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Stanford University

Mediterranean Agriculture in the Global Marketplace:

A Project Comparing Policy Approaches in California and the Southern EU States

Report on Stage 1

Lee Ann Patterson
Research Associate
European Union Center
University of Pittsburgh

Timothy E. Josling
Professor and Senior Fellow
Institute for International Studies
Stanford University

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Table of Contents

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I. Introduction

Agriculture in the Mediterranean EU states, Italy, Spain, France, Greece and Portugal, and in two of the new members, Malta and Cyprus, shares many characteristics with that of California.[1] The range of crops is similar and climatic and soil conditions are not markedly different. Both the EU and the US "Mediterranean" regions face similar challenges in expanding exports to world markets and both sell extensively into each other's domestic market. Public policies do, however, differ sharply and these differences have led over the years to suspicion and mistrust. Trade disputes have been frequent and long-lasting, rivaling the better-known disputes that have characterized the grains, oilseeds and livestock sectors of the EU and US.

This project explores the similarities and the differences in the policies influencing the market for five key Mediterranean commodities. The commodities are olives (including table olives and olive oil), grapes (including table grapes, wine and raisins), tree-nuts (primarily almonds), citrus (primarily oranges), and tomatoes (including fresh and canned tomatoes.) The key policy dimensions include market access; domestic and export subsidies; market structure and marketing institutions; technology policy; quality and intellectual property policy; and health, safety and environmental regulations. The ultimate objective of the project is to link together these various aspects of the policy environment to give an indication as to the importance of policy differences for the performance of these two "Mediterranean" regions. Though not considered centrally in this project, it is hoped that the results will shed light on the performance of similar regions in other countries, such as Australia, Chile and South Africa.

The project will be conducted in two stages. The initial stage will be a pilot study to explore the literature and data needs and to develop the research plan for the project as a whole. This current document is a draft report of stage one. The second stage involves an intensive study and comparison of the commodities with the three-fold purpose of 1) providing critical in-depth analysis to policymakers at the state, federal, and international levels many of whom are engaged in on-going negotiations, 2) informing producers and commodity groups in both the EU and the US of policy differences in their respective

[1] Portugal has no Mediterranean coastline, but share agronomic characteristics with the other countries of the region. France has a significant Mediterranean region although much of its agriculture is similar to that in northern Europe. Other EU states such as Hungary have considerable production of the crops considered in the study, and are mentioned in context. In the US there is important production of these crops in other states, such as Florida and Arizona, but the focus in this study is on California.

countries, and 3) exploring ways in which environmental objectives can be met and markets can be expanded without the use of trade distorting measures. This second stage will involve an in–depth analysis of these commodities and issues conducted by a consortium of experts. The ultimate goal of the study is to provide producers and policymakers on both sides of the Atlantic with relevant and up to date information and analysis on the impact of policy on the relative competitiveness of these "Mediterranean" products in the EU and in California. It is hoped that a follow up project can expand the scope to include other regions, such as Chile, Australia and South Africa where similar crops are grown and similar issues arise.

The six dimensions of the policy comparison

The structure of the policy comparison is to focus on six dimensions of policies affecting the mediterranean agricultures of the EU and the US. Though not intended as exhaustive, and not always independent of each other, these six dimensions capture the major policy differences and their associated impacts on the markets. They are briefly described below.

Market access.

Tariffs have traditionally been one of the primary ways of protecting domestic production against imports. The Uruguay Round made significant progress by converting non-tariff barriers to equivalent bound tariffs and then reaching a commitment to reduce agricultural bound tariffs. Some countries established tariff rate quotas that allow limited imports at low in-quota tariff rates and unlimited imports at much higher over quota tariffs. However, much remains to be done in this area and work is continuing on this in the Doha Round. What is the tariff structure for these Mediterranean commodities in the US and the EU? How will the Doha Round affect these tariffs? How will the reduction or elimination of tariffs affect producers in the EU and the US?

An added dimension to the question of market access is the conditions of preferential access through regional and bilateral agreements. The US is currently a party to NAFTA (North America Free Trade Agreement) and is negotiating the FTAA (Free Trade Area of the Americas) as well as several bilateral agreements with individual countries. Likewise the EU hopes to establish the Euro-Mediterranean Free-Trade Area by the year 2010. This free-trade area is supposed to link together the EU Member States and 12 Mediterranean Partners. Together with EFTA and the new Central and Eastern European members of the EU this zone will include some 40 States and 600-800 million consumers. How will these free trade areas affect other trading partners who do not enjoy the same access? How will bilateral agreements with developing countries that currently produce these commodities at a lower price (due largely to cheaper land and labor) affect production in the US and the EU?

Subsidies.

Countries, states, and regions use a wide variety of policy mechanisms to support the production and marketing of the commodities considered in this study. Among these, domestic support instruments are the most complex, ranging from trade distorting to non-trade distorting and can be classified as domestic subsidies or export subsidies. In the Uruguay Round three categories of subsidies were delineated: the amber box (measures

that are subject to strict surveillance and were to be reduced over the transition period, the blue box (unconstrained policies for domestic support on the condition that production is limited) and the green box (allowing for support measures that do not distort trade or production such as assistance for research and environmental programs.) This study will examine current subsidy levels for the above-mentioned commodities and how changing subsidy rules are affecting production and markets.

For instance, in the past the EU has subsidized the production of olives and olive oil to a great extent. EU subsidies equal about 2.3 billion dollars a year and are based on total production with low yielding farms receiving lower subsidies and higher yielding farms receiving higher subsidies. In 2003, growers could qualify for up to $5.23 per gallon in subsidies with the average in Spain equaling $3.96 per gallon. The EU also provided aid for storage and overproduction. However, a 1998 reform stated that all new plantings would be ineligible for subsidies. Export subsidies are also being eliminated and private storage schemes are being adopted to replace intervention buying. How will this affect olive production and processing in the EU? What is the likely impact of the current Doha Round of negotiations on olive producers? How will these changes in subsidy schemes affect California producers?

Market structure and marketing institutions

The impact of market structure and marketing institutions on competitiveness is extremely important. Market structures in the US and the EU are changing. Through regulation and subsidy policy the EU is encouraging large scale industrialization of commodities which have traditionally been grown by small farmers. While the adoption of new technologies tends to increase productivity it may also result in over-exploitation of the environment, the elimination of farmers who can not afford to adopt new technologies, and the loss of jobs as casual farm labor in some of the poorer regions in the EU is replaced by machinery. From an economic standpoint, more efficient production implies a better use of resources. However, the regional socioeconomic impact of changing market structures cannot be ignored.

One way to mitigate the impact on small farmers is to encourage the development of marketing institutions such as cooperatives. Co-ops allow small farmers to pool their crops, increase the leverage of the seller as s/he negotiates with the buyer, allow the joint purchase of expensive machinery, provide a forum for establishing quality standards and facilitate marketing initiatives to actually increase domestic and foreign demand. Blue Diamond has been very effective at improving the competitiveness of California almond producers in this way. To what extent can this model be transferred to other "Mediterranean" commodities? To what extent do co-ops and similar marketing programs actually increase the demand for a certain product?

Technology

Technology is a critical factor affecting cost of production (along with land and labor costs) and thus competitiveness. Many of the Mediterranean crops have been produced using basically the same technology for centuries. However, new planting, irrigating, harvesting and processing techniques are being developed and adopted in both the US and the EU. Techniques such as super high-density olive orchards can reduce harvesting

costs by up to 80%. However, these orchards are expensive to install, only work on a few varieties of olives and require several years to reach full capacity. The five commodities in this study face similar types of improvements on traditional production technologies. This study will thus look at the rate of technological adaptation and how this is affecting the cost and quantity of production as well as the region of production.

A second type of technological advance involves biotechnology to enhance agricultural production in a wide variety of ways. For years horticulturalists have been attempting to improve the quality of agricultural products through cross-breeding and chemical and radiation mutagenesis. Recent technological advances have allowed rDNA techniques to be employed to reduce resistance to drought, frost, and herbicides. In addition, these techniques can be used to enhance quality by making fruits and vegetables firmer, sweeter and more blemish-free. The policy climate for the adoption of biotechnology varies widely across the Atlantic, with the US embracing biotechnology in agriculture and the EU placing a moratorium on all agricultural biotech products. (This has recently been lifted but under extremely strict and costly labeling and traceability provisions). How will public attitudes and governmental regulations regarding biotechnological advances affect both production and trade of these commodities in the US and the EU? How will this affect market structure? Will new opportunities for market differentiation emerge? If so, how can this market differentiation be accomplished in a non-trade distorting manner?

Quality

Quality is an interesting issue because it is so multifaceted. In fact, much of the current Doha Round really centers on issue of quality and how market differentiation by levels of quality can occur in a non-trade distorting manner. It is in this context that the issues of labeling biotech foods and utilizing geographic indicators arise. To begin with we must determine who sets quality standards and to what end? Is it a private initiative as in the case of Blue Diamond (attempting to achieve a consistently high quality product in order to convince the public to increase demand) or a public initiative as in the case of the French wine industry (attempting to capture the market for high end wines)? What is the role of geographic indicators in creating market differentiation? Under what conditions is either labeling the process by which a product is produced or the region from which a product originates trade-distorting and under what conditions are they trade-facilitating? Can quality standards be harmonized in a way that allows the consumer to compare extra virgin olive oil from Italy with extra virgin olive oil from California? These issues are salient for all crops but are particularly salient for wine and olive oil since there is a wide range of products within each commodity group and an efficient market should return premia for particularly desirable characteristics if they can be identified in a consistent way.

Health and Safety and Environmental Regulations

Health, safety, and environmental regulations are critical to protect human and animal health and the environment from potential harm resulting from agricultural practices. They can also be used as non-tariff trade barriers. The Uruguay Round SPS agreement has made some progress in stating that imports can only be banned if they meet a scientific test of harmfulness. Nevertheless the EU has adopted very strict regulations

requiring the labeling and traceability of biotech products. How will these regulations affect trade in the above noted Mediterranean commodities?

A second issue related to environmental protection has to do with changing production techniques. For instance, tree nuts when properly managed are a vital element in maintaining bio-diversity in Europe. They are vital in preventing erosion especially at higher altitudes. In some areas tree nuts play a rural development function. Regions where nut farming is prominent suffer from high water deficit and a vulnerability to desertification. Approximately 70% of EU nut production can be defined as 'extensive' (less favored areas, poor/marginal growing conditions often in remote, mountainous or hilly areas without irrigation) and 30% as normal (better varieties growing conditions, some areas including irrigation.) What will be the environmental and economic impact on these areas if more intensified production techniques are pursued? Can health, safety and environmental regulations be accommodated in highly competitive global economy in a non-trade distorting way? This project seeks to address these questions by taking a multifaceted look at these commodities in the context of the global agricultural marketplace.

Introduction to this Report

The primary goal of the pilot study is to identify the key issues and to identify available resources. These include, among others, trade statistics, commodity studies, government reports, NGO reports, WTO reports, and books and publications on these commodity sub-sectors. We also hope to identify government, private sector, and academic experts in these areas. The first stage of the project was completed by the end of February 2005 this document constitutes an initial report to the European Forum at the Stanford Institute for International Studies.

The emphasis in this first phase is to assemble information on five sectors, olives and olive oil; table grapes and wine; citrus; treenuts and tomatoes. These sectors were considered to be the most significant crops common to the EU Mediterranean regions and the agriculture of California. Other crops also compete, but are likely to be similar to one or more of the sectors included here. The following sections discuss the brief history of the sector and its place in world markets and the range of policies using the six dimensions described above. A final section poses some future research questions with respect to the five sectors. Data sources are included in an Annex.

II. Olive Sector

A. Brief History of the Olive Industry in the EU and the US

The cultivation of the olive dates back to at least 3500 B.C. Originally, it is believed that olives were domesticated first in Iran and Turkistan and/or Anatolia, Jordan, Israel, and Syria and spread westward to the eastern Mediterranean. Gradually through trade and colonization olives spread to Egypt, North Africa, and the western Mediterranean as well. Today olives flourish in Spain, Italy Morocco, Syria, Jordan Tunisia, Turkey, Algeria, Greece, Portugal, Israel, and France.[2]

Spanish settlers brought olive trees to South America and eventually these entered California as part of mission orchards in the early to mid 1800s. Olive oil was not produced commercially in California until 1871. From the 1870s to the 1920s twenty to twenty five thousand acres of olives (including table olives and those for olive oil) were planted in California. From 1920 through 1980 the California olive industry suffered a series of revivals and set-backs. Cheap European imports in the 1920s resulted in a decrease of acreage in California. The Spanish civil war in the 30s and 40s interrupted trade and California olive producers increased their acreage mainly in the Central Valley. However, when imports from Europe resumed the California industry again receded.[3]

The current revival of the olive industry in California that started in the mid 1980s can be attributed to two things. First, the widely publicized health benefits of olive oil led to increased production. And second, the California wine industry adopted and began to promote olives and olive oil as a high end product associated with good wine and fine living (although California wineries account for only 3% of California olive oil production).[4] In general, through the 1990s, olive oil production in California remained fairly expensive compared to production in Europe and thus catered to an elite market. This began to change in 1999 with the establishment of the California Olive Ranch, which has 500 acres of technology intensive olives.[5] We will return to a discussion of these new technologies below.

B. Production and Trade Statistics

Before proceeding with production and trade statistics, it is important to note that olives are characterized by several factors that distinguish them from other agricultural sectors. For instance:

- Olive production is structurally inflexible. Groves can be plowed up but new trees do not attain maturity for a variable period of at least 10 years. This

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[2] Muller, Ken. *California and the Global Olive Oil Industry*, 2004.

[3] Judith M. Taylor, *The Olive in California*. Berkeley: Ten Speed Press, 2000, 4-5.

[4] Wine Spectator, "California's New Olive Oils" June 23, 2003.

http://www.winespectator.com/Wine/Main/Feature_Basic_template/0,1197,1760,00.html

[5]Muller, p.3.

inflexibility restricts the producer's ability to take advantage of market opportunities.

- Olive yields can vary sharply depending on weather conditions and biological variation in the trees.
- On fragile or marginal land in the EU, olive production may be the only alternative to abandonment and desertification.
- Olive cultivation in the EU is characterized by intense fragmentation on both the production and the processing side.
- Olive production in most Mediterranean regions is the basis for a whole series of social and cultural events.[6]
- Most olive oil production in the EU is concentrated in the less developed regions of the community, the majority of which come under Community Regional Policy Objective 1. (Exceptions to this are Tuscany in Italy and Catalonia in Spain.)[7]

There are currently about 8 million hectares of olives in the world. Most of these hectares are located in the Mediterranean region.[8] Ninety percent of these olives go to make olive oil and the remaining 10% are sold as table olives. Table 1 shows the olive production in metric tons in the United States, Greece, Italy, Spain, and Portugal. Other important producers are Algeria, Egypt, Argentina, Lebanon, Libya, Morocco, Palestine (Occupied Territories), Tunisia, and Turkey. Total world olive production in 2003 equaled 17,168,915 metric tons. The European Union is by far the largest producer, producing about 75-80% of the world's olives.[9]

The 1990s saw a rapid rise in production in the EU, approximately 51%, due to increases in acreages and yields. Yields primarily increased due to better fertilization, the replacement of old trees by new, and an increase in irrigated areas. According to figures from the Spanish Ministry of Agriculture, the irrigated area under olive cultivation in Spain increased from 102,000 hectares in 1995 to 372,000 hectares in 2000.[10] The recent enlargement of the EU, however, should have little impact on olive oil production since only three of the new Member States (Cyprus, Slovenia, and Malta) are producers and

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[6] "Working paper of the Directorate General for Agriculture; "The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004. p. 21.

[7] The Structural Funds regulations for 2000-2006 provide, in particular, for three primary objectives. The first objective is to promote the development and structural of regions whose development is lagging behind.

[8] Muller, p.3.

[9] http://apps.fao.org/faostat/collections?version=ext&hasbulk=08=agriculture. Accessed 9/21/04

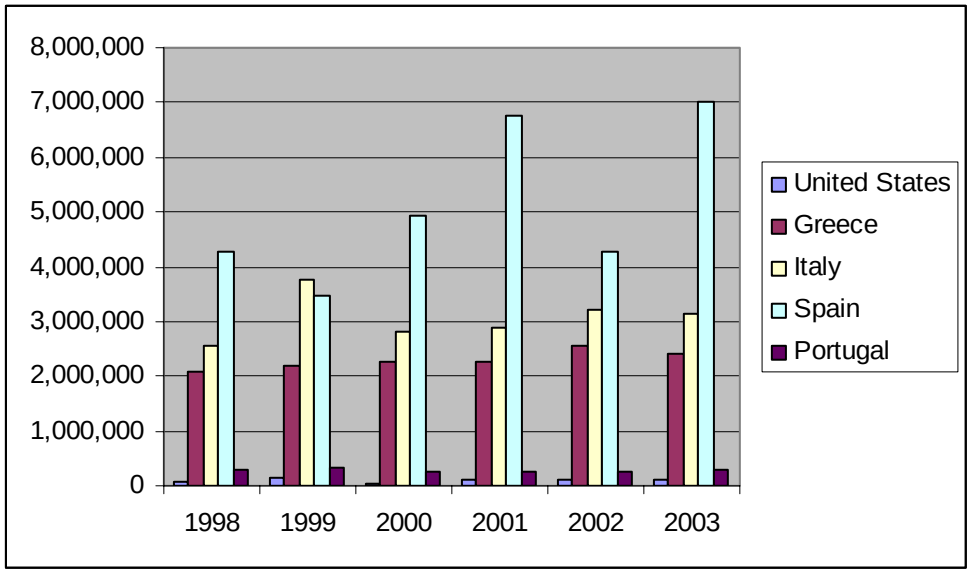
[10] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004.p.25.

together they account for only 0.4% of the combined national guaranteed quantities of the other Member States.[11]

Table1.1: Olive Production in Metric Tons

	1998	1999	2000	2001	2002	2003
United States	81,650	131,540	48,000	121,560	93,440	107,050
Greece	2,068,167	2,196,615	2,273,836	2,249,430	2,573,835	2,400,000
Italy	2,548,510	3,765,100	2,821,000	2,894,097	3,231,300	3,149,830
Spain	4,279,180	3,460,100	4,943,800	6,762,600	4,290,700	6,997,300

Figure 1.1: Olive Production in Metric Tons



Source: http://apps.fao.org/faostat/collections?version=ext&hasbulk=08=agriculture. Accessed 9/21/04.

Total US production equals about 0.1% of world production and California produces 99% of all US olives.[12] Ninety percent of the Californian olives go to table olives while 10% go to olive oil. The leading olive producing counties in California are Tulare, Tehama, Glenn, Madera, and Butte.

[11] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004

[12] http://oliveoilsource.com/statistics.htm Accessed on Sept 20, 2004.

As of 1997, there were approximately 1,225 olive growers in California. Two-thirds of these growers have less than 20 acres. By way of contrast, approximately 2.5 million producers, roughly 1/3 of all EU producers are involved in olive production. The average holding size varies from 2.47 acres (1 hectare) in Italy to 14.8 acres (6 hectares) in Spain. Table 2 compares the number of producers in the major producing countries.

Given the huge difference in the number of producers in California and the EU, it comes as no surprise that the production structures of the olive industry in California and the EU are extremely different. This point will be addressed in greater detail under the subsidy and technology sections.

Table 1.2. Number of Producers

Production Area	Number of Producers
California	1,225
Italy	1,160,000
Greece	840,000
Spain	380,000
Portugal	130,000

Source "The Olive Oil sector in the European Community" DG Agriculture June 2002 and http://oliveoilsource.com/statistics.htm Accessed on Sept 20, 2004.

World production of table olives is currently about 1.3 million tons compared to 1 million tons in the mid 1990s. New presentations such as whole, pitted, sliced and stuffed have allowed for market differentiation.[13] The US produces about 10% of the world's table olives. Other major producers of table olives include the EU (40%), Turkey (13%), Morocco (8%), Syria (7%) and Egypt (4%).

World consumption of table olives is around 1.3 million tons. In general, olive oil accounts for about 3% of the world market in edible oils but consumption has been progressing fairly steadily. Since 1995/96, the average annual increase in consumption has been 6% with even higher relative growth in new markets.[14] The EU is the biggest consumer (33%), followed by the US (16%), Turkey (11%), Syria (7%), Egypt (5%) and Brazil (3%). Among non-producers in the EU, Germany consumes about 6.6% and the UK consumes about 2.6%.

[13] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004. p.17.

[14] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004

Within the EU, Italy, Spain, and Greece alone account for over 85% of the Community's total olive oil consumption.[15] There are however, major differences between markets in producer Member States. In Spain almost 80% of the olive oil consumed is "composed" olive oil, i.e. a blend of refined and virgin olive oil. However, virgin olive oils now account for more than 20% of the market in Spain compared with only 3% in 1990. In Italy and Greece on the other hand, virgin olive oils account for the bulk of the market (78% and 85% respectively). Virgin and extra virgin olive oils represent 96% of consumption in France, 90% in Germany and 69% in the United Kingdom.[16] Based on growth rates for production and consumption in the EU in the 1990s, the Commission projects that by 2010 average production will exceed internal demand by 10 to 16.6% compared to 5.1% in 2000.[17]

The Community is the largest exporter of table olives with 48% of the total volume followed by Morocco (23%), Argentina (10%), and Turkey (8%). In 2002, the United States exported 6,289 Mt of olive oil valued at 6.5 million dollars. The EU, on the other hand, exported 372,697 Mt valued at 915.8 million dollars.[18] The main destinations for EU exports were the United States, Japan, Canada, Brazil, and Australia.[19]

The biggest importers of table olives are the United States (30%), the Community (18%), Brazil (16%) and Canada (6%).[20] In 2002, the US also imported 221,606 Mt of olive oil valued at $443 million dollars.

C. Subsidies

The story of the international olive market is not complete without an understanding of the subsidies granted to olive producers, especially in the EU. The olive regime in the EU was devised in 1966. In the initial community of six, Italy was the only producer of olive oil. The olive regime was put in place to sustain the market for olive oil, give special assistance to growers especially small producers, and boost consumption of olive oil for canning. The EU put limits on the area of production eligible for aid, set minimum prices, established border protection, established public and private storage to take surpluses from the market and granted export subsidies to assist in marketing olive oil outside the EU.[21]

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[15] Ibid., p.6.

[16] Ibid, p.8. For a definition of the different kinds of olive oil, see the section on quality. T

[17] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004, p. 16.

[18] http://apps.fao.org/faostat/collections?version=ext&hasbulk=08=agriculture. (Accessed 9/21/04)

[19] FAO numbers vary significantly form the IOOC numbers but the trends are the same.

[20] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004.p. 19

[21] "The Olive Oil Sector in the European Union, DG Agriculture, June 2002 p.2.

With the accession of Greece (1981) and Portugal and Spain (1986) the EU went from being a net importer to a net exporter of olive oil. In 1997 the European Commission put forth a proposal to reform the olive regime. The first phase of reform was adopted in 1998 and came to be known as the transitional olive oil regime. The main changes were as follows:

- Reduction in the number of policy instruments leaving production aid as the principle measure of assistance. (Production aid is granted to 2.2 million of the 2.8 million recorded producers of olive oil in the European Union.)
- Production aid to be granted on the quantity of olive oil produced rather than on the number of trees and a fixed yield.
- The EU maximum guaranteed quantity (MGQ) of olive oil eligible for production aid increased by 31.6% from 1.35 to 1.78 million tons and was apportioned among producer member states in the form of National Guaranteed Quantities (NGQs). Of the total MGQ, 42.8% is allocated to Spain, 30.6% to Italy, and 23.6% to Greece. Production aid was simultaneously reduced from EUR 142.2/ton to EUR 132.5/ton. The division of the MGQ to NGQs rendered the amount of aid in each Member State independent of developments in production elsewhere. If production in a particular year was lower than the NGQ, 20% of the difference is distributed proportionally among the Member States who exceeded their NGQs and the other 80% is carried over to the NGQ of the Member State in question for the following market year. This takes into account large annual variations in production.
- Public storage replaced private storage contracts to deal with serious market disturbances.
- New olive trees planted after May 1,1998 would not qualify for market aid.
- Possibility given to producer member states to grant aid to olive producers within the limits of their respective NGQ.
- Abolition of consumption aid.

The transitional olive regime lasted from the 1998 marketing year through the 2003-2004 marketing year. In November 2003, the EU Commission published proposals for a substantial reform of the olive oil regime that would follow the pattern of recent changes in the arable and livestock regimes. The proposal calls for a Single Farm Payment (SFP) which would equal 60% of the current production subsidies producers received during the reference period 2000-2002 (or 100% in the case of producers with less than 0.3 ha.) The payment would no longer be for actual production but would be converted into an entitlement. The number of hectares included in the program would relate to those included in the olive Geographical Information Scheme.[22] In addition, an Olive Grove Payment (OGP) system was established. This allows 40% of the current production

[22] The GIS Geographic Information system was implemented in 1998 and is a digital mapping system to identify parcels on which producers apply for aid. The database makes it possible to compare the number of olive trees identified on the photos with those declared by the producers.

subsidy to be transferred into national envelopes. Member states would then define up to five categories, in accordance with a common framework (which includes landscape preservation, environmental, social and cultural concerns), to classify priority olive grove features they wish to preserve. The aim of the payment is to ensure the maintenance of olive groves that might otherwise be abandoned.[23]

Export refunds originally established to bring Community prices in line with world prices have decreased as a result of WTO agreements. The quantity eligible for export refunds decreased from 140,500 tons in 1995/96 to 115,000 tons as of 2000/01 at a maximum cost of €54.3 million. Although the 1998 reform retained the refund mechanism, the Commission fixed an amount that since then has remained constantly at zero. This has not resulted in a decline in exports that went from 227,000 tons in 1997/98 the last marketing year before the refund rate was set at zero to 324,000 tons in 2001/02.[24]

While many environmental groups support the OGP portion of the reform they believe that the SFP rewards high intensity olive producers that do not employ environmentally sound production techniques. This will be discussed in greater detail below. It is interesting to note that in Spain the income per family worker engaged in olive growing exceeds the average of other types of farming by 20%. In Italy, the income per family worker engaged in olive growing exceeds that for arable crops but is 4% lower than the average for all other types of farming. In Greece, the income per hectare is 10% lower than the average whereas in Portugal the income of olive growing holdings is equivalent to the average for other types of farming.[25] In addition, the production of olives in the European Community plays a critical socioeconomic role. In general, olive producing regions tend to be in the less developed part of the Community. In fact, in Italy and Spain unemployment in the olive growing regions is almost double the respective national average. Both olive picking and olive oil processing generate jobs and are an important source of employment.

