



Small Farm News

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Postharvest Handling of Horticultural Products: Keeping Principles in Perspective

by Marita Cantwell, Postharvest Vegetable Specialist
University of California, Agriculture and Natural Resources.

For all fresh produce, variety selection, climatic conditions and growing practices will greatly affect the quality at harvest. Successful marketing of fresh fruits and vegetables depends on maintaining the quality harvested. Fresh products are alive and respire (e.g. enzymatically converting sugars and acids in the presence of oxygen to carbon dioxide and heat). Careful postharvest handling aims to reduce the rate of respiration and the rate of other processes that cause deterioration and quality loss (water loss, biochemical changes, softening, etc). Careful, clean, and efficient handling is more important than the sophistication of the postharvest equipment used.

Basic Postharvest Principles

Harvest at the optimum maturity for best eating quality. Immature products have higher postharvest water loss and shrivel during marketing. Harvesting fruits such as apples, tomatoes and melons too soon results in nonuniform ripening and poor flavor. Harvesting products overmature may cause toughness (asparagus, beans), rapid yellowing (cucumbers), undesirable starchiness (sweet corn) or other undesirable flavors (bitterness in lettuce), or short shelf-life (apples, peppers). Harvesting fruit vegetables too ripe (tomatoes) makes physical injury more likely and reduces shelf-life.

Harvest during the coolest part of the day. The product is coolest at sunrise, and harvesting

when it is cool minimizes deterioration and water loss. It is easier and cheaper to keep a product cool than to cool a product that has heated up. To minimize the spread of disease, harvest should begin once the foliage has dried. Use clean harvest containers, cutting equipment and gloves. Keep harvested products out of the sun (use an empty container, shade cloth, or other protection) to avoid direct sun injury and unnecessary heating of the product.

Harvest and handle gently. Injured areas on products lead to increased postharvest decay and water loss. Cuts, punctures, abrasions, crushing and bruising cause significant quality losses. In some cases, products may appear undamaged, but may be bruised internally (melons). Reduce physical damage by reducing the number of steps in which the product is directly handled. The ideal situation is to harvest and directly pack the product into the container in which the product will be marketed (strawberries is the classic example). Preparation for market may involve cleaning, trimming, washing and grading. This should be done in a protected or shaded area. Water should be clean (potable) and if reused, a sanitizer should be added to prevent contamination. Cleaning may remove the surface waxes and cause damage. Adequate lighting is important for sorting and grading. Keep all parts of the packing table smooth-surfaced and clean (wash frequently to remove sand, dirt). For food safety considerations,

cleanliness of the product, packing line and employees are all important. Ensure that clean toilet facilities with water and soap for hand washing are always available.

Pack carefully. Do not overpack or underpack. Packing too tightly causes compression bruises; packing too loosely causes vibration and abrasion injuries. Keep containers clean. If packing in plastic containers, wash the container to remove decay-causing organisms, and sand and dirt that can injure the product. If using fiberboard cartons, remember that most of the stacking strength is at the corners of carton boxes; therefore stack and align cartons properly. Containers need vents for air flow and cooling. Use thin perforated plastic liners in boxes to reduce shrivel. Paper pads on the bottom and top of plastic-lined boxes will absorb excess moisture and reduce decay.

Cool the product as soon as possible after harvest. Temperature is the most important factor determining deterioration rate. Decreasing the temperature reduces the product's metabolism (respiration and ethylene production), water loss, and the growth of decay-causing fungi and bacteria. Mechanical refrigeration is the basis for most cooling methods. Room cooling (placing



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Director's Message

The Small Farm Program is Moving Forward

The Small Farm Program is in transition after the retirement of Director Desmond Jolly in July 2006. I have had the wonderful opportunity to learn more about the Small Farm Program while serving as Interim Director. Here I would like to briefly report on the Small Farm Program Review completed in 2006, the recruitment for the new Director of the Small Farm Program, the hiring of a Communicators Coordinator for the Small Farm Program, translation of important marketing and food safety publications, and the upcoming California Farm Conference.

The Small Farm Program is a statewide UC program and periodically undergoes a review process to assess effectiveness and to make recommendations for future efforts. In 2006 a **Small Farm Program Review** was conducted by a seven-member panel of persons from within and outside the University of California at the request of Maxwell Norton, UC Division of Agriculture and Natural Resources Program Leader for Agricultural Productivity. This review committee strongly reaffirmed the importance of Small Farm Program efforts on behalf of its clientele in California. The review concluded that the Small Farm Program should continue to be an independent state-wide special program, but work closely and collaboratively with other existing and newly established UC programs (In the next newsletter we will describe these programs and some of the Small Farm Advisors' collaborations). The review concluded that the Small Farm Program is considered one of excellence nation-wide with a high level of productivity and visibility for UC small farm research and outreach activities. The review committee also made numerous recommendations, including the need for increased support for the program (both from UC and external

grant sources), and the need for an on-going strategic planning process.

Recruitment for the new permanent **Small Farm Program Director** is underway. The Director is selected by an internal University of California recruitment process and is a 5 year appointment. The Program Director is a 50% administrative position that involves directing and managing the Small Farm Center on the UC Davis campus and overseeing the program advisors and staff of the statewide Small Farm Program. Interested UC applicants submit materials by February 15 to Maxwell Norton, Division of Agriculture and Natural Resources Program Leader for Agricultural Productivity. Small Farm Advisor Ramiro Lobo is chairing the search committee and interviews are expected to occur during the latter part of March with the permanent Small Farm Program Director likely named by April. If you have comments about the Small Farm Program or the hiring of the permanent Director, please send them to Maxwell Norton (mnorton@ucdavis.edu; tel: 209-385-7403) or Ramiro Lobo (relobo@ucdavis.edu; tel: 858-694-3666).

As web-based learning and access increases, we consider it very important to update and continue to improve the Small Farm Program website (<http://www.sfc.ucdavis.edu>). To achieve that and to further expand writing and communications expertise for the Small Farm Program, we are recruiting for a **Communications Coordinator**. This person will be responsible for the Small Farm website and all electronic media; coordination and editing of publications, including newsletters, publications, brochures and articles; and coordinating Small Farm Program efforts internally with the Small Farm Advisors, the Small Farm Workgroup, as well as with our farmer and marketing clientele. We expect

to have this person in place by March 2007 and you should see significant updates to the website soon after that!



Marita Cantwell

Translations. Another component of communications is to have materials available in different languages. We consider this key for important information, such as implementation of Good Agricultural Practices to ensure food safety. Therefore we have hired students from our small scale farming and ranching communities with excellent bilingual abilities (Spanish, Chinese, Vietnamese) to assist in translation of several recent and important Small Farm Program bulletins. These translations will be available on the Small Farm Program website so they may be printed as needed. With the next newsletter we will be providing a list of the materials being translated and soon to be available. And we continue to be interested in hiring other bilingual students (Hmong, Laotian for example) to work with us on this translation project.

