



Assessing the Local Marketing Potential For Mandarin Growers in Placer County

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Agriculture and Natural Resources
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INTRODUCTION

During the last decade, Placer County initiated several innovative programs to support a regional, sustainable food system. This includes the well-known PlacerGROWN agricultural marketing program, a citizen-based, non-profit organization that is dedicated to the survival of local agriculture. The county is also home to the Foothill Farmers' Market Association and 16 farmers' markets, several Community Supported Agriculture (CSA/subscription) farms, and roadside stands. A variety of harvest festivals celebrate the local abundance, including the Eggplant Festival, the AGRO-Art Festival, the Farm & Barn Festival, and the Mandarin Festival, as well as the newly established Mandarin Mountain Orchard Tour. Finally, Placer County employs the first countywide local agricultural marketing expert who helps farmers/ranchers find local markets for their products.

One of the most promising new agricultural products to flourish in Placer County in the last five years is the mandarin orange. A recently formed association of Placer mandarin growers now includes 35 members, mandarin production is increasing, and 30,000 people attended the 2003 Mandarin Festival. Even as the production sector increases, growers and other agricultural experts sense that the local market for mandarins has barely been tapped. The principle objective of this project is to identify and assess potential marketing strategies for mandarin growers in Placer County. A similar study that examined the local marketing opportunities for organic produce in Chicago was used as a model (Birkerts, 2002).

The purpose of the information presented here is twofold. First, it is part of UC SAREP's continuing participation in the multi-state research project *NE 1012, Sustaining Local Food Systems in a Globalizing Environment: Forces, Responses*. As one component of this analysis, the Placer study focused on ways in which local, small-scale producers are attempting to sustain their foothold in the agricultural economy. Second, this study is intended to provide Joanne Neft, Director of Agricultural Marketing in Placer County, and mandarin growers with an assessment of the current production and marketing systems as well as specific recommendations for improving the producers' economic returns. Specialty fruit producers, marketers, and others interested in targeting niche markets for agricultural goods may also find this document to be valuable.

The report is organized into five sections: current supply, demand, market channels, barriers, and outreach and marketing. We hope that this information both assists and encourages mandarin growers in Placer County.

EXECUTIVE SUMMARY

The world supply of mandarins is showing an upward trend, as mandarins become more popular and production efforts increase. The United States is far behind other regions of the world in production, but this is due to a historically lower consumption pattern than in regions such as Asia. In some Asian countries, mandarins are the highest valued citrus family. Still, as mandarins develop a reputation as a healthy, easy-to-eat food, and more Americans include greater amounts of fresh fruits and vegetables in their diet, the demand for mandarins in the U.S. is rising. Currently Americans eat approximately three pounds of mandarins per year. Most are consumed fresh, with very little volume processed for juice or canned products. The majority of the demand resides in the Pacific Northwest; California is among the leaders in increased acreage planted to mandarins. Placer County has been reflecting this growth in recent years. It is ranked fifth in production in the state for increased acreage planted, and per capita consumption in the county was up to almost four pounds last year.

Mandarin sales in Placer County commonly occur on farm, directly between the grower and consumer. With more large-scale operations entering into mandarin production, local growers have had to re-think their marketing habits. Current marketing channels for local fruit include wholesale, direct retail, institutional sales, farmers markets, seasonal festivals and farm tours, and holiday shipping, with the last four methods accounting for only 11 percent of sales. Still, agriculturalists are facing major obstacles to local and statewide markets, largely because of the effects of global agricultural trends, and a lack of grower knowledge about agricultural marketing and promotion. Agricultural livelihoods and farmland are increasingly threatened by development and the rapid urbanization of Placer County.

However, opportunities for increasing mandarin sales for local growers do exist. Placer County has the only county-appointed agricultural marketing specialist, as well as local officials and an agricultural support staff who are sympathetic to farming issues. The county is also the home to a well-established system of farmers markets, the decade-old Mandarin Festival, and a newly established grove tour. Opportunities for further development highlighted in this report center on increased product differentiation, further utilization of existing resources such as the PlacerGROWN label, the continuation of efforts to organize mandarin growers, increased efforts to educate the general public about this unique local product and the importance of supporting regional agriculture, and increases in innovative and new marketing venues.

Summary of Opportunities:

- **Product Differentiation**
 - Market the unique flavor of *mountain-grown* mandarins
 - Promote the *local* aspect of mandarin production
 - Develop value-added products such as juice, jams, chutneys, and sauces

- **Utilization of Existing Resources**
 - Take advantage of educational opportunities and support from University of California Cooperative Extension, including farm advisor Cindy Fake
 - Utilize the support and resources offered by the Agriculture Commissioner, Christine Turner

- Utilize the marketing and networking services of PlacerGROWN and the Director of Agricultural Marketing, Joanne Neft
- **Continuation of Efforts to Organize Mandarin Growers**
 - Increase the level of cooperation among local producers
 - Consider the non-profit and coalition models of other agricultural associations
- **Targeting and Educating Consumers**
 - Capitalize on new residents moving into the area as a pool of potential consumers
 - Market beyond Placer County to surrounding areas
 - Raise awareness about the existence, uniqueness, and significance of locally grown mandarins
 - Educate consumers about the health benefits of eating mandarins
- **Development and Expansion of Marketing Strategies**
 - Internet Web sites
 - Direct retail
 - Direct sales
 - Placer County mandarin label
 - Ag Tourism
 - Newly established Mountain Mandarin Magic tour
 - Increased investment into marketing



MANDARIN SUPPLY

The current supply of mandarins¹, both worldwide and within Placer County, is on an upward trend, as mandarins gain in popularity and production efforts increase. The United States is far behind other regions of the world in production of mandarin fruit but this reflects a different historical consumption pattern by Americans compared to areas such as Japan, where mandarins are the most highly valued member of the citrus family. Domestically, California is among the leaders in increased acreage planted to mandarins and Placer County, the fifth largest producer of mandarins in the state, reflects this growth in recent years.

Worldwide Production

China leads the world in mandarin production, accounting for 36 percent of the world tangerine (a variety of mandarin) total in 1999-2001 (Perez and Pollack, 2003) and an estimated 39 percent in 2001-02 (Economic and Market Research Department, 2004). Spain became second after surpassing Japan in the late-1990s, and accounts for 10 percent of world production, mainly in Clementine tangerines. After third-ranking Japan, Brazil, Iran, Thailand, the Republic of Korea, Italy, Turkey and Egypt complete the list of top producers from 2001 (Perez and Pollack, 2003). Within the last few years, production of tangerines has risen in Argentina and Morocco (Economic and Market Research Department, 2004).

