

University of California Cooperative Extension
 Fresno Kern Madera Riverside San Bernardino San Diego San Luis Obispo Santa Barbara Tulare Ventura Counties
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News from the Subtropical Tree Crop Farm Advisors in California

Editor's Note:

The subtropical farm advisors in California have re-organized and will publish a quarterly combined newsletter. We will emphasize citrus and avocado, but we will also discuss the minor subtropicals and introduce some new crops (at least new to us) for you to consider. If you receive this newsletter, you are on our mailing list. If you would like to change the information on the mailing label, or add someone else to the mailing list, simply call or send an email message to the farm advisor in the county where you live. Phone numbers and email addresses can be found at the end of this newsletter. If you have any suggestion for an article, please give us a call.

Gary Bender (editor for this issue)

The Mexican Fruit Fly Quarantine ... A Caution for All Growers in California

By Gary Bender



The Mexican Fruit Fly Quarantine in Valley Center (San Diego County) is described in some detail in the next article, but all growers in California should pay close attention because this could happen to you! San Diego County is on the border and some people sneak fruit in from Mexico for the fun of it, or they don't know the consequences, or they just don't care. Unfortunately, with our efficient transportation system, a bag of maggot-infested fruit brought across the border by somebody who wants work on a picking crew, can be in a Tulare County orange grove in less than a day.

What can you do to help reduce the incidence of fruit fly infestations? Let's start with abandoned groves. All of our counties have some abandoned groves that really should come out. If the grapefruit isn't making money, the trees should either be cut down, or the crop harvested for juice just to get it out of the grove. The crop should not be left on the trees to rot. You may get rid of a small incidental infestation just by harvesting and removing the fruit.



And, we have had some problems with illegal activity in a few groves that should stop (we have had incidents of meth production, cock fights, prostitution rings, and marijuana production inside groves). If this kind of thing is going on in

your grove, what else is going on? Is there an illegal packing operation in the grove packing smuggled fruit? We don't know the cause of the problem in Valley Center, but we do know that we need to make some improvements in our farming operations in some groves. If you think you have a problem, contact a sheriff deputy and they will help you out.

And, pay attention to your picking crews! I talked to one crew in Pauma Valley a few years ago that came up on a bus every day from Tijuana. I admired their work ethic because they had to get up at 2:30 every morning to be at work by 6:00 am, but at lunch they were eating mangos that they had bought in Tijuana, and throwing the peels under the orange trees! The ag inspectors don't check lunches at the border, so watch out! If you are in that situation, you should offer lunches to your picking crews and make sure they leave their fruit home.

The Mexican Fruit Fly Quarantine in San Diego County

If you read the papers, or you are a grower in the Valley Center-Pauma Valley region of San Diego County, you know that we have been dealing with one of the most serious threats to agriculture that we have ever experienced.

- If you are in the quarantine zone, you should have signed compliance agreements with CDFA and started a bait treatment program. If you haven't, there is more information that you need to know that you can only get by visiting the USDA, CDFA, County Agriculture Dept. command center on the corner of Cole Grade and Valley Center Roads, next the Valley Center Water District. Or, you can attend a periodic meeting held by the California Avocado Commission.
- If you are not in the quarantine zone, but nearby, you need to consider your harvest strategy and talk to your packer. If they find more flies, the quarantine zone could immediately shift and possibly include your grove. Fruit flies have a tendency to hitch hike in cars and trucks. If you are visiting an infested grove in the area, there is possibility that you might bring home an unwanted fly. If you are very close to the zone, you may want to harvest as early as possible this year.

In November, 2002, agriculture inspectors in Arizona discovered fruit fly maggots in a delivery of grapefruit juice

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from California. The origin of the fruit was traced back to a grove on Keys Creek Road in Valley Center. After placing MacPhail traps in the grove and in surrounding groves, it was discovered that we had a fairly significant infestation, complete with maggots inside fruit. Trapping around the area picked up more flies in grapefruit, orange, and tangerine groves. They have found more than 270 flies at this point, along with maggots in fruit at ten locations. (Remember, the Fallbrook quarantine was initiated with the finding of only two female flies).