While California producers do not benefit from production and export subsidies, almost *all* California agricultural producers benefit from water subsidies. (It should be noted that olives are only one of the commodity groups that benefit from water subsidies.) As the Natural Resources Defense Council (NRDC) points out "In 1902, the federal government passed the National Reclamation Act, aimed at building water projects that would deliver irrigation water to small farmers in the West. To ensure that only true family farmers would receive this water, the Act limited to 160 acres the amount of land on which growers could receive federally subsidized water. Over time, the original 160-acre limit for water delivered by the federal government became 960, and many much

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[23] "EU policies for Olive Farming towards Sustainable Production in Europe" http://www.eeb.org/activities/agriculture/EU-Policies-for-Olive-Farming-Policy-Recommendations-February2004.pdf accessed 09-22-04.

[24] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004, p. 42.

[25] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004, p. 28.

larger corporate farms began using legal dodges to qualify for "small farm" status under the law. These large farms divide ownership on paper, form trusts, and use other subterfuges… Many California farmers still pay the government between $2 and $20 per acre-foot for irrigation water -- as little as ten percent of the water's full cost. Taxpayers make up the difference; between 1902 and 1986 irrigation subsidies have cost taxpayers around $70 billion."[26]

D. Technology

There are three broad types of olive growing technologies in the EU: traditional groves, managed traditional plantations, and intensive plantations. Traditional groves are often composed of ancient olive trees. The managed traditional plantations involve a higher use of inputs and the intensive plantations use more mechanization and other technologies including irrigation. "The mix of ancient and modern helps explain the differing farm sizes, ownership characteristics and processing structures that exist within the EU."[27] Production costs in the EU are highly variable. In general, the cost of harvesting accounts for 50% or more of the production costs. The cost of harvesting is highly dependent on the cost of labor. It should be noted that many olive producing areas in Europe are mono-varietal meaning that the majority of the olives ripen at the same time leading to important seasonal labor shortages. Dense groves allow for a greater use of mechanization. However, mechanization is only justified on holdings of a certain size with good yields per hectare. In addition, the end use matters. Table olives, for instance, require careful picking.

Super High Density (SHD) olive groves are a fairly new development and are found mainly in Spain. The average yield from the use of traditional olive technologies in Europe is about .7 tons per acre. SHD groves yield 5-7 tons per acre. Many of these groves have been planted since 1998 and are therefore ineligible for EU subsidies. Consequently, they must compete on an equal footing with other world producers. Olive trees in SHD groves are planted in hedgerows and are spaced 4-6 feet apart and can be harvested with a mechanical grape harvester. The trees are kept relatively short, (about 8 feet tall) and are shaken by the harvester as it passes over the top of them causing the olives to fall onto conveyor belts which than dump the produce into a bin or wagon. They are generally irrigated by a drip system and are heavily pruned. Three varieties have been adapted to this system, the Arbequina, the Arbosana, and the Koroneiki. It is estimated that this system can reduce harvesting costs by 80%. Another advantage is that the olives move more quickly from the tree to the processing plant thereby reducing spoilage. In addition, these varieties generally start producing in 2 years and reach their full production potential in the fourth or fifth year.

However, there are several limitations to SHD production. The first and most significant is the high cost of installation. UC Cooperative Extension estimates the cost per acre of installing this sort of system to be $4200 to $8-9000. Consequently, there are only about

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[26] "Industrial farms: Water Hogs and Subsidy guzzlers." At

http://www.nrdc.org/water/conservation/fcawater.asp

[27] "The olive oil sector in the European Union" DG Agriculture, June 2002.

25,000 acres of these SHD plantings in the world. (Compare this to the 17.9 million olive acres in the world.) Secondly, it works with a limited number of varieties. Thirdly, it requires irrigation, and finally, it does not work if the olives are planted on a slope.[28]

New world producers of olives such as California, Chile, Argentina, South Africa, and Australia, are better positioned to adopt SHD technologies because they are not as locked in to traditional production systems. In addition, many well established agricultural industries are looking for new profitable crops. In the case of California, this is particularly true of grape producers. As noted by Muller, however, one of the biggest obstacles to new world production has been a lack of processors, bottlers, and marketers of olive oil.

Recently, there have been two major breakthroughs in California olive production. The first came in 1990 when Nan McEvoy, the former matriarch of the San Francisco Chronicle planted 18,000 trees on a 500-acre ranch in Petaluma and within a few years became the nation's largest producer of estate grown oil. This led to an increase in the number of artisanal olive oil producers, going from about 15 in 1990 to 150 in 2003. However, the biggest breakthrough in California production occurred in 1999 when a group of Spanish investors invested in the California Olive Ranch (COR). This was the first SHD olive ranch in California. The COR consists of about 700 acres of olives groves. The hope is that this ranch will eventually be able to produce approximately 125,000 gallons of olive oil a year. The California Olive Ranch has a processing facility with a capacity four times greater than its own needs. Consequently they provide production contracts to outside growers to utilize their processing facility thus insuring a reliable outlet for olive producers.[29]

E. Market Access

As mentioned above, the EU is fairly self-sufficient in olives and olive oil. With production rising substantially, EU imports have followed a downward trend since 1995. In 2002, according to the FAO, the EU (15) imported only 37,721 Mt valued at 65.6 million dollars, (excluding intra-trade).[30] However, despite reductions under the WTO, EU customs duties on olive oil remain high. They currently amount to € 122.6/100 kg for lampante oils, €124.5/100 kg for virgin and extra virgin olive oils, €134.6/100kg for non-virgin olive oils, € 130.3/100 kg for olive residue oils and €13.10/100 kg for fresh or preserved olives. Nearly all the olive oil imported by the Community comes from Tunisia, however, which has a zero rated import quota of 53,000 tons (increasing to 56,000 tons in 2005). In March 2003, a similar agreement was reached with Lebanon in which an annual duty free quota of 1,000 tons is allowed.

The US, on the other hand, may experience export competition and competition for their domestic market from other new world producers such as Argentina, Australia, South Africa, and Chile which are also increasing their olive production. Some estimates predict that Argentina is likely to increase the area under olive production by 300% over

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[28] Ken Muller "California in the Global Olive Oil Industry" pp. 14-16.

[29] Ken Muller "California and the Global Olive Oil Industry", pp.22-25.

[30] http://apps.fao.org/faostat/collections?version=ext&hasbulk=08=agriculture. (Accessed 9/21/04

the next seven years. Likewise Australia is estimated to go from 936 tons of olives in 1996 to 30,000 tons in 2007. Chile is likely to also become an important new world producer of olives because of its cheaper land, and labor costs but also because two Chilean government programs: Corporacion de Fomento de Produccion (CORFO) and Fundacion para la Innovacion Agraria (FIA). CORFO, which is a Chilean government program, is charged with the promotion of emerging economic sectors. "Through CORFO's program TodoChile, designed to attract investment in the wine industry, it has organized discussions between Chilean businessmen and European companies and investors regarding olive oil production in Chile….FIA is leading the process of coordinating the efforts of the public and private sector in organizing and developing the Chilean olive oil industry, adopting new technologies, establishing quality regulations, and promoting the industry in order to compete in national and international olive markets."[31] US free trade agreements with Argentina, Chile and Australia will give olive producers in these countries access to the growing market in the US. Because of this European investors are attracted to countries like Chile that have lower land and labor costs. By producing in these countries, they can circumvent US tariffs and at the same time, it is cheaper to transport their produce to the US market.

F. Market structure and marketing institutions

The 2001 EU reforms allow Member States the possibility to withdraw a limited share of market aid in favor of producer organizations (POs) undertaking activities in areas such as market follow-up, improving the environmental impact of olive oil production, and quality improvement and traceability aspects. These POs administer aid and also work to improve quality. Almost all olive producers belong to a PO. There are 83 POs in Greece, 188 POs in Italy, 71 in Spain (accounting for 80% of the Spanish olive growers), and 26 in Portugal. The POs themselves may belong to an association. There is one in Greece, two in Spain, and five in Italy. As DG VI's working paper on olive oil and the table olive sector suggests, "The extent to which growers are involved in the marketing of olive oil varies significantly between Member States. In Spain growers sell their olives to mills (cooperatives in 75% of the cases). The mills then deal with the marketing of the oil once it has been produced. In Italy and, above all, in Greece, the mill in many cases merely provides a service (olive crushing), and it is the grower who markets the oil. In Spain and Portugal, there are no direct sales by growers since national legislation prohibits the sale of olive oil in bulk. There are approximately 11,000 approved mills in the Community: 6,000 in Italy, 2,200 in Greece, and 1,700 in Spain where the production is more concentrated in geographical terms. The high number of mills leads to a certain degree of fragmentation in the industry.[32]

At the international level, many of the marketing efforts are coordinated by the International Olive Oil Council (IOOC).[33] The IOOC was created as part of the 1956

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[31] Ken Muller, p.28

[32] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf (Accessed September 23, 2004) p. 29.

[33] The EU is a member while the US only has observer status.

Olive Oil Agreement. Its aims are to encourage international cooperation, modernize olive growing, facilitate international trade in olive products, and standardize international trade in olive products. The main activity of the IOOC is the generic promotion of olive oil in non-producer, non-member countries. The IOOC has also developed marketing standards for trade that seek to guarantee the quality and authenticity of oils.

G. Quality

Olive oil compared to other edible oils is an expensive product. In the wholesale market the price of olive oil compared to other edible oils is about 4 or 5 to 1. The major aim of the EU's future olive policy is to enhance the quality of the product on the world market. Commission Regulation (EEC) no 2568/91 specified the characteristics of olive oils and olive-residue oils as well as methods for carrying out analyses of authenticity. A new definition for olive pumace oils was established in Commission Regulation (EC) No 796/2002of 6 May 2002 amending regulation (EEC) no 2568/91. This will allow a clearer distinction to be made between these oils and lampante virgin oils.[34] A technical agreement recently concluded between Codex Alimentarius, the IOOC, and the Community harmonized from 2003 the standards for olive oil and olive oil residue that apply in both the Community and international trade. (These are outlined in Annex 2.) In addition, in 2001 the Community initiated a program to adopt measure to combat fraudulent mixtures and to better inform consumers by among other things requiring inclusion in the labeling of a description of the category corresponding to the oil in question.[35]

The U.S. is one of the few major markets that has not adopted the IOOC definitions. Currently, the United States standards for Grades of Olive Oil stated as U.S. Fancy, U.S. Choice, U.S. Standard and U.S. Substandard have been unchanged since 1948. The US is wildly out of step with the rest of the olive exporting world. For example, at this time there is no USDA definition of "extra virgin olive oil." Consequently, importers of European oil can label poor quality pomace oil as "extra virgin" with few if any repercussions. In addition, "Lite" or "Light" olive oil in the US refers to flavor not caloric content. There is no official definition of "lite" or "light." According to the Olive Oil Source, "Olive oil importers have effectively blocked passage of more meaningful labeling."[36] The California Olive Oil Council (COOC) has announced that it has filed a petition with the U.S. Department of Agriculture Standards Division to establish new trade standards for grades of olive oil. The COOC is requesting that IOOC standards be adopted. "The current language defining U.S. olive oil standards is extremely dated," said Bruce Golino, board president of the California Olive Oil Council. "Common terms used to describe olive oil today, such as 'extra virgin,' are not included in the current standards. The result is that the terms the consumer recognizes,

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[34] The olive Oil sector in the EU p.3

[35] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004.p 43.

[36] The Olive Oil Source , http://www.oliveoilsource.com/definitions.htm accessed October 4, 2004.

and is willing to pay a premium for, are used to describe olive oil without regard to its true character. The updated standards are a necessity and represent a major milestone for the olive oil industry and the U.S. consumer."[37] In the mean time, the California Olive Oil Council has attempted to rectify this by issuing a seal to oils that achieve IOOC Extra Virgin olive oil quality standards.

There also exist some California olive oil labels that the state has defined. For instance, "California olive oil" must solely be made with California olives. "Estate grown" must contain 95% of oil from olives grown on that estate. And olives labeled "Sonoma Valley" or "Napa Valley" are from designated American Viticultural areas and 75% of the olives used to make these olive oils must be grown in that area.

H. Environmental and Phytosanitary Concerns

The production of olives, particularly in Europe requires a complex analysis of environmental impacts. Olive trees are particularly well suited to the harsh conditions of many Mediterranean regions. Traditional low intensity, non-irrigated groves often contribute to landscape preservation by decreasing desertification and contribute to greater biodiversity by providing shelter and food for wild fauna. On steep slopes, terraced olive groves can prevent soil erosion. However, when these olive groves are abandoned, they turn into a form of scrub which if not maintained is at risk for summer fires, one of the chief environmental hazards of the Mediterranean regions. In addition, they may meet the social and cultural objectives of keeping people on the land in more remote areas.

On the other hand, in large areas of olive monoculture, such as in Spain, olive production can result in major problems of soil erosion, degraded biodiversity (due to he increased use of fertilizer and herbicides which wash into water systems and clearing of wildlife sanctuaries to increase cultivation), and excessive water use. For example, in 1997 the Jaen area (within the Guadalquivir river basin) had a 480 million cubic meter water deficit. It is estimated that 300 million cubic meters of water was consumed irrigating olive farms.[38]

The environmental problems related to processing have to do with: 1) the high amounts of water consumed in regions where supplies are limited, and 2) the associated waste run off which contains a high level of organic substances. Processing table olives produces highly polluting liquid waste because of the high organic content and the traces of sodium and brine used in processing the olives.

Another production problem of great importance for the California olive industry is the phytosanitary problem posed by the olive fruit fly. The olive fruit fly is found throughout southern Europe, northern Africa, and in the Middle East. So far, it has not been detected on the South American continent. This pest was detected in Los Angeles County in 1999 and within five years has become present in 51 of the 57 counties in

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[37] California Olive Oil Council Petitions U.S. Department of Agriculture for New Olive Oil Trade Standards, June 24, 2004, http://www.cooc.com/fpress.html accessed October 4, 2004.

[38] http:// www.igreens.org.uk/eu_olive_subsidies.htm (Accessed 09/23/04.)

California. This single host pest is devastatingly effective because it does not kill its host, destroys fruit in a way that does not preclude production the following year, can travel significant distances, (reportedly more than six miles), can winter over in different developmental forms, is multigenerational within a season, and has no natural enemies in California.[39] The fly burrows into the fruit and lays eggs. These hatch into tiny larvae which tunnel through the fruit feeding off the flesh of the fruit and allowing infestations of bacteria and fungi which can rot the fruit. The Agricultural Research Service (ARS) is studying ways to control this pest through biological control agents (including a newly discovered parasite and a cold tolerant parasite as methods) to reduce populations in regions with high infestations. The physical factors that limit insect growth including temperature and humidity will also be studied in the laboratory to determine the effect of weather on the distribution of olive fruit fly in California and potential growth of populations in regions with a high production of canning olives. Quarantine treatments previously developed including low temperature storage regimes and brine solutions will be supported with further research to control larval populations in the fruit. Previous observations and laboratory investigations to study insect-host interactions will be continued to determine factors that affect fruit susceptibility to attack. UC Davis along with members of the table oil and olive oil industries are also trying to develop natural and chemical controls. However, this pest has the potential to severely limit California's market potential.

[39] California Olive News. April 2004 www.oliveoilsource.com/olivenews.htm7 (Accessed October 4,) 2004.

III. Tree Nut Sector

A. Brief History of the Tree Nut Industry in the EU and the US

The tree nut industry consists of several products including almonds, pistachios, pecans, walnuts, hazel nuts, macadamia nuts, Brazil nuts, and chestnuts. The primary tree nuts produced in the EU are almonds, walnuts, hazelnuts, pistachios and a few chestnuts. The primary tree nuts produced in California are almonds, walnuts, and pistachios. Consequently this sector analysis will focus on almonds, walnuts, pistachios, hazelnuts and chestnuts.[40]

The cultivated almond as we know it today traces its origins to the deserts and lower mountain slopes of central and southwest Asia. It is thought to have evolved from the same primitive stock as the peach. The peach seems to have evolved eastward into China, at lower elevations in regions of higher humidity, while the almond spread along the fringes of the deserts and lower mountain slopes to the west, developing many subspecies along the way.

The offspring of those early varieties still grow in western China, Kazakhstan, Kirghizia, Tajikistan, Uzbekistan, Afghanistan, Turkmenistan, and northern Iran. Typically small, thorny trees, they produce small, hard-shelled, bitter nuts. These varieties favor the mild, wet winters and dry, hot summers found at moderate elevations in this rugged region of the world.

At some point in prehistory, humans discovered that these hardy trees and shrubs sometimes produce sweet, edible kernels. Nomads used these nuts along with chopped dates, bits of pistachios, sesame oil and bread crumbs to create a nutritious and mobile food. "By 4,000 B.C., almonds were in use in nearly every ancient civilization. That was also about the time that humans learned to cultivate the trees. Almonds took readily to what is modern-day Iran and Iraq, and the lands surrounding the Mediterranean Sea. The climatic patterns of present-day Israel and Turkey favor almonds: cool, wet winters; mild spring; warm, dry summer; and, mild fall. These conditions prevail for about 100 miles inland from the seacoast. Hebrew literature from 2,000 B.C. mentions almonds in Canaan, modern-day Israel. Early references from Turkey, Romania and the Baltic peninsula also mention almonds." [41] Today, almonds are grown in France, Greece, Italy, Spain, Portugal, Morocco, Tunisia, and Turkey. However, only Spain plays an important role in the international market. The other countries can not compete with California growers who have adopted modern production techniques.

Commercial almond production in California began in the 1840s. Most of the almonds were from stock brought to California from southern France. By 1860 almond orchards dotted the California landscape.[42]

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[40] It should be noted that macadamia nuts are produced in Hawaii and pecans are produced in the southern US but this study will not focus extensively on these nuts.

[41] http://www.bluediamond.com/almonds/history/index.cfm

[42] Gary Allen, "The Almond People, Blue Diamond Growers at 90", Blue Diamond Growers: Sacramento, CA, 2000. pp. 1-8.

The walnut, like the almond, has been a staple food crop for thousands of years. The walnut and the oil extracted from it have been known since ancient times. In Périgord, from Peyrat to Terrasson, excavations have brought to light petrified shells of nuts that were roasted during the Neolithic period, more than eight thousand years ago. Around 2,000 B.C. in Mesopotamia, the Chaldeans left inscriptions on clay tablets revealing the existence of walnut groves within the famed Hanging Gardens of Babylon. In addition, there is evidence of walnut consumption dating from the same era on carved stelae containing the Code of Hammurabi, in a section devoted to food. In the Old Testament, King Solomon speaks with delight of visiting his walnut grove.[43]

One theory has it that the walnut may have disappeared in parts of northern Europe during the glacial period but was then reintroduced by barbarian invaders and by Greco-Roman conquerors. Once the tree was reestablished, the exploitation of its products spread steadily through increasing trade.[44]

In the early 1800's Spanish Franciscan monks established missions along the California coast. Part of their teachings included the cultivation of food plants and trees in the areas surrounding the missions. One area that eventually became the city of Walnut, California, was home to the San Gabriel Mission named for the Gabrielino Indians, originally of Shoshone origin. Many acres of walnut trees, originally brought from Spain, were planted here and became known as "mission walnuts." These first walnut trees produced small nuts with very hard shells. By the late 1930's the commercial walnut business had moved northward to Stockton, California. Today, this area of California produces 99% of the commercial United States walnut supply. On the global market, California produces two-thirds of the world's supply of walnuts. Other countries that grow commercial walnuts include Turkey, China, Russia, Greece, Italy and France.

Hazelnuts have been cultivated in China for more than 5,000 years. The *hazel* part of its name comes from the Anglo-Saxon word *haesel* meaning a headdress or bonnet, referring to the shape of outer shell covering. Hazelnuts are reputed to be native to Asia Minor, from whence they spread to Italy, Spain, France, and Germany via Greece. Prior to the 1940s, hazelnuts were imported to the States. Today they are grown commercially in the northwest US, primarily in Oregon.[45]

Chestnuts also date back to prehistoric times. The chestnut tree, *Castanea sativa,* was first introduced to Europe via Greece. The majority of the chestnut trees currently found in America are of native European stock, but Native Americans feasted on America's own variety, *Castanea dentata,* long before European immigrants introduced their stock to America. In 1904, diseased Asian chestnut trees planted on Long Island, New York carried a fungus hitchhiker that nearly devastated the American chestnut population, leaving only a few groves in California and the Pacific Northwest to escape the blight.

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[43] http://www.globalgourmet.com/food/special/1999/walnut/history.html

[44] http://www.globalgourmet.com/food/special/1999/walnut/history.html

[45] http://homecooking.about.com/cs/nuts/a/hazelnut.htm

Nowadays most chestnuts in the US are imported from Japan, China, Spain, and Italy. Chestnuts are known as *marrons* in France and some parts of Europe.[46]

Pistachios originated in India, central Asia, the Middle East and the eastern Mediterranean. They were introduced into Europe in the first century A.D. where they spread throughout the Mediterranean countries.

Pistachios were originally imported by American traders in the 1880s, primarily for U.S. citizens of Middle Eastern origin. The birth of the California industry followed shortly. It was in 1929 that American plant scientist William E. Whitehouse spent a lonely six months in Persia (modern day Iran), collecting seed and sifting through piles of produce to find the most distinctive pistachios. He returned carrying a burlap sack 20 pounds heavy with seed.

The next year, experimental plantings were established in California, the perfect host with its desert-like climate. With pistachio trees requiring a full seven to ten years to mature, it was 1950 before one stand-out tree emerged.. The first commercial crop of 1.5 million pounds was harvested in 1976 from 4,350 acres. California now has over 100,000 acres planted yielding more than 200 times the amount of that first harvest.[47] Commercial production today is concentrated in California's San Joaquin Valley. Today California is the world's second largest producer of pistachios behind Iran but ahead of Turkey, Syria, and China.[48]

B. Production and Trade Statistics

Almonds

Production. According to the Food and Agriculture Organization, the seven top almond producers in the world in calendar year 2003 were the United States (741,440 Mt), Spain (197,300 Mt), Syria (139,010 Mt), Italy (91, 382 Mt), Iran (105,000 Mt), Morocco (70,800 Mt) and Greece (40,000 Mt).

US almond production reached 454,000 metric tons in 2003/2004.[49] This is the second largest crop on record and the largest crop ever produced in the downswing of the US production cycle. Foreign production dropped in 2003/2004 due to a severe drought across most of southern Europe. Production levels should rebound in 2004/2005 assuming normal weather conditions.

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[46] http://homecooking.about.com/library/weekly/aa120400a.htm

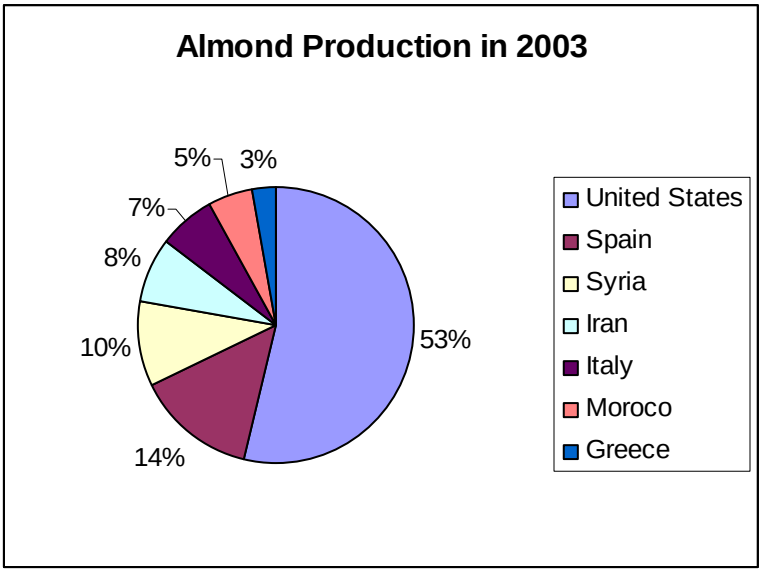
[47] http://www.pistachios.org/History/History.asp

[48] ERS, Fruit and Tree Nuts outlook/FTS-298/may 22, 2002, p.18

[49] World Almond situation and Outlook, April 2004. Numbers taken from USDA National Agricultural Statistics Service (NASS), It should be noted that split years refer to harvest and marketing period, which begins in the fall and extends to the spring. This corresponds roughly to July-October in the northern hemisphere and January-March in the southern hemisphere. For the southern hemisphere, harvest occurs almost entirely during the second year shown. P.1. FAO numbers and NASS numbers differ because of the time periods included in the database, marketing year vs. calendar year and the units metric tons vs. '000 pounds. One metric ton equals 2,200 pounds.

In general, EU almond producers find it difficult to compete with either US or Turkish producers. The US competitive advantage lies in intensive techniques and irrigation while the Turkish competitive advantage lies in low production costs, particularly low labor costs. EU almond production is dependent on alternative year cycles which are exacerbated by the marginal conditions in many of the nut tree groves. Nevertheless, on average the EU accounts for about 31% of world total production. Spain is the major EU almond producer with 61.1% of EU almond production. Italy is the second major EU producer with 23.3% followed by Greece and Portugal.[50]

Figure 2.1 Top Almond Producers in 2003



Source:FAOSTAT

US almonds are grown in California. Table 2.1 shows the alternate year production cycle and the corresponding prices per pound. Contrary to expectations when the supply increases the prices do not always decrease. This can be attributed to increasing domestic and foreign demand, the weak dollar, and poor weather in other regions. The main thing to note however, is the trend towards higher levels of production even in off years.

[50] Commission Staff Working Paper: Analysis of the Nut Sector. Commission of the European Communities Brussels 10.7.2002. SEC (2002) 797.

