

*Student Research*  
*Case Studies in Agribusiness*

---

*California Polytechnic State University San Luis Obispo Year 2013*

---

Future Fruits Mandred Acreage  
Projection

Kirstin Hodges  
Agribusiness

Tom Nichols  
Agribusiness

Joey Roedl  
Agribusiness

Matt Hyre  
Agribusiness

This paper is posted at DigitalCommons@CalPoly.  
[http://digitalcommons.calpoly.edu/agb\\_cs/10](http://digitalcommons.calpoly.edu/agb_cs/10)

# Future Fruits Mandared Acreage Projection

Senior Project

AGB 462

Case Study

December 4, 2013

Kirstin Hodges

Joey Roedl

Tom Nichols

Matt Hyre

## History

Innovation by definition is the application of better solutions that meet new requirements, inarticulated needs, or existing market needs. In other words, it is the introduction of something new, whether it is a new idea, method, or device. Today's generation will soon become the leaders in advancing new approaches to old methods and improving them for the years to come. However we, as a team of graduating California Polytechnic San Luis Obispo students, were honored to have had the chance and pleasure to meet and interview a man and his team who are changing the conventional ways of citrus farming and marketing, not only in the United States, but also on a global scale.

In 1975, Peter Alvitre started his journey at Cal Poly right out of high school. He graduated in 1980 with a degree in Agriculture Management, with a concentration in Farm Management. Post-graduation, Peter was hired as an assistant farm manager for a family-owned, multifaceted farming operation located in the San Joaquin Valley. Rocky Hill Incorporated was run by one woman who inherited the farm from her father. They dealt with livestock and other minor crops, but they mostly grew citrus, approximately 2,000 acres. After working for Rocky Hill Incorporated for about four and a half years, he decided to transfer to Paramount Citrus.

Alvitre was employed at Paramount Citrus for nearly nine and a half years as a farm manager. In 1993, Alvitre met Ray Copeland, the superintendent of the Linco field station. These communities, located in the Visalia area, are associated with the University of California, the spawning area of farm advisors from the cooperative extension services, and part of the land grant college system. The cooperative extension services conduct most of the citrus research. Linco's citrus research is mainly science based with variety evaluation, cultural activity evaluation, and physical experimentation of packaging design.

Subsequently, after Copeland's retirement from Linco, he became a private consultant for citrus production. His work required extensive traveling to many countries. In Morocco, he observed the cultural activities associated with agriculture for several years and noticed that they used a worldwide fungicide on their local crops. The fungicide was eliciting a growth response devoid

of any pathogens. In other words, a tree sprayed with the fungicide was free of fungi and it continued to grow and produce its commodity. Copeland quickly realized that this was an excellent opportunity to introduce this new type of nutrient to the American growers.

Copeland approached Alvitre with the idea of introducing the use of phosphites to the American farmers in their nutritional use as a fungicide. The phosphites should not to be confused with phosphates. Consequently, Copeland and Alvitre partnered together and formed the company Biagro Western in March of 1993. Copeland left the formalities of running the business in Peter Alvitre's hands, explaining to him, "I will be in the field, help you whenever you need it, but otherwise, you have to take care of the nuts and bolts." Peter Alvitre and his wife ran Biagro Western through the start-up years as the company introduced new concepts that involved new technology. However, many regulators of the industry were not on board with the change.

The idea of using phosphites as nutrients for crops was a new concept. After primarily using phosphites to kill or inhibit fungal spores, the industry was skeptical of Biagro Western trying to circumvent the law. The company was accused of trying to sell a nutrient and avoiding USEPA (US Environmental Protection Agency) registration costs and requirements for a fungicide. Biagro Western was sued by Ron Palonk, the 4<sup>th</sup> largest agricultural chemical manufacturer in the world, for patent infringement. Copeland and Dr. Lovatt, both researchers at Linco, teamed together to convince the federal court of the benefits of phosphites within agriculture. Dr. Lovett discovered the use of phosphites and their nutritional capacity while on sabbatical in Africa at a citrus research institute. She filed for a patent through the University of California and, by law, gave the University the ownership of the patent. However, the university and Dr. Lovett share any royalties that are generated through licensing the technology. Alvitre and Copeland were at the front door of the office of technology transfer when her patents became available to license. They successfully received the license deal, while Ron Palonk continued with their law suit.

Biagro Western's patent attorney advised the company to get an expert witness to testify. Dr. Lovett was disqualified because of her compensation from her patent royalties, receiving two percent recompense. However, she recommended Nigel Grech, a plant pathologist. Nigel, a British born scientist from South Africa was doing research in the United States on sabbatical.

Grech spent ten years in South Africa researching citrus before coming to the United States. He received a P.H.D. in Plant Pathology and a Master's degree in plant biochemistry. He focused his research on plant nutrition and developing ways to help plants overcome and avoid pathogens. In Africa, Grech began experimenting with the use of phosphites as a crop nutrient. This aspect of his research made him valuable to Biagro Western's court case.

Grech was more than willing to come on board, and he was offered a full partnership with Biagro Western. For over 20 years, Grech worked with Alvitre and Copeland in taking the company to the next level. The company was destined for success with such a well-rounded team: an acute scientist such as Grech, Alvitre's business skillsets, and Copeland being the venerable stakes man. Subsequently, the partnerships of Biagro Western were forged and the company prevailed in federal court in Fresno, California before the honorable Judge Wanger, whose good understanding of agriculture played a huge role in the outcome. The phosphites were given the title of a nutrient for agricultural purposes.

