

SMALL FARM CENTER

The Small Farm Center is sponsoring the Farmer To Consumer Conference in West Sacramento on October 15, 1988. The Conference will focus on new production and marketing opportunities in the lower Sacramento valley area (Solano, Sacramento, and Yolo Counties). It is a one-day event with a keynote speech, workshops, and a farm/market tour- an excellent chance for growers interested in specialty crops and selling directly to stores, restaurants, and consumers. One of the goals of the conference is to forge a stronger link between farmers and marketers in the three-county area, for market development and economic revitalization. By utilizing direct marketing, farmers can receive a higher price for their goods. Increasing profits can help ensure the survival of small, family farms and the preservation of farmland from urbanization.

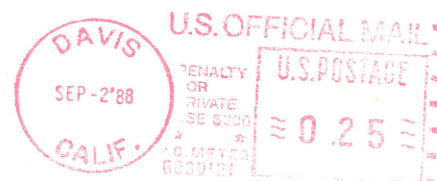
Also in the works is a survey of market outlets in the region, including wholesalers, grocery stores, and restaurants- to determine how much produce is actually purchased from local farmers at the present time. A directory of marketers who are interested in purchasing more items from local farmers will be compiled and distributed to farmers in the area. The directory is intended to help match local retailers with local farmers.

For more information and a registration form contact: Linda Vieira, secretary, Small Farm Center, University of California, Davis, CA 95616. (916) 752-6690. Between 1:00-5:00pm daily.

Erin Chapman
Editor

Cooperative Extension
U.S. Department of Agriculture
University of California
Berkeley, CA. 94720

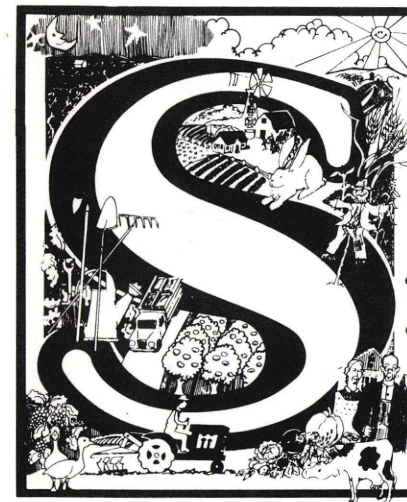
Official Business
Penalty for Private Use
9396



COUNTY DIRECTOR
FRESNO CO. COOP. EXT.
1720 SOUTH MAPLE AVE.
FRESNO, CA 93702

In accordance with applicable Federal laws and University policy, the University of California does not discriminate in any of its policies, procedures or practices on the basis of race, religion, color, national origin, sex, marital status, sexual orientation, age, veteran, medical condition, or handicap. Inquiries regarding this policy may be addressed to the Affirmative Action Director, University of California, Agriculture and Natural Resources, 300 Lakeside Drive, 6th Floor, Oakland, CA. 94612-3560. (415) 987-0097.

COOPERATIVE EXTENSION • UNIVERSITY OF CALIFORNIA



Small farm News

SMALL FARM CENTER

SEPT/OCTOBER 1988

PESTICIDES IN CALIFORNIA AGRICULTURE: RISKS AND ALTERNATIVES

(In 1988, the University of California's Agricultural Issues Center completed a major study entitled: *Chemicals In the Human Food Chain: Sources, Options, and Public Policy*. Five study groups considered the following questions: 1) What chemicals get into the human food chain? 2) What options and alternatives exist to reduce or replace the use of chemicals in food production systems? 3) What policy concerns and goals should divergent interest groups pursue in order to obtain effective regulation of chemicals in the food supply? The author of this article conducted research for the study group dealing with alternatives to pesticides in plant crops. -Ed. Note)

One of the most controversial issues currently debated in California agriculture surrounds the use of pesticides in various crop production systems. The safety of our abundant supply of fresh fruits and vegetables is being called into question. Nationwide, two reports have recently taken the lead in addressing the problems of pesticides in food. These are *Regulating Pesticides in Food* (National Academy of Sciences, 1987) and *Pesticide Alert* (Natural Resources Defense Council, 1988). Within California, the State Department of Food and Agriculture publishes an annual *Pesticide Residue Report* which has shown very few problems with pesticides in the food supply. However, an Assembly Office of Research Report questions the scope

and accuracy of the CDFA residue monitoring program. The title of their report is *The Invisible Diet: Gaps in California's Pesticide Residue Detection Program*. A provocative, but somehow disconcerting title.