Table 2.1 California Almond Production, Price Per Pound and Value of Production

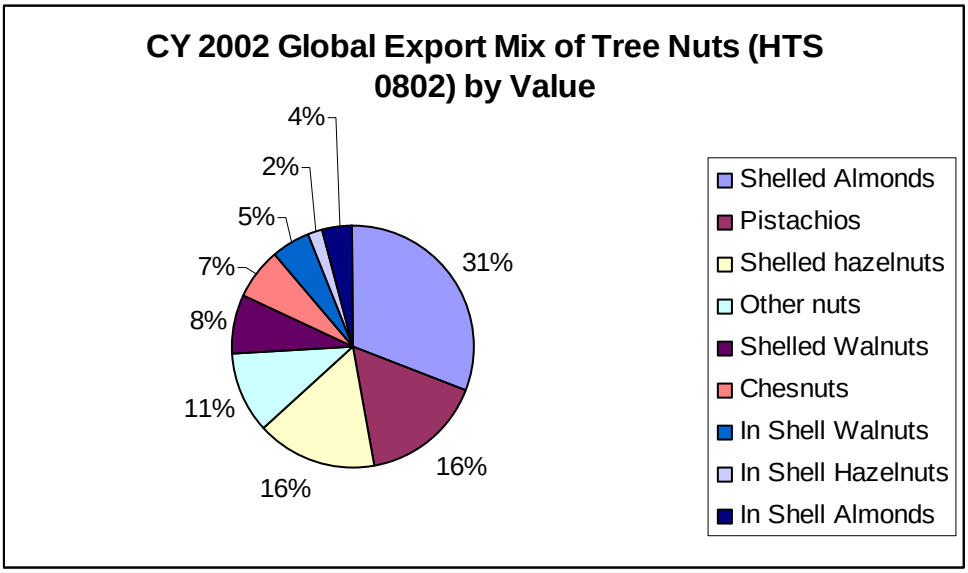
Production in Million Pounds	Price per Pound in Dollars	Value of Production in 1,000 dollars	Year
735	1.34	965,202	1994
370	2.48	880,896	1995
510	2.08	1,018,368	1996
759	1.56	1,160,640	1997
520	1.41	703,590	1998
833	0.86	687,742	1999
703	0.97	666,487	2000
830	0.91	740,012	2001
1,090	1.11	1,200,687	2002
1,040	1.42	1,447,264	2003

Source; California Almond Forecast, 2004. http://www.nass.usda.gov/ca/oth/405almpd.htm

Exports and Imports. Almonds are a major component of world nut exports. Figure 2.2 shows the 2002 global export mix of tree nuts (HTS 0802) by value. According to the Global Trade Atlas, CY 2002 global exports of selected tree nuts rose 6.3% to reach $2.8 billion. Of the total tree nut exports in CY 2002, shelled almonds accounted for 35 percent ($978 million) and in shell almonds accounted for 5% ($136 million).[51]

[51] There is some discrepancy in these numbers but they are fairly close.

Figure 2.2 Global Export Mix of Tree Nuts



Source: World Almond Situation and Outlook April 2004, p. 2. USDA, FAS

US almonds accounted for 71% of reported global almond exports (shelled and in shell) in 2002 or 28% of total global tree nut exports. This makes the US the largest global exporter of tree nuts on a value basis.[52] It also makes almonds the number one horticultural export commodity in terms of value. In 2002 about 53% of US almond exports went to the European Union while nearly 25% went to Asia. Other regional growth markets include the Middle East, the former Soviet Union, and North America.

The US exports both shelled and in-shell almonds. Figures 2.3 and 2.4 show the leading world exporters of these two types of almonds.

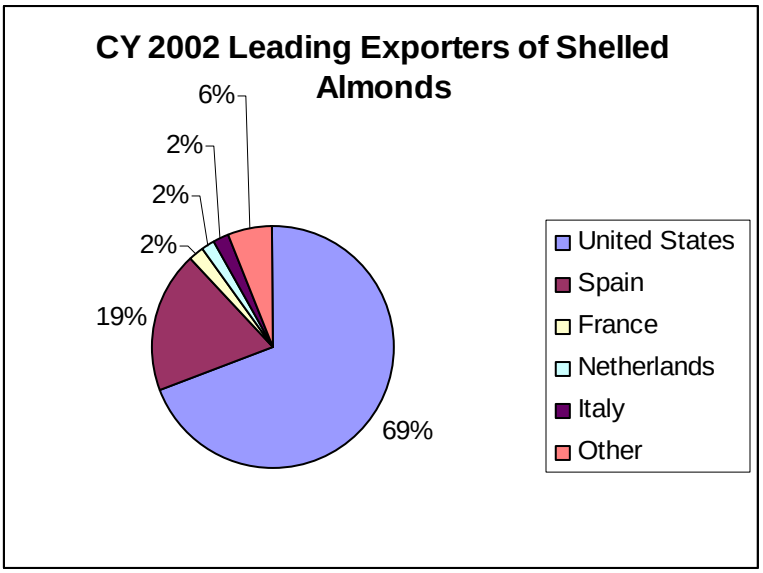
Spain is the largest export market for US shelled almonds. It is also the largest producer of EU almonds. Most almonds in Spain are used in the confectionary industry (70-80%). The rest are consumed as snacks. Although Spain's consumption is growing, industry sources estimate that between 50 and 65% of U.S. almonds shipped to Spain are re-exported to neighboring countries. Although Italy produces almonds, they are dependent on imports to meet their consumption needs. The top suppliers of almonds to Italy are then US and Spain. The largest export market for Italy is France.[53] Germany is also a leading importer of shelled almonds. The US supplies about 60% of these imports and Spain supplies about 27% of these imports. France is both an exporter and importer of almonds. In CY 2003 they exported $24 million and imported $104 million. France's

[52] Selected tree nuts includes almonds, hazelnuts, walnuts, pistachios, pecans, and other tree nuts. World Almond Sitution and Outlook, April 2004.

[53] World Situation and Outlook, April 2004

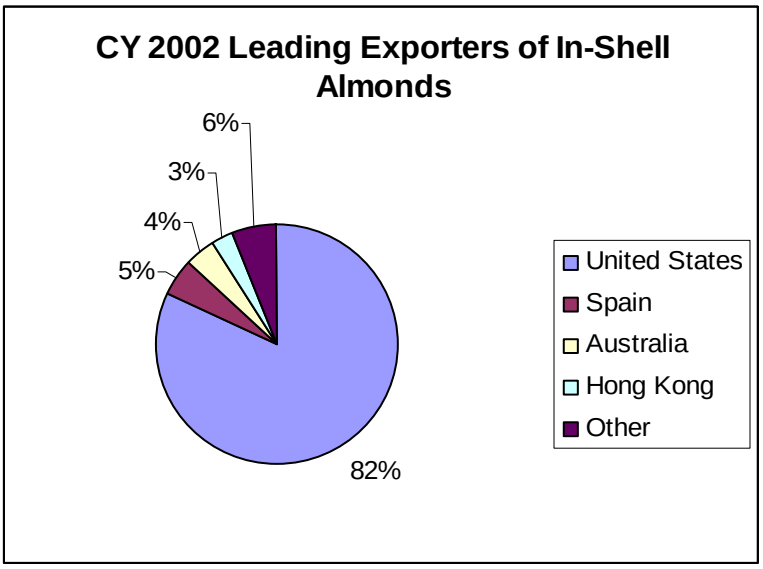
largest export market is Spain.[54] The largest supplier of almonds to France is the US followed by Spain.

Figure 2.3: Leading Exporters of Shelled Almonds



Source: USDA, FAS "Almond Situation and Outlook, April 2004, p.4.

Figure 2.4 Leading Exporters of In-Shell Almonds



Source: USDA, FAS "Almond Situation and Outlook, April 2004, p.4.

[54] World Almond situation and Outlook, April 2004, p. 5

India is the largest importer of US in-shell almonds. In CY 2003 The US exported nearly $81 million to India of which 87% were in-shell almonds. As FAS notes however, "The US dominance in this market may be challenged with the signing of the India-Afghan preferential Trade Agreement. The US industry has expressed concerns that Iranian almonds may be transshipped through Afghanistan with duties lower than those applied to US almonds."[55] Japan is also an important market for US almonds. Currently the US supplies 97% of Japan's shelled almonds and 96% of their in-shell almond imports.

Walnuts

Production. According to the FAO the six top walnut producers in CY 2002 were China, the United States, Iran, Turkey, Ukraine, and Romania. There are also many smaller producers of walnuts in the world. In the ten years between 1992 and 2002, world production has increased 29%. Both production and demand are growing quickly in China. And, production is expected to increase in Turkey as well since acreage is increasing at the same time that there is a shift towards improved varieties.[56]

European walnut production is static around 60,000 tons (in shell) a year. The distribution of EU walnut production is more balanced than for other nuts. France is the main producer with about 33.9% of the European walnut production, followed by Greece (28.5%), Italy (19.5%), Spain (12.3%), and Portugal (5.8%). French production was lower in 2003 due to a drought. In general, EU walnut production is fairly competitive with Californian production.[57]

California is the main producer of English walnuts in the United States and produces 99% of the nation's walnuts.[58] There are about 30 varieties of the English walnut produced in California. The California industry is made up of about 5000 walnut growers and 55 walnut processors. The average yield in California is 1.25 ton/acre. The farm gate value of the California walnut industry is 2.5-3.5 million dollars.[59]

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[55] World Almond situation and Outlook, April 2004, p. 5

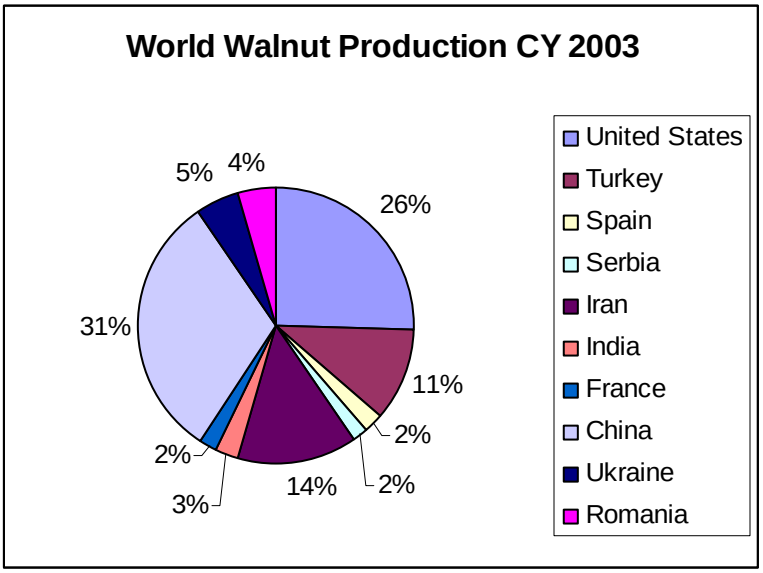
[56] USDA, FAS "World Walnut Situation and Outlook, World Horticultural Trade and U.S. Export Opportunities" December 2003. p. 1

[57] Commission Staff Working Paper, "Analysis of the Nut Sector"2002 p. 8

[58] The term" English" is a misnomer. It is thought to refer to the English merchant marines whose ships transported the nuts around the world. There are two species of walnuts: the English walnut and the black walnut which is native to the US. www.agmrc.org/nuts/englwalnutmain.html

[59] http://pom.ucdavis.edu/walnutfs.htm

Figure 2.5 World Walnut Production



Source: FAOSTAT

Imports and Exports. According to the Global Trade Atlas, the United States is the leading exporter of shelled walnuts with about 42% followed by India (9%), Mexico (8%), China (8%), Romania (6%), France (6%), Uzbekistan (5%), and other countries (16%). The US is also the leading exporter of in-shell walnuts with 47% of the exports followed by France (20%), Mexico (17%), Chile (5%), and other countries (11%). Leading destinations for in-shell US walnuts were primarily EU countries (Spain, Italy, and Germany). Since 2000, exports of US walnuts have grown 9% to reach $183 million in CY 2002. Approximately 62% of walnut exports are shelled while 38% are in-shell.[60]

France is the largest producer and exporter of walnuts in the European Union. Most of its exports go to neighboring European countries. Most of the French in-shell market is dominated by domestically produced and appellation labeled walnuts.[61]

The leading importers of shelled walnuts include Japan (19%), Germany (12%), France (8%), Greece (7%), Spain (6%), Canada (6%), and other countries (42%). The leading importers of in-shell walnuts are Spain (25%), Germany (18%), Italy (16%), Mexico (12%) and other countries (29%). For EU external trade, the US is the most important trading partner. The US supplies about 26% of EU imports of shelled walnuts and 91%

[60] FAS: World Walnut Situation and Outlook, World Horticultural Trade and U.S. Export Opportunities, December 2003. p. 3

[61] FAS: World Walnut Situation and Outlook, World Horticultural Trade and U.S. Export Opportunities, December 2003. p. 4.

of in-shell imports. The second largest supplier of shelled walnuts is Chile and the second largest supplier of in-shell walnuts is India.[62]

Germany is the world's largest importer of walnuts. In CY 2002 it imported $29.8 million of shelled and $23.6 million of in-shell walnuts. The United States was the dominant supplier in both categories with 28% of shelled and 53% of in-shell. The United States is also the largest supplier of walnuts to Spain and Italy. France is the main US competitor for the Spanish in-shell market and India is the main US competitor for the Spanish shelled market. The US is the main supplier of Italian in-shell walnuts but in 2002 Chile (22%) surpassed the US (21%) in exports of shelled walnuts.[63]

Pistachios

The top five world producers of pistachios are Iran, Turkey, Syria, the United States and China. Pistachio production in the EU is marginal with less than 9,000 tons per year and very irregular harvests. The main EU producers of pistachios are Greece (77.7%) and Italy (22.3%).

US pistachios are grown primarily in California's San Joaquin Valley (about 98%) however small quantities are also produced in Arizona, New Mexico, Nevada, and Texas. Production has grown rapidly in the US increasing from 1.8 million pounds (shelled basis) on 1,700 acres in 1977 to a record 243 million pounds on 74,600 acres in 2000. In the industry's early years, imports accounted for well over half of the US supply. By the late 90's however, this share declined to less than 1%[64] Pistachios, like almonds, are alternate bearing. Industry has tried to build inventories to help maintain a steady supply of nuts on the market. Most pistachios in the US are harvested in September. The highest valued nuts have split shells and green kernels with the deeper the green the more desirable. Pistachios are primarily consumed as a snack food or as ingredients in confectionaries, ice cream, candies, sausages, baked goods, and flavorings. Approximately 80% of pistachios are sold in shell. The other 20% are shelled and sold to the food industry U.S. consumption of pistachios is fairly low. Americans prefer to consume almonds, hazelnuts, pecans, and walnuts. Even so there is an upward trend in pistachio consumption with demand growing at approximately 9% a year.[65]

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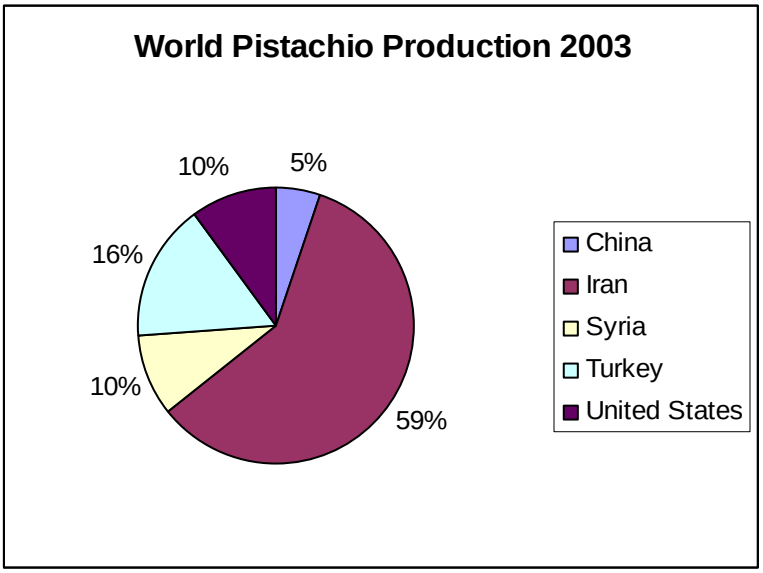
[62] FAS: World Walnut Situation and Outlook, World Horticultural Trade and U.S. Export Opportunities, December 2003. p. 5

[63] FAS: World Walnut Situation and Outlook, World Horticultural Trade and U.S. Export Opportunities, December 2003. p. 4-5

[64] ERS Fruit and Tree Nuts Outlook/FTS-298/May 2002, p.18.

[65] Ibid.p.18-20.

Figure 2.6: World Pistachio Production 2003



Source: FAOSTAT

Imports and Exports. Since the mid 1990s an average of 44% of the US pistachio crop has been exported each season making the US the second largest exporter of pistachios in the world after Iran. Hong Kong is the major market for US in shell pistachios followed by Belgium, Italy, and Germany. It is probable that much of the shipment to Hong Kong eventually makes its way to China. Eighty percent of the exports of shelled pistachio nuts go to Japan, Canada, and Israel. US pistachio imports are low in value (about $2 million in 2001) and come primarily from Turkey.

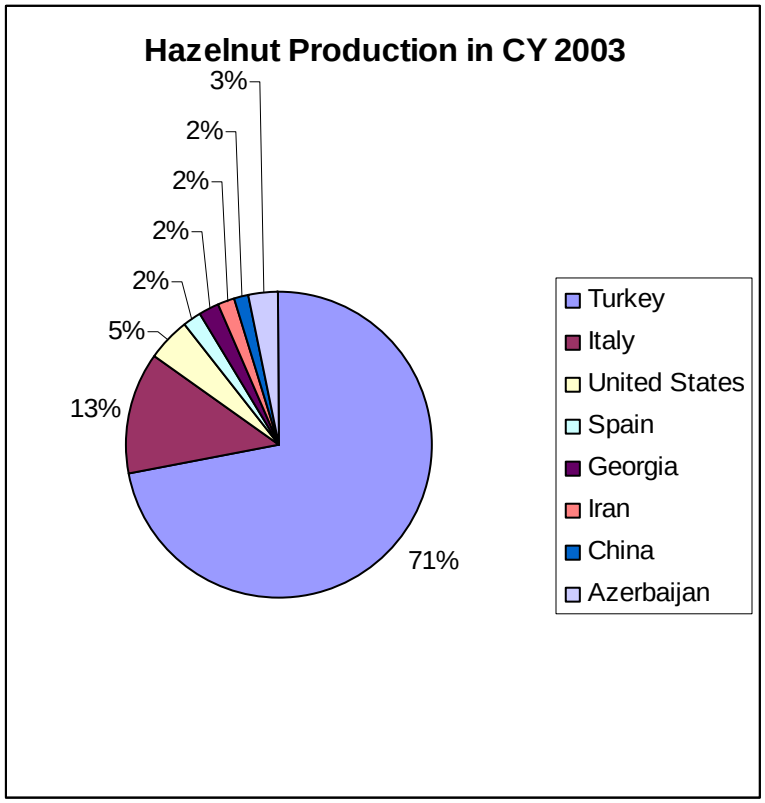
Hazelnuts

The major producers of hazelnuts (also known as filberts) are Turkey, Italy, the United States, Azerbaijan, Spain, Georgia, Iran and China. As in the case of many tree nuts, production of hazelnuts is also on an alternate year basis. Italy is the main EU producer (78.5%), followed by Spain (14.5%), France (4.1%), and Greece (2.7%). In the United States, Oregon grows 98% of the hazelnuts. There are more than 3,755,000 hazelnut trees in Oregon worth $49.5 million grown on 30,000 acres mostly in western Oregon in the Willamette Valley.[66]

In general, consumption of hazelnuts is fairly level. Hazelnuts are primarily used in the confectionary industry.

[66] http://extension.oregonstate.edu/news/story.php?S_No=611&storyType. Accessed October 21, 2004

Figure 2.7: Hazelnut Production in 2003



Source: FAOSTAT

Imports and Exports. The United States is a net exporter of hazelnuts. The top 5 export markets for US hazelnuts are China (53%), Germany (15%), Canada (6%), Spain (4%), and Venezuela (3%)[67]. U.S. exports of hazelnuts during the first 6 months of fiscal year 2002 reached 20,258 tons, up 100 percent compared to the same period last year, with an estimated value of $27 million. The US primarily imports hazelnuts form Turkey with a very small percentage coming from Canada. Most European imports also come from Turkey.

Chestnuts

Production. The major world producer of chestnuts is China. Other top producers are Korea, Italy, Turkey, Portugal, and Bolivia (See Figure 2.8). U.S. chestnut production is less than 1 percent of total world production. USDA does not report statistics on U.S. chestnut production and consumption separately.[68] However, a University of Kentucky study of cost of chestnut production in Turkey versus France showed that the cost per

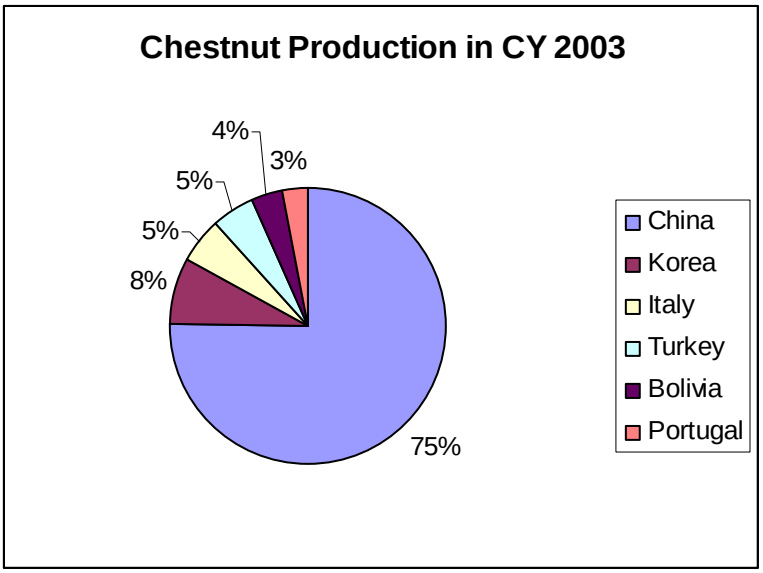
[67] US Census Bureau for marketing year 2000/01.

[68] http://www.agmrc.org/nuts/chestnutsmain.html

hectare in France was $7200 compared to $3120 in the US. The results of this study have encouraged some American farmers to establish new plantations.[69]

In the EU, Italy accounts for more than half of the total EU production with 51.2% of the total, followed by Portugal (16%), Spain (13.2%), France (9.9%), and Greece (9.7%). Chestnut production in the EU is less structured than other tree nut crops. In numerous areas chestnut trees are grown in combination with other crops and production data is less accurate.

Figure 2.8: World Chestnut Production 2003



Source: FAOSTAT

Imports and Exports. The US primarily imports chestnuts from China, with much smaller quantities coming from Italy, Switzerland, France, Spain, and South Korea. The United States imports between10 to 20 million pounds of European in-shell chestnuts annually valued at $30 to $40 million. USDA does not report statistics on U.S. chestnut production and consumption separately.[70] The EU is the largest world exporter of chestnuts followed by China. The largest exporter is Italy followed by Spain, Portugal, and France.

In general the EU balance of trade with respect to nuts is negative. In the period 1989-1999 the EU exported an average 211,926 tons of nuts and they imported 570,275 tons.[71]

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[69] Commission . "Analysis of the Nut Sector" p. 24.

[70] http://www.agmrc.org/nuts/chestnutsmain.html

[71] Commission Staff Working Paper p. 10

C. Subsidies

In the EU, specific measures for nuts and locust beans were originally introduced in 1989 under Title IIa of Council Regulation No 1035/72. This chapter introduced specific measures to improve the production and marketing facilities for almonds, hazelnuts, walnuts, pistachios, and locust beans. (Chestnuts were never included in these measures) Community expenditures on specific measures from 1990 until and including 2001 were € 970 million including € 25 million for specific aid for hazelnuts. Aid was provided to producer organizations (POs) that had submitted a plan to the Competent Authority outlining how they intended to improve the quality and marketing of their produce. Aid for improvement plans was restricted to 10 years to allow a shift in financial responsibility onto the producers. Improvement plans were financed 55% by public aid and 45% by the POs. The EU provides 82% of the public aid and the Member states 18%. These measures were intended to last 10 years. This regulation was repealed by Council regulation 2200/96. However, article 53 of this regulation allowed producer organizations to maintain rights acquired under Regulation (EEC) No 1035/72 until these were exhausted. A number of plans expired in 2000, having completed their tenth year. These plans became eligible for an eleventh year of aid under Council Regulation No 558/2001. A joint declaration of the Council and Commission issued at the Agricultural Council of 18 March 2002 stated that "The Council and Commission declare that the one-year extension of improvement plans for certain nuts and locust beans and the re-introduction for one year of the specific aid for hazelnuts adopted by the Agricultural Council on 18 March 2002 upon proposal by the Commission, are the last support measures to be taken under the current regime in place for the nut sector." All on-going plans which started from 1992 onwards are entitled to continue their 10 year plans until expiry. The last plans are scheduled to finish in 2006/07. No specific support measures are currently in place for the nut sector after the end of the improvement plans.[72]

The objectives of the improvement plans were to 1) regroup supply, 2) improve quality, and 3) improve competitiveness. Regrouping supply through producer organizations was seen as a way to improve product quality and adapt the volume of supply to market requirements. Quality improvement focused on encouraging producers to modernize their orchards in order to meet market requirements. The hope was that improved quality would lead to improved competitiveness. There are about 94 POs that are operational in 5 Member States (France (10), Spain (72), Italy (6), Greece (3), and Portugal (3)).

Nut POs are also eligible for operational funds. This financial support is complimentary to the improvement plan schemes. Since these funds are granted on the basis of the value of marketed production, only the more intensive nut production areas benefit from this scheme.[73]

Export refunds are currently granted for exports of shelled almonds, hazelnuts in shell, shelled hazelnuts, walnuts, and prepared hazelnuts. In each case refunds are fixed in advance according to the standard 'A' (the fresh products) or 'A1' (the prepared hazelnuts) systems, defined by Regulation (EC) No 1961/2001 and (EC) no 1429/95. Up

[72] Commission Staff Working Paper Analysis of the Nut Sector, p. 5, 25-27.

[73] Commission Staff working paper , p. 31.

to and including the GATT year 6 exports of fresh nuts were also eligible for 'B' type refunds. The 'B' system goes without advance fixing of the refund: licenses for export refunds are applied for after the exports have taken place and are accepted until the indicative quantities are exhausted. Community expenditures on specific measures from 1990 to 2001 were €970 million including €25 million for specific aid for hazelnuts.[74]

The United States provides a very low level of support for horticultural products and tree nuts which includes a wide variety of products ranging from frozen french fries to shelled nuts. OECD and USDA provide PSE calculations for major field crops, but few estimates are available for horticultural crops. Sumner and Hart reported such estimates in 1997 for California. These calculations are still approximately accurate under current policy. Fruits and nuts in California had a PSE of about 6%. This number reflects a wide variety of government services such as research and extension services, marketing and inspection services, some crop insurance benefits, some export marketing aids and some irrigation water subsidy. [75] Hyunok reports that "In the western United States, especially in California, the government has invested in large irrigation projects that provide relatively low-cost water to farmers. Fruits and vegetables are not the major beneficiaries of these programs, but they do enjoy some lowered production costs as a result. Most of the irrigation subsidy in California, which Sumner and Hart estimate as worth about US$ 240 million per year, goes to field crops such as cotton, rice, hay and irrigated pasture, but a fraction, (perhaps 10%), is applied to tree crops and vegetables grown in the Central Valley of California. As a share of production costs, this subsidy is less than 1 -2% of costs for most horticultural crops, because irrigation water is applied quite efficiently under modern methods. Processing tomatoes may be the largest single beneficiary of the fruit and vegetable crops. [76]

The new program, the Conservation Security Program, will provide about US$300 million per year as subsidies for growers using environmentally friendly practices in their production. Since most growers already use such methods in production this program seems to be a direct subsidy payment. The horticultural industry is eligible for these funds and may expect about US$40 million per year in benefits. Note that even if this is a production subsidy program, this funding is only about 0.15% of farm production value, and the production effects are likely to be negligible.[77]

For many years the United States has operated a program, currently named the Market Access Program (MAP), which provides matching funds for industries and firms that promote their goods in foreign markets. The Farm Security and Rural Investment Act of

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[74] Commission Staff Working paper p.30.