From then on it was full speed ahead. Nigel Grech kept finding new technologies, and Biagro Western kept licensing them. Keeping the company's focus primarily in the plant nutritional field, they have recently begun to investigate reduced risk pesticides. On September 7<sup>th</sup>, 2012, a private equity company called Verdesian Life Sciences offered to buy Biagro Western for an undisclosed amount of money. Biagro Western and its affiliated companies were sold to Verdesian. Nigel and Alvitre were kept on a three year contract; although their share percentage was small, they still had involvement within the company matters.

During the time Alvitre, Copeland, and Nigel worked for Verdesian Life Sciences, while also involved with a few other ventures in addition to their plant nutrition and pesticide operation. They started a farming company called California Clementines, which now owns 300 acres of citrus. California Clementines is a citrus Intellectual Property company, which produces patented citrus varieties. The team continues to travel to create new varieties and have an agreement with three citrus specialty breeders. California Clementines owns the rights to any new varieties and markets the varieties globally for the breeders. As of now, they only have two non-proprietary

varieties: the Marisol, which is a clementine-type mandarin farming operation, and clemenules which is also known as Nules.

Alvitre's newest business venture is Future Fruit, a limited liability company. Located in Visalia, California, Future Fruits was filed as a domestic company as of Wednesday, October 6, 2004. Serving as the managing member, Peter Alvitre has interests in other corporate entities including Plant Protectants, LLC and Future Juice, LLC. Future Fruits has trademarked numerous citrus type fruits such as the Lemora, Red Star Navel, Red Nules, and the Mandared.

## **The Fruit**

There are common names for most plants and the word "orange" is affiliated with the *Citrus sinensis*, which is for the sweet orange and not *Citrus aurantium*, the bitter orange. There are many species with the genus *Citrus*, like *Citrus reticulata*, the mandarin. The most common mandarin oranges are the Satsuma (*Citrus unshiu*), the tangerine (*Citrus tangerina*), and the clementine (*Citrus clementina*) (Hodgson).

### **CLEMENTINE**

The clementine has become a popular type of orange that is small in size, seedless, easy to peel, sweet in taste, and commonly known as seedless tangerines. It is sometimes hard to distinguish between a clementine and other types of mandarins like the Satsuma. The clementine is a hybrid, a cross between a sweet orange and a Chinese mandarin. Popularly grown in Europe, the clementine is commonly known as the Christmas orange because they sell in large numbers from November through January. The clementine market was introduced into the United States in 1997 due to a rough winter in Florida that year causing supply decreases and price increases to the domestic orange production (Hodgson). This variety of orange is grown best in colder climates, which has enabled California to increase their production and establish the brand Cutie®. The Cutie® has been trademarked by Sun Pacific, the largest grower/shipper of naval and clementine oranges in the U.S. Introduced in the early 2000s, Sun Pacific's California

clementine, which is grown in the San Joaquin Valley, has been at high demand among consumers. They have marketed this fruit in a way that is appealing to not only young children, but to adults as well. This on-the-go, easy-to-pack, cute-and-sweet orange has been continuing to fill lunch pails and fruit bowls as a nice healthy substitute. This marketing technique has increased the awareness and consumption of clementine oranges and has been a major game changer in the clementine market.

## **BLOOD ORANGE**

The blood orange is a variety of the *Citrus sinensis* with a unique flesh that resembles the color of blood. This maroon colored flesh is due to the presence of anthocyanin, which is a pigment that is known to be an antioxidant that slows or prevents the growth of cancer cells (Sunkist). This attribute has been a big marketing front for this fruit, especially since the healthy aspect of antioxidants reflects a larger demand among consumers. The maroon color will only develop when temperatures are low enough at night. Blood oranges that are cultivated in the United States are in season from December to March in Texas and November to May in California (Russo). The three most common types of blood oranges are the Tarocco (native to Italy), the Sanguinello (native to Spain) and the Moro.

## **HALO®**

Most of us are familiar with the Cutie®, the popular mandarin clementine jointly introduced by Sun Pacific and Paramount Citrus. The Cutie® is especially popular among children, due to the small size, easy peel, no seeds and sweet flavor. In May of 2013, Paramount Citrus announced that it would end the joint venture with Sun Pacific. Now, Paramount Citrus, Fowler Packing, and Wonderful Brands sell California mandarins which they now call Halo® (Paramount). Two mandarin varieties, Clementines and Murcotts, are grown on a total of 14,000 acres throughout Ventura County and the San Joaquin Valley. Similar to the Cutie®, the Halo® has now reached the citrus grid and the 2012-2013 season witnessed excellent weekly volume sales, especially the week of December 15<sup>th</sup>. The Halo® accrued a growth of 46% from last year's branded mandarin (Ashby). Having early and rapid success, the Halo® is a good product to compare to Alvitre's

Mandared and Red Nules, which are seedless, sweet, easy to peel, and is the first pigmented flesh mandarin in the industry/market. Using the Halo as a reference, Future Fruits can predict the market's reaction to the Mandared and thus license the production of an appropriate amount of fruit. A surplus in supply of the Mandared and Red Nules will result in a loss of profit because supply will be greater than demand during the introduction of the product. Growing too few of trees will negatively affect the market and potential of the product by not being able to supply what is demanded. Halo® brand is a highly recognized competitor to the Mandared and Red Nules, since Paramount Citrus is the industry's largest grower of mandarins.

## **Industry**

Before an estimate of the optimal number of acres to license can be made, one must consider the current industry as a whole. It is important to know the amount of acres that are grown throughout the state and county, consumption trends, sales trends, and production trends.

