Spanish presented in the gray and white areas of the page, respectively.

The field days in 2021 were given in WSU experimental orchards, Roza at Prosser, and Sunrise at Rock Island. The goals of the first two field days, held on mid-July and early August, respectively, was to provide an overview of the WA38 demo and research blocks that WSU has established and an update of the current studies that WSU research teams in IAREC and TFREC were doing. In the field day at the Roza, topics related to guidelines to the management of WA 38, growth of root systems based on rootstocks, advances in heat stress management were presented. Meanwhile, advances in the evaluation of rootstocks, and horticultural management, as well as harvesting recommendations for WA38 were discussed at the Sunrise orchard. Bilingual infographics of these presentations were shared with participants and are listed in Table 3. Fifteen participants attended the field day at the Roza, and eight were at the Sunrise field day.

The third field day was organized at the Roza and focused on WA38 harvesting recommendations, and maturation analysis via starch index. Starch indexes cards previously created by WTFRC were translated, re-designed, printed, and shared with the attendees who learned and practiced how to use them (Figure 3B). Ten participants attended this event.

In order to increase the participation of the Spanish speaking community in the field days, in 2022 we advertised the events in the WSU Tree Fruit website, Fruit Matters, and sent reminders via mailchimp and texts. We also shared the information through the Good Fruit Grower Magazine, WSTFA news flash, Evenbrite, and personal invitations.

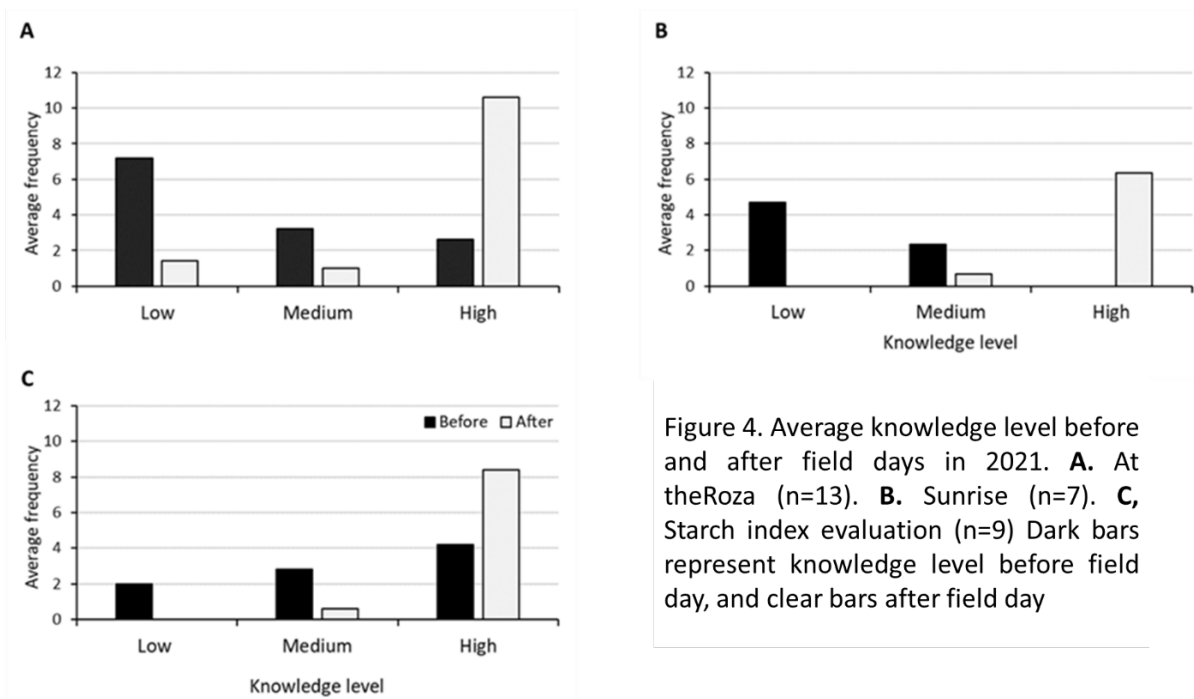
The first two field days in 2022, covered topics related to pollination and fruit set. In these two events participants learned basic floral biology and pollination by a hands-on activity, followed by experiences of growers, information about precision pollination and updates of studies related to this topic. The first field day on April 19 was given at the Roza WA 38 block, with 13 participants attending the event.

During the second event, on April 21, we visited two commercial orchard, Mountain Hill and Columbia Reach, and 25 participants attended the event.

During the field day on July 5 at the Roza, topics related to nutrition, vigor and heat stress management for WA 38 were covered. 17 participants from the industry attended the event. Research teams from IAREC presented their findings. In addition, we invited Pablo Palmandez, UW Agricultural Research and Safety Extensionist who gave an overview of how heat stress affects the persons and how to prevent it.