[75] The total crop insurance budget of about US$2 billion per year is mainly spent on field crops, but a small amount (about 10%) is provided as subsidy to horticultural crops. Issues concerned with the marketing of fruits, tree nuts, and vegetables issues in the United States, Hyunok Lee, Department of agriculture and Natural Resource Economics, University of California Davis. http://www.fftc.agnet.org/library/article/eb524.html. Accessed October 24, 2004.

[76] "Issues concerned with the marketing of fruits, tree nuts, and vegetables issues in the United States," Hyunok Lee, Department of agriculture and Natural Resource Economics, University of California Davis. 2003. http://www.fftc.agnet.org/library/article/eb524.html. Accessed October 24, 2004.

[77] Lee, Hyunok, 2003.

2002 expanded the MAP to US$200 million per year, after ten years of spending less than half that amount. Most of these funds go to the fruit, tree nut and vegetable industries. Funds are used to promote products in trade shows, in-store displays and even media advertising in many markets, especially in Europe and Asia. The funding for this program is quite small relative to crop value, but significant compared to the promotion that industries have undertaken with their own funds.[78] Opponents of MAP argue that the program is "corporate welfare" because it subsidizes the advertising budgets of some of the largest and wealthiest exporters in the United States (Sunkist Growers, Blue Diamond Nuts, Welch's Foods, Sunsweet, Ocean Spray, and others).

Marketing orders are programs by federal and state governments that typically set minimum quality standards, and fund research and promotion on behalf of an industry. They are paid for by consumers and producers and do not count as subsidies. There are three marketing orders for tree nuts.

Finally, the Farm Security and Rural Investment Act of 2002 also added a new feature to farm product marketing in the United States that raises major issues for international trade. Under the new law, many products, including perishable fruits and vegetables, will be required to carry a label showing the country of origin. Marketing firms objected to the cost of this provision, and some believe it is clearly designed to discourage imports.[79]

D. Technology

In general, EU nut production is characterized by low competitiveness and low margins. Approximately 70% of EU nut production can be defined as ‘extensive’ (less favored areas, poor or marginal growing conditions often in remote areas without irrigation.)

The Commission recognizes that the EU tree nut sector suffers from two deficiencies.

First, EU nut orchards are often in mountainous or less favored areas where intensive production cannot be carried out. Second, they have high input costs. For instance EU hazelnut producers cannot compete with the low labor costs in Turkey.

Alternative crop possibilities include vines, olives and cereals. Planting new vineyards or olive groves would offer a new dimension of competition in these two product areas that are already competing under difficult marketing scenarios. (In addition, new olive plantings are not eligible for support as mentioned in the first section of this study.) Cereals could not be grown in all tree nut areas and replacing labor-intensive nuts with low manpower cereals would not help to prevent the depopulation of rural areas.[80]

Production of tree nuts in California tends to be much more intensive and relies on irrigation far more than EU tree nut production. Some tree nut farms are relatively small (10 ha or less), however, many of the tree nut orchards in California were planted on large commercial farms between 1960 and 1975. During this period almond acreage in California went from 113 thousand to 290 thousand acres. The “late” arrival of tree nuts

[78] Lee, Hyunok , 2003.

[79] Lee Hyunok, 2003.

[80] Commission Staff Working paper p. 12.

to California meant that the most modern planting and harvesting techniques could be employed.

E. Market Access

EU import duties are as follows: almonds 5.6% (in shell) and 3.5% (kernel); hazelnuts 3.2% (in-shell and kernel); pistachios (1.6%); walnuts 4.0 (in-shell) and 5.1% (kernel); and chestnuts (5.6%).

US import duties are lower. The harmonized tariff schedule shows the following tariffs: almonds in-shell (7.7 cents/kg), shelled almonds (24 cents/kg), in-shell hazelnuts (7 cents/kg), shelled hazelnuts (14.1 cents/kg), walnuts in-shell (7 cents/kg), walnuts shelled (26.5 cents/kg), chestnuts (free); and in-shell pistachios (.9 cents/kg), shelled pistachios (1.9 cents/kg). Many bilateral agreements such as the FTAA have given nut imports duty free access to the US.

A somewhat controversial recent issue has been the requirement in the 2002 Farm Act that retailers inform consumers of the country of origin at the final point of sale for covered commodities, which include perishable agricultural commodities (fresh fruits and vegetables as defined by the Perishable Agricultural Commodities Act). The Secretary of Agriculture is required to issue guidelines for voluntary country-of-origin labeling by September 30, 2002 and to promulgate mandatory regulations by September 30, 2004. Some marketing firms view this as a move to discourage imports.

F. Market structure and marketing institutions

The nut sector in the EU has evolved from a process whereby the farmer carried out all the stages in the production and marketing chain (cleaning, drying, and storing) to a system of producer organizations (POs) that help with cultivation, processing and marketing. Primary processing includes shelling, peeling, and industrialization. POs were discussed to some extent under the subsidies section. There are 10 POs in France covering a certified area of 13, 377.96 ha in 2000; 72 POs in Spain covering a certified area of 456,000ha in 2002; 6 POs in Italy covering a certified area of 16, 349 ha in 2000; 3 POs in Greece covering a certified area of 2,123 ha in 2000; and, 3 POs in Portugal covering a certified area of 1,801 ha in 2000. The shelling industry is often located in small rural centers and provides employment opportunities in many rural areas.

Producer organizations are also very important in California. Blue Diamond is the world's largest processing and marketing cooperative. It was founded in 1910 and led the development of California's almond industry from a minor domestic specialty crop to the world leader in almond production and marketing. Four thousand California almond growers deliver nearly one-third of California's almonds annually to Blue Diamond. The crop is marketed to all 50 states and more than 90 foreign countries, making almonds California's largest food export, and the sixth largest U.S. food export. The California crop is valued annually at over $1 billion dollars. Blue Diamond provides members with expert assistance in their geographic area regarding decisions on variety selection, cultural practices, quality control and payment timing as well as crop and market information.

Blue Diamond has played a critical role in opening up new international markets for California almonds. In addition, they created new demand for almonds in the domestic market by engaging in aggressive ad campaigns geared at housewives and the confectionary, bakery, and ice cream industries.

Similar cooperatives and producer organizations exist for pistachios. In 1981, the California Pistachio Commission was established to provide support through public relations, government relations, and marketing and production research. The California Pistachio Commission is funded by an assessment of each pound produced in the state.

G. Quality

The almond shell is enclosed in a gray-green hull that splits open at maturity. In California, the trees are harvested with mechanical shakers and the nuts are left to dry naturally in the field. Mechanical sweepers gather the nuts, which are then cleaned of foreign material and de-hulled. After the hull is removed, almonds are ready for shelling. A series of rollers crush the nuts so that shells and foreign matter can be removed by gravity separation, electronic color sorting and hand sorting. The almonds are inspected and graded for size, defects and broken pieces. Typical defects include double kernels, chipped or scratched skin, and shriveling.

Natural almonds receive no further processing, other than cutting into the many formats-sliced, diced, slivered, flaked-or grinding into meal. Other processing can include blanching, which removes the skin, or pellicle, producing a white and almost waxy appearance. Blanching also gives the nut texture a degree of elasticity, which is a benefit during the slicing process. Almonds can be dry or oil roasted. Roasting imparts a stronger flavor and darker color. Oil roasting provides a moisture barrier and intensifies the flavor impact.

Walnuts are encased in a thick, green hull that splits open when the nuts are ready for harvest. In California, the nuts are shaken off the tree mechanically, then picked up by mechanical harvesters, where they are cleaned and hulled. The hulled walnuts are dried in hoppers by forced air to a moisture level of 8% to prolong storage. In-shell nuts are sized according to USDA standards.

To extend the shelf life, nuts for shelling are stored in the shell until needed. Shells are removed via cracking machines, configured to crack each walnut separately to minimize damage to the kernel. Shell material is removed with blowers and the kernels are sorted by electronic color graders which further remove foreign material and shells. The colors range from extra light-a pale gold to amber - to dark brown. Kernels then undergo size screening to meet USDA requirements or specific customer specifications. They pass through a final hand sorting for quality.

Walnuts have a slightly astringent flavor produced by phenolic acids contained in the skin. Additional roasting, dry or oil roasting, enhances the nut flavor and provides a further reduction in moisture.

Pistachios grow in grape-like clusters, each nut surrounded by a hull. When ready to harvest, the hull takes on a rose colored hue and the nut shell inside splits open. Pistachio trees are mechanically shaken and the nuts fall onto a catching frame rather than the ground.

The hull must be removed and the nuts dried within 24 hours or the shell becomes stained. Modern U.S. processors strive to produce ivory-shelled nuts; so dyeing nuts, using Red X40, is only done for consumers who prefer the traditional red color.

After drying, the nuts are sorted for size and graded. Defects that impact the quality include poor or nonexistent shell splits, hull material, staining and loose kernels for in-shell nuts; damage and foreign material for kernels only. Pistachios can be shelled through a series of rollers. After grading and electronic and/or hand color sorting, pistachios may be roasted and salted for direct consumption.

Pistachio kernels should be green with a reddish brown skin. They are categorized by size as whole (more than 80% as 3/4 inch kernels and larger), whole and broken (40% whole), large pieces (majority over 24/64-inch) and small pieces (majority smaller than 16/64-inch). The kernels can be purchased raw or roasted, and with or without salt.

American varieties of hazelnuts produce a larger nut than the Turkish types. Hazelnuts are grown on bushes trained to resemble small trees, allowing room for the harvesting equipment. When ripe, the nuts fall to the ground, requiring multiple harvests to preserve optimum quality. After being air-blown to remove foreign material, the nuts are washed. After cleaning, the nuts are dried to a moisture level of 9% and, if required, are shelled after drying upon demand.

Shelled hazelnuts are sold as natural or raw, averaging about 5% moisture, or as oil, or as dry roasted products containing 2 to 3% moisture. Roasted nuts have a more intense flavor and a crisper texture. Whole nuts, broken pieces, slices, dices and meal are available.[81]

Marketing orders for tree nuts also exist to help insure consistent quality. Marketing orders, administered by the USDA's Agricultural Marketing Service (AMS), are designed to collectively solve instability within fruit and vegetable markets. That goal is accomplished by enforcing product quality standards, regulating the flow of product to the market, standardizing packages and containers, creating reserve pools for storable commodities, and authorizing production and marketing research and advertising. Industries participate voluntarily and agree to Federal oversight over certain aspects of their operations. Once established, a marketing order becomes binding on all individuals or businesses serving as "handlers" in a geographic area covered by the order. Imports may be directly affected by these marketing orders. Under the Agricultural Marketing Agreement Act of 1937, Section 8e, imports of commodities for which domestic marketing orders are in effect are required to comply with the same or comparable regulations on grade, size, quality, or maturity issued in the marketing order.[82] Federal marketing orders are in place for almonds, pistachios, walnuts and hazelnuts.[83]

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[81] http://www.foodproductdesign.com/archive/1993/0193de.html. Accessed October 28, 2004.

[82] http://www.ers.usda.gov/Briefing/FruitAndTreeNuts/policy.htm. Accessed October 28, 2004

[83] For more on the specifics of these marketing orders see http://www.ams.usda.gov/fv/moab.html. Accessed October 28, 2004.

H. Environmental and Phytosanitary Concerns

Many tree nuts in the Mediterranean area are grown under fairly harsh conditions. Almond and pistachio trees can grow under conditions of water deficit and warm temperatures. Almond trees can survive in drought conditions of around 300 mm average annual rainfall although to be profitable they need 600 mm of rain. In Spain 93% of tree nuts are planted in areas where rainfall averages 600 mm or less. Consequently, tree nuts play an important role both in terms of environmental and socio-economic sustainability in regions where there is a water deficit and vulnerability to desertification. As the Commission analysis of the nut sector states, "in the Mediterranean region, not only is rainfall limited, but most of the natural water resources available during the year are concentrated in short periods of time. This fact provokes flooding, aggravating erosion problems, which are especially harmful for agriculture."[84] In addition to preventing erosion, tree nuts adapt well to deficient soils. In general, nut-farming practices in extensive systems are environmentally friendly. In many areas, terraces are used. Land abandonment however, can lead to the degradation of terraces that cause rapid removal of soil by run-off. In addition, the low use of pesticides and fungicides allows for a wide range of bio-diversity both in tree nut varieties and in the flora and fauna that surround them. Some of these environmental objectives could also be met by planting other trees or ground cover.

Intensified nut farming on the other hand, including excessive tillage to keep the soil weed-free can be harmful and actually lead to erosion even on moderate slopes. Furthermore intensive farming employs more irrigation placing higher demands on limited water supplies. In addition, residual herbicides used in intensified-traditional and modern-intensive nut plantations remain highly concentrated in the top 5-15 cm of soil even after many months.

In the United States, the Farm Security and Rural Investment Act of 2002 expanded some environmental programs, and created a new program to provide subsidies to growers who undertake environmentally friendly practices on land that remains in production. The Environmental Quality Incentives Program will provide about US$1.3 billion per year to aid investments that are supposed to yield environmental improvements. Of this, about US$130 million per year, may go to horticultural crops. These funds are for investment, and are given as matching funds.

The new program, the Conservation Security Program, will provide about US$300 million per year as subsidies for growers using environmentally friendly practices in their production. Since most growers already use such methods in production this program seems to be a direct subsidy payment. The horticultural industry is eligible for these funds and may expect about US$40 million per year in benefits. Note that even if this is a production subsidy program, this funding is only about 0.15% of farm production value, and the production effects are likely to be negligible.

The most significant phytosanitary issue for tree nuts is aflatoxin contamination particularly of almonds, pistachios and walnuts. Aflatoxin is produced by the mold Aspergillus flavus, a fungus found almost universally throughout the environment.

[84] Commission Staff Working Paper p. 1

Aflatoxin is reported to be one of the most potent natural carcinogens known. Aflatoxin contamination of tree nuts intended for human consumption has become a serious food-safety and marketing issue. Meager contamination levels found in tree nut exports have resulted in rejection of almost 100 tons of domestically produced tree nut commodities over the past few years. Consumers are very sensitive to the issue and negative public perceptions threaten the industry. Action levels for aflatoxin set by a number of major importing nations are quite strict at 4 ppb. About 50-70% of domestically produced tree nuts are exported and action levels for aflatoxin set by importing nations threaten the tree nut industry. Aflatoxin develops when insect feeding creates wounds in protective layers surrounding nut kernels. These wounds are major avenues through which fungal spores can infect the kernel. Studies are underway to develop innovative approaches to controlling insect pests in orchard environments and to breed resistant varieties of tree nuts and to improve management of orchards.[85] According to Susan McCloud, research director of the Almond Board of California, Sacramento CA, the almond industry is eliminating any suspect or potentially infected nuts, such as those with cracked shells, through an aggressive inspection campaign.[86]

Recently, the tree nut industry has been struck with a major new problem in the form of a parasite called the varroa destructor mite. This parasite attacks honeybee colonies. These bees are necessary to pollinate the many fruit and nut trees in California. It is estimated that the 500,000 acres of almonds in California require 1.1 million hives for pollination. The American Beekeeping Federation estimates that 50% of the bee colonies in California have been killed or severely weakened by this mite. This could have a significant impact on the tree nut industry.

[85] http://www.ars.usda.gov/research/projects/projects.htm?ACCN_NO=403736&showpars=true&fy=2003. accessed October 24.

[86] http://www.foodproductdesign.com/archive/1993/0193de.html. Accessed October 28, 2004.

IV. Wine and Table Grape Sector

A. A Brief History of Grapes

Grapes and wine have been around for a very long time. In fact, no one knows exactly when wine production originated. In ancient times the drinking water was not good so people would drink wine (albeit not very refined wine) instead of water. There is some evidence that wine was being produced as long ago as 6000 BC in Mesopotamia.

The Egyptians refined wine making. During the time of the Pharaohs, the god Osiris was worshiped. 'Osiris' means Lord of the vine in flower. The ancient Egyptians related his annual resurrection to the budding and blooming of grapevines every year. Another thing they worshiped was the Nile River. The Nile regularly flooded its banks and, when it receded, it left rich, fertile soil behind. The Egyptians found they could grow flourishing grapevines on the banks and deltas of the river. They trained them to grow up the trunks of trees, and watered them with skins, a slow but effective process. Wine was a delicacy reserved for the royal and the elite. The common people drank crude palm wine and beer.

As the Roman Empire started to take its hold on the Mediterranean, the art of winemaking spread north. The drinking of wine was becoming more refined and it had similar effects on its drinkers. Thucydides, the Greek historian, summed it up when, in the 5th century BC, he said "The peoples of the Mediterranean began to emerge from barbarism when they learnt to cultivate the olive and the vine."[87] As the Roman Empire expanded from Italy to France, Spain, Germany, and parts of Britain, so did the consumption of wine. It also became more readily available to the lower classes.

After the fall of the Roman Empire and throughout the Dark Ages the art of winemaking was largely kept alive in the Christian monasteries that had spread throughout Europe. The monks found planting and tending vineyards to be relaxing work. As the art of winemaking progressed, a movement started towards stronger, heavier wines that weren't so sweet. The French Bordeaux region was thriving, exporting wines around Europe. After England lost control of that area in the 14th century, they had to import their wines from Portugal and Germany. England continues to import most of their wine because of their poor climate but today it comes primarily from the US. In the 17th century the drinking water in London improved and the wine industry was forced to improve the quality of wine. It was also during this time that the use of glass bottles was introduced along with the cork (and the corkscrew). In addition, improved production techniques created more palatable wines.

In the 18th Century, England began to turn to their colonies to supply them with wine. South Africa turned out to be a wonderful source of wine and is still an important player

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[87] Marples, Gareth, "The History of Wine – The Grapes of Time," http://www.jorbins.com/food-drink-magazine/articles/winemaking-history.php. Accessed 11/07/04.

in the global market today. During the Napoleonic Wars, the French wine industry managed not only to survive but also to thrive. It was during this time that French Bordeaux became the envy of the wine world.

As Marples points out, "With the discovery of the New World, Europeans immigrating to America brought their winemaking know-how with them. The industry was welcomed by Thomas Jefferson, who thought Americans drank too much hard liquor. Ideal conditions for vineyards were found first in Ohio, but soon after, California took over as the premier wine-growing region in the country. In fact, California wines were so good that, in 1889, they won 20 of the 34 medals awarded in an international wine-tasting competition in Paris."

At the same time, Marples points out that many vineyards in France were struck by a vineyard disease called phylloxera. This disease was caused by microscopic aphids that sucked the juice out of the roots. It was discovered that phylloxera came from America, where local vines were immune from its attack. So American vineyards began propagating the American vine roots and exporting them to the French regions that had been attacked. This created a hybrid of different types of grapes, which, in turn, created different and more varied wines.[88]

The winemaking industry in California began in 1769 when Spanish friars, mostly Franciscans, established missions throughout the region. The padres planted a European grape variety, known as the Mission, in order to make sacramental wine. Native American wild grapes of the type *Vitis girdiana* grew along California stream banks, but these grapes were sour and of little use for winemaking. The Old World origins of the Mission grape are obscure, but the variety also had been planted in Mexico for the same purpose. (The same friars also brought figs and olives to southern and central California.) As the century passed and more settlers came to California, additional varieties of European grapes were introduced, some for winemaking, others for eating fresh, and still others for making raisins. All of these European introductions were varieties of the species *Vitis vinifera*. Today, California wine, table grapes and raisins are all important agricultural commodities, with approximately 700,000 acres planted in vineyards. In the United States, 97 percent of commercially grown table grapes are from California.[89] In addition, three other men made important contributions to the California wine industry: William Wolfskill, Agoston Haraszthy, and William Thompson. In 1839, William Wolfskill, a former trapper from Kentucky, planted the first vineyard of table grapes in California, near what is today Los Angeles. He was the first person to ship grapes to Northern California gold miners. Agoston Haraszthy was an immigrant from Hungary who is often referred to as the father of California viticulture. In the mid 1800s, Haraszthy brought one hundred thousand vine cuttings from Europe to California. Unlike Wolfskill, his interest was in wine, so these vine cuttings were for three hundred varieties of wine grapes. In addition to planting them at his own winery, Buena Vista, he sold his imported vine cuttings to growers around the state. Finally, William Thompson who was

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[88] Marples, Gareth, "The History of Wine – The Grapes of Time", http://www.jorbins.com/food-drink-magazine/articles/winemaking-history.php. Accessed 11/07/04.

[89] http://www.tablegrape.com/teachers/history.asp Accessed 11/07/04.

born in England in 1839 and immigrated to the United States in 1863 grafted three vine cuttings of a grape variety called Lady de Coverly to California grapevines. Over a four-year period and with some additional graftings, the grapes he produced were named Thompson seedless. Today the Thompson seedless grape is the most popular table grape as well as one of the most versatile. It is also used for juice and wine and accounts for 95 percent of the raisins produced in California.[90]

B. Production and Trade Statistics

Production. Italy, Spain, France, and the United States are the top grape and wine producers in the world. Three main products that arise from grape production are table grapes, raisins, and wine. Unfortunately, the FAO does not keep production and trade statistics on table grapes and raisins. Table 1 shows grape and wine production figures for 2003 for the world's top 12 producers. France is the world's number one wine producer. Of the top twelve producers the EU producers (Italy, Spain, France and Germany) account for about 67% of wine production.

Table 3.1 World Grape and Wine Production, 2003

Country	Grape Production (mt)	Wine Production (mt)
Italy	7,483,780	4,408,611
Spain	6,480,000	4,623,750
France	6,178,469	4,735,260
United States	5,876,620	2,350,000
China	3,934,972	1,120,000
Turkey	3,650,000	35,000
Iran	2,525,000	0
Argentina	2,370,000	1,180,000
Australia	1,771,000	1,255,000
Chile	1,750,000	575,000
Germany	1,423,142	828,885
South Africa	1,400,000	761,000

Source: FAOSTAT

Wine growing varies from one member state to another and from region to region within member states. Variations include the degree of specialization, the size of the vineyard, the type of wine produced, and the specific oenological practices used. Thus there is a strong regional component to the production of wine in the EU.

[90] http://www.tonytantillo.com/fruits/grapes.html. Accessed 11/07/04.

Europe saw its weakest wine and must harvest in the past 10 years in 2003 according to COPA-COGECA. The production of 156 million hectoliters is a 9.3% drop in the 171.9 million hectoliter average of the past 5 years. The drop was primarily due to a heat wave and drought that hit central and southern Europe in the summer of 2003. This was the fourth year in a row that wine production in Europe has dropped. The most significant falls are in Germany (-21%), France (-16%), Italy (-16%), Luxembourg (-15%) and Austria (-11%). Overall production did increase in Spain, Portugal, and Greece however.[91] In addition to the drought, the decrease in production was due to production controls that are in place to encourage the production of high quality wines while discouraging the production of poor quality wines.

The common market organization (CMO) for wine covers the following products: fresh grapes other than table grapes, unfermented grape juice and grape musts, wine of fresh grapes (including sparkling wines, liqueur wines, and semi-sparkling wines), wine vinegar, wine making by-products like piquette, wine lees, and grape marc. It also distinguishes between quality wines produced in specific regions and 'table wines'.

The CMO for wine was established in the 1970s. There were very few curbs on planting and very few market regulation instruments to control for annual variations in production. It also coupled the freedom of plantings with virtually guaranteed sales thus generating serious structural surpluses. In 1976, a regulation was adopted prohibiting new planting of vines for table wine production and subsidizing the conversion of vineyards to other agricultural products. In 1980, new regulations established premiums for temporary and permanent abandonment of viticultural area and special distillation measures were introduced with the objective of reducing the wine surplus. In 1982, the distillation measures became permanent but this led in turn to the building up of stocks of alcohol and their subsequent disposal costs. The CMO was further reformed in 1987 and in 1999. The 1987 reforms led to a decrease in the supply of wine. At the same time however, table wine consumption decreased. This led to an interesting situation in which in some areas there was surplus production due to a decrease in consumption and in other areas domestic and foreign demand was outstripping supply. The entry into force of the Uruguay Round Agreement in 1995 changed the EU wine regime by opening up the EU market to world competition. This resulted in a further reform in 1999. The 1999 reform was formalized under Agenda 2000.[92]

The current aim of the wine regime is to limit supply by: 1) limiting replanting and granting premiums for grubbing up vines, and 2) applying to table wines a price and intervention scheme involving distillation, i.e. withdrawal at a guaranteed minimum price of production, surpluses to be processed into potable alcohol or fuel.[93] The planting of vines in the EU is strictly regulated and controlled in terms of acreage and allowed varieties to insure the production of quality wines. New plantings of wine grapes are prohibited until July 31, 2010 except under certain circumstances. Abandonment

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[91] USDA/ FAS GAIN Report E23213, November 10, 2003. Accessed November 14, 2004.

[92] "Descriptin of the Common Market Organization for Wine" Tender AGRI/EVALUATION/2002/6. Final Report.

[93] FAS/ USDA GAIN Report #E23063April 29, 2003. Accessed November 14, 2004.

premiums may be granted to producers for the permanent abandonment of vineyards in a particular area. Member states set the level of the premium subject to certain levels. Member states may also grant national aid for grubbing up and manage a restructuring and conversion system to convert unmarketable varieties to marketable ones. (This is done through grafting, relocation of vineyards, and improvement of management techniques.) Producers are compensated for lost revenue during the conversion period as well as restructuring costs. The EU funds 50% of these costs with the rest covered by the producers themselves. As the GAIN REPORT #E23063 notes member states do not cover any of the costs, except in cases where they wish to support conversion in a larger area than that designated for that member state by the EU. In these cases, the member states may distribute EU payments to a larger number of producers and top-up the payments with national funds so that producers continue to be compensated for 50% of their costs.[94]

In 2003 US wine exports reached a record high of $634 million and wine imports hit a record of $3.3 billion. Grape production, however, decreased nearly 15% from the previous year due to above average temperatures in July and August rainfall. More specifically, wine type production decreased 8% from 2002, raisin type production dropped 24% and table type production was down 9 %. On the other hand, utilized production increased from 2002 in Georgia, North Carolina, Ohio, Oregon, Pennsylvania, Texas, and Washington. California accounted for 89% of the 2003 US grape crop.[95]

In California (2003) red wine varieties accounted for the largest share of grapes crushed at 1.6 million short tons. The 2003 white wine variety crush totaled 1.2 million short tons; crushed raisin type varieties equaled 351 thousand tons; table type varieties totaled 84 thousand short tons. On average, California grape growers received prices in 2003 for raisin (+26%) and table grapes (+13%) that were above 2002 prices while the prices they received for red (-1%) and white wine grapes (-1%) were below 2002 prices. Lower prices for wine grapes may be due to the rapid expansion in wine grape production in the early 1990s.