The Risks of Pesticides In Cropping Systems

There are many factors (genetic, environmental, agronomic, economic) which determine the specific type and amount of pesticide a grower chooses to apply in a particular season. When pesticides are used in cropping systems, a number of things can happen to pesticide molecules. The pesticide may have immediate effect as it hits the target organism; there will also be some residual effect from pesticide that remains on the inedible and edible portions of the crop. A portion of the chemical will reach the soil surface where it can make its way into ground or surface water; and much of the pesticide will become airborne and eventually be deposited on plants, soil and/or water. The exact distribution and pathway for any pesticide is influenced by many factors and may be highly variable within the same crop or field in a given season and from year to year. Degradation mechanisms and by-products within crop production systems are also variable and result in various other compounds which may be more or less harmful than the original pesticide.

As a means of dealing with the complex picture

Cont' on p. 2

SMALL FARM NEWS IS PUBLISHED BY:

Small Farm Center
U.C. Davis
Davis, Cal. 95616
(916) 752-6690

Editor

Erin Chapman

Erin Chapman

Assistant Editor

Linda Vieira

Linda Vieira

Associate Director

Claudia Myers

Claudia Myers

Program Director

Ron Voss

Ronald E Voss

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 to County Small Farm Advisors, and answers numerous requests. We encourage our readers to send us information express views, and contact us for any assistance we can offer.

Mention of specific product names are intended for the information of our readers or as examples of similar products. This is not a recommendation for that specific product.

TABLE OF CONTENTS

Pesticides in Agriculture	1
Cover Crop Summary Table	3
Pesticides Summary Table	5
Specialty Greens	6
Cal. Cert. Org. Farmers	7
Low-Input Funding	8
Sustainable Ag. Grants	8
Farm Advisor Profile	9
Announcements	10
Publications	10
Calendar	11

CORRECTION

The cover crop summary table printed in the July/August issue contained a misprint. In column four, instead of reading "nitrogen-fixing rate," the correct title is "seed planting rate." See page three of this issue for the correct version.

Cont' from p. 1

of pesticide use in California, the Options in Crop Plants study group narrowed the scope of their report to five case studies: tomatoes (all pesticides), almonds (Navel orangeworm insecticides), grapes (Botrytis bunch rot fungicides), rice (herbicides), and citrus (all pesticides). In each cropping system, the objectives were basically the same:

1. To provide information on the cropping system (ecology and production practices) that provides the background for evaluating the appropriateness of options and alternatives.
2. To describe the current conventional cropping system within California in terms of pesticide use.
3. To present the integrated pest management principles that apply to the cropping system.
4. Within the framework of the IPM strategy, to present an inventory of other alternatives and options currently being practiced and/or evaluated by California growers and researchers.

Analysis of the use and impact of pesticides in the five case study crops indicated a number of potential problem chemicals. These are shown in Table 1 and focus on three problem areas: pesticide residues, water quality, and worker health.

Pesticide residues

All of the pesticides under citrus and grapes, and most under tomatoes, have been found as residues on the commodities shown, albeit at levels below current EPA tolerance levels. According to CDFA sources, methamidophos is the only pesticide to have been found in California exceeding the tolerance limit on tomatoes (1986 residue report). Captafol and mancozeb have not been found as residues on tomatoes but are currently under special review/re-registration due to evidence of potential oncogenic (tumor-causing) effects.

Cont' on p. 4

COVER CROP SUMMARY TABLE

COVER CROP	USE	PLANTING DATE	SEED PLANTING RATE (lbs/acre)	GROWTH HABIT
Lana woolpod vetch <i>Vicia dasycarpa</i>	winter annual	fall	30-60	low and viny
Purple vetch <i>Vicia benghalensis</i>	winter annual	fall	30-60	low and viny
Berseem clover <i>Trifolium alexandrinum</i>	winter annual	early fall	20	low and bushy
Austrian winter peas <i>Pisum sativum</i>	winter annual	fall	80-120	low and viny
Bell beans <i>Vicia faba</i>	winter annual	fall	100-200	stiff-stemmed and tall
Cowpeas <i>Vigna sinensis</i>	summer annual	spring-summer	30	low and viny
Sesbania <i>Sesbania bipinosa</i>	summer annual	spring-summer	10	stiff-stemmed and tall
Crotalaria <i>Crotalaria juncea</i>	summer annual	spring-summer	10	stiff-stemmed and tall
Subclover <i>Trifolium subterraneum</i>	orchard winter annual	fall	15	prostrate
Medics <i>Medicago spp.</i>	orchard winter annual	fall	10	prostrate
Ladino colver <i>Trifolium repens</i>	perennial	fall or spring	5	low and bushy

NOTE: Nitrogen-fixing rates differ for each legume, according to management techniques; and can vary between 40-250 lbsN/acre.