Intensive trapping to look for more flies is continuing. Eradication efforts have included harvesting and burying fruit in the “core” areas. This has been completed. Trees in the core areas and surrounding areas have been sprayed with a spinosad bait treatment several times now, but the soil underneath these trees has not been treated to kill pupae. Diazinon is no longer on the special local needs label for avocado and citrus, and there were questions about the efficacy of the material anyway. (A “core” area is defined as an area with a one-mile diameter around the fruit fly find.) The problem lies in the fact that flies may keep emerging from soil looking for fruit to lay eggs.

Fruit in the core areas cannot be harvested for shipping from the grove as fresh fruit. This fruit may (with permission of CDFA) be processed on the property. For instance, oranges could be juiced and frozen. The practicality of doing this, the environmental health regulations, and the economics, probably make this an unlikely choice. Citrus fruit can be moved out under permit to a juicing facility from the quarantine area, but not from the core areas. Citrus fruit has also been subjected to cold treatment to move it out of the quarantine zone (33 F for 18 days), but we have not heard yet how this fruit is faring.

A quarantine zone has been established in an area that is at least a 4.5 mile radius from each fly find. Taken all together, with all of the fly finds, the quarantine as it now stands encompasses 130 square miles. Fruit outside the core zones, but inside the quarantine zone, cannot be moved off the property unless you do one of these:

- If you have not done this yet, sign a compliance agreement with CDFA and enter into a bait treatment program. The trees may be treated every two weeks with a malathion/bait or spinosad/bait for three life cycles of the Mexican fruit fly. The life cycle is slow in the winter, but speeds up in the summer, so if you waited to treat until June you would only have to treat for 30 days before harvesting. If flies are found in or near your grove at some point, the treatments you have done will be negated, as you will then be in a core zone.
- You might be able to just wait this out and harvest after the quarantine is over. When will that be? In Fallbrook, a lot of Hass avocado growers waited until June when their quarantine was over, then harvested. With the number of flies and maggots found, it is likely that the quarantine will not be over until October. My own personal opinion is that

we cannot rely on the quarantine being lifted this summer; a bait spray is the most likely option.

Valencia oranges. If the strategy is to wait out the quarantine, then harvest, it might be possible to extend the life of the Valencia oranges by spraying them with 2,4 D ester. 2,4 D ester is applied in the spring to reduce fruit drop of the maturing crop, and improve fruit size in the new crop. 2,4 D is applied at 15 g acid equivalent per acre in volumes up to 500 gal/acre. See the website www.ipm.ucdavis.edu, look in “Pest Management Guidelines”, click on citrus and find “Plant Growth Regulators”. This material is not approved for organic production.

Disaster Assistance. We don’t know yet if there will be any special assistance from the federal government, but there won’t be any from the state (other than to eradicate the pest). If you need a low interest loan to get through the year, you can get details on the website www.fsa.usda.gov/pas/disaster/emloan.htm. As with all government loans, you have to be turned down by a bank (because the government is not allowed to compete with private banks), and you have to have collateral, or a repayment ability may be substituted. Other requirements include: you have to have suffered a 30% loss directly related to the quarantine and have multi-peril crop insurance (MPCI). If you can’t get on the internet, call (760) 347-3675 for information. Up to \$500,000 is available for an emergency loan at 3.75% interest. This USDA emergency loan is coded Q03 for your paperwork.

And finally, Is Mexican Fruit Fly that serious a pest?