Unlike in Europe, US domestic wine consumption has been rising slowly and steadily over the last 10 years. The massive wine grape plantings of the mid 1990s led to the introduction of many new brands of wine. Extreme- value varietals, a new category of wine retailing for $3 and below for a 750ml bottle drove the volume growth in 2003. Consumers purchased 6.8 million cases of these wines. Currently extreme value wines (under $3) and everyday wines ($3-7) account for 70% of the volume sold and 38% of winery revenues and premium wines (over $7) account for 30% of the volume and 62% of the revenues. California supplies about 67% of the US market. Bottled and bulk foreign wines held a 26% share and other states had seven percent of the country's wine market. US supermarkets report that 40.2 percent of the wine volume sold was white wine, 39.5 % was red wine and 20.3% was blush wine. Top varietal wines by volume were Chardonnay, Merlot, White Zinfandel, Cabernet Sauvignon, Pinot Grigio, Syrah

[94] Gain Report #E23603.

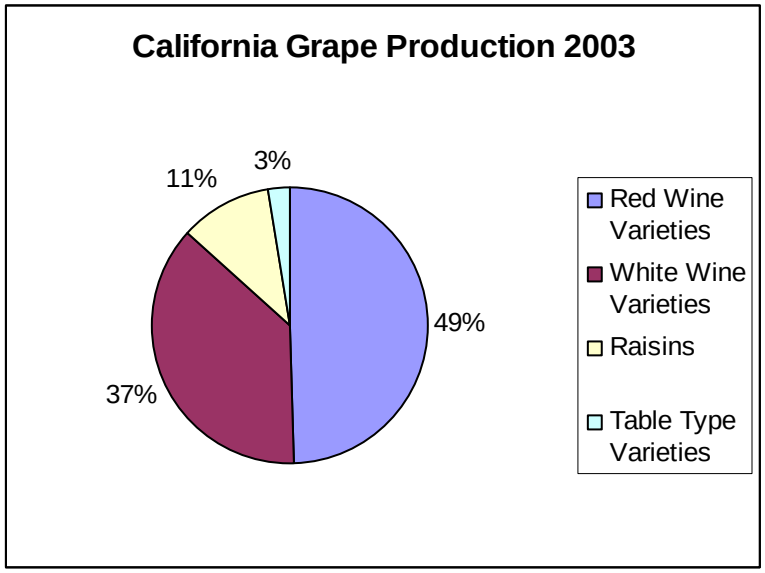
[95] FAS/USDA. World Wine Situation Outlook, June 2004. p.1.

and Sauvignon Blanc.[96] As for sparkling wine, the US market grew 5% to 28 million gallons. US products supplied 63% of the market with imports supplying the other 37%.

Americans are also drinking more imported wines from Italy, Australia, Chile, and Spain.

Table 1 shows the upward trend in California wine shipments to all markets and to the US market from 1996 to 2003.

FIGURE 3.1: California Grape production in 2003



Source: World Wine Situation and Outlook FAS/USDA

Trade. Many countries produce, export and import wine. The primary exporters of wine are France, Italy, Spain, Australia, Chile, Germany, United States, South Africa, Portugal, and Argentina. The major European wine producing nations, France Italy, Spain, Portugal and Germany, have 67% of the wine export volume market. France is the world's number one wine producer. The US market represents about 6.4% in volume and 16.3% in value of France's export market. (On the other hand, French imports of US wine have increased over 400% from 1995-2003.)[97] Italy is the top supplier of wine to the US in volume terms. However, shipments of US wine to Italy continue to be minimal. Most Italian imports come from France and Spain. Spain has the most area planted in vineyards and thus accounts for 1/3 of the vineyards in Europe. However, Spain's production ranks third following France and Italy because of its poor soil and variable rainfall. Figure 3.2 shows the export volume market share of the major producers.

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[96] Wine Institute. "2003 California wine shipments to US rise four percent: market Poised for Growth amid intense competition." April 2004. http://www.wineinstitute.org/communications/statistics.

[97] FAS/USDA. World Wine Situation and Outlook, June 2004 p. 12.

Table 3.2 California Winery Shipments to All Markets in the US and Abroad*

YEAR	CALIFORNIA WINERY SHIPMENTS TO ALL MARKETS	CALIFORNIA SHIPMENTS TO THE US MARKET
2003	493.6	417.3
2002	464.3	401.1
2001	449.1	386.8
2000	445.9	393.5
1999	443.1	397.5
1998	432.5	385
1997	423.1	384
1996	414.7	376

*Includes champagne/sparkling, dessert, vermouth and other natural, sake and others. Includes foreign bulk shipped by California wineries.

Source: Wine Institute and Gomber-Fredrikson and Associates. Available at www.wininstitute .org/communications/statistics. Accessed November 18,2004.

Figure 3.2: Wine Export Volume Market Share

Source: FAS/USDA World Wine Situation and Outlook 2004

The primary importers include Germany, the United Kingdom, the United States (where imports exceeded exports in 2003), France, Russia, the Netherlands, Belgium, Canada, Denmark, Switzerland, Japan, Sweden, and the Czech Republic.

According to the Foreign Agriculture Service, the wine trade in 2003 proved to be very robust. US wine exports after leveling off the last few years reached a record high of $634 million in 2003. In quantity terms the US exported 3.58 million hectoliters of wine in 2003, a 29% increase.

The top market for US wine is the UK, which now accounts for 33% of the total US wine export market. Wine production in the UK is minimal due to the climate and UK consumption continues to grow, mainly among women and existing wine drinkers. The strengthening of the euro also helped to make US wines more competitive. In fact, US wines have enjoyed average annual growth rates of over 20% since 2000 in the UK and there are no signs that this market growth is slowing. Australia is proving to be a major competitor to the US for the UK market. In fact, 50% of UK wine comes from Europe and 50% comes from "new World" producers including the US, Australia, Chile, Argentina, and South Africa. The accession of 10 new east European countries to the EU may eventually affect US exports to the UK. Although wine production in Bulgaria, Hungary and Romania is fairly low at this time, it could increase substantially. However, the wine produced in these countries is usually targeted at the lower end of the market and therefore might not compete with US wine after all.

The second biggest market for US wine is Canada. Most of the Canadian grapes are grown in the Niagara region that is subject to fluctuations in the weather. During 2003, the United States exported about $111 million in wine to Canada up $19 million from 2002. The main competitors for the Canadian market are Italy, Australia, Chile, Spain and France. The United States is also Canada's largest export market for wine although Canadian exports dropped from $66.9 million in 2002 to $41.3 million in 2003.

The third and fourth largest markets are Japan and the Netherlands (which acts as a major transshipment point.) Wine is not produced in the Netherlands. U.S. wine shipments to the Netherlands increased 9 fold from 1996 to 2000. However, sales in the following two years declined significantly but in 2003 recovered to the 2000 levels. Wine re-exports are significant with Germany being the primary destination. In general, nations in the EU 25 account for nearly half of US wine exports in value and two thirds of US wine exports in quantity.[98]

Japan is also a major importer of US wine. Beer is currently the most consumed alcoholic beverage in Japan and per capita wine consumption is well below that of Europe or the US. Japan imports bottled wine and bulk wine. Often the bulk wine is bottled in the country and marketed under a Japanese domestic brand name because import tariffs are lower on bulk wine. This raises interesting questions about country of origin labeling. In any case, many in the wine industry believe that substantial growth potential exists in the Japanese wine sector.[99]

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[98] FAS/USDA. World Wine Situation and Outlook, June 2004.

[99] FAS/USDA, World Wine Situation and Outlook, June 2004.

Other new world producers such as Australia, Argentina, South Africa, and Chile are major competitors for both the US and the EU. Australian wine production in 2003/04 is expected to increase by 18% due to increased plantings and more normal weather after a drought. US imports of Australian wine increased 37% in value terms and 36% in volume terms during 2003. In addition, as FAS reports, "Australian companies are buying wineries and seeking acquisitions and partnerships abroad to take advantage of growth projected for markets overseas."[100] US imports of Argentinean wine also increased significantly, up 16% in volume and 7% in value. South Africa ranks eleventh as a supplier of wine to the US. However, South African wine benefits form duty free treatment for its wine exports under the African Growth and Opportunity Act (AGOA). Chile is the fourth largest wine supplier to the US market. Chile has signed a free trade agreement with both the EU and the US. The free trade agreement with the US is not expected to produce major changes.

Raisins. Raisins are traded at a much lower level than wine. The major world exporters in volume terms are Turkey, Iran, the United States, Chile, South Africa, Greece and Argentina. The major world importers are the UK, Germany, Russia, the Netherlands, Canada, Japan, France, and Italy. In the United States, raisins are only commercially produced in California. California raisin production has fluctuated somewhat over the last decade but the total quantity produced changed little from 1991 to 2001. The acreage devoted to raisin production has increased from 266,000 acres in 1991 to 280,000 in 2001. The US is a net exporter of raisins with the majority of raisin exports going to Europe. Other important destinations for California producers are Japan and Canada. In 2001 exports reached $144 million while imports equaled only $12 million. It should be noted that the majority of imports came form Chile and Mexico with a few imports coming from Argentina and South Africa.[101]

C. Subsidies

As mentioned above the European common market organization (CMO) for wine was established in the 1970s and has undergone many revisions. The latest and most substantial revision was in 1999. The current goal of the CMO is to improve the quality of European wines so they will be more competitive on the world market. The EU is concerned about the overproduction of table wines especially in France and Spain. These often go unsold and are distilled for industrial agriculture. In order to encourage wine producers to focus on quality instead of quantity the EU announced in early October 2004 that it was setting aside €450 million or $562 million in subsidies for restructuring and conversion of EU vineyards. This involves the uprooting and replanting of varietal vineyards that are not desirable for producing products for the international wine market. This money will also be available to the 10 new incoming countries. Spain will get the biggest slice of the money €145 million followed by France with €107 million and Italy with €103 million. Among the new members Hungary gets €10 million with smaller amounts going to the Czech Republic, Cyprus, Malta, Slovenia, and Slovakia.

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[100] FAS/USDA, World Wine Situation and Outlook, June 2004. p. 15.

[101] AG MRC (Agricultural marketing Resource Center) Agricultural Issues Center, University of California. August 2002.

Although the EU classifies these restructuring and conversion subsidies as "Green Box" subsidies The California Association of Winegrape Growers (CAWG) classifies these as direct producer supports that distort production and trade. In addition, the CAWG points out that there is an increasing trend in EU expenditures that have gone up continually since 2000/2001 when budget expenditures for restructuring were €380 million. (Although it should be noted that Spain, France, and Italy will receive less in 2004/05 than in 2003/04 because the new member countries will also receive some funds.) Unlike European producers, US wine grape growers do not receive any domestic subsidies. The CAWG states that due to shifts in market demand, 100,000 acres of older California vineyards of varietals no longer in favor with consumers have been uprooted at the growers' expense since 2002.[102]

In addition to domestic subsidies for restructuring and conversion, the EU still pays out a substantial amount in export subsidies for wine. For instance, in 2000/01 the EU provided $21.6 million of export subsidies to wine producers with an allowance to spend as much as $35.8 million on wine exports. The US hopes to reach an agreement to eliminate export subsidies over a 5 year period in the Doha Round.[103]

D. Technology

As with olives and tree nuts, new world wine producers have an advantage over some old world producers because most of their vineyards are newer and thus incorporate newer production practices and techniques. The 1999 revision of the European Common Market for wine has tried to provide subsidies and regulatory support for updating vineyards so they can produce higher quality wines.

Improvements in production techniques are also being made in California. The Wine Institute and the California Association of Winegrape Growers (CAWG) introduced the Code of Sustainable Winegrowing Practices in October 2002 to promote environmental stewardship and social responsibility in the California wine industry. The California Department of Food and Agriculture recognized the importance of this project by awarding a $280,000 grant for widespread implementation of the Code's sustainable practices. The funds were used to hold educational workshops to help the industry adopt the Code. In October 2003, Wine Institute and CAWG received the Department of Pesticide Regulation's "IPM Innovator of the Year Award" for the Code's work in the area of pest management. Additionally, CSWA (California Sustainable Winegrowing Alliance) was awarded a $150,000 grant from American Farmland Trust in November 2003 to measure the adoption of integrated pest management (IPM) methods in the state and report on the progress of the program. Special IPM workshops will soon be launched. Some of the sustainable production technologies include:

1) Regulated deficit irrigation (RDI). RDI means applying less than the full potential water requirement on vines with a drip irrigation system to achieve

[102] Letter from Karen Ross CAWG to Secretary of Agriculture Ann Veneman, October 25, 2004.

[103] http://www.fas.usda.gov/info/factsheets/WTO/commodities2002/Wine2.pdf. Accessed November 24. 2004.

properly timed mild water stress. The results are improved wine quality and conservation of water and energy.

2) Cover Crops. Cover crops planted between vine rows are a common practice in California vineyards. They provide many benefits such as weed and erosion control. The cover crops can be no-till perennials or disked annuals that add organic matter and nutrients to the soil.

3) Canopy Management. The canopy management techniques of leaf removal shoot positioning, trellises and vine spacing can be used to improve the light and air circulation on the fruit. This helps produce better color, flavor and ripeness of wine grapes, and can also reduce the need to treat for leafhoppers, mites and diseases.

4) Preserving wildlife corridors. Preserving wildlife corridors and habitat near vineyards can provide refuge for beneficial insect and animal predators, as well as reduce erosion and act as a buffer for waterways. Providing ecological diversity improves the health and beauty of the landscape and enhances relationships with the community and government agencies.

5) Energy efficiency. Using energy efficiently in buildings and facilities, production processes and transportation can reduce costs, conserve resources, enhance image, and improve the environment.

6) Soil Conversation. Conserving soil is essential for contributing to the "terroir" of a wine and its unique personality. Controlling erosion stabilizes the land and helps protect fish by preventing silt and pollutants from entering creeks.

7) Preserving air and water quality. Wineries are discovering new ways to preserve the quality of our water and air such as treating winery process water more efficiently with a biodigester and its waste-eating bacteria; reducing air emissions with vegetable-based biofuel to power farm equipment; and establishing a wetland with habitat value to handle winery process water.

The California Environmental Protection Agency has announced a partnership with Wine Institute and CAWG, called Performance for Sustainability (PFS). The newly formed partnership will include representatives from the Department of Pesticide Regulation, the California Integrated Waste Management Board, the Air Resources Board and the Regional Water Quality Control Boards, among others. The group is currently working on intended outcomes for the partnership.[104]

E. Market Access

Wine is faced with several market access issues. The most obvious is the level of tariffs on imports. The allowed WTO tariff on wine is 76%.[105] The average EU wine tariff on

[104] http://www.wineinstitute.org/communications/SustainablePractices/project_description.htm. Accessed 12/07/04.

[105] "What's at stake for Wine" Us Dept of Agriculture, FAS July 2002.

US wines is twice as high as the average US tariff on EU wines.[106] In the Doha Round, the US is calling for a tariff agreement that would reduce high tariffs more than low tariffs with no tariff line greater than 25%. See Annex 3 for a list of EU tariffs and Annex 4 for a list of wine tariffs in selected other countries. In addition to EU tariffs, each country imposes its own taxes on wines in the form of excise taxes and Value Added Taxes (VAT). Each state in the US also taxes wine differently. Additional taxes and fees, such as handling charges, are assessed by individual member countries. The EU is attempting to harmonize its excise and value added taxes but has not yet done so. The EU currently grants tariff preferences on wine imports from certain countries including Algeria, Bosnia-Herzegovina, Bulgaria, Croatia, Israel, Macedonia, Morocco, Romania, Tunisia, and Turkey. Tariff reductions vary by country and wine type. (Cyprus, the Czech Republic, Hungary, Slovenia that have received tariff preferences in the past are now part of the EU.)

Non-tariff market access barriers include regulations on oenological practices, geographic indicators, labeling regulations and certification requirements. In 1999, the EU instituted an acceptable list of oenological (wine making) practices (see Annex IV of Council Regulatioin 1493/1999 of 17 May 1999) in order to protect health and insure quality and it commonly rejects any oenological practice that is not specifically provided for in the EU regulation. In order for a foreign country to have an oenological practice approved it must apply to the EU Commission and provide numerous technical studies, a process that can take years and may result in not being approved anyway

It should be noted that the United States, Canada, Australia, Chile, Argentina and New Zealand have signed a Mutual Acceptance Agreement (MAA) on Oenological Practices.[107] This MAA entered into force on December 1, 2002. The agreement states that each country will permit the importation of wines from every other signatory country as long as these wines are made in accordance with the producing countries domestic laws, regulations and requirements on oenological practices. The agreement recognizes that different countries use different winemaking practices due to local conditions and climatic variations and it recognizes that grape growing and winemaking conditions are constantly evolving. (The US already allowed wine imports as long as they met the standards of the country of origin. This agreement ensures that participating trade partners apply the same conditions to US exports.) One of the forces driving the Agreement is the current practice of the European Union (EU), which includes the three largest wine-producing countries. The EU policy is to negotiate bi-lateral agreements with trading partners that permit only specifically listed "traditional" winemaking practices. For example, in 1983, a Wine Accords Agreement was signed which recognized a number of US wine varieties, viticultural areas and wine making practices. Also under the agreement the EU temporarily recognized several US winemaking

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[106] Murphy, James. "U.S. Hopes for a Deal on Wines- and What to Call them" European Affairs. Winter 2003. http://www.europeanaffairs.org/archive/2003_winter/2003_wintwr_118.php4. Accessed November 15, 2004.

[107] The group of countries originating the MAA, formerly known as the New World Wine Producers' Forum, changed their name to the World Wine Trade Group. (WWTG) The name was changed to reflect the emphasis of the group on facilitating trade in wine.

practices pending final approval of their safety. Although the EU has had several years to approve the safety of temporarily approved practices, several remain unrecognized. Because of disputes over practices and geographic indicators the Wine Accords have not become permanent but are subject to short temporary extensions.[108] Many wines made employing innovations developed and approved for sale within "New World" wine producing countries have been excluded from EU markets. The MAA seeks to eliminate these restrictive 'positive' lists under the theory that if the wine is sold in the producing country without any consequences to human health or safety, the same wine should not pose a risk to foreign consumers when imported.[109] The EU does not accept the concept of mutual recognition. (However, EU negotiators have said that they are willing to accept all current wine making practices approved by the Bureau of Alcohol, Tobacco, and Firearms of the US Treasury but they cannot give the US a blank check on any future practices that the ATF might approve.)[110] One of the major goals of the US in the Doha Round is to get the EU to agree to mutual acceptance of oenological practices.

Second, many countries view the EU approach towards geographic indicators as a form of nontariff barrier. GIs can be used to protect domestic products from competition and limit import access either through the GI itself or because complying with the required labeling and verification process is so cumbersome. On the other hand, geographic indicators help to differentiate goods on the market allowing consumers a greater choice of products and allowing producers to capture additional rents for real or perceived higher quality. In this way, GIs serve a positive market-enhancing role. The issue of geographic indicators will be examined at length under the Quality section of this paper.

A third type of non-tariff barrier can be labeling regulations (not including geographic indicators which will be examined below.) Each country has specific mandatory labeling requirements regarding the information that must (or cannot) appear on the wine label, the size of the font, and the placement of the information on the label, and the placement of the label on the bottle. To avoid the possibility of stiff fines for re-labeling or even the rejection of wine at the port of entry, current regulations must be followed, but these regulations are often subject to change.[111] The EU maintains very strict labeling requirements and has made little attempt to harmonize these regulations with those of the US or the rest of the world. For instance by heavily legislating “quality” terms such as “reserve” and “select” on labels and retaining the exclusive rights to the term “table wine,” the EU effectively prevents US exporters from marketing their wines as dinner wines (the single largest consumption market for wine).[112] These requirements are laid out in EU Regulation 732/2002 that details the requirements for description, designation, presentation, and protection of wine sector products. The EU is also facing opposition

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[108] http://www.winevision.org/globalexporting/europe.html accessed December 2,2004.

[109] http://www.americanwineries.org/newsroom/intlwineagreement.htm. Accessed December 2, 2004

[110] http://www.europeanaffairs.org/archive/2003_winter/2003_winter_188.php4. Accessed December 2, 2004.

[111] http://www.winevision.org/globalexporting/labeling.html. Accessed December 2, 2004.

[112] http://www.winevision.org/globalexporting/europe.html Accessed, December 2, 2004.

from its own member states since many are having difficulties complying with the standards of EU Regulation 753/2002.[113]

A fourth and more minor market access issue is the EU's burdensome requirement for certification forms for US wines. The EU requires that the wine meet the standards of the country of origin and conform to those of EU member countries unless there is a specific exception or derogation. The lab tests that usually cost between $80 and $100 must show that the wine is within the compositional limits prescribed by the EU. A VI-1 form can be completed in the US through a special BATF procedure but it can be tedious and somewhat complicated.[114] The US does not require similar certification of EU wines.

F. Market Structure and Marketing Institutions

The market structure for wine in both the US and the EU is very complex. Unlike almonds, which lend themselves to large cooperatives that set and enforce quality standards and help advertise various uses, highly differentiated wines often come from private estates and are marketed worldwide through a wide variety of mechanisms. However, many of these estates do belong to producer organizations.

The three largest producer organizations in California are the Wine Institute, the California Association of Winegrape Growers (CAWG), and Family Winemakers. The Wine Institute is a public policy advocacy association of California wineries. Its membership includes 798 wineries and affiliated businesses. Its primary job is to support legislative and regulatory advocacy, international market development, media relations, scientific research, and education programs that benefit the entire California wine industry. They also provide a voluntary code of advertising standards.

The CAWG was founded in 1974 to represent the interests and concerns of wine and concentrate grape growers. CAWG' objectives are to:

1) Represent growers before legislative bodies, government agencies and the news media.
2) Provide an open forum to exchange ideas.
3) Resolve issues related to growing and marketing.
4) Encourage cooperative efforts among grape growers.
5) Support the continued production of quality winegrapes. Work to stimulate consumption of grapes for wine and other grape-based products.
6) Collect and disseminate information on production and marketing to members.[115]

Finally, the Family Winemakers of California was founded as a non-profit trade association in 1991 and represents small family owned wineries before the California

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[113] http://www.americanwineries.org/publicpolicy/internationalissuesreport2004.htm accessed December 2, 2005.

[114] http://www.winevision.org/globalexporting/europe.html.

[115] http://www.cawg.org

Legislature and state regulatory agencies. FWC also partners with the American Vintners Association (now called WineAmerica) for national and international policy coverage.

There are many national wine associations in Europe. In addition, a wine charter was adopted by the European Conference of Wine Producing Regions (CERV) on 21 October 1991, during the III Plenary Session of the organization at Vilafranca del Penedès (Catalonia). In 1994 CERV was replaced by AREV (The Assembly of Wine Producing European Regions). The Assembly of Wine-producing European Regions is an apolitical, nonprofit association of European wine producing regions. The aims of AREV are to promote the common interests of wine growing regions, within the European and world economies and within the framework of the construction of Europe. The member countries are: Germany, Austria, Spain, France, Greece, Hungary, Italy, Portugal, Romania, Switzerland, Luxemburg, Slovenia, Czech Republic, and the Ukraine.

G. Quality

The issues of wine quality and geographic indicators are intricately linked. Geographic indicators, or GIs, are thought of as a type of collective trademark that helps producers sell their products to consumers as differentiated goods and so avoids the need to compete solely on the basis of price in global food markets. GIs allow products to be marketed by reputation and other special characteristics associated with origin. In essence, they allow for greater market differentiation. The TRIPS agreement in the Uruguay Round has increased the legal standing of these indicators by setting out minimum standards of protection but it does not define a system that WTO members must implement. Geographical indications are therefore protected by a wide variety of national laws and a wide range of legal theories.

The TRIPS agreement was built on earlier multilateral conventions such as the 1951 International Convention for the Use of Appellations d'Origine and Denominations of Cheeses (Stresa Convention), the 1958 Lisbon Agreement for the Protection of Appellations of Origins and their International Registration and the 1986 International Agreement on Olive Oil and Table Olives. The parties to the Lisbon Agreement have registered 738 GIs for a wide range of products including wines and spirits and many other agricultural products. France alone accounts for ½ of the registered GIs. Under the Lisbon Agreement, members are obliged to protect each others' GIs provided that they are protected as such in the country of origin and registered at the World Intellectual Property Organization (WIPO). However, there are many outstanding questions regarding GIs that have yet to be fully addressed. For instance the EU accepts country names as GIs only in exceptional cases. They argue that a geographic indicator must be smaller than the entire territory of a country. There is also some question as to whether plant varieties that can grow in several countries can be used as GIs. The EU has called for the use of traditional expressions (TEs) such as "ruby", "tawny", and "vintage" for port to be protected. They argue that these TEs are so closely linked to a GI that they themselves meet the TRIPS definition of a GI. Finally, there is some question about what terms are generic and therefore are available for use by everyone and what to do with

semi-generic terms like chablis and burgundy.[116] Not least among the questions is whether these issues should be dealt with in the TRIPS negotiations or the agriculture negotiations of the Doha Round.

Once GIs are established, there is no international agreement on how these should be protected. For instance in the US, GIs can be registered as certification marks or collective marks under trademark laws. Protection for GIs in the EU can only be secured by a bilateral treaty unless EU authorities determine that petitioners are from a country with an equivalent regime for protecting GIs. [117]

In the US, the Bureau of Alcohol, Tobacco, and Firearms (ATF) provides protection for all names including those originating in the European Union. No wine can be sold in the US until the ATF approves the label, and the ATF has devoted a large amount of resources to the approval process. The EU Commission on the other hand does not really have a similar system and the protection of names is enforced at the Member State level.[118] In fact, Jon Dudas, Deputy Director of the United States Patent and Trademark Office stated in 2003 that according to US officials "no U.S. geographical indication is currently protected in the EU under its Agriculture Regulation."[119]

Under current domestic EU regulations, to list geographic indications, 100% of the grapes must come from the US. For geographic indications of political areas, 75% of the grapes must come from the listed state. If a county is named, 75% of the grapes must come from that county. For geographic indications of viticulture areas, 85% of the grapes must come from the viticultural area and 100% of the grapes must come from the state or states in which that viticultural area is located. US wineries may also list several geographic indications under the following conditions: the geographic names are the names of two or three counties all in the same state and 100% of the grapes must come from these counties or the geographic indications are the names of two or three immediately neighboring states and 100% of the grapes come from those states. [120] This policy raises two types of enforcement questions. First, how can you verify that 75% of the grapes (and not 70% for instance) come from a specific region? And second, how does the EU plan to protect US GIs from local producers who may try to capture premia by labeling their wines with a US GI?