California Farm Conference will take place at the Beach Resort Monterey hotel from March 4-6, 2007. The program has been posted on the web at <http://www.californiafarmconference.com/> for some time, but we wanted to include some of the program and registration information here in case you had not yet seen it. Please review the program insert and I think you will find something of interest and use for your farming, ranching or marketing operation. Small Farm Program Advisors and staff will be attending California Farm Conference and we will look forward to seeing you there!

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The Small Farm Center links those who need information on small-scale farming with those who have the information. The Center produces publications and a newsletter; sponsors conferences and seminars; holds a library of periodicals, reports and books; gives referrals; and answers numerous requests for information.

Readers are encouraged to send us information, express views, and contact us for assistance. Mention of a specific product is intended for readers' information or as an example of a similar product—not as a recommendation of that specific product.

Postharvest Handling — FROM PAGE 1

products in a refrigerated room) is a relatively low cost, but also slow method. Forced-air cooling pulls the cold air through the containers and greatly increases the rate of cooling. Hydrocooling (by submersion or spraying cold water) products that tolerate wetting provides fast cooling and avoids water loss. Sanitation of the hydrocooling water is critical to prevent contamination. Some products tolerate contact with ice; crushed or flaked ice can be applied as a slurry in water. Evaporative cooling can be used in hot dry environments by pulling outside air through wet pads to provide high humidity, cooler air.

Freshness is a very important quality attribute. Freshness can be maintained by expedited marketing, but can also be achieved by storing for short periods under the proper conditions. The longer the period from harvest to consumption, the greater the need for good temperature management. Once the product has been cooled, use low rates of air circulation to reduce water loss. Many fruits and vegetables require low storage temperatures, but others are chilling sensitive and need to be stored at intermediate temperatures. See the following websites for storage information for specific products; <http://postharvest.ucdavis.edu>; <http://www.ba.ars.usda.gov/hb66/>. Most fruits and vegetables require high humidity (>85%). Ethylene is a natural gas produced by fruits (apples, pears, tomatoes, melons). However, leafy vegetables are damaged by ethylene. Avoid storing ethylene-incompatible fruits and vegetables together.

Use adequate transport vehicles. Secure the load to reduce vibration injury; drive slowly; cover the product to prevent exposure to the sun and excessive water loss. For transporting product to market, use an insulated truck if a refrigerated vehicle is not available. Refrigerated trucks have sufficient refrigeration capacity but lack air flow capacity for cooling; they can only maintain product temperatures, so products need to be pre-cooled before transport. Stack containers on pallets away from the truck walls and leave channels so cold air can flow around the containers. Avoid temperature fluctuations during loading & unloading since moisture condensation will increase decay (closed refrigerated docks are therefore best). During display for market, protect products from high temperatures & air velocities, and low humidity. Where appropriate, use shade, mist with clean water. Display products in their containers to reduce handling injury.

Ten Important Guidelines for Postharvest Handling of Fresh Produce:

1. **MATURITY.** Harvest the product at the correct stage of maturity.

2. **REDUCE INJURIES.** Minimize handling. Every time the product is handled, it is damaged.
3. **PROTECT PRODUCT.** Protect the harvested product from the sun and warm temperatures.
4. **CLEANLINESS & SANITATION.** Keep the packing line simple and clean. Use clean potable water or a sanitizer if the water is reused. Maintain strict worker hygiene. Use Good Handling Practices.
5. **PACK CAREFULLY.** Sort, classify and pack carefully in an adequate container to protect product.
6. **PALLETIZE.** Insure that the boxes are well placed on the pallet and that the pallet is strapped.
7. **COOL.** Cool the product as soon as possible after harvest.
8. **KNOW MARKET AND PRODUCT REQUIREMENTS.**
9. **COORDINATE HANDLING.** Make the handling system efficient and rapid to keep product quality.
10. **TRAINING.** Train, provide tools and pay well the workers involved in critical handling steps.

Sources of Information on Postharvest Handling:

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2. Kader, A.A. (ed.). 2002. *Postharvest Technology of Horticultural Crops*. Univ. CA Div. Agr. Natl. Res. Publication #3311. 535 pp. UC Postharvest Research & Information Center, Wickson Hall, UC Davis; <http://postharvest.ucdavis.edu>.
3. Kitinaja, L. and A.A. Kader. 2002. *Small-scale postharvest handling practices: A manual for Horticultural Crops* (4th ed). UC Postharvest Research & Information Center, UC Davis; <http://postharvest.ucdavis.edu>. 260 pp.
4. Suslow, T.V. 1998. *Postharvest Chlorination- Basic Properties*. UC Div. Agr. Natl. Resources Publication 8003. 8 pp. <http://ucgaps.ucdavis.edu/documents/newsletter537.htm>.
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6. *The Packer*. Weekly newspaper for the produce industry. Subscription includes guides updated yearly on produce availability and merchandizing, trends in produce marketing, packaging and transportation. <http://www.thepacker.com>.
7. Thompson, J.F., F.G. Mitchell, T.R. Rumsey, R.F. Kasmire and C.H. Crisosto. 2001. *Commercial Cooling of Fruits, Vegetables and Flowers*. UC Div. Agr. Natl. Resources Publication 21567. 61 pp. UC Postharvest Research & Information Center, Wickson Hall, UC Davis; <http://postharvest.ucdavis.edu>.
8. University of California Postharvest Website: <http://postharvest.ucdavis.edu>
9. University of California Good Agricultural Practices website: <http://ucgaps.ucdavis.edu>
10. University of California Food Safety website: <http://www.ucfoodsafety.ucdavis.edu/>

program news

Richard Molinar and Michael Yang, UC Cooperative Extension Small Farm Program in Fresno County, received the California Department of Pesticide Regulation's IPM Innovator Award. The Award recognizes groups that provide integrated pest management leadership in developing and implementing economically sound, reduced-risk pest management programs. The Award Ceremony was held in Sacramento, CA, on October 26, 2006.

California Small Farm Conference Mark your calendars for the next California Farm Conference to be held March 4-6, 2007 in Monterey. The 3 day event includes farm tours, focused workshops, general educational sessions and many opportunities for networking. Conference topics include cultural practices, value-added processing, specialty crops, marketing and business strategies, and more! To learn more about the conference visit the website: www.californiafarmconference.com, or write to California Farm Conference, PO Box 73614, Davis, CA 95617 or call 530-756-8518 Ext.38. We hope to see you there!

Small Farm Advisors and Staff Research and Outreach Updates



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Artichoke Response to Timing of GA Application

Annual artichoke is a desirable crop to add to the rotation program for small-scale growers. It is a hot seller in direct markets and has an especially strong demand in organic markets.