One only needs to look at an olive tree to answer that question. Olives are now infested by olive fly, one of the fruit flies that got away from us without an eradication effort. For the last three years olives have averaged 98-100% maggot infestation at an olive grove in Ranch Bernardo. The grower spent one whole season spraying with a bait spray pesticide every 10 days with no control, but the grove is surrounded by backyard olive trees that had no control effort. Mexican Fruit Fly is worse because it has a very wide host range, essentially all fruits except lemons and limes. Enough said about that!

Lychee and Longan – New Crops for California?

By Ben Faber

The lychee (*Litchi chinensis*) and the longan (*Euphoria longana*) are subtropical fruit trees native to southern China. They are a highly perishable fruit and in Southeast Asia are commonly dried, giving the name lychee nut (which it is not). Demand for this fruit is expanding in the US, in large part due to the growth of Asian and Hispanic populations who readily seek out the fruit in specialty stores. In recent years, lychee has appeared in more mainstream chain stores. Demand is also growing among health-conscious consumers who seek exotic

fruit dishes. Historically, the demand was satisfied primarily by frozen or canned fruit, but demand for fresh fruit is increasing.

Currently, much of the supply of the fresh fruit in California is from small back-yard plantings in Southern California and periodic shipments from fruit fly-free zones of Mexico. The undocumented import of lychee and longan fruit in California is a source of a number of exotic pests, including oriental fruit fly, lychee fruit borer and Asian fruit fly. The demand is so great, however, that fruit importers have taken to smuggling the precious fruit from Canada where phytosanitary restrictions on imported fruit are lighter. In 1995, longans led the list of fruit interceptions on the Canadian border, followed by lychee. Thirty-six percent of the intercepted pests were oriental fruit fly. The largest intercepted shipments in 1996 involved refrigerated semi-trucks with one shipment containing 11,000 pounds of longans and another with 17,000 pounds of longans.

Florida is the only US production area of any size and a large proportion of Florida fruit moves to Northeastern markets. In 1996, Florida producers harvested 1.37 million pounds of lychee valued at \$2.75 million and 875,000 pounds of longan valued at \$1.75 million. Recent planting in Florida have resulted in 1,200 acres of lychee and 1,000 acres of longan. A small industry exists in Hawaii, but erratic bearing due to low chilling hours has limited commercial plantings.

Israel, Taiwan, South Africa and China are also sources of fresh lychee. Domestic supplies of Florida fruit are available from May into July, Mexico ships from June through July and recent imports from China and Taiwan extend availability into September. Taiwanese fruit is shipped via ocean freight and undergoes extensive cold treatment to control fruit fly pests, which changes the vibrant red color of the fruit to brown. Over the past 10 years, Australia has successfully established a lychee/longan industry with something over 4,500 planted acres. Much of this fruit is consumed internally, but Australia is shipping to growing Asian markets.

There is a tradition of back yard and small orchard plantings of lychee, longan and other non-traditional subtropical fruits in California dating back to the late 1800's. Today, lychee and longan from small plantings in Southern California appear in farmers markets in the greater Los Angeles area.

Fresh lychee and longan fruit production offers a promising new crop for coastal California growers. Development of local production would markedly reduce the demand and economic attractiveness for importing fresh fruit contaminated with exotic pests. California fruit would also have a competitive advantage over imported fruit in the market place because of the effects of post-harvest treatment and shipping time on fruit quality.

Wholesale prices in Los Angeles for fresh lychees in recent years have ranged from \$4 per pound at the beginning of the season and falling to \$1-\$2 per pound when volumes are at peak supply. The Taiwanese and Chinese fruits often tend to be lower in price because of the discoloration which occurs during cold

treatment. The discoloration does not affect the eating quality of the fruit.