The issue of geographic indicators is being addressed in a wide variety of international fora. However, specific attention seems to be focused on negotiations in the current Doha Round. The EU wants the WTO negotiations on GIs to focus on three main issues:

- the establishment of a multilateral register of GIs (TRIPS negotiations),

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[116] Josling, Tim and Donna Roberts and David Orden "Food Regulation and Trade Towards an Open and Safe Global System: Institute for International Economics Washington, DC March 2004. pp132-136.

[117] Ibid.

[118] James M. Murphy, Jr. "U.S. hopes for a Deal on Wines – And what to Call Them" Trade Relations, Winter 2003. http://european affairs.org/archive/2003_winter/2003_winter_118.php4 accessed 11/29/04.

[119] http://www.aplf.org/mailer/issue97.html accessed December 2, 2004.

[120] http://www.winevision.org/global exporting/europe.html accessed 12/2/2004.

- the extension of the protection foreseen for wines and spirits to other products (TRIPS negotiations)
- the claw-back of certain EU GIs whose names have been usurped worldwide (Agriculture negotiations).

The EU is claiming the following names as GIs (for wine) originating in the European Communities.

Table 3.3: Geographical indications for wines and spirits originating in the European Union (1) (2)

Wines & spirits
Beaujolais
Bordeaux
Bourgogne
Chablis
Champagne
Chianti
Cognac
Grappa di Barolo, del Piemonte, di Lombardia, del Trentino, del Friuli, del Veneto, dell'Alto Adige
Graves
Liebfrau(en)milch
Malaga
Marsala
Madeira
Médoc
Moselle
Ouzo
Porto
Rhin
Rioja
Saint-Emilion
Sauternes
Jerez, Xerez

(1) In conformity with the ECs proposal of modalities, the protection proposed also covers translations, such as “Burgundy”, “Champaña”, “Coñac”, “Port”, “Sherry” etc. Transliterations in other alphabets, such as “ÊÎÍÜßÊ” for Cognac, are also covered. (2) The present list will be completed with geographical indications originating in the Acceding States (to the EU).

The US, Argentina, Australia, Chile, New Zealand, Canada and several other countries argue that the current system Based on Article 23.4 of the TRIPS Agreement provides adequate protection but that it could be extended through a system of voluntary notification. The US proposal for geographic indicators on wines and spirits would place

obligations only on those WTO members volunteering to participate. The WTO would distribute all such geographic indicators submitted to it. Participating members would uphold TRIPS obligations under their own existing system for protecting intellectual property rights. The burden of enforcement would fall on holders of the geographic name rights, not on governments. The US states that the EU proposal would necessitate a sweeping new bureaucracy that would impose costly inefficient procedures on all WTO members including developing countries[121] Whether the US will have to concede on the issue of GIs in order to assure a reduction in EU agricultural domestic and export subsides remains to be seen.

There is one additional quality issue that should be briefly mentioned. There is an ongoing discussion about how to label organic wines in the United States. In general, organic wine tends to be produced from some percentage of organically grown grapes. The difference between "100% organic wine" and "organic wine' has to do with the allowed use of sulfur dioxide. Sulfur dioxide is a pungent gas used in wine to inhibit wild yeast growth, to protect wine from air oxidation and to inhibit browning in juice and wine. Pure sulfur dioxide gas has the pungent smell of burned (or burning) match heads. Fortunately, nobody has to use more than a few parts per million in wine. If done properly, the sulfur dioxide in wine is unnoticeable. Even without the addition of sulfur, yeast fermentation produces a natural sulfur level of between 15-20 pp. There are no wines that are sulfite-free. Thus, wine virtually always contains traces of sulfur dioxide whether the winemaker adds it or not.[122]

The maximum amount of sulfites allowed in wine sold in the U.S.A., to legally avoid affixing a sulfite disclosure statement, is only 10 ppm. The maximum legal limit for sulfites in wine in most countries is about 335-350 parts per million. In practice, the average amount of sulfites in bottled wine is between 20 and 50 ppm. This is a much lower level than virtually all sulfur-containing processed foods, which may range from as little as 6 to 6,000 ppm. The maximum legal limit for sulfites in dried fruit, for example, is 2000 parts per million. One hundred percent organic wine means that the wine was made from organically grown grapes and processed within the organic standards and with only the allowed organic materials from the national materials list. No sulfites can be added. Ninety five percent organic means a minimum of 95% ingredients must be organic. This allows for the use of sulfur dioxide in wine up to 100ppm.

The problem with "organic" labeling from a trade point of view is that the market is now confronted with hundreds of private sector standards and governmental regulations and two international standards for organic agriculture {Codex Alimentarius Commission and the International Federation of Organic Agriculture Movements - IFOAM), and a number of accreditation systems. Lack of harmonization is a very significant problem.[123]

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[121] http://www.useu.be?Categories?WTO/Sept2002USEUGeographical... accessed 11/30/2004.

[122] http://glossary.reference-guides.com/Wine/Sulfur_Dioxide/ accessed 12/05/04.

[123] http://www.ifoam.org/orgagri/oecd_harmonization_paper.html. Accessed 12/06/04.

H. Environmental and Phytosanitary Concerns

Wine production in the EU faces many of the environmental problems discussed earlier with respect to olives and tree nuts because it also plays an essential role in the socio-economic development of the regions involved, many of which do not have other viable economic alternatives. Many of these areas are environmentally fragile and therefore not economically productive. As the EU continues to emphasize quality over quantity, there will be an inevitable relocation of some production towards areas where wine-growing is more profitable. However, the pure and simple abandonment of wine-growing in environmentally fragile areas should be avoided. The maintenance of wine production in many traditional regions is essential not only to safeguard the landscape, but also to limit soil erosion. Likewise, the intensive production of grapes (olives and tree nuts), although more profitable, often involves the use of more fertilizer, water, and agri-chemicals. This has a negative environmental impact. Consequently, the EU must find a non-trade distorting way to balance rural development, agri-environmental programs, and profitability.[124]

On the phytosanitary front, California wine producers are faced with a major phytosanitary issue in the glassy winged sharpshooter and the deadly Pierce's disease that it carries. Although California wine producers have been dealing with Pierce's disease since the 1880s, it is now being spread at a much more rapid rate by the glassy winged sharpshooter. The glassy winged sharpshooter was accidentally introduced in 1989 through nursery stock imported from the southern US. It is an aggressive flier and spreads Pierce's disease with astonishing speed. As of 2002, 15 counties (primarily in southern California and the southern San Joaquin Valley) have been identified by the state as being infested with this pest.

Pierce's disease is a bacterium, *Xylella fastidiosa*, which is spread by sharpshooters that feed on infected vegetation and then inject the bacterium into the sap of nearby grapevines. The bacterium lives and multiples in a plant's xylem, eventually blocking the movement of water and killing the vine. There is no known cure for Pierce's disease. It affects only plant physiology and the vine's ability to produce a crop but it does not affect wine quality or pose a health risk to human consumers. Pierce's disease also threatens almonds, citrus, stone fruits, alfalfa, and oleander. Pierce's disease is not found north of California suggesting that it may be vulnerable to lower temperatures.

In an effort to control the spread of this disease, Federal, state, and local governments as well as the wine industry have committed more than $60 million. In 2001, Governor Gray Davis signed AB1394 to assess the wine grape community an estimated $5 million annually for five years. These funds will be used for research and other necessary activities to fight the glassy winged sharpshooter. The Wine institute, California Association of Wine Grape Growers and Family Winemakers supported the bill to cost share with the California Department of Food and Agriculture (CDFA) and the US department of Agriculture. The money is being used to inspect nursery stock and bulk grapes moving throughout the state to prevent the further spread of the sharpshooter. A statewide survey via a monitoring, trapping, and reporting system is underway to

[124] http://europa.eu.int/comm/agriculture/publi/pac2000/wine/index_en.htm

determine the migration of the sharpshooter. Parasitic wasps that lay eggs in the sharpshooter's eggs are also being introduced. There is an educational outreach program identifying the pest, symptoms of infection, and methods to control the disease. There has also been targeted ground spraying. (Aerial spraying and quarantines have not been seriously considered.) Growers are selectively removing vegetation around vineyards and replanting with vegetation that will not carry the disease.[125]

[125] "Pierce's Disease Update," The Wine Institute. http://www.wineinstitute.org/communications/pierces_disease... accessed 11/22/04.

V. Tomato Sector

A. A Brief History of Tomatoes

Tomatoes are one of a few foods that are native to the Western Hemisphere. Tomatoes originated in the coastal highlands of western South America and then appeared later in Central America where Mayan Indians used them as food. With the conquest of Mexico in 1519, tomatoes were carried eastward to Europe. At first Europeans believed tomatoes to be poisonous because they belong to the poisonous nightshade family. However, the Spaniards and Italians eventually found many culinary uses for them. [126]

In the United States there are records of Thomas Jefferson growing tomatoes at Monticello in 1781. However, tomatoes did not really start to become popular until after the Civil War. [127] By the early 1900s, tomatoes were considered a staple of American cookery and they are currently the third most widely consumed vegetable after potatoes and lettuce. (Technically speaking, tomatoes are a fruit but in 1893 the United States Supreme Court ruled that the tomato is a vegetable.) It is estimated that more than 85 percent of home gardeners plant tomatoes.

B. Production and Trade Statistics

Production. Tomatoes are produced either for the fresh or the processed market. In some countries tomatoes may be used for either of these purposes. In the United States, tomato varieties are bred specifically to serve the requirements of either one market or the other.

Processing requires varieties that contain a higher percentage of soluble solids averaging 5-9%. Most tomatoes in the US are grown under contract between growers and processing firms. Fresh tomatoes tend to be sold on the open market and are hand-picked. Processing tomatoes are machine harvested. Consequently fresh market tomato prices are higher and more variable due to larger production costs and greater uncertainty.

Tomatoes are produced in every state in the nation with commercial-scale production in about 20 states. California is the leading producer of all tomatoes in the United States accounting for 95% of U.S. processing tomato output and just under a third of the fresh crop. In fact, California leads the world in the production of processing tomatoes. However, it should be noted that while fresh tomatoes are typically valued at 25-35 cents per pound, processing tomatoes are valued at about 3 cents per pound[128]. Consequently processing tomatoes account for only 1/3 of all cash receipts despite a crop size that is 5-6 times greater than the fresh market crop. The Economic Research Service estimates that 35% of processed tomatoes are used to make sauces, 18% are used to make paste, 17% are used for canned whole tomato products, and 15% are for ketchup and juice.[129]

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[126] http://www.pastrywiz.com/archive/recipe/0451.htm. Accessed 1/4/2005.

[127] http://www.producepete.com/shows/tomato.html. Accessed 1/4/2005.

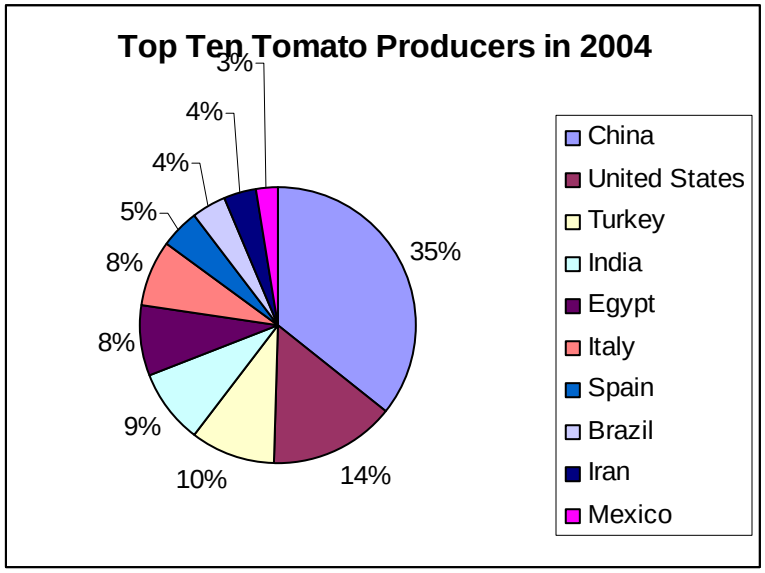
[128] In 2004 fresh tomato prices were averaging about 99 cents per pound due to a severe storm which hit central California on October 19 and 20, 2004damaging a large portion of the crop and halting harvest. This followed on a series of storms and hurricanes which hit Florida.

[129] http://www.ers.usda.gov/Breifing.Tomatoes/background.htm. Accessed 1/4/2005.

Florida is the second largest tomato producing state but it is the number one producer of fresh-market tomatoes. Other important tomato producing states are Ohio, Virginia, Tennessee, South Carolina, North Carolina, and Georgia. Commercial fresh market tomato shipments peak in the spring when Florida's volume is highest and commercial volume and prices are lowest in August and September due to the availability of local tomatoes. Florida's winter crop is primarily shipped to markets in the east while the bulk of the demand in the western US is met by Mexican imports.[130] In addition, 4-5% of US imports of fresh tomatoes are supplied by hothouse producers, primarily Canada and the Netherlands.

The top ten tomato producers in the world are China, the US, Turkey, India, Egypt, Italy, Spain, Brazil, Iran and Mexico. Figure 4.1 shows the percentage of total tomato production across these countries in 2004. It is interesting to note that while Greece and Portugal do not fall into the top ten producers, adding them to the production of Spain and Italy makes the EU the second largest producer of tomatoes after China. About 15 million tons of tomatoes are produced in the EU each year making tomatoes the most produced vegetable in the EU.[131]

Figure 4.1 Top Ten Tomato Producers in 2004



Source: FAOSTAT

Consumption. US consumption has increased steadily since 1992 from 13.1 pounds per capita to 18.3 pounds in 2002. Americans consume 3/4s of their tomatoes in processed form. The USDA also estimates that because of the growth in the domestic

[130] http://www.ers.usda.gov/Breifing.Tomatoes/background.htm. Accessed 1/4/2005

[131] http://europa.eu.int/comm/agriculture/publi/fact/horti/2003_en.pdf. Accessed 1/12/05.

greenhouse/hydroponic industry, per capita consumption of tomatoes may even be a pound higher.[132] The increase can be accounted for by greater information about the positive health effects of eating tomatoes and tomato products and the increase in demand for ketchup, salsa, and pizza sauce.

Trade. According to the Global Trade Atlas, the EU is the dominant exporter of processed tomatoes. In 2003, the EU 15 accounted for approximately 14% and 30% of the world's canned tomato and tomato paste exports by volume respectively.[133] Italy, Greece, and Portugal and Spain are the main EU producers of tomato paste. Paste is sold as a final consumer product and an input into other tomato products such as sauces and ketchup. It takes approximately 5.5-6 tons of tomatoes to yield one ton of tomato paste. Italy and Spain are the dominant exporters of canned tomatoes and in 2002 accounted for 80% of the world's canned tomato exports[134]. Canned tomatoes can be further classified into whole peeled tomatoes, crushed tomatoes and diced tomatoes. It takes approximately .8 to 1.2 tons of crushed tomatoes to make a ton of processed canned tomatoes. (In 2003, Spain was the world's leading fresh tomato exporter.) Northern European countries such as Germany, the UK, and the Netherlands are major consumers of southern European processed tomato products. Other key global suppliers of processed tomatoes included the United States, China, Turkey, and Chile. However, these suppliers each accounted for less than 15% of the world's processed tomato exports, with the exception of China which supplied 25% of the world's tomato paste exports in 2003.

China's processed tomato exports have increased exponentially over the past decade and its export shares are expected to increase significantly over the next several years as well. Figure 4.2 illustrates this growth while US and EU exports remain basically steady. Chile is also a major producer of processed tomatoes including canned tomatoes and tomato paste.[135]

The United States is a net exporter of processed tomato products. In 2001 the value of exports equaled $233 million while imports were valued at $65 million. The University of California Agricultural Issues Center estimated that 94.7% of US exports originated in California in 2000.[136] Tomato sauces account for the largest share of processed tomato exports followed by paste, ketchup, and canned whole tomatoes.[137] (In 2003, US tomato paste exports reached 142,640 tons up 25% from 2002 and up 80% from a decade ago.

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[132] Briefing Room: Tomatoes background. http://www.ers.usda.gov/Breifing/Tomatoes/background.htm accessed 1/4/05.

[133]FAS/USDA. "World Horticultural Trade & US Export Opportunities." June 2004.

[134] FAS/USDA. World Horticulture trade & US Export Opportunities, "Tomato and Tomato products situation", March 2004.

[135] FAS/USDA. "World Horticultural Trade & US Export Opportunities." June 2004.

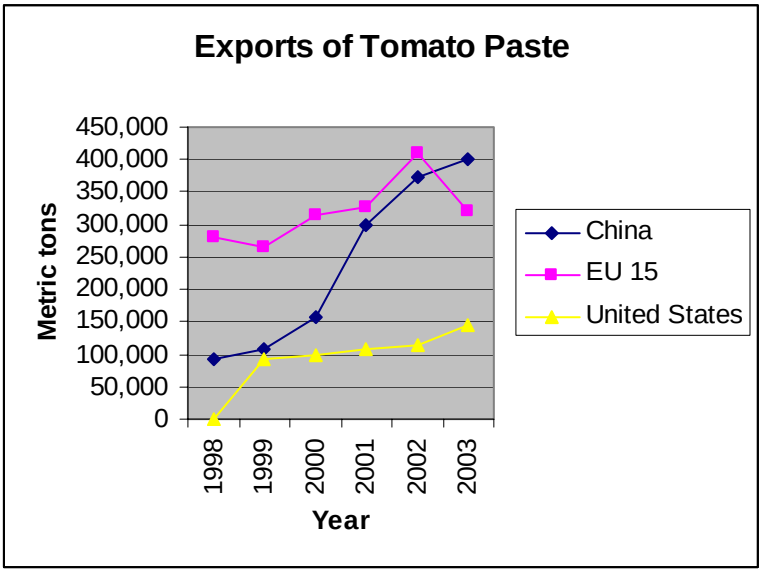
[136] Brunke, Henrich. "Commodity Profile with an Emphasis on International Trade: Tomatoes, Processed. " Agricultural Issues Center, University of California, August 2002.

[137] ERS/USDA. "Briefing Room: Tomatoes background." http://www.ers.usda.gov/Breifing/Tomatoes/background.htm accessed 1/4/05.

However, paste exports are still below the 1997 record, due mainly to intense competition.)[138]

The top three US export markets in 2000 for processed tomatoes included Canada (over 50%), Japan (12%), and Mexico (11%). The passage of CUSTA and NAFTA have significantly enhanced the North American tomato trade. About ½ of the US ketchup and sauce exports in 2001 went to Canada. The primary exports to Mexico were ketchup and sauces (due to the growing fast food industry in Mexico), and paste and puree. Of the 65 million dollars of US imports in 2001, 62% of the imports were ketchup and sauces. The second largest category of imports was pastes and purees. Processed tomato imports from Mexico have been variable. However, imports from Canada reached $33 million in 2001, which was nearly half of all processed tomato imports to the US.[139]

Figure 4.2 Tomato Paste Exports



*EU-15 excluding intra-trade.

Source: FAOSTAT

Total US exports of fresh tomatoes were valued at $135 million in 2002. The NAFTA partners are the largest destination for US fresh tomatoes accounting for 91% of exports in 2002. About 83% of US export value of fresh tomatoes went to Canada. (About ¼ of all US fresh tomato exports to Canada originate in California and the majority of fresh tomato exports to Mexico originate in California). The US is a net importer of fresh tomatoes and Mexico is the main source for US fresh tomato imports. Canada is the

[138] FAS/USDA. "World Horticultural Trade & US Export Opportunities." June 2004

[139] Brunke, Henrich. "Commodity Profile with an Emphasis on International Trade: Tomatoes, Processed. " Agricultural Issues Center, University of California, August 2002.

second largest supplier. Most of their fresh tomatoes are grown in greenhouses or hydroponically. The value of fresh tomato exports from Canada to the US has gone up tremendously since the passage of CUSTA. In 1989, the US imported 2.9 million dollars worth of fresh tomatoes from Canada. By 2002 imports from Canada were valued at 172.6 million. The Canadians have captured the niche market for greenhouse and hydroponic tomatoes in the US.[140] These trade numbers point to the great impact and importance of regional trade agreements.

C. Subsidies

In the United States, there are no federal price or income support programs that cover tomatoes. There are also no processing subsidies. However, tomatoes do fall under a variety of non-crop specific programs such as federal crop insurance, disaster assistance, and western irrigation subsidies. Federal food purchase and donation programs such as the School Lunch Program and the Food for Peace Program cover tomatoes and tomato products.[141] In addition tomatoes are covered under the Market Access Program (MAP). The MAP program forms a partnership between non-profit U.S. agricultural trade associations, U.S. agricultural cooperatives, non-profit state-regional trade groups, small U.S. businesses, and USDA's Commodity Credit Corporation to share the costs of overseas marketing and promotional activities such as consumer promotions, market research, trade shows, and trade servicing.

Tomato producers in the EU receive both domestic and export subsidies. The EU fresh fruit and vegetable regime and processed fruit and vegetable regime were reformed in 1996. The 1996 fresh fruit and vegetable reform reinforced the role of producer organizations, introduced the entry price system and took account of the Uruguay Round accord. The main objective of the processed fruit and vegetable regime was to provide financial assistance to the processing industry. The EU processor aid was a direct transfer from the EU Budget to processors and covered 16 categories of processed tomatoes. The amount of the subsidy was determined by the raw material price, raw material prices in competing countries, the amount of aid paid the previous year and trends in external trade. To be eligible for the subsidy, the processor must have paid the minimum price to the grower and the raw material must have met certain quality requirements.[142] Minimum prices were established by the Commission every year and specified in a contract between the processor and the grower before the marketing year. In 1995 a certain number of these contracts were written between processors and producer organizations. The minimum price was set at about 95 ECU per ton of raw tomatoes through most of the 1990s but dropped to 88 Euro per ton in 1999 and 2000. There is a limit on the quantity of tomatoes eligible for processor aid. For more on how these quotas were distributed between countries and products see Sumner, Rickard, and

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[140] Brunke, Henrich and Min Chang, "Commodity profile: tomatoes fresh" Agricultural Issues Center University of California" prepared Nov. 2003.

[141] ERS/USDA. http://www.ers.usda.gov/ Breifing/Tomatoes/policy.htm. Accessed 1/13/05.

[142] Daniel Sumner, B. Rickard, and D, Hart "Economic Consequences of European Union Subsidies for Processing Tomatoes'" University of California Agricultural Issues Center, 2001. p. 20

Hart. Appropriations for production aid in 1999 and 2000 were 317 million euro and 269 million euro respectively.[143]

In 2000, the EU modified this system and as of marketing year 2001/02 production aid for tomatoes was paid directly to Producer Organizations (POs). This is the same system that was already in place for citrus. The new regulation also fixed a permanent amount of aid for the quantity of raw material intended for processing instead of fixing a rate at the beginning of each market year for finished products. In the case of tomatoes this replaced aid for 16 different finished products with a single amount of aid. Council Regulation 2699/2000 also replaced the quota system for processed tomatoes with the threshold system already in existence for processed peaches, pears, and citrus. National thresholds were introduced and in the case of overrun, the threshold would be reduced in the member state exceeding its threshold. Thresholds are expressed in raw materials rather than finished products. Member states can sub-divide their thresholds into full peeled tomatoes and other tomato products. The amount of aid set under the threshold system was 34.5Euros/MT of tomatoes. Despite these changes there has not been a significant decrease in the level of domestic support. Appropriations for production aid for processed tomatoes in 2002 and 2003 were 285 and 270 million euros respectively.[144]

There was also a withdrawal compensation program for tomatoes which benefits members of producer organizations. The volume eligible for intervention is equal to 10% of a PO's marketed quantity. In marketing year 2002/03 the intervention price for tomatoes was 4.83 euro per 100 kg. Total appropriations for withdrawal compensation in 2003 equaled 134 million Euros.

Fruit and vegetable producers may also qualify for financial aid under rural development programs. However, since these programs are non-product specific, it s impossible to determine how much of the rural development budget goes for which products. Finally, the EU grants financial support for marketing programs both in the EU and with third countries. Promotional measures are part financed by the EU (50%), producer organizations (30%) and Member Sates (20%).[145]

The EU has explicit export subsides for selected canned tomato products going to selected destinations. Sumner, Rickard, and Hart estimate that the share of canned tomato exports that receive the export subsidy in 2000 was 6.7%.[146] It is difficult to tell exactly what percentage of export subsidies go to tomatoes and tomato products since The EU publishes the numbers in aggregates such as "fresh fruits and vegetables" and "processed fruit and vegetables." The US has no export subsidies on processed tomato products.

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[143] FAS/USDA. "EU Agricultural Situation, EU Fruit and Vegetables Regime," GAIN Report E20070, 6/14/2000 http://www.fas.usda.gov/gainfiles/200006/25697971.pdf

[144] USDA/FAS, "EU Trade Policy Monitoring: Fruit and Vegetables -EU Subsidies 2003" Report #E 23064. http://www.fas.usda.gov/gainfiles/200304/145885444.pdf

[145] USDA/FAS"EU Trade Policy Monitoring: Fruit and Vegetables -EU Subsidies 2003" Report #E 23064.p.4. http://www.fas.usda.gov/gainfiles/200304/145885444.pdf

[146] Daniel Sumner, B. Rickard, and D, Hart "Economic Consequences of European Union Subsidies for Processing Tomatoes'" University of California Agricultural Issues Center, 2001. p. 18.

D. Technology

There are a wide variety of technologies in use throughout the world in the production and harvesting of tomatoes. Two of the newest technologies involve the use of hydroponics and hothouses. These technologies are increasingly affecting world trade. Hydroponics is a technology for growing plants in nutrient solutions (water and fertilizers) with or without the use of artificial medium (e.g., sand, gravel, vermiculite, rock wool, peat, coir, sawdust) to provide mechanical support. Liquid hydroponic systems have no other supporting medium for the plant roots: aggregate systems have a solid medium of support. All hydroponic systems in temperate regions of the world are enclosed in greenhouse-type structures to provide temperature control, reduce evaporative water loss, and reduce disease and pest infestations. The principal advantages of hydroponic production include high-density maximum crop yield, crop production where no suitable soil exists, a virtual indifference to ambient temperature and seasonality, more efficient use of water and fertilizers, minimal use of land area, and, disease and pest control. The major advantage of hydroponic production compared to field grown produce is the isolation of the crop from the soil, which often has problems of diseases, pests, salinity, poor structure and/or drainage. The principal disadvantages of hydroponics, relative to conventional open-field agriculture, are the high costs of capital and energy inputs, and the high degree of management skills required for successful production.[147] While there is no risk that hydroponics will replace traditionally produced tomatoes, it is increasing the import opportunities for tomatoes in off seasons and is creating a shift among trade partners with Canada and the Netherlands supplying more and more of these tomatoes.

