

CENTRAL VALLEY POSTHARVEST NEWSLETTER

COOPERATIVE EXTENSION

UNIVERSITY OF CALIFORNIA

Kearney Agricultural Center
9240 S. Riverbend Avenue, Parlier, CA 93648 USA
(559) 646-6500

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Carlos H. Crisosto, Editor
carlos@uckac.edu

Contents:

- **Increasing Kiwifruit Size! Prestige (CPPU) Approved for Kiwifruit**
- **Increasing 'Blackamber' Plum Consumer Acceptance**
- **Olive Oil Facts: An Interview with Paul Vossen**
- **Top Ten Factors in Producing Quality Olive Oil**
- **How to Handle and Store Your Olive Oil**
- **Future Dates**
- **Subscription Form**

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INCREASING KIWIFRUIT SIZE! PRESTIGE (CPPU) APPROVED FOR KIWIFRUIT

Barbara Windmiller
California Kiwifruit Commission
barbara@kiwifruit.org

New Prestige™ Plant Growth Regulator (PGR) from Valent is registered and now available for California kiwifruit growers as of March 15, 2005.

One timely application of Prestige PGR increases both kiwifruit size and yield to help growers maximize the value of their crops at packout, according to Valent sources.

For best results, Valent recommends growers apply:

- 32 oz. of Prestige in 100-200 gallons per acre.
- When fruit is 30-45 mm in diameter (typically 2-3 weeks after bloom).

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(See following label information.)

Plant Growth Regulator

Prestige™

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OTHER INGREDIENTS	99.20%
TOTAL	100.00%

This package contains 8 grams active ingredient.

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See attached booklet for First Aid, storage/disposal statements, additional precautionary statements and directions for use.

AGRICULTURAL USE REQUIREMENTS
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. Refer to attached booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.



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EPA Est. No. 33762-IA-001
List No. 05250-04-01

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INCREASING 'BLACKAMBER' PLUM CONSUMER ACCEPTANCE

Carlos H. Crisosto

Plant Sciences Department, UC Davis
located at Kearney Agricultural Center

'Blackamber' plum (*Prunus salicina* Lindell) consumer acceptance and market life were highly dependent on harvest date. For fruit within the most common industry ripe soluble solids concentration (RSSC) range (10.0-11.9%), ripe titratable acidity (RTA) played a significant role in consumer acceptance. Plums within this RSSC range combined with low RTA ($\leq 0.60\%$) were disliked by 18% of consumers, while plums with RTA $\geq 1.00\%$ were disliked by 60% of consumers. Plums with RSSC $\geq 12.0\%$ had ~ 75% consumer acceptance, regardless of RTA. Fruit harvested between 8-4 lbf had high consumer acceptance because of lower RTA and higher RSSC than earlier harvested fruit. Ripening plums before consumption decreased TA by approximately 30% from the TA measured at harvest. In some cases, this decrease in TA during ripening may increase the acceptability of plums that would otherwise be unacceptable.

Development of chilling injury symptoms limited market life of fruit harvested early (10-8 lbf) and late (4-3 lbf). Late harvested fruit were more likely to develop flesh translucency (overripeness) when stored at 5°C, whereas early harvested fruit had low consumer acceptance and were more prone to develop flesh browning during storage at 0 or 5°C (Fig. 1).

Based on this work, 'Blackamber' plums are well adapted to a controlled late harvest but proper postharvest temperature management, including ripening, and marketing within its market life potential are necessary to avoid the onset of storage disorders and maintain flavor. This recommendation should be extended to other Japanese plums such as 'Fortune', 'Friar', 'Royal Diamond', and 'Angeleno', that are

even less likely to bruise during postharvest operations. Our work suggests the use of firmness as an indicator of how late to safely harvest ("Tree Ripe"), thereby maximizing orchard quality for other plum cultivars too. However, the decision when to harvest should also take into account other factors such as fruit drop, environmental conditions, hand labor availability, market prices, distance to market, potential transportation damage, and temperature management at the receiving location.