Domestic U.S. Production

The United States has never been a major contributor to the world mandarin market, but mandarin production has been consistent over the last decades. It made up six percent of world production in the 1970s and roughly four percent in the 1980s, and in recent years has dropped to approximately three percent. Production of mandarin fruit within the U.S. is centered in Florida and California and includes some growing regions in Arizona, Louisiana, Alabama and Texas. Most of these areas are subtropical and have a historical and cultural connection to major citrus production. It is not surprising that the acreage planted to varieties of mandarins is growing significantly in these zones. Tangerine production in Florida went from 43 percent in the 1986-87 season to approximately 70 percent by the 2002-03 season (Perez and Pollack, 2003). Similarly, acreage planted to tangerines is on the rise in California, where 25 percent of U.S. production is centered.

Imports of mandarins have also increased significantly in the last 10 years, some years growing by as much as 27 percent (see Table 1). They are primarily coming from Spain, the world's largest Clementine producer (Perez and Pollack, 2003). Mexico has also regularly supplied the U.S. with supplementary tangerines, but these imports have remained relatively stable. Total foreign imports of tangerines increased from 33 million pounds in 1994-95 to 169 million pounds in 2003-04 (Perez and Pollack, 2003; Pollack and Perez, July 2004), an increase of over 400 percent. The small decrease in imports observed in recent years is due to the ban placed on European tangerines in 2001-02, a result of the Mediterranean fruit fly found in Spanish Clementines that season (Perez and Pollack, 2003). The inspection protocol between the

¹ See Appendix A for the definition of mandarin used in this report.

U.S. and Spain was redefined, and importation slowly began again, but there is some hesitation on the part of Spain to resume the levels of operation that existed before the ban.

Year	Domestic Production	Imports	Total supply --Million pounds--
1995-96	645	43	688
1996-97	710	75	784
1997-98	619	90	709
1998-99	602	124	726
1999-2000	697	207	904
2000-01	618	206	823
2001-02	691	140	831
2002-03	646	170	816

Source: Economic Research Service

California Production

The California Department of Food and Agriculture estimates that the value of the state's fruits and nuts exceeded \$7 billion in 2001 (CDFA, 2002). California ranks 2nd in U.S. mandarin production and cultivates 25 percent of the domestic crop. Still, compared to the rest of the state's 350 crops, mandarins do not represent a large percentage of acreage or cash income. In 2000 they were ranked 60th on the list of commodity crops in California and 57th in 2001 (CDFA, 2002). Leading counties include Tulare, Riverside, San Diego and Imperial. Harvest runs from the beginning of November through the end of April, and in 2001, 82,500 short tons (roughly 165,000,000 pounds) were harvested from the nearly 9,000 acres planted. Cash values of tangerines from 1999 to 2001 ranged between \$17,684,000 and \$31,815,000 (CDFA, 2002).

Satsumas and Clementines are the most common mandarin varieties grown in California (Perez and Pollack, 2003), accounting for most of the nation's Satsuma production and a rapidly growing share of its Clementine production. Recently, more Clementines have been planted in California than other varieties. This is likely due to the similarity of the state's climate with regions like Spain where Clementines thrive, and an increased demand for mandarins by U.S. consumers. Florida cannot grow Clementines at a comparable scale because the climate is too humid to produce good-quality fruit (Pollack and Perez, 2004). Acreage planted to tangerines went up three percent in 2003-04 and is mostly located in the San Joaquin Valley (Pollack and Perez, 2004).

In general, fruit that does not meet fresh market standards within its industry is often processed. Unlike Florida, California and Arizona do not have statewide quality and size standards for processing mandarins. With little quality control, and a very low demand for processed mandarin products, growers are unable to command high rates for boxes of the fruit. They are usually able to recover some costs by selling the already-picked fruit in this manner, but it is not a major revenue source. Prices reported for mandarins, therefore, more closely reflect fresh market prices.

² Fruit and Tree Nuts Outlook/FTS-306, USDA Economic Research Service, 24 Sept 2003

Placer County Production

To better understand the importance of farming to Placer County, the area's agricultural history must be examined. Beginning in the 1800s, Welsh immigrants settled the region and began planting citrus and palm while establishing the granite quarries in what is now Penryn. By the 1950s, orchard farming was well established in the county and Placer was known nationwide for its pear, plum and peaches. The demand for these fruits was so high that truckloads of produce were being sent to the east coast by train, and numerous packing warehouses lined the streets of urban centers like Loomis and Newcastle. Farmers first planted mandarins in Placer in the 1950s. Frank Poyer was one of the farmers, and by 1958 he convinced several other established growers, including Ed Pilz and Frank Aguilar, to do the same in the Penryn area. At this time an outbreak of pear decline hit the Placer County region and many growers lost a majority of their fruit trees. Shortly after convincing his colleagues to start growing mandarins, Poyer lost his trees to frost, but the Pilz and Aguilar families still raise mandarins.

Today, many of the growers planting mandarins are returning to farming after the difficulties they experienced during the pear decline of the 1960s. Others are newer farmers, interested in trying agriculture as a hobby or as a second income. These growers have either retired from their first careers or are still working other jobs. A rare few have entered the field only to farm, but this group is increasingly limited by the rising cost of land. Even those that grew up farming or with family connections to county land are pursuing off-farm incomes, either to supplement or completely replace what they generate through agriculture. According to Cindy Fake, a Placer County UCCE farm advisor, acreage planted to mandarins has tripled within the last 10 years, although most of the increase occurred before the major housing growth that has marked the region in the last few years. With the growing supply of mandarins in Placer County and popularity of events like the Mandarin Festival, growers are starting to work together to sell their fruit and to solidify their place in Placer County agriculture. As producers of the only cultivars of sweet mountain-grown mandarins, the market is theirs to create, although they face unique marketing and sales hurdles, as detailed in this report.

According to the Placer County Agriculture Commissioner's 2004 Crop Report, 160 acres of land in the county were bearing mandarins. With an estimated average output of 2.9 tons per acre, the total production of mandarins in Placer was 7,464 tons. These mandarins were valued at \$1,252 per ton, which is down from the previous three years (see Table 2). The total annual value of mandarin production in Placer County peaked at almost \$2 million in 2002, a sum nearly triple the value of 2001. This increase reflects both the jump in bearing acreage over the same period, and the higher dollar value per ton that also peaked in 2002. It is important to note that mandarin production tends to be cyclical, alternating between good bearing years of bumper crops, and resting years in which yields go down. County production in tons per acre reflects this fluctuation, the value dropping from 5 to 2.9 tons from 2003 to 2004. It is currently estimated that the crop report for 2005 will show a return to higher yields, since it is being described as a "limb-buster" year.