One of the techniques that growers use is the application of gibberellic acid (GA) for earliness and increased yields. One of the challenges that small-growers have is when to apply an organically approved GA formulation to enhance bud initiation.



A grower displaying the first of his annual artichoke buds

This project was started at the request of a small Hispanic organic cooperator. The objective was two-fold: 1) to determine whether the 2 varieties tested can be grown locally as an annual artichoke crops, and 2) to determine the appropriate time to apply GA to enhance earliness and productivity.

The trial was based on sequential application of GA as a function of plant growth stage as opposed to scheduled spraying. The two varieties with commercial appeal that were tested were 'Imperial Star' and 'Colorado Red'. We used leaf stage as a marker and applied 20 ppm GA as follows: 1) one spray at 4-leaf stage, 2) sprays at leaf stages 4 and 5; 3) sprays at leaf stages 4, 5 and 6, and finally 4) sprays at leaf stages 4, 5, 6 and 7. The control received one spray of water at the 4 leaf stage.

Multiple harvests were carried out. At each pick, we segregated buds into commercial pack sizes 18, 24, 26, 48, 60, plus small and cull buds. Buds in each category were counted and weighed.

Although the data are not completely summarized yet, I would like to share some preliminary trends. The variety Imperial Star is an earlier producer than 'Colorado Red'. During the first 4 harvests (8 week period), very little production was obtained in plots that were untreated or treated only once at the 4-leaf stage. Less than 3% of total yield was obtained in these treatments over the initial eight week harvest period. Treating 'Imperial Star' at 5-leaf stage resulted in significant earliness, with 32% of total yield being obtained during the initial 8 week harvest period.

'Colorado Red' artichoke treated at the 6-leaf stage produced about 34% of the total yield by the end of the 8 week harvest period.



Good quality artichoke Imperial Star (I) and Colorado Red (R)

I would like to caution against increasing the rate and the frequency of GA application. Preliminary data showed a greater tendency for production of deformed artichoke buds as a result of repeated applications and a higher cumulative applied concentration.



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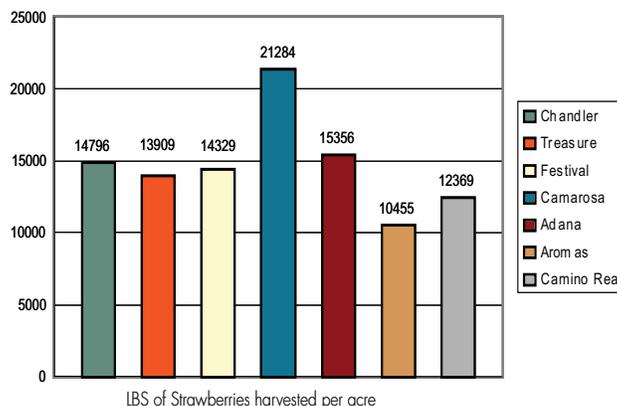
Small Farm Strawberry Variety Trial Stockton CA 2006

Benny Fouche, U.C. Small Farms & Specialty Crop Advisor
Alex Acosta, Junior Specialist UC Davis
David Sa Lee and Family, Grower/Shipper Lodi, CA



This year's experimental test plot evaluated 7 replicated varieties for potential use by small farms in direct market channels. Varieties were chosen for their fresh market and frozen market potential. The plot was established in a commercial field, bed fumigated with vapam and drip irrigated. The plants were donated by Bob Whittaker of Bonseeds. Similar trials were established in Merced and Fresno using the same plant source so that data could be collected in three different climatic locations of the Central Valley for direct market farmers. Plants were transplanted in the Stockton area on August 13th 2005. Results are from 14 harvests beginning on April 28 and ending on June 14. Data was collected from 10 plants in the middle of each plot, replicated 4 times. We collected only the fruit suitable for fresh market and freezer sales. Unfortunately for the growers and our research results this season, we had one of the wettest years in recent history and much of the crop was lost due to botrytis and other soft rots. There were also many cloudy days that prevented the fruit from ripening normally.

The results show that under these wet, cloudy conditions the Camarosa variety produced the most marketable fruit.





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Effects Of Varying Planting Density On Blueberry Yield And Fruit Size.

Alternative management practices are important to small scale blueberry growers who need to improve production efficiency. We have established trials to evaluate different plant and row spacing configurations to provide different planting densities and the effects on blueberry yield and fruit quality.

Initial harvest data is now available from two blueberry trials established in 2002 on a farm in the Edna Valley near San Luis Obispo. The trials are using Sharpblue and Misty cultivars established in different planting configurations with one or two rows per bed. The two rows per bed trial compares treatments that provide a range of approximate planting densities between 2540 and 4235 plants per acre. These plants are planted in double, staggered rows on 6 ft wide beds separated 12 ft center to center at spacing of 18", 24", and 30". These treatments correspond to planting densities of 4235, 3178 and 2540 plants per acre. Treatment plots are replicated five times.

A second trial compares the Misty and Sharpblue cultivars planted at a range of single row treatments of 18", 24", and 30" spacing and thus, compares approximate planting densities of 1744 plants per acre (30"), 2180 plants per acre (24"), and 2904 plants per acre (18"). These plants are planted in single rows on 4 ft wide beds separated 10 ft to center. Treatment plots are replicated five times. Typical plant densities commonly used for southern highbush blueberries in California are 30" spacing utilizing approximately 1744 plants per acre).

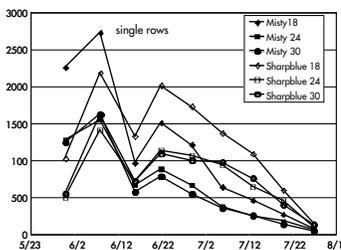


Fig. 1. Weekly fruit yield of Misty and Sharpblue blueberries at varying plant spacing in single rows per bed. San Luis Obispo, CA 2006 season.

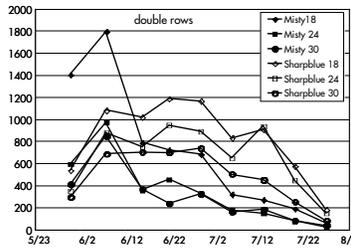


Fig. 2. Weekly fruit yield of Misty and Sharpblue blueberries at varying blueberry plant spacing in double rows per bed. San Luis Obispo, CA 2006

The trial was first harvested in 2005 but data was not collected the first season. Data collection began in late May of 2006 with delayed harvest following an unusually cool wet spring. The two cultivars showed marked yield differences across the two trials with the Sharpblue consistently out-producing the Misty cultivar at all plant spacings (Pr<0.05). The Misty production was higher in the initial harvest weeks but Misty had a narrower production

peak than Sharpblue in this season but Misty yields fell rapidly and after the third or fourth week Sharpblue yields were consistently higher than Misty (Fig. 1-2).