To maximize flavor and storage potential, 'Blackamber' plums should be harvested when they reach a minimum SSC within the range of 10.0-12.0% and a titratable acidity $< 0.70\%$, but with a firmness 8-4 lbf. Any fruit in the population with firmness ≤ 4.0 lbf will likely be bruised during standard postharvest operation. This work also pointed out the need for plum ripening at the production site prior to shipment as it has been recommended for peaches or at the warehouse before retail display. Our ongoing sensory work on plum, peach and nectarine cultivars suggested that the relationship between consumer acceptance and quality attributes will be cultivar dependent; thus, the establishment of a minimum quality index based on SSC or SSC:TA needs to be evaluated for each cultivar. Also, plums should be marketed and consumed within their potential market life. This information provides guidance for growers, packers, shippers, handlers and retailers in designing their postharvest strategy to increase plum consumption.

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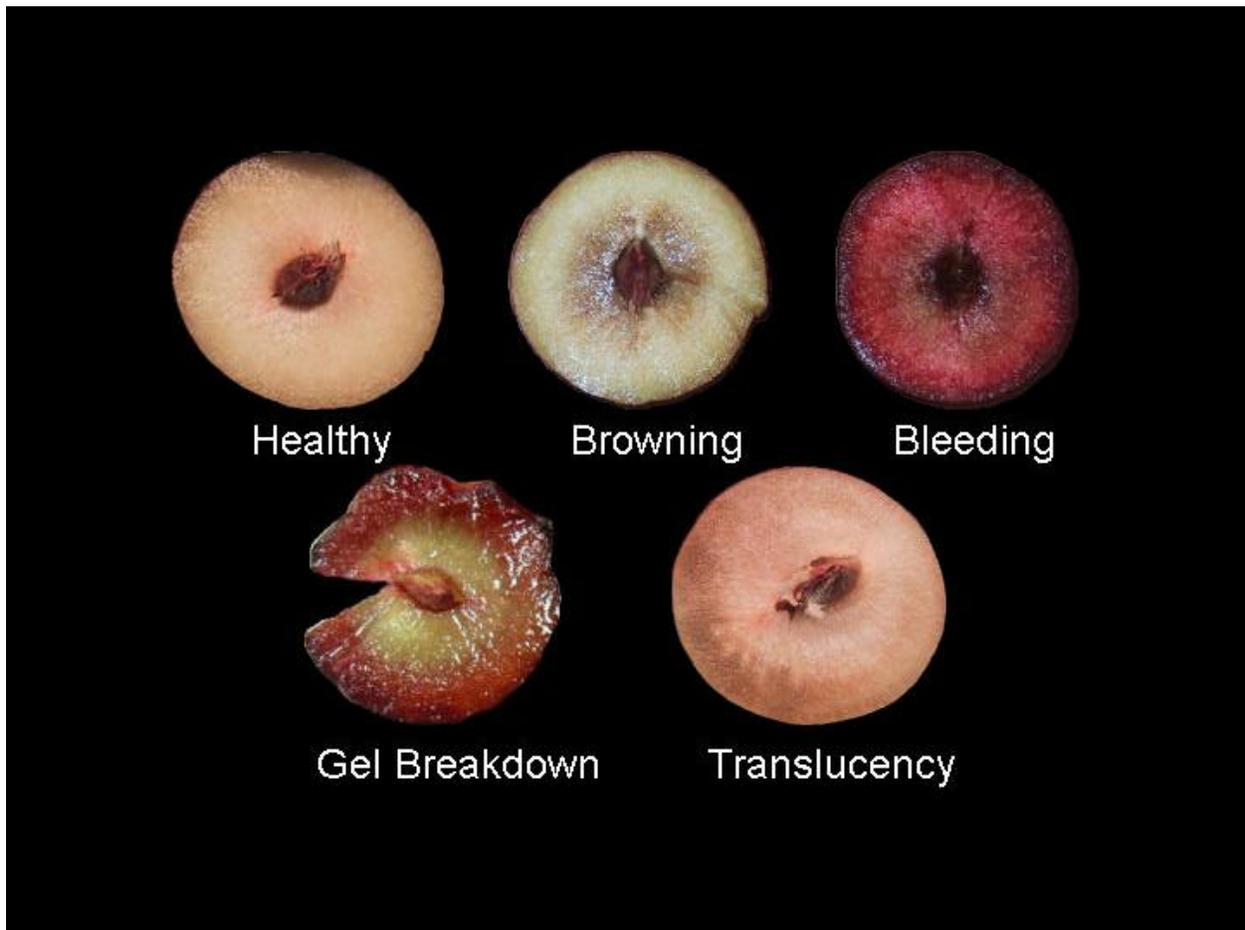


Fig. 1. 'Blackamber' plum chilling injury symptoms observed during cold storage: flesh browning, flesh bleeding, gel breakdown, flesh translucency (overripe).

