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Topics in Subtropics Newsletter

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News from the Subtropical Tree Crop Farm Advisors in California

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Editor's Note

Please also let us know if there are specific topics that you would like addressed in subtropical crop production. Phone or email the advisor in your county.

Visit your County Cooperative Extension website and the Calendar of Events to register for upcoming workshops or seminars.

In our effort to conserve resources, please help us save paper by signing up to receive your newsletter on line. Just visit the Cooperative Extension website, go to newsletters, click on Tropics in Subtropics and enter your email address.

Craig Kallsen
Editor of this Tropics in Subtropics issue

Vertebrate Damage

Neil O'Connell, Farm Advisor, UCCE Tulare County

Recently a six-year old W. Murcott orchard was evaluated for causes of tree decline. A high percentage of the trees exhibited damage to the bark of the tree generally from the soil line up 6-8 inches (Fig. 1). In some instances the tree had been almost totally girdled. On close inspection of the trunk, an open hole 4-5 inches in diameter was found at the base of the tree (Fig. 2).

Meadow Mice (Voles) can produce serious damage in a citrus orchard resulting in partial or complete girdling of trees (Fig. 3). Five species belonging to the genus Microtus are found in California, two of which Microtus californicus and M.montanus are reported to cause damage. Damage has been reported in permanent pasture, alfalfa, hay, artichokes, Brussels sprouts, carrots, cauliflower, potatoes, sugar beets, tomatoes, grains, nursery stock and the bark of apple, avocado, citrus, cherry and olive trees.

Microtus are often found where there is grass cover. They generally do not invade cultivated crops until the crop is tall enough to provide food and shelter. Meadow mice are active all year round. They forage at any time during the day or night but are chiefly nocturnal. They are usually found in colonies marked by numerous 2-inch wide surface runways though matted grass. Small piles of brownish feces and short pieces of grass stems along the runways are evidence of activity. The burrows consist of extensive underground tunnels, nest chambers and storage chambers. Home range is typically small, less than a 60 foot radius in the case of M.californicus. All meadow mice swim well. Therefore, irrigation ditches will not serve as effective barriers against meadow mice movement into fields. Meadow mice may forage beyond the sheltered runways. Food consists of tubers, roots, seeds, grain, and succulent stems and leaves.

Females breed at 4 to 6 weeks of age with liter size of M.californicus averaging around 4. Under natural conditions a female Microtus may produce from 5 to 10 litters a year. The major breeding season corresponds with the season of forage growth. Microtus populations build up to a peak every 3 to 4 years, followed by a rapid decline during the next breeding season. The exact causes of the cycle of buildup and decline are not known, though disease, food shortages, physiological stress from overcrowding, and other factors may be involved. It is assumed that in cultivated areas Microtus populations are permanently based in favorable habitat such as roadsides, canal banks or adjacent non-cultivated land. Invasion of cultivated cropland occurs when the population builds up or when the wild habitat becomes unfavorable. Coyotes, badgers, weasels, snakes, hawks, owls, herons and gulls are among the principal predators. It is believed that predators are not able to prevent or control a population eruption because of the birth rate of the fast breeding Microtus population. Meadow mice are classified as nongame mammals by the California Fish and Game Code. Nongame mammals, which are found to be injuring growing crops, may be taken at any time or in any manner by the owner. Management: The most effective management options in an orchard situation are a reduction in ground cover and the use of toxic baits. Meadow mice are cover dependent. If cover is the management of choice - typically weed or grass, the cover can be removed from around the base of a tree, this often solves meadow mice problems. In situations where cover removal is not possible or is insufficient to solve the problem, the next best option is the use of toxic baits. Many bait carriers are used (e.g., oat groats, wheat bait). Baits: Crimped oat groats is the most satisfactory bait although crimped whole oats are used (e.g., oat groats, wheat grains, pelletized formulations, etc., but crimped oat groats have typically been most effective). The primary toxicants used for meadow mouse control include zinc phosphide, diphacinone, and chlorophacinone. Use of toxicants and poison baits are closely regulated and their legal use is affected by the presence of threatened or endangered species. Learn and follow all regulations prior to application. Directions for management including baiting can be obtained by contacting the Agricultural Commissioner's Office. *Portions taken from J.P.Clark Vertebrate Pest Control.