The results also indicate a clear difference among planting spacing in both single and double rows per bed (Pr<0.05). In the single bed configuration, both Misty and Sharpblue total yields were highest at 18" spacing, followed by 24" plant spacing, and finally the 30" spacing (Fig. 3.). Overall however, there was no statistically significant difference between the 24" and 30" spacing in the single rows. In the double row trial (Fig. 4), total yields of both Misty and Sharpblue were again highest at the 18" spacing but the total yields for the 24" and 30" spacings were not significantly different from each other.

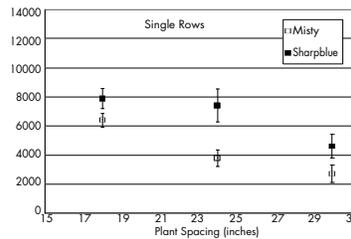


Figure 3. Total fruit yield of blueberries at 18", 24", or 30" spacing in single rows per bed. San Luis Obispo, CA. 2006 season.

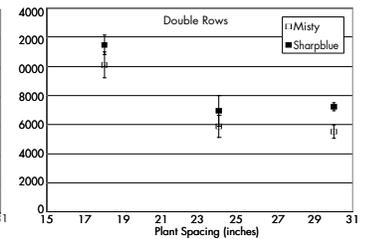


Figure 4. Total fruit yield of blueberries at 18", 24", or 30" plant spacing in double rows. San Luis Obispo, CA 2006 season.

No clear pattern emerged for fruit size among cultivars or planting spacing and data from the single row plots is shown in Fig. 5 for illustration.

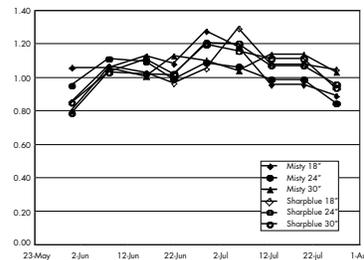


Figure 5. Weekly average fruit size from Misty and Sharpblue blueberries planted at varying plant spacings in single rows per bed. San Luis Obispo, CA 2006 season.

As plants are planted more densely they compete with each other for light and nutrients and usually fruit size falls off and often fruit number as well. The plants in the field reach an optimum spacing and configuration for a given cultivar in a specific, environment.

The one and two row configurations were evaluated in separate trials so they cannot be analyzed

or compared with strict statistical confidence. Still, these trials were side by side in the same field and planted at the same time from the same groups of transplants. It is noteworthy that the highest yields in the two-row configuration were from 10,000 to more than 12,000 lb per acre (Fig 4) compared to the one-row configuration with highest yields in the 6000 to 8000 lb per acre range (Fig 3).

These results are important because they indicate that blueberry yields appear to increase with higher planting densities down to 18" between plants on either single or double rows per bed. This harvest period is the fourth year from planting 18 month old plants in the field. Data from subsequent seasons will be important to determine if these yield advantages to higher planting densities persist. Or rather as plants continue to grow if they will reach the point of over competition and yield and fruit size will be adversely affected at higher planting density.



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**Specialty Crop Research
Blueberry Studies**

Kearney Agricultural Center, 2007

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Plant Size Trial

Purchasing plants is expensive. This trial was designed to compare the cost effectiveness of planting smaller, less expensive plants to various other size plants. This study included a 2" cell, RP5, 3 1/2" pot, 1 Liter, 1 gallon and bare root plants. The data shows that after the first four years of harvest, the larger plants produced the highest cumulative yield. However, as of the spring of 2006, there were no yield differences between any of the treatments.

Table 1. Plant Size Evaluation- Misty, lbs./plot

	2006	2005*	2004	2003	Cumulative
1 Gallon Grow Bag	47.87 ns	46.05 A	55.50 A	25.65 A	175.1
1 Liter Pot	54.24 ns	40.96 AB	44.18 B	11.70 B	151.1
2x5 Field Liner	46.31 ns	36.42 AB	44.83 B	0 C	97.5
Rooted Cutting	46.78 ns	34.35 B	32.25 C	0 C	113.4
2" cell	58.61 ns	33.52 B	41.98 BC	0 C	133.8
3.5" pot	47.95 ns	33.49 B	40.88 BC	0 C	122.3
CV	16.7	12.81	14.94	54.41	
LSD	-	10.01	9.75	4.17	

*Approximately 20% of the fruit remained on the plant in 2005.

Plant Spacing Trial

The plant spacing trial was designed to determine the most profitable plant density. Treatments included plant spacings at 18, 24, 30, 36, 42 and 48 inches. Accordingly, plant populations ranged from 990 plants per acre (at the 48" spacing) to 2,640 plants per acre (at the 18" plant spacing). During the first two years (2003-2004), the higher plant populations produced the greatest yield. However since 2005 there have been no yield differences between any of the treatments.

Table 2. Plant Spacing- Cultivar: Misty, lbs./ plot

	2006	2005*	2004	2003	Cumulative
18"	57.28 ns	40.62 ns	55.75 A	40.60 A	194.24
24"	49.10 ns	41.23 ns	48.15 AB	34.58 AB	173.11
30"	53.45 ns	42.87 ns	54.28 A	30.18 BC	180.69
36"	51.97 ns	42.01 ns	56.28 A	26.80 CD	177.07
42"	53.48 ns	35.31 ns	38.58 B	21.29 DE	148.68
48"	49.78 ns	35.72 ns	42.58 B	17.35 E	145.45
CV	15.53	25.57	13.35	16.1	
LSD	-		9.93	6.91	

*Approximately 20% of the fruit remained on the plant in 2005.

Replicated Cultivar Evaluation

Since 1997, we've planted approximately 60 blueberry cultivars at the Kearney Research and Extension Center in Parlier California. In 2001 we selected 8 cultivars for the replicated trial the cultivars included O'Neal, Sharpblue, Misty and Star, Ozarkblue, Jubilee, Southmoon

and Legacy. Legacy has out produced all the other cultivars (Table 3). Since the establishment of the trial, several early and more productive cultivars have been established at the Kearney Facility.

Table 3. Replicated Variety Trial, lbs. per plot

	2006	2005	2004	2003	Cumulative
Legacy	77.37 A	65.42 A	49.60 A	38.63 A	231.02
Misty	43.08 BCD	39.09 B*	51.18 A	23.60 C	156.95
Jubilee	41.43 BCD	28.67 C	41.63 AB	34.66 AB	146.39
South Moon	58.48 B	25.05 CD	29.80 BC	24.92 C	138.25
Sharp Blue	33.15 D	24.97 CD	31.40 BC	22.89 C	112.41
Ozark Blue	14.54 E	21.74 CD*	14.20 D	12.43 D	62.91
Oneal	38.33 CD	20.30 D	18.90 CD	8.85 D	86.38
Star	52.83 BC	20.25 D	49.28 A	32.01 B	154.37
CV	24.64	16.17	26.96	17.93	
LSD	16.28	7.3	14.18	6.53	

*Approximately 20% of the fruit remained on the plant in 2005.