OLIVE OIL FACTS: AN INTERVIEW WITH PAUL VOSSEN

Paul Vossen and Alexandra Devarenne

pmvossen@ucdavis.edu

Univ. of California Cooperative Extension
133 Aviation Blvd., Santa Rosa, CA 95403

Carlos H. Crisosto

Plant Sciences Dept., UC Davis
located at Kearney Agricultural Center

What are the benefits of Olive Oil?

Most animal and vegetable fats contain monounsaturated fat, but in varying quantities. It is usually in liquid form at room temperature, but it may begin to solidify if it is chilled. Monounsaturated fat (fatty acids) is the most desirable type of fat in the diet because it helps to decrease the LDL (bad) cholesterol and helps to increase the HDL (good) cholesterol in the blood. By replacing the saturated fats in your diet with monounsaturated fat, the low-density lipoprotein (LDL) cholesterol level is lowered. However, the beneficial high-density lipoproteins are left alone; thus the dangerous, artery clogging fat does not continue to accumulate.

Good sources of monounsaturated fat are olive oil, canola oil, peanut oil, and most nuts. Among them, olive oil has the highest percentage (about 77%) of monounsaturated fat and has a high content of antioxidative (polyphenolics) substances and Vitamin E. These substances can stop damage in your arteries before it starts. Polyphenols are powerful antioxidants found in olive oil. These antioxidants disable the free radical oxygen molecules produced naturally by your body, keeping free radicals from attacking the low-density lipoprotein cholesterol (LDL) which lowers the chances that they will stick to artery walls, clogging them and causing heart disease.

Olive oil consumption has been linked to the following health benefits:

- Lowers the risk of heart disease.
- Reduces the level of LDL (bad) cholesterol.
- Lowers blood pressure.
- Decreases blood sugar levels.
- Increases the absorption of several vitamins including A, D, E, and K.
- Stimulates the gall bladder to secrete bile, which helps to prevent gallstones.
- Promotes cellular growth, speeds healing, and helps metabolism.
- Prevents oxidation of fatty acids, which reduces the risk of arteriosclerosis and some forms of cancer.

Olive oil is also beneficial for the skin and hair. Overly dry skin or sun damaged skin can be soothed with the application of olive oil. Some people apply olive oil to the skin to prevent wrinkles, although there is no scientific evidence to support this. Olive oil promotes shiny and full-bodied hair and a healthy scalp.

In order to get the most benefit from olive oil, make sure to look for extra virgin olive oil. This oil comes from the very first cold press of the olive and contains the highest and purest amounts of disease fighting polyphenols and vitamin E. In spite of the health benefits of olive oil, it should not be overused, because like all other edible oils, it is a high source of calories. One tablespoon of olive oil contains about 120 calories, but because it is so flavorful, a little can go a long way when used as cooking oil, a salad dressing, or condiment.

What Is the World Olive Oil Consumption (Liter per Capita)?

Country	Liters
Greece	26.1 (1/2 liter per week)
Spain	15.0
Italy	13.5
European Union (EU)	5.4
Australia	1.2
USA	0.6

What is the World Olive Oil Acreage?

<u>Country</u>	<u>Acreages</u>
Spain	6.0 million
Tunisia	3.8 million
Italy	3.5 million
Greece	2.5 million
Portugal	1.3 million
Turkey	1.2 million
Morocco	1.1 million
Syria	1.0 million
Argentina	245,000
Australia	100,000
USA	6,000 (oil) and 35,000 (table)

What is California Olive Oil Production?

<u>Season</u>	<u>Liters</u>
1998-1999	896,800
1999-2000	940,690
2000-2001	526,095
2001-2002	936,666
2002-2003	1,008,140
2003-2004	1,163,047
2004-2005	1,455,590

Is there a Standard for Olive Oil Quality Control in the World?

In the Mediterranean areas in Europe where most of the olive oil is produced and consumed exists the International Olive Council (IOOC) Standard for Olive Oil that defines, establishes and enforces olive oil quality.