Considering production trends of mandarins in California, the Mandared has great potential. Table 1 shows the total acreage of citrus grown in California for the years 2010 and 2012. During this time period, Navel and Valencia orange production has decreased while the Mandarin and Hybrid type has increased by 4,092 acres. Even though total citrus acreage has gone down, there is still a growth in production for this variety. The increase in mandarin supply signifies the increase in demand for this style of citrus.

Although California's overall orange crop is projected to go down by 3% from last year, the estimates for the 2012-2013 U.S. tangerine/mandarin season are up 6% from the last season (Perez). With this projection, California will have the largest specialty citrus harvest at 520,000 tons, 19% higher than last season. Comparatively, Florida's last season saw a 22% decline in production, which could be the lowest harvest level the state has seen since 2000 (Perez). With the increased production levels in California, exports of tangerine/mandarins have risen by 15%, exporting 46,306 tons. Similarly, imports of specialty citrus, mainly from Spain and Chile, have also increased (Perez). The market for tangerine/mandarins is projected to improve for the next few years.



The average price for the 2012-2013 season was \$23.83 per box, which is 13% higher than the 2011-2012 season process, over the same period of time. Every month this past season has seen a higher grower price than the same month of the previous season. This strong and steady increase in the price coincides with the increase of production, meaning that demand is also increasing. If the supply of the fruit increases when demand doesn't correlate, then there would be a decrease in the grower price. Since the price is currently increasing for the tangerine/mandarin market, demand continues to increase at a higher rate than production.

Consumption trends can help to predict demand. Table 2 displays the supply and utilization of tangerines/mandarins from 1980-1981 to present. The per capita use has been increasing, reflecting a positive consumption trend. In the last five years, the United States' consumption has increased about one pound per person per year for a total of 4.12 pounds of consumption per capita. As long as per capita consumption continues to trend in this way, the demand for tangerines and mandarins will be sufficient.

## **MANDARED AND RED NULES**

The Mandared and Red Nules are hybrids between a blood orange and a clementine from the Clemenules (Nules) parentage. This specific type of hybrid has the characteristics of a clementine, as well as beneficial health attributes. The unique thing about this certain type of hybrid is the pigmented flesh, which is due to the high amount of anthocyanin. It is a variety that has the potential to see similar numbers as Cutie® and Halo®.

Citrus is sorted into different grade depending on its quality. The lowest grade, culls, are either thrown out or sent to the local juicing plant to juice, which usually generates minimal profits. Fresh packed fruit is sorted into two grades: fancy and choice. Future Fruits' Mandared clementines are sorted as fancy grade, while Red Nules clementines are the choice grade.

Anthocyanin is a type of antioxidant that increases the health benefits of the fruit. An antioxidant is a substance that protects the body's cells from free radicals, which are molecules that damage

the body's cells. Free radicals are produced from the body breaking down food and also from the environment, including smoke and radiation ("Antioxidants: MedlinePlus"). Antioxidants help to prevent heart disease and cancers ("National Cancer Institute"). Mandarins have two non-functional genes of the anthocyanin, therefore do not contain the high health benefits of the blood orange. Fortunately, the Mandared contains the same level of anthocyanin as the blood orange. This characteristic can positively influence consumers due to the high amount of health attributes. These qualities, along with the characteristics of the Cutie® and Halo® are why Alvitre has such optimism for the Mandared and Red Nules.

The seasonality of this fruit is also unique because it is in the month of March. It is a variety that has the smallest window amongst all of the varieties that Future Fruit grows. This small window may cause limitations for marketing, but I think that they can do fine if done correctly. For instance, Alvitre has mentioned growers getting together and making the fruit available year-round. This would lower packaging cost if all of them were on board. The price the grower receives in March unveils some optimism. In the 2012-2013 season, March has the highest average price of \$28.43 per box. That is almost \$5.00 more than the average price for the season and can be promising for Future Fruit.

## Mandarin Operations

### **NURSERY**

Future Fruits has a contract with a single citrus nursery in Arvin, California to propagate all the Mandared trees. This nursery, Willits Newcomb, Inc., was established in the 1940's, became incorporated in 1961, and was sold to the current owners, and Mrs. Maxwell, in 1978. Producing about 250,000 trees per year and selling to about 110 nations worldwide, Willits Newcomb, Inc. has expanded in the six decades of production.

The contract with Future Fruits focuses on the control of the Mandared tree supply. The Mandared trees are sold on a contract-basis in order to control the amount of production. Willits Newcomb, Inc. grafts the trees 14-16 months prior to sale. Growers must order their trees far in

advance to account for the time elapse between ordering and being able to plant. Willits Newcomb, Inc. is required to sell to Future Fruits growers. The nursery sells the trees at their own price and pays Future Fruits a royalty of \$2.00 per tree.

### **Budding**

The Mandared is reproduced through graftage in order to make it compatible with the environment. Graftage is the process in which the fruit bearing part of the tree is attached to a different rootstock. This is helpful to grow plants in areas where they previously would not survive. The nursery can graft the Mandared tree to many different rootstocks and Future Fruits can allocate the trees to growers in different areas. Alvitre remarked that this process is similar to “marrying growing conditions to marketing objectives” (Peter Alvitre). By expanding the areas where the Mandared can be grown, the availability will increase.

There are two types of graftage: budding and grafting. Willits Newcomb, Inc. uses budding for the Mandared because this technique requires less time, a smaller scion, and less skilled labor. The rootstock is chosen based on the area that the tree will be planted and will provide the tree with nutrients as well as preventing it from acquiring diseases. The fruit bearing part of the tree during the budding process is called a scion. The scion from another Mandared tree is placed into the main stem of the rootstock. The rootstock is grown to maturity and then trimmed of all its side shoots. A standard “T” cut is used on the stem of the rootstock a few inches above ground level. The flaps of the “T” are pulled open and the scion, approximately one a half inches long, is inserted into the opening. The flaps are tied closed for three to five weeks while they heal shut, leaving the bud to grow out of the stem. The rootstock stem is eventually bent over itself, allowing the bud to become the dominant stem of the tree.