Mulch Study

The use of wood mulch is essential to good blueberry production. This trial was designed to compare two types of wood and plastic and an untreated check (no mulch). The wood mulches used were pine and almond shells. Mulch alternatives included black and white plastic. Two untreated checks were established. One untreated check received mulch on the fifth year of establishment. Star was the cultivar used for this trial. The data shows yield differences only in the first year of production. It should be noted that the fall of 2006 we observed plant decline in the non-pine treatments. Therefore we expect to see significant yield differences in 2007.

Table 4. Mulch Study 2005, lbs. per plot

	2006	2005*	2004	2003	Cumulative
Pine Mulch	49.83 ns	17.12 ns	33.10 ns	28.18 BC	128.24
White Plastic	57.51 ns	15.20 ns	34.78 ns	38.30 A	145.78
Black Plastic	51.33 ns	13.60 ns	33.55 ns	35.06 AB	133.52
Untreated (4 yrs.) + Mulch yr. 5 >	41.23 ns	12.70 ns	29.43 ns	24.29 C	107.63
Almond Shells	43.58 ns	12.18 ns	32.73 ns	26.90 BC	115.37
Untreated Check	43.78 ns	11.76 ns	31.58 ns	30.19 ABC	117.31
CV	20.81	38.69	25.34	18.44	
LSD				8.48	



Ramiro Lobo

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**Small Farm Advisor's Report
Ramiro Lobo, San Diego County**

Research and Extension activities in San Diego County have focused on new or specialty crops suited for fresh market consumption. Pitahaya or dragon fruit and blueberries will continue to be the focal point of research and extension efforts in this area. In collaboration with Gary Bender, we have expanded

these efforts by incorporating blackberry/raspberry variety trial and demonstration plantings under conventional and organic production systems. These trials have been recently established with grower cooperators in Carlsbad and Escondido.

Our research and extension activities focusing on *pitahaya* or *dragon fruit* have generated positive and unanticipated results. First, several varieties in our experimental plots have proven to be self-fruitful, setting fruit on their own without the need for hand or cross-pollination. In addition, we were able to obtain data on blooming dates, fruit size, and brix scores for these varieties which will help with an early screening for productivity and fruit quality. Second, freezing temperatures at our trial site allowed us to evaluate and to screen the varieties for susceptibility to frost damage. While most of the varieties showed signs of damage, only two were damaged severely. Third, research results and experiences with pitahaya were presented at a pitahaya festival sponsored by the California Rare Fruit Growers in Cal Poly Pomona on October 7th, 2006. I helped coordinate and promote the event which attracted an estimated 70 people. Finally, I had the opportunity to meet Dr. Yosef Mizrahi of Ben Gurion University in Israel, who is the leading Israeli researcher on dragon fruit and other desert fruiting cacti. We discussed possibilities for collaboration and for exchanging visits to learn about research efforts at our institutions.



Educational activities planned include a berry or caneberry production school scheduled for Spring 2007. This program will highlight the potential for caneberry production on small acreages and cover all aspects of production and marketing for fresh consumption. In addition, I am collaborating with the San Diego County Vintners Association in planning and sponsoring an educational series titled *San Diego Wine University*. This program will target new and existing, small scale wine grape growers in Southern California and cover the entire wine production process from site/variety selection to wine production and marketing. The seminar series is scheduled for Spring 2007 as well.

The development of Cost and Return studies for minor crops grown in San Diego County has also been an important activity of the program. I am collaborating with Eta Takele and Gary Bender to develop cost and return studies for guavas, macadamias and other minor subtropical crops. Recent collaborative efforts with Shermain Hardesty and Jim Bethke have focused on helping the California Protea Growers Association develop a strategic plan that will help them improve the promotion and profitability of proteas for California growers. Sample costs to establish and produce proteas in San Diego County have been developed in collaboration with Jim Bethke, Karen Klonsky and Rich DeMoura as part of this effort.



Richard Molinar

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Small farms and Specialty Crops Advisor Richard Molinar, M.S., is working with other U.C. Davis academics, Community Based Organizations, USDA agencies, and other non profits to assist small farmers with IPM (integrated pest management) practices and pesticide safety issues. Almost ½ of the 5,000 small farms in Fresno County are minority operated (over 2,000 Hmong and Hispanic), and almost all are growing specialty crops with different and unusual pest problems and limited controls available to them. Together with Michael Yang, the SE Asian outreach assistant for Cooperative Extension, they are teaching farmers about insect identification, IPM practices for their farms, new crops such as the blueberries in the picture, and how to apply and store chemicals safely. They have been instrumental in reducing the amount of highly toxic and harsh chemicals such as Lannate® used in certain specialty crops such as 'oriental eggplant' by more than 54% (1996-2003). Farmers also receive intensive training on sprayer calibration, pesticide mixing, and reading labels. The educational needs of many ethnic farmers are better met by the fact that Molinar is fluent in Spanish and Yang is fluent in Hmong and Lao. Many meetings are conducted in 'other-than-English' languages. In October, the Small Farm Program received an IPM Innovator award from the California Department of Pesticide Regulation.



In response to a mid-September 2006 outbreak of persons with an E.coli O157:H7 infection from spinach harvested in Salinas, California UC Cooperative Extension in Fresno joined with Farm Bureau, the Ag Commissioner's office and the Small Farm Center to offer a

half day **Food Safety Forum**. This training provided updates and guidelines to help avert problems with microbial contamination of the Valley's fruits and vegetables. Speakers included Marita Cantwell, Trevor Suslow, and Linda Harris from UC Davis, Jeremy Baloian from Baloian Farms, and a panel consisting of Jerry Prieto (ag commissioner), Kate Farrell, PHN and Tim Casagrande (both from the Fresno County Department of Health). Over 75 people were in attendance. The planning committee was composed of Richard Molinar (small farms advisor), Shannon Mueller (agronomy advisor) and Connie Schneider (nutrition, family, and consumer sciences advisor).



Kristin Reynolds

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Kristin Reynolds has conducted research and outreach on agritourism and women in agriculture, as a graduate student researcher (International Agricultural Development), and staff member with the Small Farm Program over the past 3 1/2 years. In 2006 she presented research findings on an agritourism study (conducted through the SFP with retired director Desmond Jolly) at the Ecological Farming Association Conference in Pacific Grove. She also collaborated on presentations of the research at the PlacerGROWN agritourism conference in Placerville, and the California Cultural and Heritage Tourism Symposium in Sacramento.