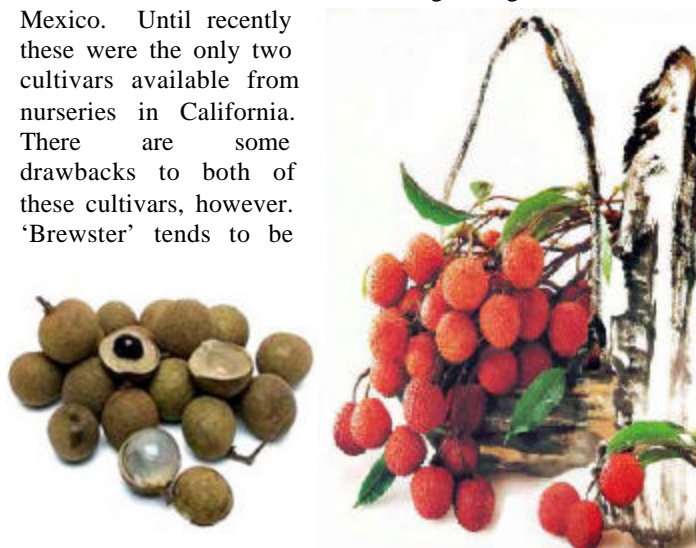
Longans by comparison are generally more exotic than lychees and relatively little has traditionally entered U.S. market channels. The longan is closely related to the lychee and is similar in growth and fruiting habit. They typically fruit about 3-4 months later than lychee varieties.

Lychee and longan are subtropical fruits and in key production areas in China they are grown in areas that have cool and dry winters and warm, humid summers. Experience thus far in California indicates that lychee and longan are adapted to coastal avocado growing areas. Lychee and longan flower and fruit best with warm spring conditions. A certain amount of winter chilling between 100 and 200 hours is required for flower bud development.

Longans are somewhat more cold tolerant than lychee and overall are considered to be somewhat tougher and less demanding with respect to climate and soil conditions than lychee. Both trees become more winter hardy as they age. Mature lychee have survived temperatures below 25° F.

One aspect about both trees is that they are propagated by air-layering. This initially creates a weak root system. Prior to planting out, the plants need to be evaluated to make sure they have an adequate system. Even then, field trees are helped in their first year by a protective wind screen, until they have become well established. Because of the weak root system, frequent, small amounts of both irrigation and fertilizers (micronutrients, as well as nitrogen) are required. Once established they are quite vigorous and should follow a typical avocado irrigation program. Nitrogen fertilizer applications should initially be sufficient to support tree establishment, but too much vegetative growth in the bearing years can lead to alternate bearing.

Cultivar selection is important. 'Brewster' and 'Mauritius' varieties are the most common commercial cultivars in Florida and have been successful in other growing areas, including Mexico. Until recently these were the only two cultivars available from nurseries in California. There are some drawbacks to both of these cultivars, however. 'Brewster' tends to be



more prone to alternate bearing and ‘Mauritius’ has a large seed. Consumers favor a large fruit with a small seed and even seek out “chicken-tongue” fruit, fruit that has aborted seed in it so that there is more flesh to eat.

Additional cultivars are available which may offer unique adaptation, fruit quality or market alternatives to prospective growers. Some of these are not available in large quantities at this time from nurseries within the State, but may be available from nurseries in Florida and Hawaii. Because the trees are air-layered, they tend to cost about twice what an avocado tree costs. Some of the promising lychee varieties include:

No Mai Tse	Bengal
Groff	Kwai Mai Pink
Hak Ip	Emperor
Wai Chee	Kwai Mai Red
Kaimana	Tai So
Salathiel	

Among longan cultivars, Kohala is the most common Florida cultivar with good fruit quality and wide adaptation in other growing areas. It is a very vigorous tree and in a number of field trials here in California, it has shown the fewest problems in early establishment of any of the other lychee and longan cultivars. Other promising longans are Biew Kiew, Sri Chompoo, E Wai and Diamond River.

Both lychee and longan can become as large as an avocado tree, but they are generally slower growing and easily lend themselves to pruning. Work done in Australia and Israel has shown that the trees can be kept to 10-15 feet making it easier to harvest and maintain productivity.