Figure 1. Bark Damage

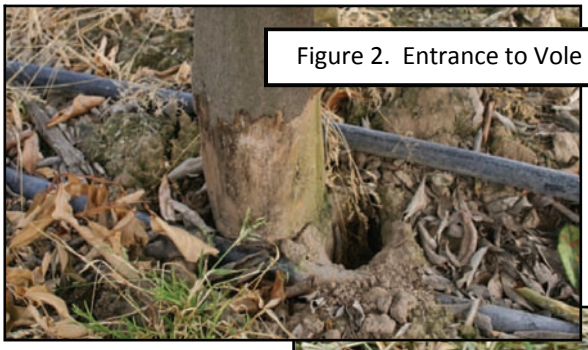

Figure 2. Entrance to Vole Chamber

Figure 3. Microtus spp.

Chemical Thinning of Olives

Elizabeth Fichtner, Farm Advisor, UCCE Tulare County

The light 2011 olive crop may result in a heavy crop load in 2012. With the prospect of a heavy crop load, it may be wise to consider thinning to reduce fruit quantity and increase fruit size. Management of fruit size may be achieved by pruning and/or chemical thinning.

Why thin your olives?

Larger fruit. Overloaded trees bear small, unprofitable fruit. If a crop is thinned during the fruit's early growing period, the remaining fruit will grow larger. The larger fruit command a higher price that more than offsets any reduction in total yield. By thinning the crop, you will bring otherwise substandard-sized olives up to canning sizes.

More consistent yearly crops. After a modest crop, shoot growth and prospects for a satisfactory crop the following year are good. In contrast, a heavy crop of olives is followed almost invariably by a light crop.

Early maturity. A moderate crop matures earlier than a heavy crop. An early crop is more likely to get a good reception from the handler, has less competition for harvest labor, is less likely to fall victim to cold weather in the early fall, and ensures a good bloom for the next year.

Lower harvest costs. Olive picking costs are figured on a per-ton basis, so the per-acre harvest costs for a moderate crop are less than for a large crop.

Pruning vs. Chemical Thinning

Pruning removes potential fruit and foliage, stimulating growth which will help minimize alternate bearing. Chemical thinning is achieved with use of the plant growth regulator, naphthaleneacetic acid (NAA). NAA is absorbed into the leaves and fruit and is then translocated to the fruit stems. An abscission layer forms during the first two weeks after NAA application, causing some fruit to drop. Pruning plus chemical thinning is recommended for crop control in Manzanillo; however, chemical thinning is not recommended for Sevillano.

NAA for Olive thinning

NAA Formulation for Olive Thinning. NAA is manufactured in the form of an ammonium salt for commercial use on olive orchards, with 200 g of active ingredient per gallon. This formulation is marketed as Liqui-Stik Concentrate (EPA reg #34704-382) by Platte Chemical Company. The material does not contain wetting agents.

Amount and Timing. The concentration of NAA applied depends on the method used to determine spray timing (full bloom method or fruit size method) and whether a spray oil is used.

Full bloom date method. If you time your spray according to the full bloom date, apply NAA as a dilute spray (300 to 500 gallons per acre 12 to 18 days after full bloom. If applied at 10 days, use a concentration of 100 ppm. Thereafter, increase the concentration by 10 ppm for each day that treatment is delayed. For example, if you spray 15 days after full bloom, use a concentration of 150 ppm. CAUTION: Abnormally cool weather will delay fruit growth. In such a circumstance, use the fruit size method for spray timing.

Fruit size method. If you use the fruit size method, sprays are applied when fruit on the north and south sides of the trees average between 1/8 and 3/16 of an inch. This can be determined by folding a standard 2 x 3-1/2 inch business card in half across the narrow dimension. When 11 to 16 fruit can be placed side by side across the card, it is time to thin. With normal weather, this will usually be between 12 and 18 days after full bloom. It is useful to note the day of full bloom (when approximately 80% of the flowers are open, 10% are unopened and 10% are at petal fall) to allow you to predict spray timing. If you use the fruit size method and spray without a spray oil, apply a concentration of 150 ppm NAA with a wetting agent or spreader-sticker.