Outreach to women producers has included work developing a risk management curriculum for women farmers and ranchers, (a project initiated by Jolly), that will be available in CD-ROM and online formats by early 2007.



Tourgroup at Ferry Plaza

This fall, as a part of a project on urban and peri-urban agriculture, Kristin attended sessions on urban agriculture at the Community Food Security Coalition conference in Vancouver, BC. She also led a tour of urban agriculture sites in the San

Francisco Bay Area for Small Farm Workgroup members. Tour participants visited urban production and marketing sites in Alameda County, visited with farm-direct market managers, and met with the director of the Center for Urban Education about Sustainable Agriculture (CUESA) in San Francisco. Kristin will be conducting an assessment of peri-urban and urban agriculture in the coming months. (The study will also be a part of her research as a doctoral student in the Geography program at UC Davis.)

As a part of the Small Farm Center's outreach efforts, Kristin interacts regularly with diverse groups of farmers and food system groups. Most recently she met with a delegation of farmers, organizational- and agricultural ministry representatives from Belarus and co-facilitated a workshop at the BANPAC/BARNN "Growing a Healthy Food System" meeting (partially sponsored by UC DANR) in Oakland. She also attended a two-day anti-racism training in Vancouver led by the organization Dismantling Racism Works, and continues this work at the SFP. Please check the SFC website for periodic updates on several of the projects mentioned here.

CALIFORNIA FARM CONFERENCE

MARCH 4-6, 2007 • MONTEREY, CALIFORNIA

The conference theme this year is The Time is Ripe. Never before have consumers been so interested in buying local, buying organic, and buying specialty products. California farmers are in an ideal position to benefit from this consumer interest: The time is ripe to improve your farming and business skills to meet the increasing demand for locally-grown produce. The time is ripe to diversify your crops to meet changing demands. And the time is ripe to capitalize on the markets and opportunities that are unfolding daily in many business sectors not just farmers' markets.

Conference participants will learn how direct marketing, sustainable farming practices, and specialty crops provide promising opportunities for small family farms to improve their financial conditions. The tours and short courses will offer examples of small farms that are successfully employing promising strategies. Our speakers will offer plenty of inspiration and vision to help you realize your goals.

Conference Venue Hotel: Beach Resort Monterey

2600 Sand Dunes Drive, Monterey, CA 93940
TEL: (800) 242-8627 or (831) 394-3321
E-mail: information@montereybeachresort.com

The Beach Resort Monterey is located on the beach just off Highway 1 north of Monterey. Exit from Highway 1 at Highway 218 - Seaside / Del Rey Oaks Exit.

Schedule of Events

Schedule of Events		
Sunday, March 4	8:00 am – 9:30 am	Conference Registration Open
	9:00 am – 5:00 pm	Tours
	9:00 am – 4:00 pm	Short Courses
	3:00 pm – 6:00 pm	Conference Registration Open
	5:30 pm – 8:30 pm	Tasting Reception
Monday, March 5	7:30 am – 4:00 pm	Conference Registration Open
	9:00 am – 10:15 am	Opening Plenary and Keynote Address
	10:30 am – 12:00 pm	Workshops
	12:00 pm – 1:00 pm	Networking Luncheon (No Speaker)
	1:15 pm – 2:45 pm	Workshops
	3:00 pm – 4:30 pm	Workshops
	6:00 pm – 7:15 pm	Networking Reception (No-Host Bar)
	7:00 pm – 9:00 pm	Banquet and Plenary Address
Tuesday, March 6	7:30 am – 9:30 am	Conference Registration Open
	8:00 am – 9:00 am	Breakfast and Plenary Address
	9:15 am – 10:45 am	Workshops
	11:00 am – 12:30 pm	Workshops
	12:30 pm – 1:00 pm	Late-bird Raffle Drawing

2007 CALIFORNIA FARM CONFERENCE REGISTRATION FORM

Instructions: There are three options for registering:

- 1.) Complete this form on your computer and email it back using the button above.
- 2.) Return this form with your check or credit card information to:
California Farm Conference, P.O. Box 73614, Davis, CA 95617.
- 3.) Fax this form with your credit card information to 1-888-712-4188.

Hotel rates are not included in the registration fee. You must make those reservations on your own. Please see the website or page 2 of the registration brochure for specific information. For general questions about the conference and your registration status, call 1-888-712-4188 or e-mail us at: info@californiafarmconference.com.

Save! Early bird registration discount is available until February 1, 2007. All fees are per person.

CONTACT INFORMATION

Farm/Business name: _____

Contact Name: _____

Address: _____

City: _____ State: _____ Zip code: _____

Home phone: _____ Business phone: _____

Fax: _____ E-mail: _____

Please check which category best applies to you:

- Farmer Farmers' Market Manager Consumer Educator
 Ag Media Government Produce buyer Non-Profit/Community Organization Other

CONFERENCE REGISTRATION

The registration fee includes the keynote address and the workshops. You can add meals, the tasting reception, short courses and tours for an additional fee. You may sign up for conference registration and add only those meals that you like or you may select the Meals Savings Package which includes all of the meals for one low price.

A discounted Early Registration price is available if your registration is postmarked by February 1, 2007. Meals can only be guaranteed for those registering before February 21.

Please use one form per farm, household or business. Print the names clearly. They will be used for name tags. Please note the Participant ID number. It will be used for the remaining portion of the registration form. Non-registrants such as spouses or children may purchase meal tickets without paying the registration fee. If you are traveling with a spouse, children or others who are not registering for the conference, but who will join you for meals or a tour, please include their names in this section.

Contact name: _____ ID #1

Name: _____ ID #2

Name: _____ ID #3

Name: _____ ID #4

Registration for ID# _____, _____, _____ (Registration postmarked by February 1, 2007): \$100 per person \$ _____

(Registration postmarked after February 1, 2007): \$135 per person \$ _____

Conference Registration Total \$ _____

Cancellation Policy:

A full refund of registration fees will be made if written cancellation notice is received before January 20, 2007.

A 50% refund will be made if written cancellation notice is received by February 10, 2007.

No refunds will be given after February 10, 2007.

Continue on next page.

Full Conference details at www.californiafarmconference.com

MEALS

The following meals and the Tasting Reception are offered to group participants as an opportunity for networking with your colleagues. Remember to also indicate meals for your spouse, children or others traveling with you who are not registering for the full conference.