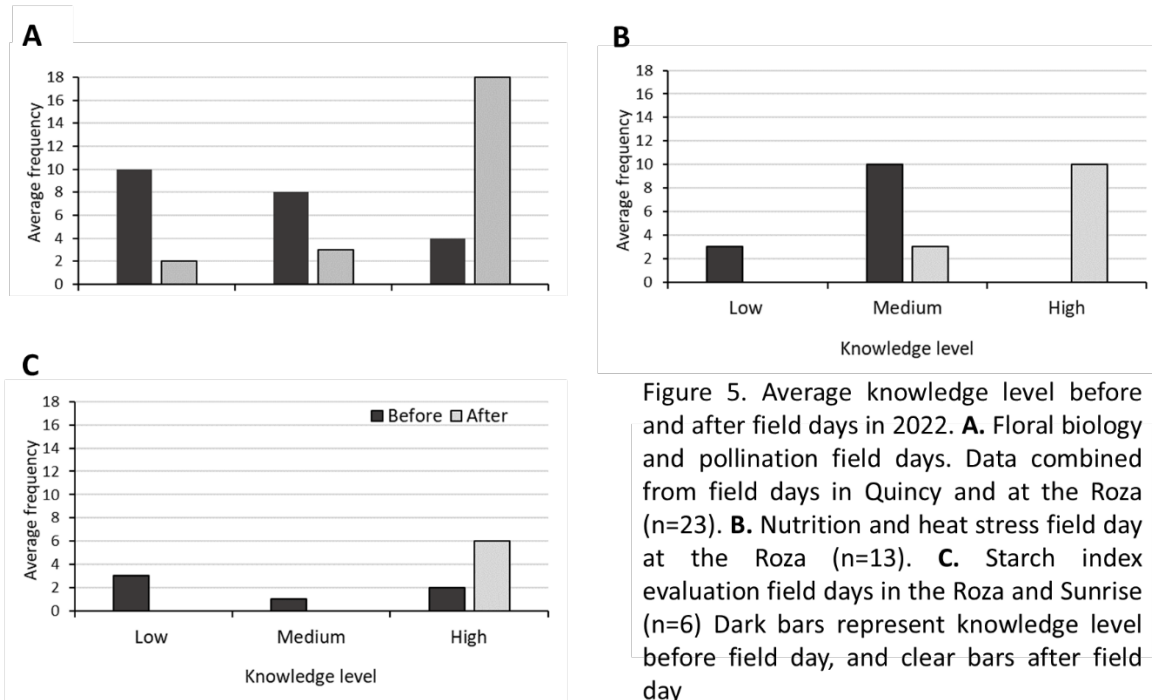
The last two field days held on September 20 at the Roza and Sept. 22 at the Sunrise WA 38 blocks, with 6 participants in total, covered the most common fruit defects found in Cosmic Crisp®, recommendations for harvesting, and how to properly use the starch index cards in Spanish were provided by representatives from WTFRC, WSU and PVM. At the end of all the field days, attendees evaluated the quality of the events and the presentations, as well as level of knowledge before and after the field days and their intention of changing practices.

In general terms, all the field days in 2021 and 2022, had a positive response from the audience, who found that the organization and quality of the field days in both years were between excellent and good. Likewise, the participants considered that the information presented in these events were excellent. They also reported gained of knowledge at the end of the events in 2021 and 2022 (Figures 4 and 5, respectively). For example, for most of the field days, the level of knowledge perceived by the participants before the event was low for field days related to overview of the WSU blocks in 2021 (Figure 4 A and B), and in 2022, for topics related to floral biology and Starch index field days (Figure 5 A and C). However, this pattern changed as the participants felt that their level of knowledge highly increased at the end of the events.



In addition, in field days like the one related to floral biology and pollination, 50% of the participants reported high interest in implement changes in their practices, mainly to explore in more depth the use of assisted pollination and retain to guarantee an optimal pollination of their WA 38 trees. At the end

of all the field days the attendees provided positive no requested feedback. They enjoyed the hands-on activities organized for the field days about floral biology and the starch index and harvest recommendations for CosmicCrisp®. They also appreciated that the information was given in Spanish as they felt more comfortable asking questions and participating in the events.