Risks and precautions of chemical thinning. The thinning response is dependent on the temperatures shortly following application. Response can vary from no thinning, if temperatures are unusually cool following application, to nearly complete crop removal if temperatures are excessively warm. EPA registration for NAA covers the period from full bloom to 21⁄2 weeks after bloom. Later NAA applications are both illegal and useless. Too early an application will overthin; too late an application will yield unsatisfactory results. An application during bloom will destroy the crop. Hot weather during and following bloom, especially when accompanied by drying winds, can reduce fruit set and make thinning unnecessary. Research has demonstrated that the first two or three days after treatment are the most critical in determining the thinning response. Pay attention to weather forecasts prior to treatment and if forecasted temperatures are significantly warmer or lower than average, (see Figure 1) treatments should be delayed until more normal temperatures return. As the length of time from full bloom increases, the thinning response decreases. NAA should not be used on water stressed trees.

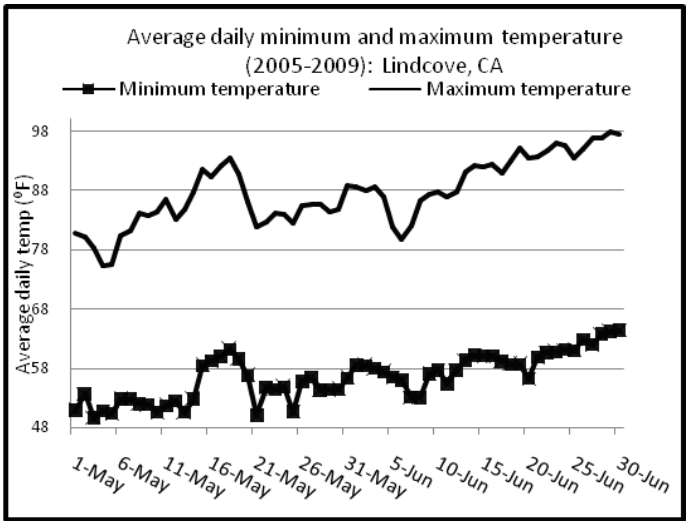

Fig 1. Average minimum and maximum temperatures recorded in Lindcove, CA from 2005-2009. Data was collected from California Irrigation Management Information System (CIMIS):

Tips on Producing the Earliest Early Citrus in the San Joaquin Valley

Craig Kallsen, Farm Advisor, UCCE Kern County

The three things which seem to be unavoidable during life in the southern end of the San Joaquin Valley are death, taxes, and a considerable price premium in the marketplace for having the earliest of the early citrus for sale. The most robust early market in the San Joaquin Valley of California is for navel orange, however, early lemons and mandarins also reap price benefits. The early citrus market for a given variety may only last for a few weeks or even days.

For navels, the early market usually begins with the first navels picked in mid-October. The chance of a grower being able to profit from this early market requires that the correct planting and cultural decisions be made. To be a player in the early market, the grower has to produce an orange that meets a minimum sugar/acid ratio and the minimum level of color change at the earliest possible date. Pick too early and the fruit receives a red-tag from the Agricultural Commissioner's Office and may have to be discarded; pick too late and you miss the 100% premium that often goes with the earliest fruit.

To be acceptable to the consumer, this early fruit must be treated with ethylene gas at the packing shed to change the color from yellow-green to orange. Ethylene gas treatment is commonly knows as "sweating" or "gassing" the orange. Generally speaking, the greener the orange, the longer it must be sweated. Sweating the fruit generally reduces fruit size and shelf life and increases problems with the rind and disease susceptibility. There is concern in the citrus industry that the rush to produce the first fruit of the season may compromise fruit quality characteristics such as sweetness and juiciness. A disappointed early-season fruit consumer may not return later in the season to buy more citrus fruit.

Choosing the Right Location

The production of the earliest of the early navel oranges, or the earliest of any of various kinds of citrus in the San Joaquin Valley requires that your trees are located in warm areas. However, very hot mid-summer temperatures are not the key. Temperatures greater than 98˚F are probably more harmful than beneficial to citrus production. The earliest citrus-maturing areas in the San Joaquin Valley are south-facing slopes and terraces located along the higher elevations of the citrus belt on the east side of the southern San Joaquin Valley. The Edison area and foothills west of Arvin south and southeast of Bakersfield are examples. These areas tend to retain the insulating layer of fog common in the lower areas of the valley in the coldest months, but break out of the fog in the spring. Less spring fog means more sun and warm temperatures in the early spring, which creates an earlier start in setting and sizing fruit. All else being equal, sandy soils appear to mature fruit earlier than heavier soils.