Tasting Reception Sunday evening \$25 per person for ID# _____ = \$ _____

Monday Lunch \$25 per person for ID# _____ = \$ _____

Monday Banquet Dinner \$35 per person for ID# _____ = \$ _____

Tuesday Breakfast \$20 per person for ID# _____ = \$ _____

Meals Savings Package. **Must be received by February 1, 2007. This package includes the Tasting Reception, Lunch, Banquet Dinner, and Breakfast for \$95. You save \$10.00 per registrant over the regular meals price.**

\$95 x number of registrants for participant# _____ = \$ _____

What are your group's meal preferences? _____ Vegetarian _____ Meat _____ Fish
(List number required)

Meals Total \$ _____

TOURS AND SHORT COURSES

These are pre-conference events on Sunday, March 4, that are open to conference registrants and those who may be unable to attend the full conference. Tours and Short Course require payment of a separate fee of \$50 each. Space on the Tours and in the Short Courses is limited and reservations will be honored on a first-come, first-served basis. Some events are half-day, others are full day (see descriptions for details). When registering, please select both a first and second choice in case your first choice is sold out.

Choice (Please indicate your 1st and 2nd choices)

_____ Mediterranean Tour \$ 50 per person for ID# _____ = \$ _____

_____ Ag. History Project in Watsonville Tour \$ 50 per person for ID# _____ = \$ _____

_____ Carmel Valley Wine Tour \$ 50 per person for ID# _____ = \$ _____

_____ Blueberry Production Short Course \$ 50 per person for ID# _____ = \$ _____

_____ Strawberries and Caneberries Short Course \$ 50 per person for ID# _____ = \$ _____

_____ Biofuel Opportunities for CA Farmers Short Course \$ 50 per person for ID# _____ = \$ _____

_____ Organic Transition, Production & Marketing Short Course \$ 50 per person for ID# _____ = \$ _____

Short Course and Tour Total \$ _____

Conference Registration, Tours and Meals Total \$ _____

RAFFLE

At each conference, a raffle and silent auction help to raise funds for scholarships at future convenings of the California Farm Conference. This year's grand prize raffle features a Marriott Travel Vacation package that includes two RT airfare tickets in coach class and a 7-night stay at a Marriott Hotel or Resort anywhere in the United States. You can purchase raffle tickets now by adding them on to your conference registration. Tickets are \$2 each. Indicate in the space below how many tickets you would like and they will be automatically produced and placed in the drawing, using the contact information you included above. Please help us support this worthy cause!

Number of raffle tickets _____ x \$2 each = \$ _____

PAYMENT INFORMATION

Visa Mastercard Check
(Make checks payable to: **California Farm Conference**)

TOTAL PAYMENT AMOUNT \$ _____

Card number: _____

3 Digit security code (on back of card) _____

Card member name: _____

Expiration date: _____

Signature: _____



Speakers

Keynote Address: *Michael Dimock*, Executive Director of the Roots of Change Fund, will present the keynote address. He is Founder and former President of Ag Innovations Network. He has focused on agriculture and the food system since 1989 and has worked on both ends of the spectrum, as a marketing executive in Europe for Riverbend International, and as an organic farmer in Sonoma County. Michael Dimock serves on the President's Committee of Slow Food International.

Banquet Address: Noted author and radio personality *Michael Olson* will present the banquet address. Michael Olson is the author of *MetroFarm*, the Ben Franklin Book of the Year Finalist and Executive Producer and Host of the syndicated Saturday *Food Chain* radio talk show, which received the Ag/News Show of the Year Award from the California Legislature.

Breakfast Address: *Marita Cantwell*, Interim Director of the UC Small Farm Program, will be breakfast speaker on the final day. The program is part of the University of California's Division of Agriculture and Natural Resources, and the Small Farm Center office is located on the UC Davis campus. The Program consists of 6 Advisors located in San Diego, Santa Barbara, Tulare, Fresno, Santa Clara and San Joaquin counties, and other campus and county-based staff. The Small Farm Program provides research results, publications, and educational programs on small farm topics.

Food & Wine Tasting Reception (March 4)

Celebrate the fine wines and cuisine of Monterey and Santa Cruz counties. Delectable seasonal offerings created with fresh produce from California growers will be offered and will be paired with exceptional local wines. You'll also enjoy olives & olive oil and the best savory and sweet treats the region has to offer, and live cooking demonstrations. Meet and greet new and old friends. Ticket Cost: \$25. Must be 21 year or older.

Tours (March 4)

See conference website www.californiafarmconference.com for more details.

- **Mediterranean Tour:** Olio delle Coline Olive Farm in Aptos, UCSC Arboretum and Farm.
- **Ag History Project Watsonville:** Codiga Center & Museum, ag, history of Pajaro Valley.
- **Carmel Valley Wine Tour:** Chateau Julien winery ; Bernardus, Heller, Talbott & Georis wine tasting rooms.

Short Courses (March 4)

Blueberry Production

9:00 am to 3:00 pm, with 1 hour for lunch (This course will be at UCSC - transportation provided from the hotel). This short course is aimed at farmers on the central coast and the northern San Joaquin and Sacramento Valleys. The short course will be held at UCSC Farm and Garden. Topics to be covered are blueberry varieties, marketing, sustainable production techniques, post harvest, with some information on organics, visits to variety trials and discussion of production techniques from a farmer's point of view.

Strawberries and CaneBerries: Cultivars, Production and Marketing

9:00 am to 1:00 pm. In this short course, strawberry experts will discuss strawberry and cane berry cultivars, management techniques of diseases (soil borne and foliar), integrated pest management of insects, and farmers will talk about their strawberry production and marketing strategies.

Organic Transition, Production and Marketing

9:00 am to 3:00 pm, with 1 hour for lunch. This course will provide an overview of organics and the certification process, what the organic market looks like and what products are "hot", organic practices, basic approaches to organic production and soil management, food processing and food safety issues, and a discussion on informational and financial resources available to farmers wishing to transition to organics. A panel of experienced organic farmers will discuss transition strategies, challenges of transitioning and maintaining organic certification, marketing considerations and changes to the land they've seen under organic management.

Biofuel Opportunities for California Farmers

9:00 am to 4:00 pm, with 1 hour for lunch. This day-long short course will offer realistic, up-to-date, and practical assessment of biofuel opportunities for California farmers. Ethanol and biodiesel plants are springing up like weeds in the Midwest and the President is talking about switchgrass. This may be good news for Midwestern corn and soybeans growers, Wall Street investors, and for reducing our reliance on foreign oil. But what does it really mean for California farmers?