### **Breeding Seedless**

The Mandared is a seedless variety through the process of breeding, not irradiation. Irradiation creates “a physical mutation” within the fruit genetics (Peter Alvitre). It is used in a variety of accepted foods including watermelons, lemons, and other mandarins because of the quick turnaround in results. Irradiation is a quick process that replicates itself in a short period of time. Breeding is the cycle of taking out the gene that creates seeds. This is a more natural process,

although it requires more time and planning than irradiation. With the growing health trends, Future Fruits is willing to put in the time and effort to create a product that is more desirable through the use of a more natural process.

## **GROWER LICENSE AGREEMENT**

Every grower must sign the Grower's License Agreement with Future Fruits before he/she can buy a Mandared tree. The agreement leases a specific quantity of trees to the grower to produce and sell the fruits from those trees. For the privilege to grow the trees, the grower pays a royalty for the life of the patent, a royalty for the use of the trademark name, and a royalty per package or per acre basis. Future Fruits holds a strict criterion for producing high quality fruit and using the trademark name, but the growers are given the choice of how to grow, how to market, and where to market the fruit that is produced.

The three main purposes of the Grower's License Agreement are to limit the number of trees that are planted, balance and coordinate the production in the northern and southern hemispheres, and the use of the same trademark name worldwide. Limiting the production and market supply of Mandareds will help maintain a high demand over the entire season, which will keep prices at a stable level. The balance between hemispheres will eventually increase the global supply year-round causing the Mandared to become a well-known favorite. Future Fruits wants to create a recognizable product that people can trust to be of high quality.

The licensed agreement guarantees the growers patent protection, patent infringement inducement, and the right of refusal. Alvitre created this agreement to be flexible with the environment, so the growers will not be punished if the weather or other unavoidable disturbances occur and ruin the crop. The patent infringement inducement controls the fruit coming into the market. It stops the import of Mandareds from foreign markets to regulate the supply and volume of the domestic market. Mandareds have genetic markers that allow the company to test the fruit and verify whether or not the fruit is truly a product of Future Fruits. The first growers that were contracted have first right of refusal on two grounds: 1) when more

acreage of a specific variety is offered; 2) when new varieties are introduced. The long-term growers have a higher priority on expanding and new products.

## **HARVEST SEASON**

The Mandared harvest period is in March. Currently, the Mandared has a relatively small availability window, but with the expansion of production in new areas, the availability will increase. Table 3 illustrates the availability of the main mandarin varieties that are offered by Future Fruits. Other competitors include Sunkist and Fresh Fruits Company. Sunkist offers Satsuma mandarins from mid-October to late December, the Orlando tangelos from mid-November to early February, and Royal mandarins from mid-January to mid-March (“Organic Citrus”). Fresh Fruits offer the Frutia mandarin from July to September (“Products and Brands: Citrus”). The Mandareds have great potential because they will be introduced into the market when the other mandarin seasons are coming to a close. While the quality and supply of the other mandarin varieties is decreasing, the Mandared supply and quality will be at its peak.

## **DISTRIBUTION PROCESS**

Future Fruits is not interested in marketing the Mandareds. The company believes that the trademark and the advertisement from the retail markets will drive sales. Instead, Peter Alvitre is relying on the growers organizing and consolidating their production into one packing house. This will increase volume control and quality control. Quality will be more consistently organized and consumers will come to expect high quality. Volume control will increase convenience for retailers to buy bulk fruit throughout the season. Combining multiple growers into one packing house will make the Mandared more available during its harvest season.

## **Conclusion**

In the past, certain commodity varieties have failed due to poor management. A particular variety will become popular, which triggers the growers to mass produce that particular varietal. When growers are not in communication with each other, too much fruit can be produced. Once the

market is flooded with the product, it in turn drives the price down due to the overabundance of supply.

Future Fruit will control the supply by owning the license on the Mandared. This supply side control will give the Mandared an advantage in the market due to consistent prices both for the grower and the consumer. However, this will require insightful management by Future Fruits to optimize production levels.

Due to the similarities between the California clementines and the Mandared, it is reasonable to project the demand of the Mandared by using clementine consumption figures. Assuming similar demand, supply must also be similar. During the 2012-2013 season, approximately 14,000 acres of California clementines were harvested. If each acre produced four to seven tons of fruit, approximately 56,000 to 98,000 tons of clementines are required to fulfill demand (Thompson). Assuming that one acre of Mandared produces three tons of fruit and the goal is to capture the entire California clementine market of 98,000 tons, approximately 32,600 acres would be required.