Table 2 – Production and Value of Mandarins in Placer County, 2000-04

Year	Total Bearing acreage	Bearing, tons per acre	Total number of tons produced	Value per ton	Total Value
2000	93	2.70	251	\$1,589	\$398,800
2001	93	3.10	288	\$1,900	\$547,800
2002	127	5	635	\$2,867	\$1,820,500
2003	148	5	740	\$1,790	\$1,324,600
2004	160	2.90	464	\$1,252	\$580,900

Source: 2001, 2002, 2003, and 2004 Agricultural Crop Reports, Placer County Ag Commissioner

Interviews were conducted with eight mandarin growers in the spring and summer of 2004, representing 18 percent of the total number of growers at that time,³ and 66 percent of the total bearing acres within the county.⁴ In addition, interviewers gathered data at five grower association meetings in April, May, June, July and October of 2004; follow-up information was collected from numerous growers via telephone.

In 2003 the average value of sales generated by those interviewed was \$177,110. This value does not reflect the varied prices each grower obtains through different marketing venues or product differentiation (i.e. organic). To help determine what percentage of their sales occurred inside or outside of the county, growers were asked how they market their fruit (see “Marketing Channels” p. 15). Data from the ag commissioner and interview responses show that most of the mandarins sold by Placer growers are purchased through venues within the county. It is estimated that as much as 66 percent of sales occur within Placer, with the remaining 34 percent made outside the county.

	2002 Values in \$US	2003 Values in \$US
Sold within Placer County ⁵	\$1,201,530	\$874,236
Sold outside Placer County ⁶	\$618,970	\$450,364
TOTAL	\$1,820,500	\$1,324,600

³ There were 43 growers at the time of data collection.

⁴ The eight growers account for approximately 99 acres of the 148 within Placer County.

⁵ Based on venues described by growers.

⁶ Ibid.

DEMAND FOR CITRUS AND MANDARINS

The demand for citrus is rising as more U.S. consumers are including higher quantities of fresh fruits and vegetables in their diet. Oranges have long been a favorite both as a fresh food and as processed juice, but mandarins are gaining popularity throughout the U.S. Most are consumed fresh, with very little volume processed for juice or canning. On average, U.S. per capita consumption is approximately three pounds of mandarins per year, and the majority of domestic consumption occurs in the Pacific Northwest. Within Placer County, per capita consumption of mandarins rose from just over one pound in 2000 to almost four pounds in 2003. This upward trend is possibly due to the rapid growth of local mandarin production within the last decade and major efforts to increase direct marketing within the county.

Demand for Citrus in the U.S.

According to the USDA, U.S. consumers have consistently displayed a preference for oranges⁷ over other fruits. They are the number one citrus fruit consumed in the States, are the second most popular fruit overall, and rank first in juice consumption. In terms of production value, oranges are second only to grapes. On a global level, only Brazil produces more oranges than the U.S.; the two countries combined account for over half of the world's production.

Partially because of the convenience and year-round availability of orange juice, consumption of fresh oranges has declined while consumption of other citrus has gone up. Consumption peaked at 19 pounds of oranges per capita in 1959, but began to decline in the late 1960s and early 1970s. Fresh orange consumption began to rise in the 1990's as more U.S. consumers became interested in including more fresh fruits and vegetables into a healthy diet. Rising imports of oranges and tangerines have also increased the quantity and diversity of citrus available, a possible factor in the resurgence of the fruit's popularity.⁸ The highest consumption of fresh oranges and orange products in the U.S. is by non-Caucasian ethnic groups (Pollack et al., 2003). For example, U.S. citizens of Asian descent consume an average of 116 pounds of fresh and processed oranges per person annually, while Caucasian citizens consume an average of 80 pounds.⁹

Demand for Mandarins in the U.S.

Mandarins are easy to peel and contain few seeds, two highly marketable qualities. According to Perez and Pollack's 2003 report, "tangerines fit modern consumers' preferences for convenient, easy-to-eat foods and have gained in popularity while other fresh citrus fruit have suffered" (Perez and Pollack, 2003). The bulk of current production is marketed to the Pacific Northwest (Ibid, 2003). According to UC Davis horticulturalist Louise Ferguson, mandarins

⁷ In much of the USDA data, mandarins (or tangerines) are included within the orange label.

⁸ USDA, Electronic Outlook Report from the Economic Research Service, August 2003. www.ers.usda.gov

⁹ USDA, Electronic Outlook Report from the Economic Research Service, August 2003. www.ers.usda.gov

make-up only two percent of the Western citrus market because of the immense popularity of navel and Valencia oranges. By comparison, mandarin consumption in parts of Europe accounts for approximately 30 percent of citrus fruit (Contra Costa County Farm Bureau, 1999).

Unlike oranges, the demand for processed mandarin products is much lower than for fresh fruit. Within the U.S., an average of 70 percent of mandarins, both domestics and imports, are sold in the fresh market. The remainder is sold as processed juice, segments, or utilized in other forms. For example, tangerine juice is often blended with orange or grapefruit juice for coloring and sweetening in Florida (Perez and Pollack, 2003).

According to a USDA report published in 2003, Americans consumed an average of 2.6 pounds of mandarins annually in the last decade (Perez and Pollack, 2003). Consumption of mandarins was up to 2.9 pounds per capita in 2002-03 (see Table 4). This is the second lowest average among the fresh citrus fruits but is the fastest growing.

Year	Total supply	Exports	Domestic consumption	Per capita consumption
	--Million pounds--			--Pounds--
1995-96	688	49	640	2.4
1996-97	784	51	733	2.7
1997-98	709	55	654	2.4
1998-99	726	32	694	2.6
1999-2000	904	62	843	3.1
2000-01	823	33	791	3.0
2001-02	831	34	797	3.0
2002-03	816	37	779	2.9

Source: Economic Research Service

Demand for Mandarins within Placer County

The average annual consumption of mandarins in the United States has been approximately three pounds per person for the past decade and is increasing. Assuming that Placer residents buy two-thirds of the mandarins grown in the county, local consumption of Placer mandarins is also rising. Four years ago, local consumption per capita averaged just over one pound, increasing slightly to 1.5 pounds in 2001. In 2002, local consumption jumped to 3.4 pounds per capita and reached nearly 4 pounds by 2003 (see Table 5).¹⁰ Unfortunately, these numbers do not accurately distinguish between mandarins that are bought and eaten within the county, and fruit purchased by residents to be shipped as gifts to other locations. Shipping is a very common practice, especially during the December holiday season.