International Olive Oil Council (IOOC) Trade Standard for Olive Oil

The International Standards under resolution COI/T.15/NC no 3-25 (revised June 2003) lists ten grades of olive oil under two primary categories – (1) Olive Oil and (2) Olive Pomace Oil. The standard is in compliance with Codex Alimentarius standards regarding olive oil. The IOOC standard oils must meet certain criteria for inclusion into specific categories. The olive oils must not be adulterated with any other type of oil, must

pass a sensory analysis by a certified panel of tasters, and meet the analytical criteria. The standard indicates all the tests used to determine genuineness and purity plus the legal requirements for the label. Olive oil is defined as oil obtained solely from fruit of the olive tree (*Olea europaea sativa*). Virgin oils further are obtained solely by mechanical means that do not lead to alterations in the oil.

The numerical sensory values for each of the first three grades (extra virgin, virgin, and ordinary virgin) come from a rating of the oil by a qualified taste panel that has been officially recognized by the IOOC. The majority of the tasters, usually five of eight, must agree statistically on the rating of the oil indicating the same defect, if any is present, and similar intensity for fruitiness, bitterness, and pungency. These are the official definitions of each of the ten grades:

2.1 OLIVE OIL CATEGORY

Oil obtained solely from the fruit of the olive tree (*Olea europa L.*) to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds (seed or nut oils).

2.1.1 Virgin Olive Oils – obtained solely by mechanical or physical means under thermal conditions that do not lead to alterations in the oil; using only treatments such as washing, decantation, centrifugation, and filtration. Those fit for human consumption are as follows:

- i. **Extra Virgin Olive Oil:** This oil, as evaluated numerically by the mean of a certified taste panel, contains zero (0) defects and greater than zero positive attributes. In other words, more than half of the tasters indicated that it is not defective and has some fruitiness. Extra-virgin oil also must have a free acidity percentage of less than 0.8 and conform to all the standards listed in its category.

This is the highest quality rating for an olive oil. Extra virgin olive oil should have clear flavor characteristics that reflect the fruit from which it was made. In relation to the complex matrix of variety, fruit maturity, growing region, extraction technique, and blends, extra virgin olive oils can be very different from one another.

- ii. **Virgin Olive Oil:** This is oil with a sensory analysis rating of the mean of tasters, having defects from 0 to less than 2.5, a free acidity of less than 2%, and conforms to all the other standards in its category. These are oils with analytical and sensory indices that reflect slightly lower quality than extra virgin olive oil.
- iii. **Ordinary Virgin Olive Oil:** Oil with a lower organoleptic rating (defects from the mean of tasters 2.5 to less than 6.0), a free acidity of less than 3.3%, and conformity within its category for all other standards. This is inferior oil with notable defects that is not permitted to be bottled under European Union (EU) laws, so it is sent for refining. The EU has eliminated this category and other regulating agencies are likely to follow. It will simply be absorbed into the lampante category.

2.1.1.2 Virgin Olive Oil – Not Fit for Human Consumption (Lampante) – Oil with severe defects (greater than 6.0) or free acidity of greater than 3.3%, and which conforms to the other standards within its category. It is not fit for human consumption and must be refined. These oils come from bad fruit or from improper handling and processing.

2.1.2 Refined Olive Oil – Not Fit for Human Consumption – Oil obtained from virgin oils by refining methods that do not alter the initial glyceride structure. It has a free acidity of less than 0.3 and must conform to the other standards within its category. The

origin of refined olive oil must not come from the solvent extraction of pomace. The refining process usually consists of treating bad virgin oil/lampante with sodium hydroxide to neutralize the free acidity, washing, drying, odor removal, color removal, and filtration. In the process, the oil can be heated to as high as 430°F (220°C) under a vacuum to remove all of the volatile components. Refined olive oil is usually odorless, tasteless, and colorless. It is not fit for human consumption in many countries including the EU.

2.1.3 Olive Oil – Oils that are a blend of refined and unrefined virgin oils. It must have a free acidity of not more than 1% and conform to the other standards within its category. This grade of oil actually represents the bulk of the oil sold on the world market to the consumer. Blends are made in proportions to create specific styles and prices. Oils in the US labeled as “Extra Light” would most likely be a blend dominated by refined olive oil. Other blends with more color and flavor would contain more virgin or extra virgin olive oil.

2.2 OLIVE POMACE OIL CATEGORY

Oil obtained by treating olive pomace with solvents. It does not include oils obtained in the re-esterification processes or any mixture with oils of other kinds (seed or nut oils).