## Tables and Figures

<b>Table 1- Detailed California Citrus Acreage, 2010 and 2012</b>						
<b>Type</b>	<b>Acres Standing in 2010</b>			<b>Acres Standing in 2012</b>		
	<b>Bearing</b>	<b>Non-Bearing</b>	<b>Total</b>	<b>Bearing</b>	<b>Non-Bearing</b>	<b>Total</b>
<b>Grapefruit <sup>1/</sup></b>	7,826	1,103	8,929	8,523	512	9,035
<b>Lemons</b>	41,535	2,942	44,477	41,222	2,247	43,469
<b>Limes</b>	462	11	473	429	36	465
<b>Oranges, Navel</b>	130,469	4,437	134,906	126,654	3,432	130,086
<b>Oranges, Valencia</b>	41,862	678	42,540	38,391	188	38,579
<b>Pummelos and Hybrids</b>	1,559	20	1,579	1,517	19	1,536
<b>Mandarins and Hybrids</b>	32,734	6,092	38,826	37,036	5,884	42,920
<b>Total</b>	256,447	15,283	271,730	253,772	12,318	266,090

1/ Excludes Pomelos and hybrids

<[www.nass.usda.gov/ca](http://www.nass.usda.gov/ca)>

Table 2: Fresh tangerines and tangelos: Supply and utilization, 1980/81 to date

Season 1/	Supply			Utilization		Per Capita use Pounds
	Utilized production 2/	Imports	Total supply --Million pounds--	Exports	Domestic	
1980/81	453.0	29.1	482.2	35.4	446.8	1.95
1981/82	429.1	48.0	477.1	28.9	448.2	1.94
1982/83	452.3	23.5	475.8	37.1	438.7	1.88
1983/84	413.5	38.4	452.0	22.5	429.4	1.82
1984/85	350.5	15.0	365.5	35.2	330.3	1.39
1985/86	368.4	21.3	389.7	19.0	370.7	1.55
1986/87	433.6	31.4	465.0	34.0	431.0	1.78
1987/88	430.7	35.4	466.0	32.7	433.3	1.78
1988/89	426.7	37.4	464.1	44.1	419.9	1.71
1989/90	323.0	37.2	360.2	29.7	330.5	1.33
1990/91	330.0	46.1	376.0	27.1	349.0	1.39
1991/92	496.3	41.9	538.2	43.2	494.9	1.94
1992/93	477.1	40.4	517.6	33.4	484.2	1.87
1993/94	562.9	41.0	603.9	51.9	552.0	2.11
1994/95	523.6	46.8	570.4	40.8	529.6	2.00
1995/96	582.8	45.1	627.8	48.4	579.4	2.16
1996/97	659.6	77.8	737.3	49.8	687.6	2.54
1997/98	567.6	85.3	652.9	54.7	598.1	2.18
1998/99	548.3	125.7	674.0	31.4	642.6	2.32
1999/2000	657.9	212.5	870.4	62.2	808.2	2.88
2000/01	586.9	220.6	807.5	31.6	775.9	2.73
2001/02	653.5	116.1	769.6	33.9	735.7	2.57
2002/03	638.6	190.0	828.6	37.5	791.1	2.73
2003/04	651.2	203.7	854.9	43.3	811.6	2.78
2004/05	569.7	214.6	784.3	43.0	741.3	2.51
2005/06	621.0	226.5	847.4	46.3	801.2	2.69
2006/07	540.2	266.8	807.0	35.3	771.7	2.57
2007/08	793.7	213.0	1,006.7	70.5	936.3	3.08
2008/09	745.8	288.9	1,034.7	65.0	969.7	3.17
2009/10	959.8	282.8	1,242.5	17.1	1,225.5	3.97
2010/11	1,068.2	329.0	1,397.1	113.6	1,283.6	4.13
2011/12 3/	1,070.5	299.5	1,370.0	80.7	1,289.4	4.12

1/ Season begins in November of first year shown. 2/ Includes all tangerine varieties, such as Fallglo, Sunburst, Honey, clementine, mandarin, and satsuma, as well as tangelos and tangors. 3/ Preliminary.

Source: USDA, Economic Research Service calculations.

<<http://www.ers.usda.gov>>.



Table 3: Future Fruits Mandarin Varieties Availability

	September			October			November			December			January			February			March			April			May					
	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late
Alkantare										██████████																				
Lemox/Liora				██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████	██████████						
Mandalate																									██████████	██████████	██████████			
Mandared/ Red Nules																			██████████	██████████	██████████									
Miyazaki	██████████	██████████	██████████	██████████	██████████	██████████																								
Nemsa							██████████	██████████	██████████	██████████	██████████	██████████																		
Sophia							██████████	██████████	██████████	██████████	██████████	██████████																		
Tacle										██████████	██████████	██████████	██████████	██████████	██████████															

(Future Fruits)

Table 4: Fresh tangerines and mandarins: Average equivalent on-tree prices received by U.S. growers 2007/08-2012/13

Month	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
	<i>--Dollars per box 1/--</i>					
October	15.65	17.48	14.00	11.90	9.55	15.05
November	23.88	22.24	26.31	34.53	21.99	23.98
December	21.21	15.19	25.05	30.30	26.88	28.21
January	21.18	18.46	19.43	21.41	19.18	22.97
February	19.52	23.76	11.22	18.51	22.03	24.36
March	20.39	18.96	16.40	15.99	26.82	28.43
April	17.45	--	18.55	18.66	--	--
May	6.65	--	--	--	--	--
<b>Oct.-May average</b>	<b>18.24</b>	<b>19.35</b>	<b>18.71</b>	<b>21.61</b>	<b>21.08</b>	<b>23.83</b>

1/ The net weight of a tangerine box for Florida: 95 lbs, for Arizona and California: 80 lbs (75 prior to the 2010-11 crop year).  
 Source: USDA, National Agricultural Statistics Service, Agricultural Prices, various issues.

<<http://www.ers.usda.gov>>.