Water quality

All of the chemicals listed have been found in California groundwater with the exception of chlorothalonil. Though not detected in any wells, chlorothalonil is currently under special review by EPA due to properties which indicate a high potential for contamination. It is nearly impossible to correlate groundwater contamination with normal agricultural use of a pesticide by a single farmer. In other words, problems in this area stem from the use of pesticides in the aggregate over long periods of time. The chemicals are listed under a particular crop in Table 1 in order to indicate the areas for which alternative pest management research may be necessary.

Worker health

The chemicals in this category are listed due to one or more of the following: 1) the pesticide is associated with at least one reported incident of worker health problems in 1985 or 1986 (CDFA data); 2) the pesticide is a Category I (restricted) material, highly toxic; and/or 3) the pesticide is currently under special review by EPA and/or CDFA.

Alternatives to Pesticides

The case studies described a number of alternatives which reduce (or could reduce if adequately developed) the amount of pesticides used in California cropping systems. Growers themselves are always looking for ways to limit the use of chemicals (thus cutting costs of production), and much agricultural research and extension conducted over the last two decades has also focused on alternative methods of pest control. Many of these strategies are pulled together within the context of the integrated pest management programs for the crop. Some of the most current recommendations for pest control can be found in University of California IPM Manuals for Tomatoes, Almonds, Grapes, Rice and Citrus. However, an extended analysis of each cropping system presented some very promising areas that would supplement IPM programs. Brief descriptions of the options reported for tomatoes are listed below.

Currently Practiced Short-term Alternatives

Resistant varieties: resistance known for Fusarium, Verticillium, Root Knot Nematode, Alternaria, Stemphyllium, Tomato Mosaic Virus.

Adjust planting date: earlier plantings usually miss pest population peaks in late summer.

Crop rotations: diversification for control of weeds, diseases, nematodes.

Water management: minimize damage from Phytophthora and fruit molds.

Sub-drip irrigation: weed control, reduce disease problems.

Biological control: mainly for insect control; a variety of predators and pathogens at work.

IPM implementation: field monitoring, pest identification, record keeping, integration of best cultural practices.

Long-term Alternatives

Pheromone confusion: disrupt mating by use of synthetic chemicals to mimic communication between male/female of insect species.

Microbial pesticides: environmentally sensitive materials such as *Bacillus thuringiensis*, nuclear polyhedrosis virus, and other bacterial or fungal organisms that are antagonistic to pests.

Biotechnology: gene transfer to incorporate such traits as insect resistance, herbicide resistance, disease resistance.

New chemical application techniques: new sensory and delivery devices to determine crop architecture and increase application efficiency; development of electrostatic sprayers.

A number of these same options came out in the citrus case study. Crop production practices that include the use of biological control, resistant varieties, good water management and other IPM practices do much to reduce the amount of pesticides used in citrus culture. Additional options discussed for citrus include: acceptance of imperfections in rind quality by consumers, more frequent plantings by growers (plan for a shorter life span for each tree), mowing of weeds, and the use of cover crops.

Options for control of the navel orangeworm in almonds focus on the following cultural practices: orchard sanitation, rapid and timely harvest, proper drying of nuts, use of resistant cultivars, and enhancement of natural enemies of the navel orangeworm in the orchard.

Weed control alternatives in rice center around four key components of the production system: selection of competitive rice varieties, minimum tillage, water management, and crop rotations.

Botrytis bunch rot in grapes can be curtailed by several non-chemical methods of control. The important strategies here are: development and use of resistant varieties, vineyard sanitation, irrigation management, canopy management (leaf removal), and biological control.

The aim of this report is to bring together the kind of analysis that will help California farmers make the transition to production systems that continue to meet consumer demands, are profitable, and environmentally sound. For details on alternatives to chemical use and other aspects of the study, please refer to the Ag Issues Center report to be published later this year, or contact the author through the Small Farm Center.

By Dave Chaney, Farming Systems Analyst, UC Sustainable Agriculture Research and Education Program, UC Davis. (916) 752-6690.