2.2.1 Crude Olive-Pomace Oil – Not Fit for Human Consumption – This is the solvent extracted crude oil product as it comes out of the pomace extractor after distillation to separate and recover most of the solvent. EU law also defines any oil containing 300-350 mg/kg of waxes and aliphatic alcohols above 350 mg/kg to be crude pomace oil. It is not fit for human consumption, but is intended for refining.

2.2.2 Refined Olive-Pomace Oil – Not Fit for Human Consumption

– Oil obtained from crude pomace oil by refining methods that do not alter the initial glyceride structure. It has a free acidity of not more than 0.3% and its other characteristics must conform to the standard in its category. Refining includes the same methods used for “refined olive oil” except that the source of the raw product comes from pomace by means of solvent extraction. It is not fit for human consumption in many countries and under EU laws.

2.2.3 Olive-Pomace Oil – A blend of refined olive-pomace oil and virgin olive oil that is fit for human consumption. It has a free acidity of not more than 1% and must conform to the other standards within its category. In no case shall this blend be called “olive oil.”

What Are the Olive Oil Sensory (Organoleptic) Quality Attributes?

According to the International Olive Oil Council Organoleptic Assessment of Olive Oil there are five common negative sensory attributes (fusty, musty, muddy sediment, winey-vinegary and rancid) and three positive sensory attributes (fruity, bitter, and pungent) that are perceived by consumers.

International Olive Oil Council Organoleptic Assessment of Olive Oil

COMMON NEGATIVE ATTRIBUTES

Fusty – Characteristic flavor of oil obtained from olives stored in piles, which have undergone an advanced stage of anaerobic fermentation.

Musty – Characteristic moldy flavor of oils obtained from fruit in which large numbers of fungi and yeast have developed as a result of its being stored in humid conditions for several days.

Muddy sediment – Characteristic flavor of oil that has been left in contact with the sediment in tanks and vats.

Winey-vinegary – Characteristic flavor of certain oils reminiscent of wine or vinegar. This flavor is mainly due to aerobic fermentation in the olives leading to the formation of acetic acid, ethyl acetate and ethanol.

Rancid – Flavor of oils which have undergone a process of oxidation.

POSITIVE ATTRIBUTES

Fruity – Set of the olfactory sensations characteristic of the oil which depends on the variety and comes from sound, fresh olives, either ripe or unripe. It is perceived directly or through the back of the nose.

Bitter – Characteristic taste of oil obtained from unripe olives. Perceived on the back of the tongue.

Pungent – “Picante” or biting tactile sensation characteristic of certain olive varieties or oil produced from unripe olives. Perceived in the throat.

Do We Need More Olive Oil?

According to the U.S. Bureau of the Census, the resident population of the United States (2004) is ~295,996,219 so if olive oil consumption per capita in the United States is 0.6 liter, we are consuming ~177,597,731 liters. Statistics show that in 2003 we imported 206,733,376 kilograms (~186,078,038 liters) of olive oil and we produced 1,008,140 liters; thus the majority of the olive oil consumed in our country is imported from Europe and distributed in our stores around the country.

How Is Olive Oil Quality Controlled in California and the USA?

Actually there is no an enforced quality control in the USA and California. The members of the California Olive Oil Council, Inc. (COOC) are joined in a mission to make California an economically-sustainable source of world-class extra virgin olive oil. The main purpose is the establishment and maintenance of a reputation both for producing the highest quality oil, and for practicing unimpeachable truth in labeling. The members recognize that any labeling or marketing practice that is misleading to the consumer or unfair to competitors may jeopardize that reputation.

Therefore, as a condition of membership in the COOC, producers and marketers agree as follows:

- To make every effort to avoid misleading consumers with respect to olive oil.
- Any oil labeled as extra virgin olive oil from California that is produced, bottled or labeled will be certified as extra virgin by the COOC, and all marketing activities and materials will be consistent with the terms and conditions of that certification.
- Any oil labeled as extra virgin olive oil from areas other than California that is produced, bottled or labeled will conform to the relevant labeling standards of the International Olive Oil Council in effect as of July 1, 2004, and all marketing activities and materials will be consistent with those standards.