Choosing the Right Variety

Having the earliest microclimate in the valley does no good if the grower plants late-maturing varieties. As yet, there is no price premium for having the earliest of the late navels, although some growers are cashing in by having the earliest 'Valencia' oranges in the spring. Even varieties like 'Atwood' or 'Parent Washington' will probably be too late for the very early market most years. 'Fisher' navels, like the various selections of 'Thompson Improved', do have the ability to attain a legal sugar/acid ratio as early as anything else in the Southern San Joaquin, but color is usually delayed. If 'Fisher' navels are picked too early the long sweating required to bring up the color usually is associated with substantial green-spotting, especially if the fruit is wet and turgid at picking.

Two navel orange varieties, that have almost disappeared from the San Joaquin Valley, but which still occasionally make an early profit for the owners of the few remaining healthy groves, are 'Bonanza' and 'Tule Gold'. For early fruit producers the 'Bonanza' and 'Tule Gold' are somewhat frustrating in that unlike the 'Fisher', they tend to show color very early, but getting the sugar/acid ratio above that required for legal harvest proceeds more slowly. The time lag between the show of acceptable color and the achievement of an acceptable sugar/acid ratio often produces unacceptable levels of anticipation in the grower. All of the early navel trees tend to grow slowly but 'Bonanza' and 'Tule Gold' trees may be the slowest growing of all. 'Bonanza' trees have a problem with what appears to be self girdling, which causes an early decline, although testing conducted a few years ago demonstrated that many trees in these blocks were infected with Stubborn disease. As the groves become older, 'Bonanza' and 'Tule Gold' trees tend toward the production of heavy loads of small, split, and sunburned fruit.

Two proven producers and similar looking navel oranges for the early market are the 'Earli-Beck' and the 'Newhall'. These two varieties produce a characteristically football-shaped navel. Generally, color and the sugar/acid ratio appear roughly together and usually in the same time-frame as the 'Bonanza'. The 'Earli-Beck' and 'Newhall' can achieve a deep, orange-red color and these varieties are prime candidates for the grower who wants to participate in the early market. For a brief period of time years ago, the 'Earli-Beck' navel was available in two budlines. One budline contained a viroid and another was free of the viroid. The budline containing the viroid generally appears to produce fruit a few days earlier, however, the growth of the trees is non-uniform and may be associated with an earlier decline of the tree. Although some orchards remain, the budline containing the viroid has not been available for many years.

A relatively new entry (1990s) into the early market is the 'Fukumoto'. 'Fukumoto' navel is early, as early as the 'Earli-Beck' and 'Newhall' in many years and colors early. This navel is capable of producing a large, well-shaped fruit that responds as well to application of ethylene as any of the other early-maturing navels. Successfully administered, ethylene produces a very, deep, attractive orange color in these oranges. The 'Fukumoto' as with most early navels grows slowly, suckers heavily, suffers from a currently unknown malady called foamy bark rot during hot weather, and the fruit appears more prone to ridging or chimeras. Some evidence suggests that this tree may be exhibiting some growth incompatibility with current rootstocks commonly used in the San Joaquin Valley. Trees that were planted in colder areas and were one or two years of age when struck by a significant frost event may be more susceptible to tree decline as they age.

Choosing the Right Rootstock

The commonly reported sugar/acid ratio consists of a separate measurement of the total soluble solids (i.e. sugar) divided by a separate measurement of the acidity. When a given scion

variety is budded onto a wide selection of different rootstocks, significant differences are normally found among the different rootstocks for both, total soluble solids (i.e. sugars) and for acidity. However, significant differences are seldom found for the sugar/acid ratio. The reason for this is that some rootstocks, such as the trifoliates and citranges, will produce a scion fruit with juice high in soluble sugars and high in acidity. Other rootstocks, such as those with lemon heritage, produce fruit low in sugar and low in acids. A high value for soluble solids divided by a high value for acids will produce a sugar/ acid ratio similar to that of a fruit low in sugars and low in acids. Thus, there does not appear to be a rootstock that consistently produces early, high sugar/acid ratios.