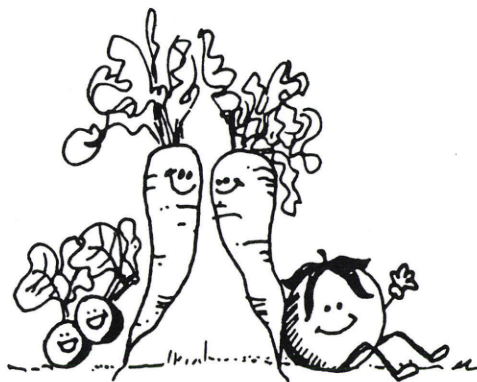
CHEMICALS OF POTENTIAL CONCERN IN CASE STUDY CROPS

Potential Problem Areas	Tomato (all pesticides)	Citrus (all pesticides)	Rice (herbicides)	Almond (Orangeworm insecticides)	Grape (Botrytis fungicides)
pesticide residues	captafol carbaryl chlorothalonil dimethoate mancozeb methamidophos parathion	carbaryl chlorbenzalate chlorpyrifos dicofol methidathion methomyl			captan dichloran
water quality	carbaryl chlorothalonil diazinon dichloropropene dimethoate endosulfan malathion parathion	bromacil carbaryl diazinon dichloropropene dimethoate dinoseb diuron simazine	found in surface water molinate thiobencarb		
worker health	carbaryl chlorothalonil diazinon dimethoate endosulfan methamidophos methomyl parathion triadimefon	azinphosmethyl malathion methidathion methomyl methyl bromide monocrotophos parathion phosmet phosphamidon propargite (Omite CR)		azinphosmethyl phosmet	benomyl captan mancozeb

NOTE: The pesticides in this figure are presented in order to show potential risk and to suggest possible priority chemicals for alternative research. They are listed due to: 1) known occurrences in the problem area in the crop; or 2) chemical characteristics that indicate possible human health risk. More detailed information and analysis would be required in order to directly correlate health hazards with the use of the chemical on the case study crop.

TABLE 1.

SPECIALTY VEGETABLE GREENS



Fall is one of the best times for planting lettuces and other leafy plants, not to mention that marketing in late fall and winter can be a boon for many California growers, since other locales may be literally snowed in by this time of the year. Consumers are genuinely interested in salad plants. Not just greenleaf and redleaf lettuces either, but the more esoteric varieties such as perella, lollo rosso, prima, danilla, cocarde oakleaf, and others. The marketing trend is moving toward the specific—as taste, color, and textures of leafy salad plants become key factors in selection. Consumers want variety as well as quality, so if you think you'll be planning—and planting—for fall you might consider some of the selections listed below. Please note that the traditional "cole" crops such as broccoli, kale, and cauliflower are not listed, due to space limitations.

BEETS: Golden, Chioggia (candy-cane striped), baby red. Plant in full sun; harvest as babies in 50 days; full size, 70 days.

BROAD BEANS: Also called horse beans or favas, these are best planted in late October for April maturity. Can withstand some frosts.

CARROTS: Late summer planting results in minimal bolting; allow enough warm weather for full root development. Varieties such as chantenay and muscade develop full flavored, meaty roots. Nantes selections make standard mini-carrots.

CHARD: A kitchen garden staple that is sought after by European shoppers, chard is a kin of beets. Full sun; choose red ribbed ruby or Italian white ribbed chard. Leafy Orach is another close kin and nice complement to other greens.

CHICORY: This is a vast category of plants, many of which do best planted in late summer and fall. You'll find radicchios, escaroles, endives, and green-leafed chicories in this category. Most are rugged; bear beautiful leaves that are slightly bitter to the taste but make delicious ingredients to salads or braising mixtures. A few chicories are grown for their roots which are either dried and ground as a coffee substitute or sauteed fresh for winter-time meals.

FENNEL: Plant mid- to late summer, into early fall. Establish the crop just as you would carrots, and mound loose soil over enlarging roots. Fennel is used raw in salads (it's delicious with apples or oranges) or cooked with fish and tomatoes. Fennel seems to be receiving more popularity from the American public each year.

LETTUCE: Batavians and romaines seem to withstand winter-time temperature changes a bit better than loose-leaf varieties, but there's still time for a crop or two of the lovely open leaf types. Be sure to plant several varieties at a time, as a trial if you will, to test heat and cold tolerances. In autumn California can experience great ranges in temperatures.

Cont'

MACHES: (also known as corn-salad and lamb's lettuce): Autumn is the best time to germinate this little green. Moisture and temperatures below 80 degrees are essential. Mache makes a beautiful bright green addition to almost any salad mixture.

ONIONS: While many gardeners prefer sets, onion seed allows a person to choose more specific varieties. Granex types are recommended south of Fresno; 501 is the much touted new development from Texas. Slender bunching onions do well anywhere and may be harvested when just the size of a tiny skewer as well as standard pencil diameter.

PEAS: Even though the consumption of fresh peas has decreased dramatically over the last 15 years, fresh peas can't be beat, especially those planted in fall. Consider the petit pois, sugar snap, Chinese types, or standard English shelling peas. A few of each kind will satisfy all cooks, as will a bouquet of colorful sweet peas. Be sure to add bone meal to most soils.