Few diseases are reported for either tree and at this point there are no major pests of the trees in California. The University is currently evaluating varieties in several counties from San Diego to San Luis Obispo and we will undoubtedly learn more of the production issues associated with these varieties.

There are a number of reports on lychee and longan production. An excellent lychee production manual is available from Australia’s Queensland Horticulture Institute. Over the internet, a good introductory information source is available from California Rare Fruit Growers – <http://www.crfg.org>.

Bees and Mandarins – The New Range War?

By Craig Kallsen



Citrus growers and beekeepers have a long history of cooperation in the San Joaquin Valley. Often bees are allowed in citrus groves by growers in exchange for a few jars of citrus-flavored honey. However, with the advent of

new plantings of some varieties of mandarin, this sweet arrangement is in jeopardy.

For many varieties of citrus, pollinators (such as honey bees, native bees, wasps, flies and other insects and mites) are not necessary for fruit production. In some of these varieties the presence of pollinators will not increase seediness. A few examples are ‘navel’ orange, ‘Delta Valencia’ orange, ‘Tahiti’ lime and ‘satsuma’ mandarin, which are male (pollen) and female (ovule) sterile and will have very few if any seeds. In these groves honeybees, with no risk of additional fruit seediness, can harvest pollen and nectar. Navel orange remains the dominant variety in the San Joaquin Valley and since its pollen is sterile will not produce seeds in other neighboring citrus varieties. The fruit of most ‘Valencia’ orange cultivars and most of our lemon cultivars, which are partially female sterile, will have a few seeds and the presence of pollinators, such as bees, will do little to increase seediness.

Other varieties of citrus will produce fruit without pollination and remain seedless if not cross-pollinated by pollen from a different citrus cultivar. However, bees bearing pollen from neighboring citrus cultivars may produce very seedy fruit. Many tangors, mandarins and tangelos fall into this category.

A few varieties of citrus like the ‘Star Ruby’ grapefruit and some grapefruit x pummelo hybrids require only the stimulus of pollination to produce fruit even though this stimulation will not result in seed production. For varieties like this, pollinators are not only desirable but also economically necessary.

Some varieties of citrus will set and produce commercially acceptable fruit yields only if cross-pollinated and only if seeds are produced. Unfortunately, if these cultivars are allowed to cross-pollinate, fruit in this category can be excessively seedy. Plant scientists have discovered that some of these cultivars, like the ‘Clemenules Clementine’ and some other Clementine cultivars, can be artificially stimulated into fruit production without pollination by foliar sprays during bloom of the plant-growth regulator gibberellic acid. When sprayed with gibberellic acid, no pollen is involved and the fruit remains seedless. Gibberellic-treated fruit acts as if it had been pollinated and remains on the tree through harvest. However, these trees must still be isolated from either pollinators or other varieties of citrus producing fertile pollen.

Clementine and ‘W. Murcott Afourer’ mandarin acreage is increasing. Because of the cross-pollination hazard, growers of these cultivars are discouraging beekeepers from placing hives in their groves and in adjacent groves and properties so as to keep these mandarin blocks ‘bee free.’ Bees are capable of flying long distance and the distances vary depending upon the availability of pollen and nectar and the number of bees in competition for that pollen and nectar. Foraging bees are probably capable of flying over a mile, but typical distances would be much less, usually less than 1/3 mile. When Clementine acreage was small, beekeepers could find other locations to put their hives. The proliferation of Clemenules

Clementine and W. Murcott Afourer, and their associated need for bee-free areas, is becoming a livelihood issue for beekeepers. The need for pollinators in some crops may also pit grower against grower. For example, a flowering melon crop in April, which would require bee pollination, may be adjacent to flowering Clementine mandarins. Clementine growers cannot resort to pesticides to protect their trees from pollination. In California, it is illegal to kill bees with pesticides visiting citrus flowers during the bloom period.