Workshops by Day & Time

Workshops include a variety of topics with information useful for producers to increase their economic viability and feature local farmers, farmers' market managers, and representatives of public and private agencies in California's agricultural industry as workshop organizers and presenters. The workshops are organized under thematic

tracks highlighting important topics of investigation at the conference:

- Track 1 : Growing Your Business
- Track 2 : Making Your Market Successful
- Track 3A : New Frontiers in Specialty Crops
- Track 3B : After the Harvest: Value-Added Strategies
- Track 4 : Hot Topics in California Agriculture
- Track 5 : Marketing: If I Grow it; Will They Come?
- Track 6 : New Ideas in Production

Monday, March 5, 10:30 am - 12:00 pm

Track 1, Session 1: Using USDA Grants and Loans to Build and Diversify Farming Operations

- LaVon Treasure, USDA Farm Service Agency
- Dave Chaney, UC Sustainable Agricultural Research and Education Program
- Daniel Mountjoy, USDA Natural Resource Conservation Service
- Robert Newhall, Western SARE Deputy Coordinator, Logan, Utah

Track 2, Session 1: Market Events and Promotions

- John Silva, Pacific Coast Farmers' Market Association
- Nancy Gammons, Watsonville Farmers Market

Track 3A, Session 1: A Time to Bloom: Cut Flowers for Direct Sales

- Renee Shepherd, Renee's Garden Seeds, Felton
- Jerry Thomas, Thomas Farm, Aptos

Track 4, Session 1: Serving the Changing Demographic of California Farmers – a Dialogue

- Richard Molinar, UCCE, Fresno County
- Vivian Soffa, USDA Farm Services Agency
- Chukou Thao, National Hmong Farmers Association
- Will Scott, African American Farmers of California

Track 5, Session 1: Integrating Your Marketing Efforts

- Rick Knoll, Taiwra' Knoll Farms, Brentwood
- Reggie Knox, Farmlink, Santa Cruz

Track 6, Session 1: Alternatives to Methyl Bromide

- Hussein Ajwa, Department of Vegetable Crops & Weed Science, UC Davis
- Mark Bolda, Farm Advisor Strawberries & Caneberries

Monday, March 5, 1:15 pm - 2:45 pm

Track 1, Session 2: Solidifying Your Farm's Future through Innovative Strategies to Secure Land

- Steve Schwartz, California FarmLink

Track 2, Session 2: Health Education Food Program: WIC

- Leslie Kaye, California Department of Health Services, WIC Program
- Christina Moss, Monterey County Health Department
- Gabriela López Chávez, Latino 5 a Day Program

Track 3A, Session 2: Are Specialty Crops in Your Future?

- Mark Gaskell, UCCE Santa Barbara County
- Dana Iiso, ALBA, Salinas
- Jim Rutiz, Rutiz Family Farms, Arroyo Grande

Track 4, Session 2: Farming, A Pain in the... The Nature of Farm Injuries, Prevention and Intervention

- Martha C. Stiles, California AgrAbility Program, UC Davis
- Jim Leap, UC Santa Cruz, Center for Agroecology & Sustainable Food Systems
- Edward Kelley, Director of Community Development, Arthritis Foundation of Northern California

Track 5, Session 2: New Ideas in Agritourism

- Ellie Rilla, UCCE, Marin County Director
- Nita Gizdich, Gizdich Ranch, Watsonville
- Elaine Work, Work Ranch, Monterey County
- Joy Barlogio, Jack Creek Farms

Track 6, Session 2: Biodiverse Approaches to Pest Management

- Nicholas Mills, Chair, UC Berkeley Department of Entomology

Monday, March 5, 3:00 pm - 4:30 pm

Track 1, Session 3: Selecting What to Grow

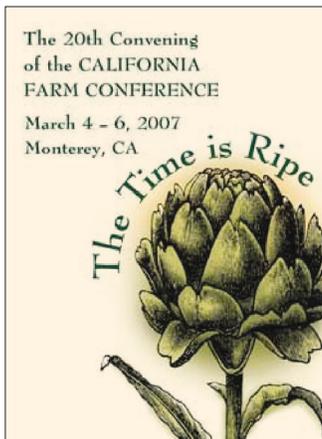
- Karen M. Klonsky, Agricultural & Resource Economics, UC Davis

Track 2, Session 3: Round Table for Market Managers

- Facilitated by Vincent Scalise, Pacific Coast Farmers' Market Association and Gretchen Sterling, Pasadena Farmers' Market

Track 3A, Session 3: Bringing Animals Back on the Farm

- Jim Dunlop, TLC Ranch
- Dru Rivers, Full Belly Farm
- Trevor Suslow, UCCE Postharvest Technology Research and Information Center



**Track 4, Session 3:
Energy Alternatives for Farmers**

- Mike Morris, National Center for Appropriate Technology

**Track 5, Session 3:
Marketing Your Farm: How and Why to Tell Your Farm Story**

- Rick Knoll, Taiwra'- Knoll Farms, Brentwood
- Emily T. Avaya, Friends Ranches, Ojai

Track 6, Session 3: Innovations in Drip Irrigation

- Larry Schwankl, UCCE, Kearney Agricultural Center
- Michael Cahn, UCCE, Monterey County

Track 4, Session 4:

California Agriculture Faces Water Quality Compliance Issues.

- Daniel Mountjoy, USDA Natural Resources Conservation Service

Track 5, Session 4: New Models of Direct Marketing

- Anya Fernald, CAFF
- Panelist TBA

Track 6, Session 4: Extending Your Season

- Manuel Jimenez, UCCE, Tulare County
- Will Delamore, Haygrove Tunnels

Tuesday, March 6, 11:00 am - 12:30 pm

Track 1, Session 5: Keeping Your Workers Happy

- Gregory Encina Billikopf, UCCE Stanislaus County

Track 2, Session 5: Maintaining Market Integrity for New and Established Markets

- Jerry Prieto, Fresno County Agriculture Department
- Mary Lou Weiss, Torrance Farmers' Market

Track 3B, Session 2: Financing Value-Added Projects

- Karen Firestein, USDA Rural Development
- Rhonda Motil, Monterey County Vintners and Growers Association

Track 4, Session 5: Farm Inventions and Appropriate Technologies

- James Thompson, Biological & Agricultural Engineering, UC Davis
- Ken Giles, Biological & Agricultural Engineering, UC Davis
- Jim Leap, UC Santa Cruz, Center for Agroecology & Sustainable Food Systems

Track 5, Session 5: Buy Local Campaigns

- Anya Fernald, CAFF
- Panelist TBA

Track 6, Session 5: Food Safety

- Trevor Suslow, UCCE Davis

Tuesday, March 6, 9:15 am - 10:45 am

Track 1, Session 4: Small Farms and Financial Management

- Laura Tourte, UCCE Santa Cruz County

Track 2, Session 4: Seven Ways to Increase Your Media Coverage

- Christina Abuelo, Foothill Farmers' Market Association

Track 3B, Session 1: Introduction and New Ideas to Value-Added Processing

- George Work, Work Family Farm, San Miguel
- Carolina Braunschwig of cbsweets, San Francisco
- Al Courchesne (aka Farmer Al), Frog Hollow Farm, Brentwood



Small Farm Center

University of California

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