¹⁰ See Appendix B for an explanation of how consumption was calculated.

	Tons produced in Placer County	Local tons (66% of total)	Local pounds (66% of total)	Local pounds consumed per person
2000	251	166	332,000	1.3
2001	288	190	380,000	1.5
2002	635	419	838,000	3.4
2003	740	488	976,000	3.9

As consumption has risen, per capita spending has gone up. Prices for local mandarins vary depending on the marketing venue and time of year. On average, direct sales garner approximately \$1 per pound while wholesale prices can dip as low as \$.40 per pound.¹¹ Annual direct sale spending by local residents rose to just under \$4 in 2003 (see Table 6).

	Local pounds consumed per capita	Average yearly expenditures (via Direct Sales) per capita
2000	1.3	\$1.30
2001	1.5	\$1.50
2002	3.4	\$3.40
2003	3.9	\$3.90

¹¹ Based on grower interviews.

MARKETING CHANNELS FOR MANDARINS

Placer County's agricultural culture is well known, and many local growers are able to sell their entire season's crop based on reputation alone through on-farm transactions. Recently, however, some growers have felt it has become more difficult to sell their fruit. An increase in large-scale mandarin operations is forcing Placer County growers to re-think their marketing strategies. Some of the marketing channels they use include: wholesale, direct retail, institutional sales (schools, hospitals), farmers markets, seasonal festivals and farm tours, and holiday shipping. A summary of marketing venue data collected from grower interviews concludes this section.

•Wholesale

Placer County used to be a major fruit supplier for California and the U.S. Local producers took advantage of the numerous packing sheds that existed in the area, and had well-established contracts with buyers in other parts of the country. Today the mandarin production environment is very different. Placer's last fruit packing facility closed in 2001,¹² and large-scale grocery retailers are replacing the smaller "mom and pop" stores in the area. Very few growers in Placer County have been able to maintain or create relationships with the wholesalers who supply these retail stores. Instead, wholesalers are engaging with large-scale producers in the southern Central Valley or outside of the state, and even import produce from overseas to provide year-round availability of goods for grocery chains. They prefer to obtain produce in large volumes from a few large growers rather than in small quantities from local growers.

Overall, the wholesale market accounts for just over a third of Placer mandarin sales, most of which are through wholesale companies outside of the county. This proportion is slightly misleading, however, since it is skewed by the sales of one mandarin grower who has a major account with a large-scale grocer. He targets value-added niche markets for certain wholesale companies, such as locally produced and/or organic fruit. Mandarins bought in Placer are shipped to the larger Bay Area or as far as Washington State.

•On-farm

With the exception of one producer, most of the interview participants sell the bulk of their mandarin supply to customers visiting their farms, generating 80 to 100 percent of total sales through on-farm transactions. Of course, the success of on-farm sales depends upon the continued interest of returning customers. Most growers rely on word-of-mouth, but some advertise in the Placer County Ag Guide (begun in 2002) and are included in press coverage for the Mountain Mandarin Festival (always near Thanksgiving). A rare few advertise on the PlacerGROWN Web site, while one grower operates his own Web site.

For some producers, on-farm sales are becoming more difficult to maintain because of the location of their orchards. They are either too far out of the way and do not draw attention from local residents, or the county roads where they are located are insufficient to handle increased traffic from customers. Instead of attempting to bring more consumers onto their property, they are looking for other ways to sell their fruit, such as through wholesale markets or direct retail relationships. Still, the majority of Placer growers depend upon on-farm sales. As a

¹² Personal communication with Joanne Neft, 3 December 2004.

group, they are trying to strengthen this approach by promoting agricultural tourism in the county. The number of consumers visiting small towns and farms as a form of recreation has increased, as has their willingness to pay more for the experience.

•**Direct Retail**

Placer County does have a handful of locally owned retailers who specialize in showcasing regional produce and goods. This is a limited venue, however, and only one retailer is actively interested in buying local mandarins. Other small-scale Placer County retailers, however, have turned to larger growers in the southern Central Valley because wholesale prices from that region are significantly cheaper.

•**Farmers Markets**

Local farmers markets are plentiful in Placer County. The Foothill Farmers Market Association is based in Auburn and includes 16 markets within the county. However, because mandarins are such a seasonal item and most sales have historically occurred on-farm, many mandarin growers have not explored this venue for selling their fruit. Some noted difficulties they encountered while trying to gain access to the well-established association. Growers have also made efforts to extend specific markets a number of calendar days to accommodate the growing season. This venue is a good one for mandarin growers to access the general public, especially for those selling other goods or value-added products. The only significant problem is that farmers market managers generally want no more than a handful of growers at a time selling the same product at a given market.

•**Mandarin Festival**

All of the growers interviewed agreed that the Thanksgiving season mandarin festival has helped their businesses. Most are successful in selling all of their fruit over the weekend, and some even sell 100 percent of their crop at the festival. However, numerous growers complain that as the festival has gained in popularity and secured corporate sponsorship, they have been marginalized from the activities and feel left out.

•**School**

One grower interviewed has an established relationship with a local high school lunch program; during the winter season, he sells and delivers fruit to the school approximately once a week.

•**Holiday Shipping**

All growers are aware of the holiday market potential that mandarins provide since harvest season coincides with Thanksgiving, Christmas and other winter holidays. Still, only one grower advertises specifically for the shipping market, while another offers to ship boxes for customers every year. Other growers sell holiday boxes to customers but do not offer shipping services. One grower and one retailer actively advertise this service online.

Grower Marketing Venue Data

Based on grower interviews,¹³ we learned that the largest marketing channel for the crop is through wholesale venues, representing 42 percent of sales (see Table 7). However, the large wholesale account of one producer skewed the sales distribution for the whole county, overestimating the importance of wholesale for the majority of growers. Conversely, on-farm venues are underestimated, accounting for approximately 30 percent of the entire county's sales during recent years. Direct retail generates approximately 20 percent of sales, while revenue from local farmers markets and the annual Mountain Mandarin Festival account for almost 10 percent combined. Sales to local schools and mandarins shipped during the fall holidays each represented approximately one percent of overall sales.

	Percentage of Sales	Tons
Wholesale	42	210
On-farm	29	143
Direct Retail	18	90
Farmers Markets	6	28
Mandarin Festival	3	13
School	1	6
Holiday Shipping	1	5
TOTAL	100	495

¹³ The mandarin crop value of those interviewed represents an estimated 66 percent of the total 2003 value in Placer County, based on Placer County's Crop report, the bearing acreage of land planted to mandarins that year, and grower figures from the previous season's sales.