Other varieties of seedless mandarins exist so why plant Clementine and W. Murcott Afourer mandarins, which have the potential to create economic hardship for beekeepers? The short answer is that Spain, Algeria, South Africa and other countries have developed market demand for these fruit in the United States and elsewhere. The Clemenules matures early in the season and the W. Murcott Afourer late providing an extended mandarin harvest season. The fruit has good size, smooth skin, deep color, and sweet taste, is easy to peel and, for a mandarin, has a relatively long storage life. Customers ask for them by name. However, mandarin options do exist which are seedless regardless of the presence of pollinators. The University of California at Riverside has recently released several mandarin varieties that are seedless, a few, which, like the Star Ruby grapefruit, may actually require pollination (by bees) for seedless fruit production. These new mandarins include 'Shasta Gold', 'Tahoe Gold' and 'Yosemite Gold' and they join an earlier seedless release called the 'Golden Nugget.' Unfortunately, building a new market for new varieties takes time even if they do have excellent taste, comparatively large fruit size, peelability and seedlessness even in the presence of bees. Like the Clementine and W. Murcott Afourer, these varieties do have a tendency to be alternate bearing. Also, these new University varieties mature later than the commonly grown 'Clemenules' clementine, and are not an option for the early mandarin market.

So what can the Clementine and W. Murcott mandarin grower do to insure seedless fruit other than try and create bee-free areas or begin growing satsuma or the new University of California mandarin releases? Rows of navel orange or satsuma mandarin could be planted around blocks of Clementine or W. Murcott mandarin. Some evidence suggests that a minimum of 10 rows might be sufficient. Theoretically, bees would collect a full load of nectar from the navels and not need to visit the mandarins. The threat of cross-pollination would be greatly reduced. Bees, though, can fly a long way. Even a small number of seedy fruit can make the rest suspect since it is impossible to tell which fruit have seeds and which do not. Research is being conducted into the use of bee repellents that could be sprayed on mandarins but it takes a very good repellent to overcome the attraction of pollen and nectar.

In an increasingly complex world, depending upon bee exclusion to maintain seedlessness is a tenuous proposition at best. The cattle range wars of the late 1800's in the American West, once the shooting stopped, were settled by new regulations and barbed wire. Neither barbed wire, nor tree

netting, is going to help settle this dispute, although constructive discussion and action among the various interested parties probably could help.

Resource and Market Information for Enterprise Selection

By Mary Bianchi

- **A question from San Diego County – “Should I pull out my avocados and plant wine grapes?”**
- **A question from San Luis Obispo County – “Should I pull out my wine grapes and plant avocados?”**

Maybe these growers can consider a swap! It's more likely that they need to research the resources needed to grow each of these crops and the market history and potential for the product.

Locating information on resource needs and markets for new crop enterprises can be challenging. In an article, 'Considerations In Enterprise Selection', Karen Klonsky, Extension Specialist Department of Ag Economics UC Davis, and Patricia Allen, Agroecology Program UC Santa Cruz provide insight into the process of evaluating existing crops and selecting new crops. Much of the following discussion is excerpted from this article, which is available at: http://www.sfc.ucdavis.edu/Pubs/Family_Farm_Series/Farmmanage/considerations.html

Klonsky and Allen discuss the importance of setting goals for the enterprise – know where you're going. A careful inventory of available physical, financial and management resources lets you know what you already have to help yourself get there. An understanding of the resource needs of potential new enterprises will outline the physical, financial and management resources you need to acquire to make the new enterprise successful. Finally, a thorough knowledge of the market you will need to access is critical.

Inventory Your Resources

The availability of resources will ultimately direct your choice of enterprises simply because the resource requirements among enterprises vary. Resources typically include land, labor and capital, but also include climate, management skills, and access to information and markets.

Carefully evaluate the potential for each of the crops you are considering. Systematically compare the resource needs for each crop to the resources available. Talk to other growers in your area or elsewhere about their experience with the crop you are considering.