Table 5: Citrus acreage by type, county, and year planted, 2012

Mandarins & Mandarin-Hybrids	2004 and Earlier	2005	2006	2007	2008	2009	2010	2011	2012	Bearing	Non-Bearing	Total
<b>Acres</b>												
Butte	88	2	-	1	-	-	-	-	-	91	-	91
Fresno	3,155	577	601	142	367	1,030	261	266	107	5,872	634	6,506
Glenn	71	-	-	-	-	3	-	-	-	74	-	74
Imperial	836	55	-	20	50	30	42	15	-	991	57	1,048
Kern	8,356	1,932	451	50	301	1,136	1,789	974	24	12,226	2,787	15,013
Madera	1,126	390	569	435	-	69	10	-	220	2,589	230	2,819
Placer	117	2	1	4	2	-	1	-	4	126	5	131
Riverside	1,942	69	109	1	1	-	-	70	-	2,122	70	2,192
San Diego	497	53	7	5	3	4	10	1	-	569	11	580
Stanislaus	226	-	-	-	-	-	-	-	-	226	-	226
Tulare	4,826	719	1,505	426	1,267	1,905	846	619	245	10,648	1,710	12,358
Ventura	363	305	170	232	144	55	267	77	2	1,269	346	1,615
All other counties	199	10	2	-	19	3	34	-	-	233	34	267
<b>STATE TOTAL</b>	<b>21,802</b>	<b>4,114</b>	<b>3,415</b>	<b>1,316</b>	<b>2,154</b>	<b>4,235</b>	<b>3,260</b>	<b>2,022</b>	<b>602</b>	<b>37,036</b>	<b>5,884</b>	<b>42,920</b>

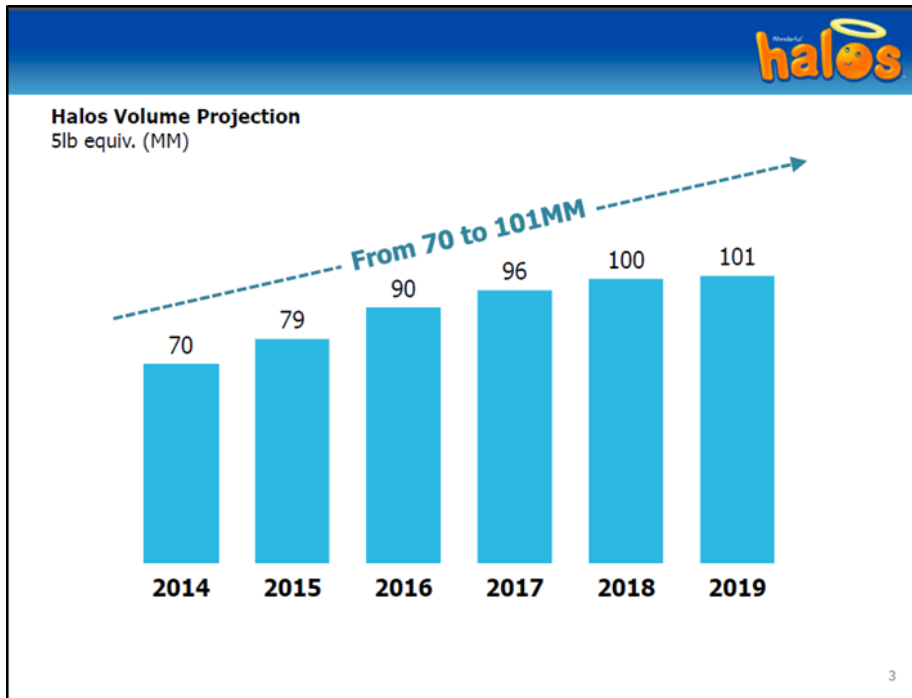
<www.nass.usda.gov/ca>

Table 6: Citrus acreage by types, variety, and year planted, 2012

Mandarins & Mandarin-Hybrids	2004 and Earlier	2005	2006	2007	2008	2009	2010	2011	2012	Bearing	Non Bearing	Total
<b>Acres</b>												
Mandarins/Tangerines	16,670	3,812	3,291	1,205	2,116	4,001	3,183	1,985	595	31,095	5,763	36,858
Clementines	6,282	1,529	308	25	195	1,162	694	447	26	9,501	1,167	10,668
Algerian/Clementine	420	58	-	-	-	35	-	-	-	513	-	513
Caffin/Clementine	393	-	175	15	30	179	-	51	20	792	71	863
Clemenules (Nules)	5,017	1,462	118	10	165	948	164	25	6	7,720	195	7,915
Fina Sodea/Clementine	309	-	-	-	-	-	500	371	-	309	871	1,180
Oro Grande/Clementine	143	9	15	-	-	-	30	-	-	167	30	197
Gold Nugget	194	109	49	56	88	74	19	111	49	570	179	749
Fairchild	976	48	13	-	-	-	-	-	-	1,037	-	1,037
Pixie	134	14	25	6	15	16	12	14	2	210	28	238
Satsuma	1,839	10	22	27	74	43	43	21	7	2,015	71	2,086
Shasta Gold	29	45	7	7	4	7	-	-	-	99	-	99
Tango	52	-	1	75	1,198	1,888	1,600	722	244	3,214	2,566	5,780
W. Murcott Afourer	4,693	1,759	1,990	847	85	183	35	24	144	9,557	203	9,760
All other Varieties	2,471	298	876	162	457	628	780	646	123	4,892	1,549	6,441
<b>Total</b>	<b>39,622</b>	<b>9,153</b>	<b>6,890</b>	<b>2,435</b>	<b>4,427</b>	<b>9,164</b>	<b>7,060</b>	<b>4,417</b>	<b>1,216</b>	<b>71,691</b>	<b>12,693</b>	<b>84,384</b>