Observational evidence suggests that rootstock may affect the development of color in the orange as well. Rootstocks with lemon heritage, for example, such as 'rough lemon' or 'Volkameriana', when compared in side by side plantings to trees on rootstocks with trifoliate heritage, such as 'Carrizo', 'C-35' or pure trifoliate types, appear to color more slowly.

As an example, in the Edison/Arvin area of Kern County, some of the citranges, like 'Carrizo, are probably the most common rootstock choice. Rootstocks with lemon heritage, although often producing a more vigorous tree with higher yields, tend to have greater problems with fungal diseases such as those caused by *Phytophthora* organisms and overall fruit quality. Trifoliates, and some citranges such as 'C-35', are more tolerant of *Phytophthora*, but often become very chlorotic due to a difficulty in absorbing or transmitting micronutrients like iron, zinc and manganese to the scion when grown in the alkaline, boric, and calcareous soils of this area.

Nutrition

Some evidence suggests that earliness is improved by keeping leaf-tissue samples at the low end of the recommended leaf nitrogen range. If nitrogen levels are too low, overall yield and size might be adversely affected, but for maximum earliness without hurting other fruit quality and yield characteristics, leaf nitrogen levels should probably be in the range of 2.2 - 2.4% nitrogen by dry weight in September and early October. Additionally, the bulk of the nitrogen fertilizer for the season should be applied before June 1. Late season nitrogen fertilizations, as well as overall high leaf-tissue nitrogen levels, will likely postpone the date at which a legal sugar/acid ratio is attained. High potassium levels in leaf tissue samples and late season applications of potassium fertilizers will have a similar effect. By maintaining leaf potassium percentages below 0.7 percent and by avoiding foliar applications of potassium, navels should be ready to harvest earlier. Some evidence suggests that high leaf-tissue phosphorous levels decrease fruit acidity, thereby increasing the sugar/acid ratio.

The presence of arsenic in some of the soils and in the well water has been discussed as the reason for the early, early navels in the Edison area, and there is some experimental evidence that arsenic does decrease acidity in the juice of treated trees. Most growers no longer use their high-arsenic well water, which tends to be very high in boron and salts, and use high quality district water from surface sources. Other growers who have never had access to water with high arsenic concentrations have some of the very earliest oranges. Warm locations and the right variety are far more important. Arsenic fertilizer compounds, including sodium arsenate, are prohibited from commercial use.

Leaf-tissue samples on early navels should always include a test for copper. Early navels may require nutritional sprays for copper. Normally, early navels are not treated with brown rot- and *Septoria*-inhibiting copper sprays in the field because they are usually picked before the fall rains. As a result, some groves become deficient in copper, something later navels almost never show due to disease-preventing copper sprays applied in the fall. Treating even the early navels with copper sprays for disease prevention is not a bad idea anyway, since these sprays can reduce the incidence of some post-harvest rots.

Irrigation

Not much is known on the effect of irrigation on earliness. There seem to be as many early navel growers that insist on irrigating close to the day of picking as those who shut the water off or reduce irrigation several weeks before picking. Water stress of short duration can temporarily decrease the amount of water in the orange, and thus increase the concentration of solids (i.e. sugar) in the juice. Less turgid fruit reduces the incidence of green-spotting of the fruit, which may occur when oil glands of the rind are crushed in handling during picking and transportation.

In an experiment conducted from 2006 through 2008 in the extreme southern foothills of the San Joaquin Valley, water stress initiated in August a continuing through harvest in October, resulted in earlier color development of 'Earli-Beck' navels, but increased the risk of loss of yield, fruit size, and quality. Care must be taken in removing irrigation from the orchard early because temperatures in October can remain high, and water-stressed trees can result in fruit losing turgor and premature fruit and leaf drop. Often the first rains of the season come in October, so water-stressing the trees prior to harvest, even if desired by the grower in the hopes of rapidly increasing the sugar/acid ratio, is not always an option.

Other Planting and Cultural Tips For Growing Early Navels

Even though early-maturing varieties grow slower than later maturing varieties, the trees should not be allowed to crowd each other. Besides difficulty associated with picking trees that have grown together, and increased pruning costs associated with trying to keep the trees apart, experimental work done in Kern and Riverside County in the late 1960s and early 1970s, demonstrated that trees that are too close together produce smaller fruit with delayed color and lower sugar/acid ratios. Crowding trees together appears to be a better strategy for producing late-maturing citrus fruit.