BARRIERS TO MARKETING LOCALLY GROWN MANDARINS

Agriculture has been an important part of the culture and economy of Placer County for many generations, and until the rapid housing development of the last decade, farmland was the dominant feature of the county's landscape. Today, the county's agricultural heritage is threatened. Numerous conversations with growers and community members directly involved with agricultural activity revealed that small-scale agriculturalists in Placer County are facing increasing barriers that preclude their ability to continue farming in the area. These barriers can be grouped into three categories: the effects of global agricultural trends, Placer's rapid urbanization, and issues related to grower knowledge about agricultural marketing and promotion.

Global Agricultural Trends

Some of the global agricultural trends over the last 50 years have increased price competition from large-scale growers outside the region and increased the availability of out-of-season, non-local mandarins.

•Competition from larger growers in Southern California

Many fruit growers in the southern Central Valley of California operate production systems that are significantly larger than the average 10-acre orchards found in Placer County. They have the capability to produce and supply vast amounts of fruit, sold mainly to equally large-scale produce wholesalers and grocery retailers, both of whom dominate the mainstream retail market. Certain grocery retailers require their suppliers to provide an entire season's worth of produce. It is more economical, in their opinion, to operate on a large scale and to do business with one or two growers or wholesalers. The system is set up to accommodate large production and limits small-scale growers like those in Placer County from entering retail markets in the state.

There are a few exceptions. Some of the larger retailers are willing to support local growers and even feature them in the store. Unfortunately such arrangements require a considerable amount of paperwork, and some growers in Placer County complain that it is not worth the effort. Other medium-scale markets, like the Sacramento Natural Foods Co-op, are accessible only through wholesalers, and only purchase organic produce (only a handful of Placer mandarin growers are certified organic). A few of these mid-sized markets used to be owned by local residents, and had long-established buying relationships with local growers. As they grew in size with Placer County's tourism economy, some found that the larger fruit operations in the Central Valley are able to provide mandarins at significantly lower prices, even as low as 15 cents a pound. For these retailers, it is not a priority to market local mandarins.

•Competition from mandarin imports

According to UC Davis horticulturist Louise Ferguson, different varieties of mandarins, both imported from Spain and those developed in California, could stretch the harvesting season from September to March. She is an advocate for establishing links with producers in the southern hemisphere to keep mandarins in American stores year-round (Contra Costa Farm Bureau, 1999). This could be detrimental to Placer County mandarin producers. Like retail

competition from large-scale growers within the state, imports of mandarins from other countries impact local growers. Mandarins shipped to U.S. supermarkets during the off-season undermine the uniqueness of Placer’s mandarins.

Urbanization in Placer County

The urbanization occurring in Placer County impacts mandarin growers by increasing restrictions on the supply of irrigation water, the number of intolerant neighbors, pressure on existing resources and markets for established growers by “hobby” farmers, and skyrocketing land values that entice growers to sell and discourage new farmers from buying property.

•Access to water

Placer County grower frustration about access to irrigation water can be summed up with one grower’s comment: “If growers do not have water already, they’re not going to get it.” Many growers are frustrated that water is being redirected toward the subdivision growth within the county, particularly in the areas of Roseville, Rocklin, Lincoln, and toward Yuba County’s Marysville. Two years ago an underground pipeline was installed in near numerous mandarin growers, but the treated water is being pumped to the new housing developments. Despite requests by local growers, the county will not allow them access to this piped water, and refuse to increase the amount of water growers are currently receiving. Only in times of hardship are requests for emergency rations considered, according to growers.

Water prices are also going up. A 15 percent annual increase over the last 10 years is reported for some areas of the county. Additionally, the water delivery system to agricultural regions may be changed. Growers are concerned that the current open ditch water system is likely to disappear as more people move into areas that have historically been devoted to agriculture. Farmers feel that ditch irrigation may be considered unsafe to new residents and eventually removed, leaving more expensive, treated water as the only option.

•Neighbor complaints

Despite the draw that many new residents expressed towards rural farmland when they moved into Placer County, many do not enjoy the day-to-day proximity to agricultural activity. Growers are receiving more complaints from neighbors about spraying and equipment noise, even though many only spray once a year and keep machine noise to a minimum. Without an established rapport with the growing number of residents who surround them, growers are concerned that more people moving into the area will challenge agricultural practices, and change their way of life.

•Competition from newcomers

Growers note that the increase in popularity of mandarins in Placer County and the U.S. has had several negative consequences. Newcomers have usurped some of the relationships between established growers and retail markets. In addition, small, hobby farmers who set-up roadside stands are underselling the general mandarin grower group.

With a greater number of farmers growing mandarin oranges in California, relationships between these growers and the retail market has changed. It is difficult to maintain existing “homes” for the harvested fruit. Informal agreements, despite their historical significance, are

often broken when newer sources offer lower prices, often in a secretive manner. Venues for Placer County mandarin growers within the county and overseas that were once secure are not always available, sometimes leaving growers scrambling in mid-season to unload their fruit.

Additionally, a number of Placer County residents, witnessing the growth in popularity of mandarins in the area, have planted tiny orchards (between 10-50 trees) in their backyards. According to some growers, these neighbors have fruit-bearing trees within a few years and often begin underselling their mandarins to tourists, advertising along roadsides and pricing their fruit for much less than the established growers whose costs of operation are greater. Others actually purchase mandarins outside the county and sell them along the major thoroughfares, advertised as Placer grown. This raises concern among Placer County mandarin growers over quality, as they feel that fruit grown elsewhere does not have the same signature taste (see Strategies section, p. 22 for a description of Placer's unique fruit).

•Increasing land value

In 2004, plots of land in Placer County sold from between \$30,000 and \$250,000 per acre. These high land prices tempt many landowners to sell to developers who are "planting homes instead of food." Some feel the only way agriculture will survive is if small growers who already own land are able to remain in business. One grower said the market potential for mandarins is good, but access for new growers or expansion of current holdings is difficult as the cost of land increases rapidly.

Grower Knowledge About Marketing and Promotion

Placer County mandarin sales and growth are related to the varied levels of knowledge among small-scale growers about the importance of marketing in today's agricultural system.

•Market deception

Many growers feel the market within Placer County is saturated and that sales to local residents have reached their maximum. The majority of sales are occurring within the county, and most growers are selling out every year. Mandarin consumption by Placer County residents is higher than the national average (3.9 lbs per year versus 2.9 in 2003).¹⁴ While some are skeptical that these numbers can continue to grow, sales figures only include established strategies (on-farm, existing wholesale relationships, Mandarin Festival) and not much individual marketing.