Cost estimates of resources needed for establishment and production are often not easily obtained, particularly for crops

new to an area. Cost and return studies for some crops in California are available for download from the UC Department of Agriculture and Resource Economics at <http://coststudies.ucdavis.edu/>. These cost and return studies offer a way of comparing your current enterprise costs with a potential new enterprise. They can give you a picture of the cultural operations, labor, and equipment needs and costs for a new enterprise. There may not be a cost and return study for your location for the crop of interest. Reviewing the information for several areas can help provide some general information. For instance, there are current cost and return studies for wine grapes for Sonoma County, the Sierra Foothills, and the Lodi area. Certainly costs might differ for wine grapes in Southern California, but many of the cultural practices, labor, and equipment needs will be similar. Review each item carefully since costs may vary widely. Studies for avocado production in Ventura/Santa Barbara and San Diego/Riverside in 2001 showed a \$400/acre-foot difference in irrigation water cost between the two areas.

Market Access And Information

Access to markets is the most commonly overlooked factor in the enterprise selection process. But in fact it can be your most limiting constraint. Simply because you can grow something does not mean you can sell it. And just because you can sell a product does not mean that it will be profitable. A third possibility is that you will be able to sell a product at a money making price but that you will only be able to sell a limited amount of the product; that is, less than the total amount that you are able to produce.

Ask the following questions about marketing your new crop:

- Do you have a preferred marketing method? Broker, retailer, direct (roadside stand, farmers market, U-pick), cooperative, contract with processor?
- How much time are you willing to spend marketing your products?
- What is your proximity to various potential markets?
- Have you contacted potential markets for their advice on crop or variety selection?
- Are you familiar with market quality standards for the crops you are considering?
- Have you studied the market history and market trends of the crop?

Following are information sources to help answer these questions:

C DFA Agricultural Resource Directory provides commodity information summaries by county as well as extensive lists of many of the agencies and organizations included in this article. It can be downloaded free from the following link or ordered by calling (916) 498-5161 for a \$15 charge. http://www.cdfa.ca.gov/card/card_new02.htm

Marketing orders and commissions are set up to aid in marketing some commodities and establishing standards for size, grade, and/or maturity. There are federal and state marketing orders and commissions. Some assess fees to growers to pay for research, advertising, or promotion. Links to marketing orders and commissions for specific crops can be accessed at <http://www.cdfa.ca.gov/mkt/mkt/mktbrds.html>

You can hear commodity market prices, supply, and demand by calling the recorded Federal-State Market News (900) 555-7500 for a charge. To use market news reports, the reader must recognize the effect of variety, grade, quality, size and condition on price. This service is managed by USDA and C DFA.

Farmer's Markets listings and contacts are available through the U.S. Department of Agriculture's Agricultural Marketing Service, which administers programs that facilitate marketing of U.S. agricultural Products, including food, fiber, and specialty crops. <http://www.ams.usda.gov/farmersmarkets/states/calif.htm> The National Organics Program information is available at <http://www.ams.usda.gov/nop/>

Organic agricultural operations have special needs for production, planning, and management beyond those of conventional farms because of limitations imposed by the terms of organic registration and certification. At present, registration is a legal requirement and certification is a private process independent of government and used by growers and marketers to maintain the integrity of the organic product. Additional information about the certification process to produce organic foods, along with contacts for certifying groups, is available at <http://anrcatalog.ucdavis.edu/pdf/7247.pdf>

California Ag Statistics Service publishes reports of crops weather as well as field crop and fruit and nut reports weekly. Data is submitted voluntarily by growers and agribusiness. <http://www.nass.usda.gov/ca/>

Researching new enterprise resource requirements and markets takes time. Klonsky and Allen note in their article that playing 'what if' on paper is always less risky and less time consuming than experimenting in the field when you are not well prepared.

Information for specific commodities can also be found online. Our San Diego and San Luis Obispo growers looking to change their enterprises might find useful information at the following sites.