Insecticidal narrow-range petroleum oils should not be sprayed in the grove within 60 days of the harvest of early navels. Oil sprays tend to interfere with the rate of coloring either on the tree or in the sweating room because early-harvested navels must be sweated for relatively long periods of time to induce the color change from yellow-green to orange. The presence of the oil on the rind in combination with the ethylene gas, can result in some fairly severe rind staining and spotting.

Control of California red and yellow scales using an augmented *Aphytis melinus* parasitoid wasp release program is, often, less effective when used on early navels in comparison to its use on later-maturing navels. The reason for the reduced efficacy is that *Aphytis* are not as active during the hot summer months as they are later in the season. At just about the time the *Aphytis* begin controlling the scale populations in heavily infested groves, it is time to harvest the early navels in October. Long-season navels have at least two additional, and effective, months for the *Aphytis* to control the California red scale populations.

The following Herbicide Registration Chart is courtesy of: ***Brad Hanson, Weed Specialist, UC Davis Campus.***

California Herbicide Registration on Horticultural Tree and Vine Crops (updated October 2011)

	Herbicide-Common Name *(example trade name)*	Almond	Pecan	Pistachio	Walnut	Apple	Pear	Apricot	Cherry	Nectarine	Peach	Plum / Prune	Avocado	Citrus	Date	Fig	Grape	Kiwi	Olive	Pomegranate
		------- tree nut -------				-- pome --		----------stone fruit ----------												
Preemergence	dichlobenil *(Casoron)*	N	N	N	N	R	R	N	R	N	N	N	N	N	N	N	R	N	N	N
	diuron *(Karmex,Diurex)*	N	R	N	R	R	R	N	N	N	R	N	N	R	N	N	R	N	R	N
	EPTC *(Eptam)*	R	N	N	R	N	N	N	N	N	N	N	N	R	N	N	N	N	N	N
	flumioxazin (Chateau)	R	NB	R	R	R	R	R	R	R	R	R	NB	NB	N	NB	R	N	NB	NB
	indaziflam (Alion)	R	R	R	R	R	R	R	R	R	R	R	N	R	N	N	N	N	N	N
	isoxaben *(Trellis)*	R	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	N	NB	R	NB	NB	NB
	napropamide *(Devrinol)*	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	R	R	N	N
	norflurazon *(Solicam)*	R	R	N	R	R	R	R	R	R	R	R	R	R	N	N	R	N	N	N
	oryzalin *(Surflan, Farm Saver)*	R	R	R	R	R	R	R	R	R	R	R	R	R	N	R	R	R	R	R
	oxyfluorfen *(Goal, GoalTender)*	R	R	R	R	R	R	R	R	R	R	R	R	NB	R	R	R	R	R	R
	pendimethalin *(Prowl H_2O)*	R	R	R	R	R	R	R	R	R	R	R	N	R	N	N	R	N	R	R
	penoxsulam (*Pindar GT*)	R	R	R	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	pronamide *(Kerb)*	N	N	N	N	R	R	R	R	R	R	R	N	N	N	N	R	N	N	N
	rimsulfuron (*Matrix, Mana*)	R	R	R	R	R	R	R	R	R	R	R	N	R	N	N	R	N	N	N
	simazine *(Princep,Caliber 90)*	R	R	N	R	R	R	N	R*	R	R	N	R	R	N	N	R	N	R	N
	thiazopyr *(Visor)*	NB	N	NB	NB	N	N	NB	NB	NB	NB	NB	N	R**	N	N	NB	N	N	N
	trifluralin *(Treflan)*	R	R	N	R	N	N	R	N	R	R	R	N	R	N	N	R	N	N	N
Postemergence	carfentrazone (Shark, Rage)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	clethodim *(Prism)*	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	N	R	N	N	NB	N	NB	N
	clove oil (*Matratec*)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	2,4-D *(Clean-crop, Orchard Master)*	R	R	R	R	R	R	R	R	R	R	R	N	N	N	N	R	N	N	N
	diquat (*Diquat*)	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
	d-limonene (*GreenMatch*)	R	R	R	R	R	R	R	R	R	R	R	N	R	N	R	R	R	N	N
	fluazifop-p-butyl *(Fusilade)*	NB	R	NB	NB	NB	NB	R	R	R	R	R	NB	NB	NB	NB	NB	N	NB	NB
	glyphosate *(Roundup, Touchdown)*	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	glufosinate *(Rely 280)*	R	R	R	R	R	N	N	N	N	N	N	N	N	N	N	R	N	N	N
	halosulfuron *(Sandea)*	N	R	R	R	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	paraquat *(Gramoxone Inteon)*	R	R	R	R	R	R	R	R	R	R	R	R	R	N	R	R	R	R	N
	pelargonic acid (*Scythe*)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	N
	pyraflufen (*Venue*)	R	R	R	R	R	R	R	R	R	R	R	N	N	R	R	R	R	R	R
	saflufenacil (*Treevix*)	R	N	R	R	R	R	N	N	N	N	N	N	R	N	N	N	N	N	N
	sethoxydim *(Poast)*	R	R	R	R	R	R	R	R	R	R	NB	NB	R	NB	NB	R	N	NB	NB