•Varying levels of marketing knowledge

Marketing and self-promotion are increasingly vital for small-scale farmers in today's agricultural markets. Food advertising influences consumer choice about where to buy food as much as what foods to purchase. As more American consumers are buying pre-packaged foods that are less connected to the places where they are grown, small-scale agriculturalists are trying to strengthen the human connection between themselves and consumers. For many growers this approach is new. For others, long-held relationships with local businesses or successful on-farm sales have made marketing outside these venues unnecessary. This is particularly true in Placer

¹⁴ See Market Demand section

County, where fruit production has a long history, and Placer's reputation as a source of high-quality agricultural products has continued despite the decline of production since the 1960s. As marketing needs change in the area, some growers are adapting, but others would benefit from greater marketing expertise.

STRATEGIES FOR MARKETING & IDEAS FOR FUTURE GROWTH

Many resources for small-scale growers will be reduced as the explosive population growth in Placer County continues. Leadership and opportunities for increasing mandarin sales for local growers do exist, however. Placer County boasts the only county-appointed agricultural marketing specialist whose efforts have produced, among other things, an annual mandarin festival and a system of farmers markets throughout the county. Local officials and supervisors are sympathetic to agricultural issues. Finally, the county benefits from an Agricultural Commissioner and a Cooperative Extension staff knowledgeable and interested in supporting Placer's farm community.

Opportunities highlighted in this report fall under the umbrella of increased marketing, grouped into the following categories: product differentiation, utilization of existing resources, increased grower cooperation, targeting consumers, and new marketing venues. Ideas for future growth are interspersed.



Product Differentiation

A key element in the promotion of local mandarins in Placer County lies in the description and differentiation of this unique fruit. Mandarins are grown across the globe, but within the US, they are produced only in northern California. Furthermore, the unique flavor of mountain-grown mandarins like those from Placer County provides an important marketing opportunity. The benefits of buying local, and the limited mandarin season may also help bring a higher price for the fruit, as would the production value-added products. A few agreed-upon standards within the Placer growing community and an accompanying label describing the fruit as PlacerGROWN (see Utilization of Existing Resources in this section) would help brand the product and inform consumers.

•Mountain-grown mandarins are unique

Because of environmental factors, mandarins grown in mountain areas like the foothills of Placer County are unique in flavor. Hillside orchards facilitate irrigation that allows sufficient water to soak into the ground and excess to run downhill. Additionally, a mountain climate

allows for warm days and cool nights. Both the irrigation method and climate increase the sugar content and enhance the overall flavor of Placer County mandarins.

•**Placer Mandarins are Local**

If marketed within northern California and Nevada, Placer County mandarins can be promoted as a local crop. Consumers concerned with the environmental and health effects of shipping produce long distances will be more likely to purchase mandarins from their local area, that are also fresher and higher in quality. According to the USDA, because mandarins are available for such a short time, and because citrus does not store well on the tree, the fruit can potentially demand a higher price than other fresh produce (Perez and Pollack, 2003). If there is any lag time between mandarin and tangerine varieties, prices tend to rise as the supply dwindles between one variety and the next.

•**Value-added Products**

Value-added products offer many opportunities for mandarin growers to generate additional income. Mandarin juice, jams, chutney, and sauces are some of the possibilities. In 2004, only one mandarin producer was making value-added products in Placer County. A line of seven distinct value-added goods accounts for a large portion of the grower's business income. Other growers are starting to experiment, including one that partnered with a local business to market mandarin butter last year. The business bought the fruit from the grower and sold the butter both in their store and on the grower's farm. Sales were high and there are plans to expand the amount of mandarin butter this year. The Placer Ag Marketing Group is trying to encourage the development of value-added products, and contracted with Nancy Jo Rieske to develop recipes that can be shared with growers.

Utilization of Existing Resources

A variety of resources exist within Placer County to help agriculturalists, many of which are free. Efforts are constantly made to update growers on what is available to them.

•**UCCE, Agriculture Commissioner**

Numerous resources have been established within Placer County to assist growers with issues from pest management to marketing. According to Cindy Fake UCCE farm advisor, the acreage devoted to mandarins in Placer County has tripled in the last 10 years. While this raises the level of competition among growers for existing marketing resources, the demand for mandarins remains high. The retail and wholesale markets within the county have yet to be tapped; the surrounding Sacramento and Tahoe areas are two other excellent potential markets.

Cindy Fake and other UCCE personnel have designed field workshops for growers to learn more about issues related to irrigation and crop rotation as well as pest control and managing disease. These activities could be expanded to include workshops about integrating farm tours for local school children, and other educational outreach programs. Placer County's Agriculture Commissioner, Christine Turner, is another excellent resource for local growers.

•**PlacerGROWN, Director of the Placer County Agricultural Marketing Program**

Placer County growers also have access to PlacerGROWN, a non-profit organization that provides marketing and networking services to farmers. The organization offers free advertising for members on its Web site as well as free links to individual grower Web sites. The county offers additional assistance from Joanne Neft, the Placer County Ag Marketing Director, who provides valuable resources to growers and retailers on marketing fresh produce and other agricultural products grown in the county. Neft has also developed festivals that focus on local mandarin growers.

Continuation of Efforts to Organize Mandarin Growers

Growers and community members have been successful in pulling local mandarin producers together in a loosely formed unnamed association. Many see this cooperation as a positive force that seems to be moving the growers toward the common goal of successful marketing and sales. A number still express hesitation, however, and are worried about divulging too much information about their operations. As one community member put it, the growers are secretive but supportive, attributing the behavior to the culture of the Sierra foothills. Locals prefer not to receive any interference in their affairs, and orchards are easily hidden in the rolling topography. Still, they are bonded through a shared interest in growing citrus fruit and in maintaining Placer County's agricultural heritage.

•Current activity

There is good grower participation in monthly planning meetings to discuss marketing issues and ideas. One of the first outcomes of the meetings has been the development of the annual Mountain Mandarin Magic Farm Tour, which has been scheduled to take place in early December, at the height of the harvest season. Mandarin growers, Joanne Neft and other community members involved in agriculture helped in the planning process. These same growers often attend the monthly field workshops put together by UC Cooperative Extension, hosted at rotating mandarin farms and orchards.