Even though the field days have been well received (Figure 6), we noticed that the number of participants in the events got lower as the growing season progressed. This pattern was drastically observed in the starch index field days when only 6 participants in total attended both events. The low attendance confirms the results of the survey in 2021, where fall season was the least preferred time to attend field days. Based on informal conversations with some participants, the low participation could be due to lack of communication within the workforce about the importance of these events, and that are not scheduled as part of their work activities or are perceived as not higher in their priorities specially at the harvesting season. However, prior discussion sessions with WTFRC, PVM and WSU, concluded that it is important to communicate information related to WA 38 in a timely manner, especially the harvest recommendations to guarantee the collection of high-quality fruit. For example, we noticed that prior to the last field days, some of the attendants were not familiar with the quality standards and harvesting recommendations, which often are provided only in English (such as fruit size, background color, stem removal, etc). For that reason, it is imperative to continue expanding the efforts that this project has started by creating more opportunities to transfer the information related to WA 38 in a bilingual format.

Finally, the booklet of the fruit defects guide (Figure 3C) was designed by the end of September 2022. 500 copies were printed and have been distributed to the industry across the state with the help of the advisory committee, WSTFA, Okanagan Horticulture Association, WSU and WTFRC.



Figure 6. Examples of WA 38 Field days in Spanish organized in 2021 and 2022. **A.** At the Roza, 2021. Tom Auvil presented in English an overview of WA 38 demo block, and was translated simultaneously by Jenny Bolivar-Medina. **B.** Floral biology and Pollination Field day, 2022. Participants worked in groups, assembled floral models, and discussed the importance of the floral structures in the pollination process. **C.** Starch Index field day, 2022. Participants prepared their Cosmic Crisp® samples, applied the iodine solution and assigned the corresponding starch index values to the samples.

Objective 3. Establish an Advisory Committee with Spanish native speakers in the apple industry who will help in the identification of priorities in the translation of the information and the delivery of Extension programs. This committee will also identify needs for future programs directed to the Hispanic community.

Advisory Committee

In July 2021, we invited 20 Spanish speaking members of the tree fruit industry to be part of a Spanish advisory group. Although only 2 persons (Eladio Gonzalez from GSLong, and Victor Bueno from Washington Fruit) answered the call, both contributed with feedback to prioritize the resources to be translated. As recommended by the WTFRC Evaluation Committee, in 2022 we extended the invitation to the community and five persons in total agreed to participate in the committee: Diana Sanchez. Stemilt. Brewster; Leticia Tejo. Fieldin, Inc (previously working in McDouglas, Wenatchee); Eladio Gonzales- GSLong, Naches; Lauren Gonzalez- GSLong; Aylin Moreno- Washington Fruit, Yakima.

As described in the objective 1, the committee contributed to the organization of topics to be translated and provided topic ideas for field days. They also participated in most of the field days organized, proofread some translated documents and provided useful feedback to improve and communicate WA 38 extension resources.

In addition, the committee identified topics of importance to be shared in the near future, not only related to WA 38 but for apples in general such as:

- New rootstocks and WA 38 yield.
- Deficit irrigation to improve fruit size, (especially in Honeycrisp)
- Crop load management
- Soil fertility
- Nutrients availability: how and when to apply nutrients.
- Pruning and tree training systems
- How to manage the vigor in other apple varieties
- Pruning
- More information about the types of pollination that the industry has available.

Executive Summary

Project Title: Implementation of a bilingual extension program for Cosmic Crisp®

Key words: WA 38, bilingual program, resources in Spanish, *Recursos en español*.

Abstract

WA 38 is an apple variety released by WSU and its fruit is commercially known as Cosmic Crisp ®. Since the release of WA 38, WSU research teams and the Tree Fruit extension team have provided information focused on improving its cultivation and the production of high-quality fruit. Most of those resources has been only published in English. In Washington tree fruit industry, most of the workforce speaks Spanish, therefore, the WA 38 resources are often out of their reach, especially workers whose knowledge in the English language is limited. The goals of this project were to translate existing information as well as to develop and deliver bilingual (English-Spanish) extension resources related to WA 38. At the beginning of the project, a survey was given to the Spanish speaking workforce. Most of them were interested in getting access to the information in Spanish, and more than 50% in field days. An advisory committee was formed and consulted to prioritize the translation of resources previously published in the WSU tree fruit website, and to provide ideas for field days. A section called *Recursos en español* (Resources in Spanish), and a QR code were created in the WSU tree fruit website, where the written resources in different formats (flow charts, summary articles and infographics) were uploaded. These resources are available to consult and cover different aspects of the WA 38 horticulture, orchard management, pre- and post-harvest recommendations. A total of eight field days, three in 2021 and five in 2022 were given in Spanish and with topics including pollination, fruit set, nutrition, vigor and heat stress management, and harvesting recommendations for WA 38, among others. All the events were well received, and participants evaluated them as the high quality related to their organization and the information provided. Despite the positive feedback, the participation in field days gradually declined as the growing and harvest season progressed. It is important to continue providing resources and events in Spanish or in a bilingual format to create more opportunities to transfer the information related to WA 38 to all the tree fruit industry in Washington.