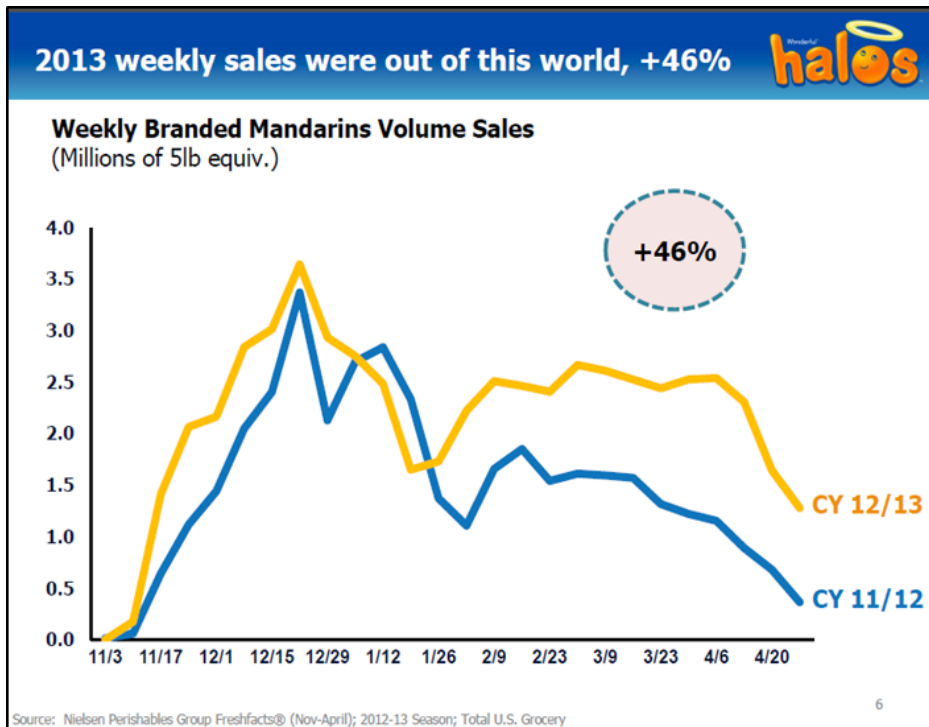
1/ shaded/bold area indicates non-bearing years. Totals may not add between county and variety tables due to rounding <www.nass.usda.gov/ca>

Figure 1: Halo Volume Projection 2014-2019



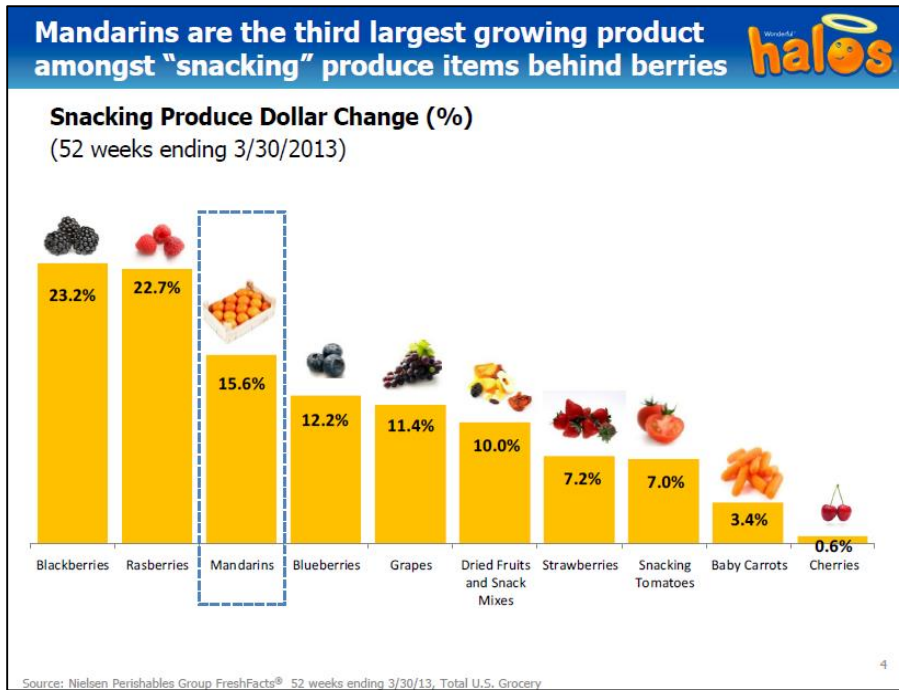
Ashby, Jean. "Halo@s." Powerpoint Presentation. E-mail. Atascadero, CA. 27 Nov. 2013.