•Other models

Like the Bay Area Farmers Association (BAFA), established in 2004, Placer mandarin growers have an opportunity to define cooperative ways in which to work together. The BAFA Mission Statement describes the organization's main goal as an increase in the "viability [and] productivity" of farming by area growers. It was created "by farmers for farmers" (BAFA brochure, 2004) and supports the expansion of consumer awareness of the importance of supporting local food connections at home, in restaurants and in retail establishments. According to one individual in Placer, the mandarin growers would also do well to follow the example created by the grape growers in the region who have established the non-profit Placer County Wine and Grape Association. Another positive model is the El Dorado County coalition of grape growers and wineries that shares the goals of creating a uniform voice for marketing, protecting agricultural landscapes, and facilitating the exchange of information.

Targeting and Educating Consumers

Educating the residents on the value of agriculture in Placer County is imperative. New homeowners moving into the area should be targeted, as should many long-term residents of Placer County and the surrounding area who are not aware of the bounty of agricultural products in the region.

•Marketing audience

Placer County is the fastest growing county in the state of California and one of the quickest developing regions in the U.S.¹⁵ This large influx of people represents a new pool of potential consumers, and offers an opportunity for mandarin growers. As Placer County continues to increase its agricultural marketing efforts and help develop a secure foothold for the farmland that remains, it can capitalize on the hundreds of new residents moving into the county. New residents shouldn't be the only targets of marketing efforts, however. According to Placer County growers and other agricultural specialists, more established residents are uninformed about mandarins, despite the area's rich history of fruit production. Promotion should focus on the concept of fresh, local food and the positive environmental effects of saving open space by supporting local growers. It would be useful for growers to go beyond Placer and target surrounding areas. Tahoe, Reno, Quincy, Truckee, and the ski areas of Carson City, Northstar, and Squaw Valley are all in close proximity. A grower could easily make a connection with some of these areas and sell large quantities of fruit.

• Educational opportunities

Stakeholders in Placer have noticed that many consumers are familiar only with canned mandarins, unaware that the fruit is a locally grown food or even a fresh citrus choice in the supermarket. Residents of Sacramento and Davis are also often surprised to learn that mandarins are grown so close to home. There is even less awareness that the mandarin varieties produced in Placer County are unique to that area and not grown anywhere else in the U.S. By knowing more about the rural areas of Placer County, consumers will take more interest in their survival. Joanne Neft suggests that it would be effective for growers to make connections with local real estate firms, giving them a box of mandarins and encouraging them to buy more to use as holiday gifts for their past and present clients.

Growers can also benefit from educating consumers about the health advantages of eating mandarins. Fresh and local fruit is highly nutritious, important for a society increasingly concerned with obesity and other health problems. Low in calories, with no saturated fat or cholesterol, loaded with dietary fiber and free of artificial colors or preservatives, mandarins can be marketed to health-conscious consumers.

New Marketing Strategies

Agricultural marketing within Placer County must be geared toward generating revenue for the growers and county but also in educating consumers on the importance of supporting local growers. Many efforts have already been established and are underway including the Mountain Mandarin Festival (in its 11th year), the Mandarin Mountain Tour and the expansion of

¹⁵ Placer County Foodshed Report, 2001.

farmers' markets specifically for mandarin sales. These and other marketing venues can continue to be explored and expanded.

•Internet/Web site marketing

The internet is a largely unused sales area for Placer County mandarin growers. Only one has a Web site and makes products available to customers online. Retailers or the association of growers could also tap into this arena. One local retailer shipped over 6,000 pounds of fruit from their online store in the 2003 season and sees a potential for more sales. Joanne Neft suggests that chain or “viral” marketing could be an effective strategy in which each grower writes to their e-mail lists about mandarins, and challenges everyone to pass on the good news about the fruit to their own lists.

•Direct Retail

While it can be difficult for small-scale growers to establish business relationships with retailers, there are a number of retailers who would be willing to buy directly from growers. According to interviews, only 90,000 pounds of local mandarins are being sold outside Placer County. Based on data from large and small-scale retailers in the county and the larger Sacramento area, some 977,000 pounds of mandarins are purchased for retail markets.

•Direct Sales

A number of mandarin growers have spent a great deal of time working with the Foothill Farmers Market Association. They wanted to expand local farmers markets in the Auburn, Roseville and Rocklin areas to include more mandarin growers. Traditionally, only one or two mandarin growers have had access to this venue in Placer County, while a few others travel to the Sacramento area to sell at farmers markets there. With special mandarin season markets at various locations, other growers have the opportunity to showcase their produce to market shoppers and increase consumer awareness of mandarins as a local crop. Growers also benefit from the higher prices at such markets. Mandarin growers at the San Francisco Ferry Plaza Farmers Market were selling conventional mandarins for two dollars a pound while organic growers were asking for three dollars per pound of fruit.¹⁶

Other direct sales opportunities exist with institutions such as local schools. Last year, one grower sold almost the entire season's production to an elementary school that was interested in using mandarins as part of a fundraiser during November and December. There are many more possibilities for similar agreements both in Placer County and the Sacramento area.

•Placer County standards/label for Placer County mandarins

Placer County growers would benefit from standards of freshness and ripeness to ensure that the county is always associated with high quality fruit. A Placer County Mandarin label that showcases a grower association logo, cohesive packaging, and point of sale items like brochures describing the fruit's high quality and the unique Placer County landscape could all help to brand the produce and create a name for Placer mandarins outside the immediate area.

¹⁶ Author notes, 11 December 2004.

•Ag Tourism

The expansion of the tourism industry, especially of agricultural tourism, can also draw more consumers into the area and encourage the purchase of local goods. Some possibilities that could be pursued in Placer County include: U-pick operations; farm visits that incorporate activities for children, picnic and play areas, and mandarin tastings; farm stays; small on-farm markets and farm tours (see below); and cooking classes. Joanne Neft, receives a variety of requests for these services.¹⁷

•Newly established Mandarin Tour

The few dozen mandarin growers that regularly meet agreed to host the first Mandarin Mountain Tour, a self-guided driving tour of participating farms and orchards that showcase the mandarin growers as well as local artists who belong to the Placer Arts Council. The tour was publicized and initiated in December 2004.

•Increased revenue spent on marketing

Given that mandarin sales have largely taken place on-farm, most growers spend very little money on marketing. The amount spent on efforts to promote local mandarins has gone up in recent years, however, consisting of small contributions to the Placer County Ag Guide and financial support for the newly established Mandarin Mountain Tour. Compared to most businesses, however, overall expenditures on advertising remain small. Avocado growers in California are required to contribute four percent of their production costs to the state Avocado Board to pay for advertising.¹⁸ Other local businesses spend as much as 20 percent of gross income on marketing,¹⁹ and large-scale grocery retailers invest vast amounts.

Advertising options include a Yellow Page line ad that costs very little to run, and an orchard brochure for the farm. Several farms could collaborate and publish all of their stories together in one brochure.