In addition, the production of hothouse tomatoes has also increased rapidly throughout the 1990s. As the California Farm Bureau Federation pointed out, "Imported hothouse tomatoes from Canada have risen in accordance with the increased acreage, from 22,000 tons in 1996 to 101,390 tons in 2000."[148] This rapid increase in production and the low prices at which these products were being placed on the US market led US greenhouse tomato producers to file an antidumping case against Canadian hothouse producers in March of 2001. In September 2001, Canadian greenhouse producers announced that they would file an anti-dumping case against US fresh tomato producers. In both cases, findings of dumping and injury were upheld. The major differences seem to be in the definition of "like product."[149]

E. Market Access

Processed tomato imports into the EU are subject to a straightforward ad valorum tariff. It was 18% until 2001 when it was reduced to 14.4% as part of the Uruguay Round

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[147] "Growing Tomatoes Hydroponically," http://ag.arizona.edu/hydroponictomatoes/overview.htm. Accessed 1/18/05.

[148] http://www.cfbf.com/agalert/2001/aa-110701b.htm. Accessed 1/18/05

[149] For more on these cases see Rick Barichello's (University of British Columbia) study entitled "Anti-dumping in Agriculture between Canada and the U.S: Two cases of Tomatoes." http://www.farmfoundation.org/flags/barichello.pdf.

Agreement. However, the EU has several preferential trade agreements such as the Euro-Mediterranean Agreement with Morocco, Israel, Turkey, Algeria, Egypt, Jordan, Tunisia, the West Bank and Gaza, and Malta and Cyprus (now part of the EU). Imports from these countries and other preferential trade partners come in at lower or zero tariffs. In addition, as noted by Sumner et. al. there is a duty drawback or tariff refund policy where the duty is refunded (or not paid) on products that are imported and then re-exported. For this to apply, the products must be imported and exported by the same company although they may be in a further processed form and may not contain the same physical product.[150]

All fresh-market tomato tariffs are now eliminated in North America under NAFTA. However, a tariff snapback to the MFN rate can be triggered by certain price and acreage conditions until 2008. The U.S. Department of Commerce suspended an antidumping investigation involving fresh-market tomatoes from Mexico, by negotiated agreement, on November 1, 1996. The agreement set a minimum price (called the reference price) covering the majority of fresh-market tomatoes imported from Mexico. The intent of the agreement is to ensure there is no undercutting or suppression of fresh-market tomato prices in the United States. Fresh-market tomatoes cannot enter the United States at less than the established reference price. Subsequent amendments clarified and expanded original provisions. The tomato season is now split into two periods—each with a separate reference price. California and Baja, Mexico are covered from July 1 to October 22 ($4.30 per 25-pound box), while Florida and Sinaloa, Mexico are covered from October 23 to June 30 with a higher floor price ($5.81 per 25-pound box). The latter floor price was increased 2.9 percent on November 1, 2003 from the long-standing level of $5.27 per box.[151]

The US tariff on tomato ketchup is 6%. Imports of tomato sauces and prepared and preserved tomatoes are charged a tariff of 11.6%. The duty on tomato juice imports into the United States is 0.14 cents per liter and US imports of conserved whole or pieced tomatoes face a tariff of 12.5%.

F. Market Structure and Marketing Institutions

In the United States, supermarkets carry many varieties of fresh market tomatoes. Since tomatoes are seasonal they can come from a wide variety of sources. However the perishability of crops which must be harvested sold and marketed within a short period of time has often meant that growers have relatively little bargaining power with sellers. In addition as Cook points out, “Increasingly, buyers are contracting with growers-shippers for high volume perishable items in order to stabilize prices, qualities, and volumes. If this trend continues, small farmers who do not have sufficient scale to offer large consistent year round volume to contracting buyers will face increasingly stiff

[150] Daniel Sumner, B. Rickard, and D, Hart “Economic Consequences of European Union Subsidies for Processing Tomatoes” University of California Agricultural Issues Center, 2001. p. 19.

[151] ERS Briefing Room, Tomatoes Trade. http://www.ers.usda.gov/Briefing/Tomatoes/trade.htm.

competition from large firms which can finance production in numerous production regions and manage complicated distribution logistics.[152]

There is only one federal marketing order in force for tomatoes and it covers the majority of fresh-market tomatoes produced in Florida from October to June. This order authorizes the handling of Florida fresh market tomatoes by grade, size, quality, maturity, pack and container. The order's pack and container requirements do not apply to imported tomatoes. The order also provides authority for production research, marketing research and development, marketing promotion and paid advertising. [153]

Processing tomatoes operate under a different system. Processing tomatoes must contain a higher percentage of soluble solids to make tomato paste. Whereas fresh tomatoes are for the most part sold on the open market, processing tomatoes are grown under contract between growers and processing firms. They are picked mechanically and transported directly to processing firms. Although many firms produce pulp based products, most of the initial processing is by firms that manufacture tomato paste. Tomato paste is a raw ingredient which is packed in bulk containers and stored for up to 18 months. This ingredient is distributed under contract or sold to remanufacturing firms that add water spice, etc. to make retail products such as soups, sauces, ketchup, and paste. As the Economic Research Service notes, the industry appears to be polarizing into firms specializing in the manufacture of bulk industrial paste and those specializing in the remanufacture of industrial paste into consumer products.[154] In the late 1980s relatively high prices for tomato products led to new investment in tomato processing facilities in California. The resulting surge in supply overwhelmed the market, causing prices to fall and several tomato processors to close in the 1990s.

G. Quality

There are two important and related issues that arise in any discussion of tomato quality. The first involves traditional production techniques and contrasts hybrid varieties with Heirloom varieties. And, the second issue deals with genetic modification.

As large corporate farms began growing tomatoes and using mechanized harvesting and packing to ship tomatoes over long distances, growers began to use hybridization to create new traits such as disease resistance, and longer shelf life. Some growers and consumers claimed that the drive to enhance the shelf life of tomatoes had robbed them of their thin tender skin and their plump juiciness. Hence some producers have turned to the production of "heirloom tomatoes." Heirloom tomatoes must be "true to type" from seed saved from each fruit; the seed must have been available for more than 50 years; and, the tomato variety must have a history or folklore of its own. Heirloom tomatoes account for only a small fraction of fresh tomato sales but they represent a form of quality-based market differentiation.

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[152] Roberts Cook, "The U.S. Fresh produce industry: An Industry in transition" http://cook.ucdavis.edu/mofp/ch-02.pdf. Accessed 01/10/05.

[153] http://www.ers.usda.gov/ Breifing/Tomatoes/policy.htm. Accessed 1/13/05

[154] ERS, "Briefing room: Tomatoes background" http://www.ers.usda.gov/Breifing/Tomatoes/background.htm. Accessed 1/04/05.

Another effort to address the quality problems brought on by agribusiness was the development of genetically modified tomatoes. Conventional tomatoes, when left on the vine to ripen, were unable to endure harvest and long transport without damage. Consequently, these tomatoes were often picked green, transported under refrigeration, and treated at the destination with ethylene to trigger the final ripening process. Ethylene makes the tomato red but does not help it attain the aroma and flavor that vine ripened tomatoes attain. Consequently, Calgene set out to produce a tomato that could ripen longer on the stem without getting soft thereby allowing it to still be transported and stored. The Flavr Savr tomato was modified in a way that the enzyme polygalacturonase (PG) which is responsible for the tomato's softness, is no longer formed in the tomato or, if so, only in negligible quantities. In 1994, the FDA approved Calgene's new "FlavrSavr" tomato. The new tomato which differed from conventional tomatoes only in terms of the delayed ripening process was marketed under the MacGregor trade name. At the same time Zeneca, working with scientists from the University of Nottingham, developed a tomato with a delayed ripening process which was particularly well suited for the production of tomato pulp. Since the degradation of the cell walls was delayed the pulp produced the desired viscosity. The resultant purée was sold by selected branches of Safeway and Sainsbury's supermarkets. It hit the market in February of 1996. Both stores pledged that they would provide a conventionally produced purée alongside the GM purée. By March 1999 public reaction to GM foods forced Sainsbury's to state that they would no longer stock the GM purée and they removed all their remaining cans in July when Sainsbury's announced that they were "GM free."[155]

Throughout the late 1990's health concerns about GM tomato products were raised on both sides of the Atlantic (but more so in Europe.) The FlavrSavr tomato which was marketed in the US in 1994 was withdrawn from the market in 1996 primarily because it cost about twice as much as non-GM tomatoes, but had no better flavor and was prone to bruising. Calgene had accrued a large debt in the development of the Flavr Savr tomato but they also made some seriously poor business decisions. For instance, the tomato was bred to be produced in California but Calgene moved the production to Florida where the tomato did poorly in the sandy soil and humidity and was susceptible to fungal diseases. Eventually, Monsanto who claimed patent infringement against Calgene finished off the struggling company by buying it out. The FlavrSavr tomato was never sold outside of California and a few outlets in the mid-west. Fresh GM tomatoes have never been sold in the EU.[156]

In general, the US and the EU have taken very different approaches to regulating biotech products. In 1998, many EU countries imposed marketing bans on GM products resulting in a virtual moratorium on approvals of new products. The European Commission has not taken steps to overturn the bans, despite the fact that several of the EU's Scientific Committees have found no justification for them. On May 13, 2003, the

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[155] Embasy of the United States of America. Dag Hammarskjölds Väg 31. SE-115 89 Stockholm. Biotechnology Issues. http://www.usemb.se/biotech/index.html. Accessed 1/21/05.

[156]The Soil Association. "Flavr Savr tomato & GM tomato puree: The failure of the first GM foods." http://www.soilassociation.org/web/sa/saweb.nsf/0/80256cad0046ee0c80256d1f005b0ce5?OpenDocument. Acccessed 01./21/05.

U.S., Argentina and Canada initiated WTO consultations with the EU regarding this de facto moratorium on biotech product approvals. In August 2003 Argentina, Canada and the US brought separate cases to the WTO (Ref. DS293, DS292 and DS291 respectively). Each country stated that, regarding EU-level measures, the moratorium maintained since October 1998 on the approval of biotech products had restricted the imports of agricultural and food products. Regarding the EU Member State-level measures, the complainants said that a number of EU Member States maintain national marketing and import bans on biotech products even though those products have already been approved by the EU. Since these cases are essentially the same, the panel that was established by the WTO Dispute Settlement Body on the 18th August 2003 will deal with the three together. In 2004, the EU adopted new regulations on the authorization of GMO products for the market (1829/2003) and on traceability and labeling of GM foods (1829/2003). The dispute settlement panel is expected to rule in June of 2005.

H. Environmental and Phytosanitary Concerns

Tomato production can raise environmental concerns because tomatoes are often highly irrigated and require the use of high levels of agrochemicals to combat a wide variety of insects, diseases, and weeds. It is estimated that insecticides are used on about 90% of all tomatoes grown in California; herbicides are used on 99% of the tomatoes grown in California; and, fungicides are used on about 60% of the processing tomatoes.[157] While similar statistics are not available for European production, the World Wildlife Federation points out that "since the 1980s, Spanish yields have increased by around 50% and production has shifted away from traditional outdoor growing towards production under plastic in areas like Murcia and Almeria. There tomato production is irrigated and involves the use of agro-chemicals. This has led to the overuse of scarce water, as well as erosion and pollution of soil." Greenhouse production raises issues of high energy use, waste disposal and landscape degradation.[158]

[157] "Crop profile for Tomatoes in California." http://pestdata.nscu.edu/cropprofiles/docs/catomatoes-processing.html. Accessed 1/4/2005.

[158] "Tomatoes" http://www.wwf.org.uk/core/about/scotland/sc_0000001316.asp. Accesses January 4, 2005.

VI. Citrus Sector

The term "citrus" includes several different types of fruits and products. Although oranges are the major fruit in the citrus fruits group, accounting for about 70% of citrus output, the group also includes small citrus fruits (such as tangerines, mandarins, clementines and satsumas), lemons and limes and grapefruits. The leading processed form in the group is orange juice.

A. A Brief History of Citrus

The exact location of origin of citrus fruits is not clearly identified, although most researchers place it in Southeast Asia, around 4000 BC. It is believed that the word "orange" originates from Sanskrit. The spread of citrus fruits from Asia to Europe was slow. It is believed that the citron was carried to the Middle East sometime between 400 and 600 BC. Arab traders in Asia carried lemons, citrons, limes, oranges and shaddocks to eastern Africa and the Middle East between AD 100 and 700. During the Arab occupation of Spain, citrus fruits arrived in southern Europe. They continued to flourish in Europe through the middle ages. International trade in fresh citrus fruits began almost two centuries ago. Even at its early stages, Spain played a dominant role in the Mediterranean area, supplying almost all citrus fruits shipped to the United Kingdom, Germany and France

Citrus fruits were not native to the Americas and were brought to America (Florida) by the Spaniards and the Portuguese in their exploration trips to the New World, around the year 1500. (Columbus took seeds of citrus fruits with him on his second trip) The early settlers in Florida some two centuries later found wild citrus groves in various parts of the state, some of them many acres in extent, which were supposed to have developed from seeds dropped by the Indians, to whom fruits had been given. They were usually found on hammock lands near lakes or rivers where conditions were particularly favorable for their growth and in places where the Indians commonly maintained villages. It also appears that oranges were being grown on the islands off Georgia and South Carolina at about the same time.[159]

Citrus trees, like many other commodities, were brought to California by the Catholic missions in the late 1700's. Twenty-one missions were ultimately established in the coastal section of the state, forming a chain extending northward as far as San Rafael. The missions necessarily were forced to produce their own foodstuffs, and all but three of them maintained gardens and orchards. The mission fathers seem to have prized citrus highly and Webber in his history of the citrus industry states that "citrus orchards apparently did not become established outside the missions until after secularization in

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[159] http://r0.unctad.org/infocomm/anglais/orange/characteristics.htm. Accessed January 25, 2004. For a very detailed history of citrus fruits see Herbert John Webber, "Chapter 1 *History and Development of the Citrus Industry"* Revised by Walter Reuther and Harry W. Lawton.

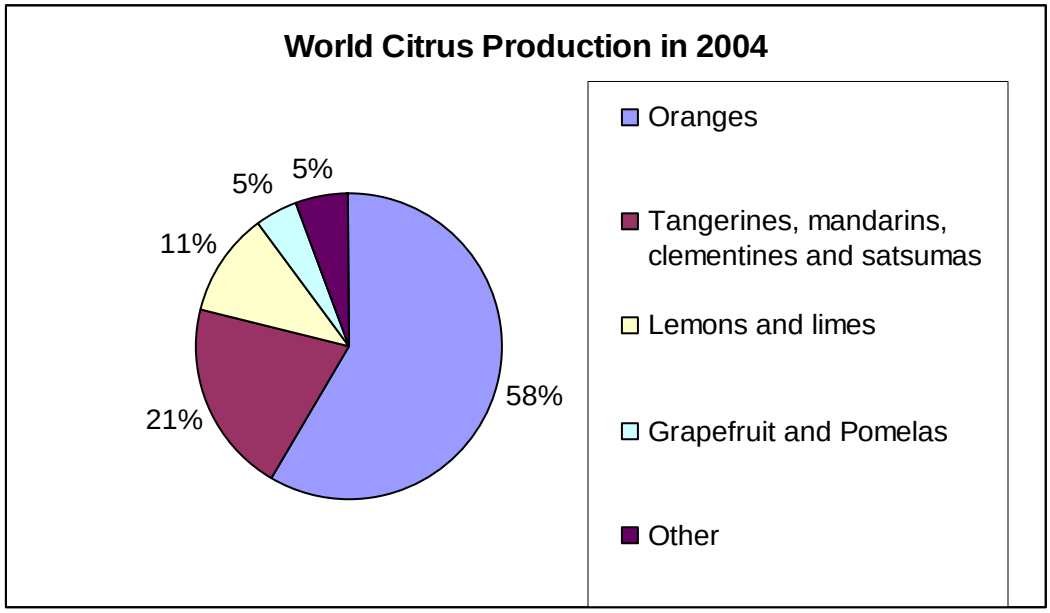
1833."[160] Webber goes on to state that the three great stimuli to the citrus industry in California were the planting of the Mission San Gabriel Grove, the gold rush which contributed to the population explosion in California, and the completion of the transcontinental railroads which allowed oranges and other citrus products to be shipped across the US.

The demand for citrus fruits increased greatly after the 1890s when physicians found that people suffering from scurvy, a vitamin deficiency disease, could be cured by drinking the juice of oranges or other citrus fruits. In 1908-09, over 15 million boxes of citrus were shipped east by rail. In the 1924-25 season, California produced about 24 million boxes of citrus. Since that time the citrus industry has continued to grow.

B. Production and Trade Statistics

Production. Citrus fruits rank first in international fruit trade in terms of value. World citrus production in selected major producing countries in 2003/2004 is estimated at 73.1 million metric tons. This represents an increase of 6% over 2002/03 levels. Citrus fruits are produced in many countries throughout the world and can be divided into 4 main categories: 1) oranges, 2) tangerines, mandarins, clementines, and satsumas -- sometimes referred to as small citrus), 3) lemons and limes, and 4) grapefruit and pomelos. Figure 5.1 shows the percentage of world production in each of these categories. Orange production outweighs the other categories by far.

Figure 5.1 World Citrus Production by Type of Fruit

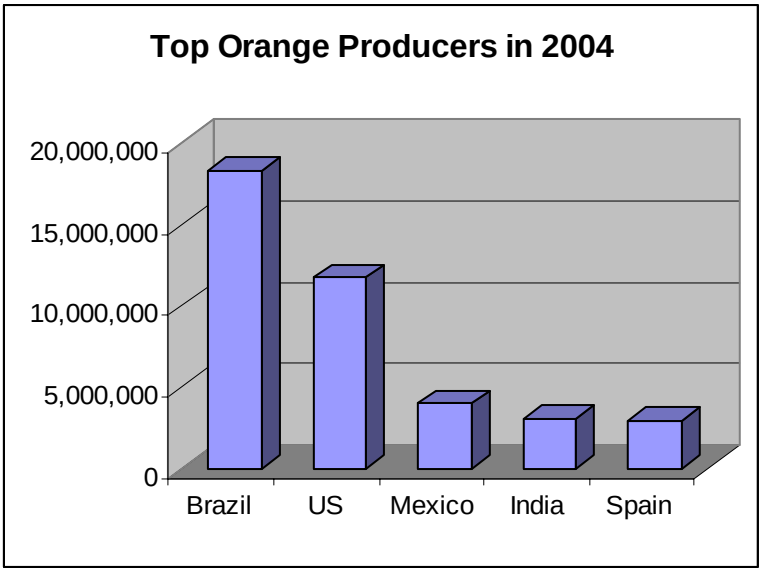


[160] Herbert John Webber, "Chapter 1 *History and Development of the Citrus Industry"* Revised by Walter Reuther and Harry W. Lawton. http://lib.ucr.edu/agnic/webber/Vol1/Chapter1.htm#origin.

Source: FAOSTAT, 2004

The top orange producing countries are shown in Figure 5.2. Brazil's orange crop for 2003/04 is estimated at 18.5 million tons, a 20% increase from the previous year. US orange production is estimated at 11.75 million tons in 2003/04 up 12% from the previous year. Spain's orange, lemon and tangerine crops also reached record levels in 2003/04 -up nearly 9%- from the year before.

Figure 5.2 Top Orange Producers in 2004



Source : FAOSTAT, 2004

Table 5.1 shows the leading producers of other types of citrus fruits, in order based on 2004 FAO data. Spain is a major producer of small citrus including tangerines, clementines, mandarins and satsumas and of lemons and limes. While the US produces relatively less small citrus, they are among the top producers of lemons and limes and the top world producer of grapefruit.

Table 5.1 Top World Producers

Tangerines, Mandarins, Clementines, and Satsumas	China, Spain, Brazil, Japan, Iran, Thailand, Korea, Italy, Turkey, Egypt, United States
Lemons and Limes	Mexico, India, Iran, Spain, Brazil, Argentina, United States
Grapefruit/Pomelos	United States, China, South Africa, Mexico, Israel, Cuba

FAOSTAT, 2004

Most of the citrus produced in California and Spain is for fresh consumption while Florida and Brazil are the leading producers of processed citrus products. In the United States most of the production is consumed domestically.

Trade. Most citrus fruits are consumed in developed countries although per capita consumption is increasing in developing countries as income levels rise. UNCTAD reports that exports of fresh citrus fruits represent roughly 10% of total citrus fruit production.[161]

The major exporters of oranges in 2003 were Spain and the US. The major exporters of small citrus in 2003 were Spain, South Africa, and the United States. The major exporters of lemons and limes were Spain, Argentina, and Mexico and the major exporters of grapefruits and pomelos were the US, South Africa, Israel and Turkey. In 2002, oranges and grapefruits represented the sixth and seventh largest horticulture exports by value in the US after almonds, wine, table grapes, apples, and frozen potato fries.[162]

The major destination of Mediterranean grown fresh citrus crops is the European Union while the major export destinations for US fresh citrus exports are Japan, Canada, and the Southeast Asian countries. Consequently there is not much overlap in the markets.

Citrus processing accounts for approximately one third of total citrus fruit production. There are only two main world players in the production of orange juice, Brazil and Florida. Together they cover 85% of the world market. The major difference between them is that Brazil exports 99% of its production while 90% of Florida's production is consumed domestically. The European Union is the largest importer of orange juice, accounting for 80% of world orange juice imports. Most EU imports come from Japan and Brazil. The US and Canada consume most of the orange juice produced in Florida with a small quantity of imports coming from Brazil.[163]

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[161] Citrus Fruit: Market, http://r).unctad.org/infocomm/anglais/orange/market.htm Accessed 1/24/05.

[162] Foreign Agriculture Service. "An Economic Overview of Horticulture Products in the U.S. http://www.fas.usda.gov/htp/Presentations/2004/An%20Economic%20Overview%20of%20HTP%20-%20(08-04).pdf. Accessed 1/26/05.

[163] Citrus Fruit: Market, http://r).unctad.org/infocomm/anglais/orange/market.htm Accessed 1/24/05

C. Subsidies

Producer organizations (POs) are the key elements in the EU's Common Market Organization (CMO) for fruits and vegetables. The CMO covers fresh citrus production. EU subsidies for fruits and vegetables are not paid to individual farmers but are channeled through the POs. Only about 40% of the entire EU fruit and vegetable production is marketed through POs and the number of POs varies significantly among member states. In order to qualify for a subsidy, POs must submit an operational program to the competent member state authorities. These programs must comply with EU requirements and objectives such as supply and price management, marketing programs, quality improvement, and promoting environmentally friendly methods. The programs must run for at least three years and for a maximum of five years. They are financed by an operational fund which holds contributions from the members based on the volume and value of products marketed through the PO. The EU's financial contribution is paid directly into the POs operational fund at the rate of 50% of the PO's actual expenditure or 4.1% of the value of marketed production whichever is lowest.

Producer members of POs may benefit from EU withdrawal compensation for satsumas, mandarins, clementines, oranges, and lemons. The volume of products eligible for intervention is limited to 5% for citrus. A PO can use its operational funds to top up withdrawal compensation. FAS reports that at the start of the 2002/03 marketing year, intervention prices were as follows:

Table 5.2 EU Withdrawal Compensation (Euro/100 kg) – regulation 2200/96

Oranges	14.00
Mandarins	13.00
Clementines	13.00
Satsumas	13.00
Lemons	13.00

Source: FAS Gain Report #E23064, 4/29/2003.

In 2003, 134 million Euros were appropriated for withdrawal compensation of fruits and vegetables. The following table shows EU withdrawal compensation in 2001 for fruits and vegetables by member state in millions of Euros. Although these numbers do not show compensation on a per product basis, it is clear that Spanish, Greek, Italian and French farmers are the major beneficiaries of the system.

Table 5.3 2001 EU Withdrawal Compensation by Member States in million euros

Belgium	Germany	Greece	Spain	France	Italy	Netherlands	Portugal	UK	Total
4.3	1.4	31.4	37	16.2	21.9	3.2	0.8	1	117.2

Source: FAS Gain Report #E23064, 4/29/2003

In addition, subsidies are granted for the processing of citrus fruits as laid out in Regulation 2202/96. This aid is paid directly to POs which deliver for processing certain citrus fruits (lemons, grapefruit and pomelos, oranges, mandarins, clementines and satsumas) harvested in the Community. The scheme is based on a contract between the POs and the processor. Processing thresholds apply and an overrun of these thresholds results in a proportional reduction of aid for the following year. Production aid for processed citrus fruits has been rising.

Table 5.4 EU financial aid for processed citrus fruit (in million Euros)

	Actual Expenditure 2001	Appropriations 2002	Appropriations 2003
Production Aid for Citrus Fruits	170	231	249

Source: FAS Gain Report #E23064, 4/29/2003

In addition to production and processing subsidies oranges, lemons and orange juice benefit from export subsidies. Export refunds are reported as an aggregate "fresh fruit and vegetables" and "processed fruit and vegetables" which makes it impossible to determine what amount was paid per product.[164]

The US does not provide explicit domestic subsidies or export subsidies to citrus fruit producers.

D. Technology

All citrus must ripen on the tree. It does not ripen at all once it is removed from the tree. In the United States almost all citrus for the whole-fruit market is picked by hand, by trained harvest crews employed by packers/shippers. The fruit is "ring picked" i.e., hand picked by using a sizing ring to ensure picking only those fruits that exceed a specified minimum diameter. Picking all the fruit on the tree or "clean tree harvesting" is rarely practiced until the end of the growing season. Ring sizes correspond to the number of fruit of a given size required to fill a standard 1.6 bushel box. Thus size 96 requires 96

[164] FAS "European Union Trade Policy Monitoring: Fruit and vegetables-EU Subsidies 2003" GAIN Report #E23064, 4/29/2003.

fruits to fill the box, size 80 requires 80 fruits. This varies from fruit product to fruit product. Grapefruit are typically ring-picked two or three times before a final clean tree harvest at the end of the season. Some oranges are ring picked once at the beginning of the season but after that are generally not ring picked. There is some mechanical harvesting but this is primarily for the juice production market. Mechanical harvesting is not feasible for the fresh fruit market because of tree and fruit damage problems and the inability of mechanical harvesters to be selective.

The citrus packing house facility converts harvested fruit into acceptable market-ready packages. This involves cleaning, waxing, grading sizing, and applying fungicidal treatments. In some cases a de-greening treatment of 5ppm of ethylene with air circulation is applied to ripen all the rind.