Figure 2: 2013 Weekly Sales



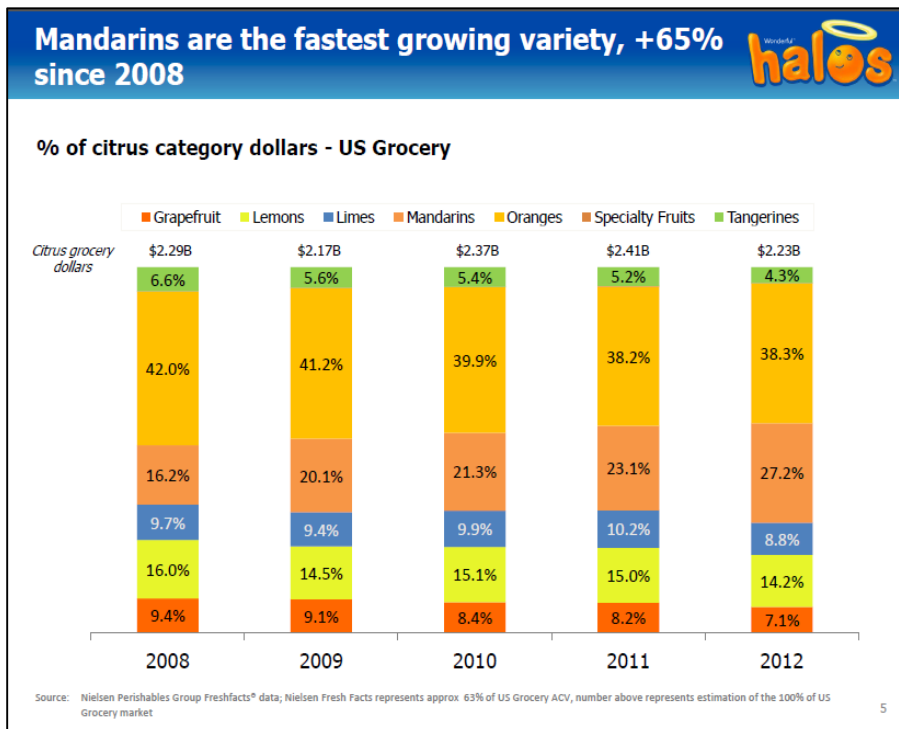
Ashby, Jean. "Halo@s." Powerpoint Presentation. E-mail. Atascadero, CA. 27 Nov. 2013.

Figure 3: Snacking Produce Dollar Change, 2013



Ashby, Jean. "Halo@s." Powerpoint Presentation. E-mail. Atascadero, CA. 27 Nov. 2013.

Figure 4: Citrus US Grocery Category Growth, 2008



Ashby, Jean. "Halo@s." Powerpoint Presentation. E-mail. Atascadero, CA. 27 Nov. 2013.

## References

- "Antioxidants: MedlinePlus." *U.S National Library of Medicine*. U.S. National Library of Medicine, 31 Oct. 2012. Web. 02 Dec. 2013.  
<<http://www.nlm.nih.gov/medlineplus/antioxidants.html>>.
- "Antioxidants and Cancer Prevention." *National Cancer Institute*. National Institute of Health, 09 13 2013. Web. 2 Dec 2013.  
<<http://www.cancer.gov/cancertopics/factsheet/prevention/antioxidants>>.
- Ashby, Jean. "Halo@s." Powerpoint Presentation. E-mail. Atascadero, CA. 27 Nov. 2013. California Department of Food and Agriculture, California Agricultural Statistics Service. USDA. *2012 California Citrus Acreage Report*. Sacramento: CDFA, 2012. Web.  
<[www.nass.usda.gov/ca](http://www.nass.usda.gov/ca)>.
- Future Fruit. Peter Alvitre, assignee. Patent 76607854. 16 Dec. 2008. Web.  
<http://www.wysk.com/index/california/visalia/x73mqvt/future-fruit-llc/trademarks>
- "Future Fruit, LLC." Personal interview. 3 Nov. 2013.
- Hodgson, Robert. "Horticultutural Varieties of Citrus." *websites.lib.ucr.edu*. N.p.. Web. 11 Nov. 2013. <<http://websites.lib.ucr.edu/agnic/webber/Vol1/Chapter4.html>>.
- Maxwell, Jackie. "History." *The Citrus Nursery*. WILLITS & NEWCOMB INC.. Web. 3 Dec 2013. <[http://www.wncitrus.com/about\\_history.php](http://www.wncitrus.com/about_history.php)>.
- Munkvold, Kathy. "Solved: The Mystery of the Blod Orange." *American Society of Plant Biologists*. American Society of Plant Biology, 16 Mar 2012. Web. 2 Dec 2013.  
<<http://my.aspb.org/blogpost/700954/140240/Solved-The-Mystery-of-the-Blood-Orange>>.
- "National Cancer Institute." *Antioxidants and Cancer Prevention*. N.p., n.d. Web. 02 Dec. 2013.  
<<http://www.cancer.gov/cancertopics/factsheet/prevention/antioxidants>>.
- "Organic Citrus." *Citrus and Products*. Sunkist Growers Inc.. Web. 3 Dec 2013.  
<[http://www.sunkist.com/products/organic\\_citrus.asp&xgt;](http://www.sunkist.com/products/organic_citrus.asp&xgt;);
- "Paramount Citrus goes from Cutie@s to Wonderful Halo@s." *Business Journal*. n. page. Web. 2 Dec. 2013. <<http://www.thebusinessjournal.com/news/agriculture/6449-paramount-citrus-goes-from-Cutie@s-to-wonderful-Halo@s>>.

- Perez, Agnes, and Plattner Kristy. United States. United States Department of Agriculture. *Fruit and Tree Nuts Outlook*. Economic research Service, USDA, 2013. Web.  
<<http://www.ers.usda.gov>>.
- "Products and Brands: Citrus." . Fresh Fruits Company. Web. 3 Dec 2013.  
<<http://www.freshfruitscompany.com/>>.
- Russo, Susan. "Blood Oranges: Change You Can Believe In." *NPR*. N.p., 29 Jan 2009. Web. 15 Nov. 2013. <<http://www.npr.org/templates/story/story.php?storyId=99883518>>.
- "Sunkist." *Citrus and Products*. Sunkist and design. Web. 11 Nov. 2013.  
<<http://www.sunkist.com/products/oranges.aspx>>
- Thompson, Pat. "Mandarin Fact Sheet." *Fruit & Nut Research and Information Center*. Regents of the University of California, 06 February 2011. Web. 2 Dec 2013.  
<[http://fruitsandnuts.ucdavis.edu/dsadditions/Mandarin\\_Fact\\_Sheet/](http://fruitsandnuts.ucdavis.edu/dsadditions/Mandarin_Fact_Sheet/)>.