California Extra Virgin Olive Oil Standards

- a) 100% of the oil is from olives grown in the State of California in the United States of America, extracted from the fruit solely by mechanical means under conditions that do not lead to the deterioration of the oil.
- b) No chemicals or heat above 27° Celsius were used in the extraction process.

- c) The oil has an acidity, in terms of oleic free fatty acid, of not more than 0.5%, a peroxide value of 20 meq O₂/kg or less, and ultra violet absorbency for extra virgin olive oil per Section 4.4 of the December 2003 IOOC Standards.
- d) The oil, evaluated by an organoleptic tasting panel approved by the International Olive Oil Council, is found to be of extra virgin quality.

Is the Lack of an Olive Oil Standard in the USA Creating a Potential Problem?

Most foreign olive oils labeled as extra virgin are being sold in USA stores but they are presenting sensory defects so they should not be labeled as extra virgin according to current European legislation.

A virgin olive oil should be oil obtained solely from the fruit of the olive tree (*Olea europaea* L.) to the exclusion of oils obtained using solvents or re-esterification processes and of any mixture with oils of other kinds (seed or nut oils) and obtained solely by mechanical or physical means under thermal conditions that do not lead to alterations in the oil, using only treatments such as washing, decantation, centrifugation, and filtration. In addition, extra virgin olive oil should be exempt of any organoleptic defects. The production of this flavorful olive oil which is rich in antioxidants is less efficient and more costly. California growers are producing and marketing extra virgin oil which has high health benefits and excellent flavor. The reason why foreign olive oils are not complying with the *extra virgin olive oil* definition has not been studied in detail, but is happening in part because there is not an enforced definition of extra virgin in the USA. It is not known whether the sensory quality of foreign olive oils has been lost before arrival because of lack of quality control or blending prior to arrival in the USA and/or during our marketing distribution because of wrong handling. The important fact is that this situation is affecting

the development of our California olive oil industry.

CONCLUSION

Add olive oil to your diet and buy California Olive Oil to support California Olive Growers!

TOP TEN FACTORS IN PRODUCING QUALITY OLIVE OIL

Paul Vossen

Univ. of California Cooperative Extension
133 Aviation Blvd., Santa Rosa, CA 95403

1. ***The Olive Should Be Treated as a Fruit*** – The delicate nature of a ripe fruit needs to be protected from pressure, temperature, and abrasion. Breakdown of the fruit begins the fermentation and oxidation process, creating defective oils. Affirmation of this premise is essential in producing quality oil.
2. ***Control Diseases and Pests*** – Any pest that directly attacks the fruit must be controlled to prevent fruit decay.
3. ***Harvest and Transport Fruit with Care and Separate Ground Fruit*** – Do not compromise the integrity of the fruit. Limit the depth of containers to reduce pressure on the fruit. Fruit picked from the ground is second class fruit and should be kept separate from tree fruit.
4. ***Classify, Segregate, and Process Different Classes of Fruit Separately*** – It is well known that different fruit qualities will produce different qualities of oil. Olive fruit should be separated at the processing facility by ground and tree fruit as well as variety, fruit condition, ripeness, or other sanitary condition. Give priority to the best fruit.
5. ***Do Not Store the Fruit*** – Prolonged storage or slow processing of the fruit is contrary to the production of quality oil. Oxidation and fermentation occurs in the stored fruit, which can lead to defects and off flavors in the oil.
6. ***Process the Olives Quickly and at a Moderate Temperature*** – Quality oil comes from fruit that was worked at temperatures below 86°F. This is important for protection of the aromas and reduction of oxidation. Poor quality fruit, however, can be worked at higher temperatures to actually reduce certain undesirable characteristics.
7. ***Sell Several Grades of Oil*** – There should be a whole line of oils offered for the consumer at different prices all classified by quality parameters reflecting the source of olives and oils produced.
8. ***Store the Oil with Care*** – Good storage is extremely important and will permit the proper aging and conservation of desirable flavor components. It is fundamental to store oil in clean stainless steel containers at temperatures below 65°F.
9. ***Keep Everything Clean*** – The failure to maintain cleanliness is a major factor in reducing oil quality since olive oil can so easily become contaminated. Odors from the fermentation of waste products can get into oils in the processing plant. Clean machinery, floors, and walls will prevent rancid odors that can also contaminate the oil. Cleanliness is especially important in the olive washing machines where the wash-water needs to be kept clean at all times.
10. ***Be an Olive Oil Expert*** – Recognize the major defects that can appear in olive oil. Know your customers, educate them about the different classes of olive oil, and know just what it takes to produce, harvest, store, and process olives of high quality. Become familiar with the sensory evaluation of olive oil and be able to help them enjoy this noble food.