Avocado Information is a University of California link that contains information on varieties, irrigation, market standards, and links to additional avocado-related sites. <http://ucavo.ucr.edu/> California Avocado Commission contains information on crop projection, yield and price, research and weather. <http://www.avocado.org/>

California Association of Winegrape Growers was founded to represent the interests and concerns of wine and concentrate grape growers. <http://www.cawg.org/>

Winefiles.org is a project of the Sonoma County Wine Library that recently came online. It includes citations, abstracts and links to articles in the technical, academic, trade and consumer wine periodicals as well as newspaper articles, government documents, press releases, advertising brochures and other ephemera dealing with wine.

<http://sunsite.berkeley.edu/WineDB/WineFiles/>

Grape Crush Report, produced by the California Ag Statistics Service, CDFA, provides details of the crushed tonnage, and weighted average prices reported by grape type and variety, as well as by grape pricing districts. The districts refer to the area in the state in which grapes are grown, for example San Diego = District 16 and San Luis Obispo = District 8.

<http://www.nass.usda.gov/ca/bul/crush/indexgcb.htm>

Grape Acreage Report, produced by the California Ag Statistics Service, CDFA, provides acreage statistics by grape type: acreage standing (bearing and non-bearing) by year planted, by county. <http://www.nass.usda.gov/ca/bul/acreage/indexgab.htm>

In 2001 a total of 489,579 acres of wine grapes were reported statewide with 64,884 acres not yet in production. The data can be quite different from that reported by the county Agricultural Commissioner's office. The 2001 Grape Acreage Report estimated 18,818 bearing acres and 4,008 nonbearing acres for San Luis Obispo County while the San Luis Obispo County Agricultural Commissioner reports 21,614 bearing and 5,986 nonbearing acres. Contacts for county Agricultural Commissioners offices can be found at

<http://www.cdpr.ca.gov/docs/counties/caclist.htm>

And Finally, A Message from Dr. France Cordova, Chancellor at U. C. Riverside

I am saddened to report that Dr. George A. Zentmyer, an emeritus professor of plant pathology who was recognized as the world's foremost authority on a deadly fungus that affects avocado plantings, died Saturday, February 8, of pneumonia at Stanford University Hospital. He was 89 years old.

Dr. Zentmyer attended UCLA in the second class at the Westwood campus, graduating in 1931; he received his master's and doctoral degrees from UC Berkeley. He began his distinguished research and teaching career in 1944 when he joined the Citrus Experiment Research Station, and he was one of the original faculty members when the University of California, Riverside, opened nine years later. He retired in 1981 but continued his research and his writing. The results of his laboratory and field research have immensely benefited avocado growers as well as growers of other subtropical and tropical crops worldwide. He was instrumental in establishing a large collection of fungus isolates and species of unmatched genetic diversity that are distributed to scientists worldwide.

Dr. Zentmyer was elected to the National Academy of Sciences in 1989. In 1966 he served as the president of the American Phytopathological Society. His other honors included a Guggenheim Fellowship in 1964-65, a NATO Senior Fellowship in Science in 1971 and a Rockefeller Foundation scholarship in 1985.

Dr. Zentmyer is survived by Dorothy, his wife of 61 years; daughters Elizabeth Dossa of Hillsborough, Jane Fernald of La Canada, and Susan Zentmyer of Belmont; and five grandchildren. Donations can be made to the UCR Foundation.

From the editor: Dr. Zentmyer's research program was of tremendous benefit to the avocado growers in California. Almost all of the clonal rootstock lines came from his program of plant exploration in Guatemala and Mexico, and selection programs in California; these include the Duke 7, G6, D9, and Barr Duke. He did most of the original work on fungicides, biological and cultural control of the fungus, and water relations between fungal pathogenicity and plant susceptibility. The root rot research program continues under the leadership of Dr. John Menge.

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