¹⁷ Email from Joanne Neft, December 3, 2004.

¹⁸ Personal communication with Will Brokaw, Ferry Plaza Farmers' Market, December 11, 2004.

¹⁹ Email from Joanne Neft, December 3, 2004.

CONCLUSION

Mandarin production and sales in Placer County have been on a steady rise in the last decade. At the same time, a drastic increase in housing developments and suburban growth is placing serious constraints on county farming resources. In response, local officials, extension personnel, and marketers have initiated various strategies to support a sustainable and regional agricultural system, and to slow the effect of urban expansion on its rural environment.

Methods to counter the negative consequences of rapid urbanization in this report focus on increased marketing. While agriculturalists in Placer County face a number of barriers in marketing their products, mandarin growers have a well-established foothold in the local economy. Furthermore, Placer County mandarins are unique in flavor because they are mountain grown. There exists the potential to target not only untapped areas of Placer County, but also high-end markets willing to pay for the unique and seasonal product.

More Placer County growers are becoming aware of the importance of marketing and the potential benefits of expanding production to include agricultural tourism and value-added products, and of educational efforts that encourage consumers to buy locally grown food. Mandarin producers are also aware of the need to pool resources, and to work together to grow and sell a quality product. Local strategies already implemented in the county include increasing mandarin grower exposure at area farmers' markets, creating linkages with the PlacerGROWN label, increasing the collaboration between mandarin producers, and establishing a new farm tour that highlights local mandarin growers.

Still, there is room for marketing strategies to develop further. These strategies include:

- **Product Differentiation**
 - Market the unique flavor of *mountain-grown* mandarins
 - Promote the *local* aspect of mandarin production
 - Develop value-added products such as juice, jams, chutneys, and sauces
- **Utilization of Existing Resources**
 - Take advantage of educational opportunities and support from University of California Cooperative Extension, including farm advisor Cindy Fake
 - Utilize the support and resources offered by the Agriculture Commissioner, Christine Turner
 - Utilize the marketing and networking services of PlacerGROWN and the Director of Agricultural Marketing, Joanne Neft
- **Continuation of Efforts to Organize Mandarin Growers**
 - Increase the level of cooperation among local producers
 - Consider the non-profit and coalition models of other agricultural associations
- **Targeting and Educating Consumers**
 - Capitalize on new residents moving into the area as a pool of potential consumers
 - Market beyond Placer County to surrounding areas
 - Raise awareness about the existence, uniqueness, and significance of locally grown

- mandarins
- Educate consumers about the health benefits of eating mandarins

- **Development and Expansion of Marketing Strategies**

- Internet Web sites
- Direct retail
- Direct sales
- Placer County mandarin label
- Ag Tourism
- Newly established Mountain Mandarin Magic tour
- Increased investment into marketing

APPENDIX A: MANDARIN DESCRIPTION

For the purposes of the study, the term mandarin is used to describe the citrus fruit that is grown in Placer County. According to Julian Sauls, professor and horticulturalist at Texas State University, mandarins can be described as “a diverse group of citrus fruit that are characterized by bright peel and pulp color, excellent flavor, easy-to-peel rind and segments that separate easily” (Sauls, 1998). The term mandarin is not commonly used to describe the fruit, however, as many American consumers refer to this small, orange fruit as the tangerine. In addition, much of the research data on mandarins is listed under the term tangerine, which contributes to the confusion and, often to the misuse of the term. To clarify, all tangerines are mandarins but not all mandarins are tangerines (Sauls, 1998).

Mandarins, as the larger grouping, can be separated into four categories: Satsuma, Mediterranean, King, and common tangerines. Of particular interest to this study of Placer County are Satsuma mandarins, though other mandarin varieties are planted and grown within the county. Close to 80 percent of the mandarins grown in Placer are Satsumas while the common tangerine variety comprises roughly 20 percent of planted acreage within the area of study.²⁰ See below for further detailed information on the four categories of mandarins.

Mandarin Varieties

The four types or categories of mandarins can be traced to different regions throughout the world. Satsuma originally came from Japan, where they are still considered the most important citrus. A number of varieties, both from Japan and others developed in the US, are in this grouping including: Owari, Obawase, Okitsu, Kimbrough, Big Early, Armstrong Early (Sauls, 1998), Caruso, C-35, trifoliolate and Cleopatra (the latter two used mainly as rootstock). The last four are predominant in Placer County²¹. Satsumas are known for their high quality and seedless nature. Bright, reddish orange in color, the peel is easily separated from the fruit and the segments are equally easy to separate. This variety does best in cool temperatures during the fall and winter.

Mediterranean, most likely from Italy, originated in the Mediterranean basin and includes Willowleaf (or Mediterranean) as the most well known variety. The fruit is medium sized, is oblate in shape and exhibits a short collar and furrowed neck on the stem end. The fruit’s flesh is yellowish-orange in color, with a thin rind of the same color. Maturity is reached between October and November.

The King type of mandarin originated in Viet Nam and was first introduced to California at the end of the 19th century. King, the primary variety, is the largest of all mandarins, with a thick rind of yellowish-orange color. The flesh of the King is a deep orange and contains many seeds. This particular variety matures late, February to March.

Tangerines are the most culturally widespread mandarin and are primarily used for hybridization. The Clementine (or Algerian) was first introduced to the U.S. from Algeria in the early part of the 20th century. It has a deep reddish orange color and is characterized by more adherences between the rind and flesh segments. Other tangerine varieties include the Dancy from Tangiers, Ponkan (or Chinese Honey) from India, the Changsha and the Fortune (a hybrid)

²⁰ Tony Aguilar, Mandarin grower, personal interview, 20 Sept 2004.

²¹ Ibid.

(Sauls, 1998). Other hybrids include the tangelo (a cross between a tangerine and a grapefruit) and the tangor (a cross between a tangerine and an orange). Hybrids of these varieties are the Minneola (a tangelo which is also called honeybell and Orlando) and the Temple (a tangor) (Sauls, 1998).

APPENDIX B: CALCULATIONS OF MANDARIN CONSUMPTION

Per capita consumption of local mandarins by county residents in 2003 can be figured as follows: If 740 tons of mandarins were produced by growers in Placer County, 1,480,000 pounds were harvested and sold. Based on interviews with local growers, a composite average of 66 percent of locally grown mandarins are sold within the county. Of those 740 tons produced in 2003, 488 were sold locally or 976,000 pounds. According to the Census Bureau, the population of Placer County in 2000 was 248,399. So, per capita consumption in 2003 was roughly 3.9 pounds per person. These consumption and spending calculations do not yet take into account waste product.

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