(Translated from a Grower Handout – Estación de Olivicultura y Elaiotecnia, Menjíbar Spain – Marino Uceda)

HOW TO HANDLE AND STORE YOUR OLIVE OIL

Paul Vossen and Alexandra Devarenne

Univ. of California Cooperative Extension
133 Aviation Blvd., Santa Rosa, CA 95403

Carlos H. Crisosto

Univ. of California, Davis
Dept. of Plant Sciences
located at Kearney Agricultural Center

Air, heat, light, and age affect the quality and the shelf life of olive oil which deteriorates through oxidation (rancidity). The oxidation process is enhanced when olive oil is stored in containers that are not air sealed and in areas where it is exposed to heat and light. If improperly stored, olive oil can easily take on other flavors. Olive oil is like other oils and can easily turn rancid when exposed to air, light or high temperatures. Olive oil should be kept cool and away from direct light in a tightly sealed container. This will assure your olive oil maintains its flavor and antioxidant qualities.

The best containers for storage are glass (especially tinted glass), ceramic, porcelain, or non-reactive metals such as stainless steel. Do not store olive oil in containers made of reactive metals such as copper or iron. The chemical reaction between the olive oil and the metal will damage the oil and may produce toxins. Olive oil should not be stored in plastic containers because the oil may absorb PVCs from the plastic. Olive oil will oxidize rapidly if it is not kept in a sealed container. If olive oil is stored in a bottle, always replace the cap on the bottle and keep it tightly sealed. Never put olive oil in a container that does not have a tight cap or some other method of sealing the container.

The ideal temperature for storing olive oil is 57°F, although a normal room temperature of 70°F works very well if the olive oil is stored in a dark area where the temperature remains

fairly constant. Refrigeration (41-50°F) will extend the life of olive oil without harming the oil. The oil will become cloudy and solidify in the refrigerator, but this will not significantly affect the quality or flavor. In cold weather, olive oil may turn cloudy, especially if the temperature of the storage area falls below 50°F but when the oil is warmed to room temperature it will return to a liquid state and its color will be restored.

Olive oil should keep a minimum of 15 months if it is properly stored. If it is stored in its original container and remains unopened, it should last for 18 months or more. Olive oil has the best flavor when it is used within a year after it is pressed and it is at its peak within 2 or 3 months after pressing. Unlike many types of wine, olive oil does not improve with age. As olive oil ages, it continually degrades and the acidity level rises. As a result, an older bottle of olive oil may have an unpleasant odor and taste. The oil will be neither harmful if consumed, nor very pleasing.

FUTURE DATES

Organic Olive Production Short Course

Friday, May 27, 2005

Luther Burbank Center for the Arts – Carston Cabaret Room, Santa Rosa, CA.

Sponsored by the University of California Cooperative Extension, UC Sustainable Agriculture Program and the Santa Rosa Junior College.

Seating is limited. To register, mail \$60 course registration fee (check payable to UC Regents – fee includes lunch, course syllabus and Shone Farm Tour) to: Organic Olive Production Short Course, UC Cooperative Extension, 133 Aviation Blvd., Suite 109, Santa Rosa, CA 95403.

2005 Variety Display and Research Update Seminars at the Kearney Agricultural Center.

Mark your calendars for these dates:

- Friday, June 3
- Friday, July 1
- Friday, August 12

8:00 – 9:00 a.m.: Variety display by stone fruit nurseries, breeders and the USDA.

9:00 – 10:00 a.m.: Research Update Topics (For example: Nutrient deficiencies, Dwarfing & semi-dwarfing rootstocks, Keeping trees short, IPM updates, Irrigation management and water stress).

For more information contact: Scott Johnson (559) 646-6547 or sjohnson@uckac.edu; Kevin Day (559) 685-3309, Ext. 211 or krday@ucdavis.edu; Harry Andris (559) 456-7557 or hlandris@ucdavis.edu; Brent Holtz (559) 675-7879, Ext. 209 or baholtz@ucdavis.edu; or Bob Beede (559) 582-3211, Ext. 2737 or bbeede@ucdavis.edu.

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