Note: This is intended as a general guide only. Before use of any herbicide, consult the label.

Labels change frequently and often contain special restrictions regarding specific use of a company's product.

N = Not registered, NB = nonbearing, R = Registered

* simazine is registered on only sour cherry in CA.

** thiazoypr is registered on orange and grapefruit only.

Weed susceptibility information and the most up to date version of this table can be found at the **Weed Research and Information Center** (http://wric.ucdavis.edu)

Resource and Market Information for Enterprise Selection

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Some growers are reconsidering avocado production.

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 their 2001 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 Lake, Sonoma, and Napa Counties, and the Sacramento/San Joaquin areas. 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. In 2007, studies for blueberry production in Ventura/Santa Barbara and San Luis Obispo County and guavas in San Diego County showed a $385/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.

Developed in partnership with the UC Small Farm Program and co-authored by UC Farm Advisor Ramiro Lobo in 2008, the Market-Driven Enterprise Screening Guide http://sfp.ucdavis.edu/Docs/new_enterprise.pdf provides an organized tool for goal setting and inventory. This guide provides a series of questions to help farmers self-evaluate their knowledge of potential new crops or products and the potential for their farming business.

This guide will help you to answer questions like the following 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 additional information sources to help answer these questions:

California Department of Food and Agriculture's 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: http://www.cdfa.ca.gov/statistics/.

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 by at http://www.cdfa.ca.gov/mkt/mkt/ordslaws.html.

The USDA Agricultural Marketing Service (AMS) administers programs that facilitate marketing of U.S. agricultural products, including food, fiber, and specialty crops. AMS issued its first Market News report in 1915. Today, Fruit and Vegetable Market News disseminates detailed information on marketing conditions for hundreds of agricultural commodities at major domestic and international wholesale markets, production areas, and ports of entry. Using direct contacts with sales persons, suppliers, brokers, and buyers, Market News reporters collect, validate, analyze, and organize unbiased data on price, volume, quality and condition, making it available within hours of collection at no cost to you. You can subscribe to Fruit and Vegetable Market News at http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateA&page=FVMarketNews.

Agricultural Marketing Service (AMS) provides a searchable database of Farmer's Markets listings at http://www.ams.usda.gov/AMSv1.0/farmersmarkets. As of mid-2011, there were 7,175 farmers markets operating throughout the U.S. This is a 17 percent increase from 2010. AMS also provides information about the National Organics Program at http://www.ams.usda.gov/AMSv1.0/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.

Additional Resources:

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 (http://www.winefiles.org/) is a project of the Sonoma County Wine Library. 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/Statistics_by_State/California/Publications/Grape_Crush.

Grape Acreage Reports, produced by the California Ag Statistics Service, CDFA, provide acreage statistics by grape type: acreage standing (bearing and non-bearing) by year planted, by county. http://www.nass.usda.gov/Statistics_by_State/California/Publications/Grape_Acreage/index.asp.

The data can be quite different from that reported by the county Agricultural Commissioner's office. A summary of County Agricultural Commissioners offices can be found at http://www.nass.usda.gov/Statistics_by_State/California/Publications/AgComm/Summary/index.asp.