The process for producing orange juice is also very demanding due to stringent minimum standards for its sale as 100-percent Florida Orange Juice. In Florida, 98% of all oranges are hand-harvested since there is no cost advantage in using mechanical harvesters. As Burden notes, at the processing plants oranges are separated into bins based on juice content and maturity. Oranges are then selected for processing from those bins to enable optimal blending. Other byproducts of oranges include citrus pulp which is a common filler in pet foods, and essential oils which are minor but high value products.[165]

The USDA Foreign Agriculture Service reports that most Spanish orange producers are part-time farmers who do not depend totally on orchard incomes. They are, therefore, more financially able and willing to invest in new fruit production technologies, including irrigation systems, conversion to new varieties, and investment in new orchards. FAS also notes that although a drop in orange production in 2004/05 is forecast they expect to see a overall increase in the area planted in oranges especially in the Andalusia region because of the significant CAP reforms to cotton and the increase in orange juice processing capacity in the region.[166]

E. Market Access

The European Union has a tariff-quota system that applies to citrus imports. However, they do have preferential agreements with some Mediterranean countries and the eventual creation of an Euro-Mediterranean Free Trade Area will have a significant impact on the fresh citrus fruit trade.

The most active country in trade agreements for citrus fruits is the United States. For instance, the United States and Japan signed in 1988 the Japan Beef and Citrus Agreement. In 1984, the Caribbean Basin Economic Recovery was implemented, allowing Belize, Costa Rica and the Dominican Republic to develop their citrus processing industries and export to the United States. Under the North American Free Trade Agreement, NAFTA, the United States and Mexico agreed to phase out their tariffs on orange juice imports over a 15 year period, beginning in 1994.

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[165] Burden, Dan. "Citrus Industry Profile" Agricultural Marketing Resource Center, Iowa State University, June 2003.

[166] FAS "Spain Citrus Annual 2004" Gain Report SP4026. p.4

The negotiations for the Free Trade Area of the Americas (FTAA) are particularly difficult regarding the citrus sector since this area would include the two major players dominating world trade in orange juice, Florida and Brazil. If agreed, by 2005, the FTAA would create a free-trade zone that would include nearly all of the countries in the Western Hemisphere. This would imply that Brazilian orange juice would be imported duty-free into the United States, consequently having a significant effect on international orange juice trade.

Florida growers consider that this would negatively affect the Florida citrus sector, since Brazilian oranges are grown and processed at lower production costs and the elimination of the US tariff could flood the country with cheaper Brazilian orange juice. By the end of 2002, the United States imposed a tariff of 29.7 cents per SSE (single strength equivalent) gallon on FCOJ (frozen concentrated orange juice) and a tariff of 17.04 cents per gallon on single strength orange juice. US production is more costly due to higher wages, taxes and environmental and agricultural regulations. [167]

F. Market Structure and Marketing institutions

The citrus industry in the United States is a mature commodity market dominated by large scale producer-packers or producer-processors. The market for large acreage citrus growers is dominated by investment groups, insurance companies, large scale growers' groups, grower-packers, and packer shippers. These groups have the financial latitude to acquire and farm larger operations. The motivation for land purchases or infrastructure expansion is to control how large volumes of products enter the marketplace in order to stabilize the marketing cycle.[168]

International trade in the fresh citrus fruits sector is characterized by a multitude of medium-sized firms providing the fruit. There is, however, a certain trend towards concentration of producer groups as a response to the consolidation of buyers.

Cooperatives also play an important role in the citrus sector and give producers enhanced negotiating power. Some examples of cooperatives in the citrus fruits sector are Sunkist in the United States and Anecoop in Spain, which is a union of cooperatives.[169] Sunkist has over 6,500 growers in California and Arizona. Their average grove size is equal to 40 acres.

Orange juice trade, on the other hand, is highly concentrated. A small number of companies that operate in Brazil and Florida dominate the market. Four major companies in the sector, Brazilian companies Citrosuco and Cutrale and multinationals Cargill and Louis Dreyfus, hold around 70/75% of the market share in Brazil and 30/35% of the

[167] UNCTAD "Citrus Fruits: Economic Policies" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

[168] Burden, Dan. "Citrus Industry Profile" Agricultural Marketing Resource Center, Iowa State University, June 2003.

[169]UNCTAD "Info Comm: Market Information in the Commodities Area: Marketing Chain" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

market share in Florida. These companies are highly vertically integrated, since size and scale are an important competitive advantage, particularly in bulk transportation of the juice. During the recent past, the international orange juice marketing chain has been marked by different developments, such as the penetration of global beverages brands (e.g. Coca-Cola with Minute Maid and Pepsi-Cola with Tropicana) and the concentration in FCOJ (frozen concentrate orange juice) supply. The Brazilian industrial sector has been buying plants in Florida to produce the juice there, in order to overcome tariff barriers, increase buying and selling power, and be better positioned in the US market (e.g. reducing transport costs), particularly in the Not-from Concentrated orange juice segment, whose demand is continuously increasing.[170]

Global retail chains are also playing an increasing role in the distribution of produce in developed countries, mainly in the EU and US. This tendency is also developing in Latin America and Asia. Increasing concentration and consolidation in retail chains, as well as their global expansion, has improved their position and augmented their buying power in the market. It allows them to influence the marketing chain in order to better control it, imposing more stringent requirements when determining conditions of production and distribution. Supermarkets demand higher quantities, better qualities and lower prices. This downstream shift of power in the produce marketing chain is leading to increased vertical coordination, mainly through supply chain management practices used by the retail chains. Supermarkets tend to build long-term relationships with preferred suppliers in order to guarantee continuous supply at the required levels of quality. (The new marketing and trade practices of retail chains also include slotting allowances and fees in order to place the product on supermarket shelves, special packaging and other marketing and trade promotion services.)[171] The wholesale sector's importance has declined dramatically as long-term relationships between retailers and growers/shippers have developed. Following suit, some citrus fruit growers and citrus processing companies are reacting by shifting from their production orientation to a more market oriented approach and improving supply chain management in order to better meet these demands.[172]

G. Quality

According to UNCTAD, international quality standards for citrus fruits and products are normally set in Codex Alimentarius. According to UNECE Recommendation for Citrus Fruit (UN Economic Commission for Europe, Agricultural Standards Unit, Fresh Fruit and Vegetables), the citrus fruits must be:
- intact
- free of bruising and/or extensive healed over cuts
- sound; produce affected by rotting or deterioration such as to make it unfit for

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[170] UNCTAD "Info Comm: Market Information in the Commodities Area: Marketing Chain" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

[171] UNCTAD "Info Comm: Market Information in the Commodities Area: Marketing Chain" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

[172] UNCTAD "Info Comm: Market Information in the Commodities Area: Marketing Chain" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

consumption is excluded
- clean practically free of any visible foreign matter
- practically free from pests
- practically free from damage caused by pests
- free of signs of internal shriveling
- free of damage caused by low temperature or frost
- free of all abnormal external moisture
- free of any foreign smell and/or taste.

Maturity of citrus fruit is defined by minimum juice content, minimum total soluble solids content (TSS), and minimum sugar content and coloring.[173]

In California, as specifically authorized in the California Citrus Improvement Program marketing order, an ongoing Quality Assurance Program is conducted by the California Citrus Quality Council (CCQC) under an operating agreement with the California Citrus Research Board.[174] The CCQC is involved in assisting growers in quality control, in quarantine matters, providing technical assistance and helping with international compliance.

In addition to international standards, supermarkets and retail chains are more demanding on quality aspects and they are very strict about third party certification. The industry is therefore increasingly paying attention to chain management and labeling systems in order to be able to trace the produce back to its origin.[175]

H. Environmental and Phytosanitary Concerns

Two of the main phytosanitary problems confronted by citrus producers are citrus canker and the Mediterranean fruit fly. Both have the potential to create an economic disaster for citrus growers.

Citrus canker is a plant disease caused by a bacterial pathogen that affects a variety of citrus species and citrus relatives. Symptoms are brown, raised lesions surrounded by an oily, water-soaked margin and a yellow ring or halo appearing on leaves and fruit. Old lesions in leaves may fall out, creating a shot-hole effect. Current regulations prohibit the movement of citrus plants, seeds and any other citrus plant parts from quarantined areas, allow the movement of fruit only to non-citrus producing states, and require that an area be free from citrus canker for a period of 2 years before it may be removed from the quarantined list.

The Mediterranean fruit fly (Ceratitis capitata), commonly called med fly, or Moscamed in Spanish is one of the world's most destructive agricultural pests. The female med fly

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[173] UNCTAD "Info Comm: Market Information in the Commodities Area: Quality" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

[174] http://www.citrusresearch.com/ccqc/home.asp. Accessed 1/31/05.

[175] UNCTAD "Info Comm: Market Information in the Commodities Area: Quality" http://r0.unctad.org/infocomm/anglais/orange/chain.htm Accessed January 31, 2005.

pierces the soft skin of fruit and lays eggs in the puncture. The eggs hatch into larvae (maggots), which feed inside the fruit pulp, before entering the pupal stage and adulthood.

The adult med fly is slightly smaller than a common housefly and is very colorful. Under tropical summer weather conditions, the med fly completes its life cycle in 21 to 30 days. It is distributed throughout the Mediterranean region, southern Europe, the Middle East, western Australia, South and Central America, and Hawaii. In general, it's found in most tropical and subtropical areas of the world.

The med fly became established in Hawaii in 1910. Hawaii remains infested with this pest and no eradication program is currently under way. The first U.S. mainland infestation occurred in Florida in 1929. Several infestations have occurred on the mainland since then. However, state and federal eradication programs in California, Florida and Texas have prevented it from becoming established.[176]

In December 2001, clementines from Spain were banned by USDA after live Mediterranean fruit fly larvae were found in several shipments already in the United States. In October 2002, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) amended its regulations to allow the importation of clementines from Spain to resume under controlled conditions. The new requirements include provisions that the clementines be grown in accordance with a Mediterranean fruit fly management program established by the government of Spain, that the clementines be subject to an inspection regimen that includes fruit cutting before and after cold treatment, and that the clementines meet other conditions designed to protect against the introduction of the Mediterranean fruit fly.

[176] Campbell, Kate, Assistant editor. "Med fly in Spanish oranges sparks citrus emergency" December 5, 2001, http://www.cfbf.com/agalert/2001/aa-120501b.htm

VII. Conclusions

Future Research Questions

Olives and Olive Oil

There are several research questions that grow out of this brief description that deserve more in depth analysis. First, there are grounds for future research in the area of supply and demand. How will the changing production structures (the shift away from traditional techniques and towards super high density olive farming) affect supply? How will the decrease or decoupling of EU subsidies affect supply? How can traditional social, cultural, and environmental objectives in the EU be met without distorting world trade? What impact will new world producers such as Argentina, Chile, and Australia have on supply and prices? In addition, the supply side of the equation must be counterbalanced by a better understanding of demand. What is the price elasticity of olive oil compared to other vegetable oils, in Europe, the US and other countries? (Interestingly, the price elasticity of demand varies widely across the EU. The elasticity is very low in Greece and Italy (-0.16). However, it is appreciable in Spain (-0.44) where the gap between olive oil prices and seed oil prices plays a key role in the decision to purchase olive oil. The elasticity of demand in France and other non-producing countries is even higher (-0.47).[177] How has the "heart healthy" campaign affected the demand for olive oil sales? Will olive oil demand continue to increase on a worldwide basis?

Second, from a marketing perspective, how can marketing increase general demand in the US and in the world? To what extent can product differentiation create premia for high quality, high cost producers? What roles do standards and labeling play in this process? Can and will the US adopt IOOC standards? What impact will this have on current importers and on California producers? Can California create a niche market for California olive oil as they have done for California wine in the US and in the world? What is the role of geographical indicators in marketing olives and olive oil?

Third, in what ways will regional and bilateral trade agreements be trade creating and trade diverting with respect to olive and olive oil productions and sales. What role will new world producers play? And finally, how will multinational corporations take advantage of these agreements to gain preferential access to new or expanding markets?

Tree Nuts

Tree nuts face many of the same issues as olives. In particular what is the right balance between extensive and intensive production? How can tree nut groves that provide environmental benefits be supported in a non-trade distorting manner? What third countries are likely to emerge as major competitors? How will bilateral and regional trade deals affect imports and exports in the EU and the US? Who benefits from country of origin labeling: consumers, producers, or importers? Can and should quality standards be harmonized?

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[177] "Working paper of the Directorate General for Agriculture; The Olive Oil and Table Oil Sectors" http://europa.eu.int/comm/agriculture/markets/olive/reports/rep_en.pdf Accessed September 23, 2004.

Grapes and Wine

This brief analysis of the grape and wine sectors in the US and the EU raises many questions that should be addressed in greater detail. For instance, how is the conversion of vineyards in Europe going? Is it resulting in greater consolidation? How will this affect wine trade in the EU and in the world? Are the EU's domestic subsidies trade distorting? Under what conditions would the EU agree to reduce these subsidies? How can regional and environmental objectives best be met in a non-trade distorting way? How do export subsidies affect the international wine trade? If these are eliminated in the Doha Round, who will be the winners and who will be the losers? How will enlargement affect the EU's wine regime over the next few years? How will it affect low cost producers of 'table wine' that those countries hope to export to the EU?

What role should the WTO play in resolving the question of geographic indicators (GIs) and traditional expressions (TEs)? Should such a regime be mandatory or voluntary? Should it be negotiated in the TRIPS Group or the Agriculture Group? Should the WTO play a role in achieving the mutual recognition of oenological and labeling practices?

How do bilateral or regional trade agreements affect wine trade? Who will gain and who will lose market share from these agreements? How will bilateral agreements deal with country of origin labeling? Should labels be harmonized or mutually recognized to decrease transaction costs? Should oenological practices be harmonized or mutually recognized in these bilaterals?

What is the role of producer groups and trade associations in the various wine producing countries? Who will gain from greater market differentiation? How should 'table wine' be defined? How should trade in table wine be regulated (if at all)? What laws and regulations exist at the member state level in the EU and at the state level in the US that affect wine trade? What are the parameters of the table grape and raisin markets? How will bilateral and multilateral trade agreements affect these markets?

Tomatoes

The study of tomatoes raises several questions for future research. The rapid degradability of fresh tomatoes has spawned development of GM products, raised questions about the use of ethylene, and generated an organic push towards heirloom tomatoes. Further research should be done to determine the health costs and benefits of these various approaches. A cost benefit analysis of labeling and traceability as now required by the EU should also be conducted. Will these requirements hinder trade in fresh produce? Will they allow greater market differentiation? Will they serve as a non-tariff barrier that can still be used to protect domestic produce.

A second major set of questions raised by this brief analysis centers on the role of regional trade agreements. Both the US and the EU have regional trade agreements with second and third world producers of fresh fruit and vegetables. What impact will these agreements have on domestic producers? Because of the short shelf life of these products, should the government focus on harmonizing quality standards in the region rather than pursuing a multinational agreement.

Finally, the processing of tomatoes also raises a series of questions. Should processors be subsidized? What happens if processed goods contain GM products? How should

processed products be marketed? What multilateral agreements should apply to processed products? Should geographic indicators be used on processed products? The fact that processed tomato products are used in so many other products requires a more in depth look at the processed food industry and the different regulations that exist to monitor this industry in the US and the EU.

Citrus

Analysis of the citrus sector raises at least three important questions for future research. First, more research should be done on the impact of regional trade agreements. Central and South America show greater potential both as export markets and as world competitors for US citrus producers than does the EU. Likewise Spanish citrus producers face competition from countries in the Middle East and North Africa as well as Brazil. The eventual creation of the Mediterranean Free Trade Area (projected at 2010) will have a great affect on EU citrus production. In this commodity area, the problems faced by EU and US producers are very similar although EU producers will have a harder time adjusting to a free market because they currently have higher levels of subsidies.

A connected and fascinating question deals with multinational investment. Brazilian investors are interested in investing in orange groves and processing plants in the US to reduce tariffs and gain better access to the US market. (This is also occurring in the olive sector). Whether a similar phenomenon is occurring in the EU deserves further attention. The extent to which regional trade agreements will facilitate this trend or make it unnecessary remains to be seen.

Finally the citrus industry shows a degree of vertical integration that is not manifested in most of the other sectors included in this study. The agreements between producers, processors, shippers and retail chains are very important in the marketing process for citrus. This is partly possible because citrus is not highly differentiated like wine or even olive oil. Is the degree of market concentration positive or negative from the producers' perspective and from the consumers' perspective? How did this level of market integration occur? Would a similar market structure be beneficial for other commodities such as tree nuts? Tomatoes are integrated to some extent into a global market, but might the commodity benefit from further integration?

Lee Ann Patterson

Tim Josling

European Forum

Stanford Institute for International Studies

29 April, 2005

Annex 1: Data Sources

Olives and Olive Oil

Many of the most relevant data sources have been referenced in the footnotes. Other sources of information which warrant further investigation include olive sector studies being done in Mediterranean universities and research institutes, IOOC databases, California Agricultural Extension Agency information, COOC databases, and ongoing olive sector studies being conducted by the US Department of Agriculture and the EU's DG Agriculture. Finally, interviews with California and EU producers might also prove helpful.

Tree Nuts

The USDA provides many reports on tree nuts through the Economic Research Service, the Foreign Agriculture Service, the Agricultural Marketing Service, and the Animal Plant Health Inspection Service.

Codex Alimentarius deals with issues related to aflatoxins.

European Parliament Report STOA506EN: PE nr.311.192: author Pascual Ferrer

Blue Diamond Cooperative

UC Davis, Department of Agriculture and Resource Economics

DG Agriculture, Commission of the European Communities

EUROSTAT

FAOSTAT

Grapes and Wine

There are many sources of data on grapes and wine:

California agricultural facts and statistics are available from the California Farm Bureau (www.fb.com) and the California Agricultural Statistics Service (www.nass.usda.gov/ca).

US export and import statistics are available from the US Foreign Agriculture Service. (www.fas.usda/gov/scriptsw/bico/bico_frm.asp).

Individual state data is available from the USDA National Agricultural Statistics Service. (www.usda.gov/nass/sso-rpts.htm).

The US Bureau of Alcohol, Tobacco and Firearms is responsible for administering alcohol related federal law. This responsibility will be transferred to the Tax and Trade Bureau within the Treasury Department as part of the Homeland Security Act of 2002.

The OIV, International Office of Vine and Wine is an inter-governmental organization of scientific and technical nature working in the field of vine and vine based products. The OIV puts together reports on general statistics, world grape supplies, geographic indications, pesticide residues, international methods of chemical analysis, and models of certificates of analysis. (www.oiv.int).

There are several consulting firms that provide industry analysis including among others: ACNeilson, Adams Business Research, Beverage Data Network, Euromonitor International, Datamonitor, Merrill Research and Associates, Scarborough Research.

There are also numerous trade and research journals related to production and management techniques, marketing, sales, finance and administration. There are also many consumer publications that discuss specific wines, travel and entertaining.

Another source of information are the national associations including the American Society for Enology and Viticulture (ASEV), the American Vineyard Foundation (AVF), the California Association of Winegrape growers (CAWG), Family Winemakers of California, the National Alcohol Beverage Control Association, the Wine Institute, and WineAmerica.

There are also several regional associations including the Napa Valley Vintners Association and the Organic Grapes into Wine Alliance. The Napa Valley wine library located at the St. Helena public library and the Sonoma County Wine Library located at the Healdsburg Regional Library also contain a wealth of information on viticulture and the wine business. Finally, the following US and EU university programs focus on wine:

1) Sonoma State University, School of Business and Economics, Wine Business Program,

2) Napa Valley College, Dept of Viticulture and Winemaking Technology,

3) University of California Davis, Department of Viticulture and Enology,

4) California State University Fresno, Department of Enology, Food Sciences and Nutrition,

5) California Polytechnic State University San Luis Obispo,

6) Forschungsanstalt Geisenheim, Germany,

7) Universite de Bourgogne-Institut Jules Guyot, Institut Universitaire de la Vigne et du Vin,

8) Univeriste Victor Segelan Bordeaux 2, Faculte d'Oenologie, and

9) Universite Montpeliar 1, UFR Sciences Pharmaceutiques et Biologiques.

Tomatoes

There are several good sources of information on tomatoes. Government sources include the Foreign Agriculture Service and the Economic Research Service. The EU Commission (DG VI) also publishes information on the fruit and vegetable regime in the EU. The Food and Agriculture Organization publishes production and trade statistics. The World Trade organization keeps an up-to-date database of dispute settlement cases. There are also several academic sources such as the Agricultural Issues Center at the University of California, Davis that produce both commodity profiles and in depth sector studies. In addition, the faculty at Davis has a wide range of knowledge and frequently publishes articles ranging in topic from market structure to regulatory frameworks, and

from agronomy to trade analysis. The California Tomato Commission can also provide some information on tomato production and trade issues.

Citrus

There are a wide variety of data sources on citrus production and trade. These include several multinational organizations:

- UNCTAD Info Comm - Market information in the Commodities Area
- FAO Intergovernmental Group on Citrus Fruit
- FAO Citrus Commodity Notes
- FAOSTAT Agricultural Data
- WTO and WTO Dispute Panels.

US government sources include:

- Economic Research Service
- Foreign Agriculture Service: Attaché Reports
    - Citrus Situation and Orange Juice Situation
    - Citrus: US and World Situation
    - Juices: US and World Situation
    - Orange Juice Situation
- US National Agricultural Statistics Service (NASS): NASS Citrus Production Annual Report

State government sources include:

- Florida Department of Citrus
- Florida Agricultural Statistics Service
- University of Florida: Institute of Food and Agriculture Sciences
- California Agriculture Statistics Service
- UC Davis

EU sources include:

- DG Agriculture see Regulations 2200/96, 2201/96, 2699/2000, 1092/2001 in particular
- EUROSTAT
- Spain: Ministerio de Agricultura, Pesca y Alimentación

Industry Sources include (among others)

- Florida Citrus Mutual and Sunkist

Annex 2: Categories of Olive Oil

The IOOC recognizes two categories of oil: olive oil and olive pomace oil. Olive oil is defined as oil obtained solely from the fruit of the olive tree (Olea europaea L) to the exclusion of oils obtained using solvents or re-estrification processes and of any mixture of oils with other kinds. Olive pomace oil is obtained by treating the olive pomace with solvents or other physical treatments, to the exclusion of oils obtained by re-estrification processes and of any mixture with oils of other kinds. Under the category of olive oil, virgin olive oils are obtained from the fruit of the olive tree solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decantation, centrifugation, and filtration. Virgin olive oils fit for consumption include:

1) **extra virgin olive oil** : virgin olive oil which has a free acidity, expressed as oleic acid, of not more than 0.8grams per 100 grams,

2**) virgin olive oil**: virgin olive oil which has a free acidity, expressed as oleic acid of not more than 2 grams per 100 grams, and

3) **ordinary virgin olive oil**: virgin olive oil which has a free acidity, expressed as oleic acid of not more than 3.3 grams per 100 grams.

(Virgin olive oil not fit for consumption is designated as lampante virgin olive oil. This is virgin olive oil which has a free acidity, expressed as oleic acid, of more than 3.3 grams per 100 grams.)

Refined olive oil is olive oil obtained from virgin olive oils by refining methods that do not lead to alterations in the initial glyceridic structure. It has a free acidity expressed as oleic acid of not more than 0.3 grams per 100 grams.

Olive oil is the oil consisting of a blend of refined olive oil and virgin olive oils fit for consumption as they are.

Under the category of olive pomace oil there are three designations:

1) **crude olive pomace oil**: has the characteristics that correspond to this category. It is intended for refining for use for human consumption or technical use.
2) **Refined olive-pomace oil**: is the oil obtained from crude olive-pomace oil by refining methods which do not lead to alterations of the initial glyceridic structure. It has a free acidity, expressed as oleic acid, of not more than 0.3 grams per 100 grams.

Olive-pumace oil: is oil comprising a blend of refined olive-pomace oil and virgin oils fit for consumption as they are. It has a free acidity of not more than 1 gram per 100 grams.

Annex 3: International EU Tariff Rates Applied on Wine

In containers of 2 liters or less:	**Duty (ECU/hl)**
Wine; alcohol < 13%	15.3
Wine; alcohol > 13% but < 15%	17.9
Marsala, port, madeira, sherry, today; alcohol > 15% but < 18%	17.3
Samos, other; alcohol > 15% but < 18%	21.8
Port, madeira, sherry, tokay; alcohol > 18% but < 22%	18.5
Other; alcohol > 18% but < 22%	24.4
Wine; alcohol above 22%	2.04*
*ECU/ % vol/hl	

In containers over 2 liters:	**Duty (ECU/hl)**
Wine; alcohol < 13%	11.6
Wine; alcohol > 13% but < 15%	14.1
Port, madeira, sherry; alcohol > 15% but < 18%	14.1
Tokay; alcohol > 15% but < 18%	15.3
Marsala, samos, other; alcohol > 15% but < 18%	17.9
Port, madeira, sherry; alcohol > 15% but < 18%	15.3
Tokay; alcohol > 18% but < 22%	16.6
Other; alcohol > 18% but < 22%	24.4
Wine; alcohol above 22%	2.04*
*ECU/ % vol/hl	

Source: "WTO Talks: EU Steps up Bid for Better Protection of Regional Quality Products," http://europa.eu.int/rapid/pressReleasesAction.do?reference+IP/03/117 (Accessed November 2, 2004).

Annex 4: Tariff rates facing US wines in selected export markets, 2001 [178]

Argentina 35 percent *ad valorem*

Australia 5 percent *ad valorem*

Canada* Free

Chile 8 percent *ad valorem*

China 65 percent *ad valorem* (will drop to a final rate of 14 percent *ad valorem* after WTO entry)

European Union** Sparkling wine: 0.32 Euros per liter (appr. $0.28 US). Standard wine (8.5% alc. vol. to 15% alc. vol.): 0.13-0.15 Euros per liter (appr. $0.11-$0.13 US)

Hong Kong 60 percent *ad valorem*

Israel* 42 percent *ad valorem*

Japan 15 percent *ad valorem*

Mexico* 4 percent *ad valorem*

Poland Sparking wine: 30 percent *ad valorem* with a minimum of 0.42 Euros per liter (appr. $0.37 US)
Standard wine: 30 percent *ad valorem* with a minimum of 0.25 Euros per liter (appr. $0.22 US)

Taiwan $119 New Taiwanese dollars per liter (appr. $3.45 US)

Singapore Sparkling wine: $13.00 Singapore dollars per liter (appr. $7.12 US)
Standard wine: $9.50 Singapore dollars per liter (appr. $4.20 US)

Switzerland Sparkling wine: 91 Swiss francs per 100kg (appr. $54.7 US)
White wine (subject to a tariff rate quota): 50 Swiss francs per 100kg (appr. $30 US)
Red wine: 3 Swiss francs per 100 kg (appr. $1.8 US)

Thailand 55.8 % *ad valorem* or 18.6 Baht per liter
(appr. $0.42 US)

Philippines 5 percent *ad valorem*

* Indicates preferential tariff rate

**includes the 15 member states of the EU in 2001

Wine defined by Harmonized Tariff System 2204.10-2204.30

Source: JBC

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[178] http://winebusiness.com/html/MonthlyArticle.cfm?AId=51711&issueId=51203 written January 15, 2002. Accessed November 30, 2004.