RADISHES: These fall into three basic categories: those that mature quickly in three weeks time; those that are long-rooted and shaped much like an emperor carrot and which take 6-7 weeks to mature; and the daikon type which can range in size and maturity dates. Even the quick to mature types can be diverse. French breakfast radishes are stubby with red and white markings, while many others are round-oval coming in a wide range of colors. Radish sprouts, or kaiware, are finding wider market acceptance in non-ethnic market-places.

SPINACH: Many people overlook spinach as they think it takes too many leaves for one meal. But if planted rather thickly in rich, moist soil, even a small plot of spinach will yield a surprising number of salads or cooked dishes. Remember there are fine-leaf and savoyed types.

TURNIPS: As a classic vegetable for many winter "presentations," turnips are not only beautiful, but also more versatile than one might think. Crunchy and tender, small turnips may be eaten as radishes; they may be included in vegetable macedoines or salads; steamed, pureed, you name it. Almost as variable as the radish in size and color, turnips come in purple or rosy red, or entirely white skinned. There are green and yellow turnips as well. "Babies" are ready for picking in one month's time.

Late summer is also a perfect time to get your perennial herbs established; clumps of thyme, savory, rosemary, lemon balm, oregano, and sage take hold with the warm days and cool nights of autumn.

By Charlotte Glenn, owner, Le Marche Seeds International, Dixon, CA

CALIFORNIA CERTIFIED ORGANIC FARMERS

The California Certified Organic Farmers Association (CCOF), is a voluntary, non-profit certification organization for organic producers and supporting members in California.

CCOF ensures compliance with the California Health and Safety Code (Sections 26569.11-17) as enacted by the Organic Food Act of 1979. The Act provides a legal definition of "organic" foods. With 15 regional chapters throughout the state, CCOF is the only statewide system for verifying organic production. The Chapters conduct an annual certification process, which is coordinated by the statewide office in Santa Cruz.

CCOF certifies farmers' land and livestock if it meets the requirements of the state code and the provisions of CCOF's by-laws. In addition to prohibiting the use of synthetic materials, CCOF requires that the farmer maintain and improve the biological fertility of his or her land. Every farm is inspected at least once a year. The program is conducted by the regional chapters, which consist of farmers and supporting members. Each chapter has a certification committee and trained inspectors who make on-site farm visits, conduct the necessary soil tests, and review the grower's records. A notarized affidavit is required from each grower stating that they will meet all the requirements of the state law and CCOF's standards.

CCOF takes regular soil samples and also conducts residue analyses if there is a concern about chemical contamination. Land committed to CCOF's certification program must conform to CCOF requirements during a pending period of at least one year before it is certified. Only produce from fully certified acreage may use the CCOF name and sunflower logo.

Livestock Standards

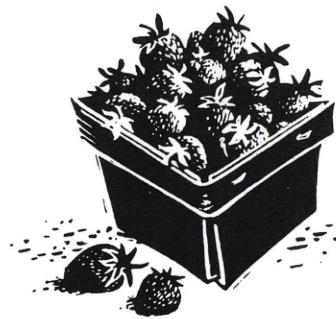
There is increasing concern among consumers about health hazards in foods that contain residues of drugs, hormones and pesticides. CCOF is committed to encouraging the production of animal products that contain a minimum of these residues by providing a certification program for organic livestock producers. CCOF also provides information and referrals for organic livestock producers, and conventional producers interested in making the transition to organic production.

Organic livestock production is a combination of old and new techniques that maximize animal health through proper preventive medicine, adequate nutrition, reduction of animal stress, and other means that do not depend on toxic drugs or pesticides.

SUSTAINABLE AGRICULTURE RESEARCH PROJECTS FUNDED

The U.C. Sustainable Agriculture Research and Education Program funded the following projects in 1988:

1. Ley Farming: Cereal-Legume Rotation and Integration of Livestock to Maximize the Use of Renewable Resources
2. Carrot Rust Fly Management for Organic Farmers
3. Development, Selecting, and Demonstration of Annual Legume Germplasm for Enhancing Sustainable Plant and Annual Farming Systems in Central and Southern California
4. Handling Beneficial Organisms for Control of Pests on the Farm
5. Comparing Low-Input to Conventional Culture Methods in Commercial Almond Production in Central California
6. Learning from Sustainable Agriculture in China: Least Toxic Pest Management Techniques Relevant to Vegetable, Trees, and Vine Crops in California
7. Promoting the Conservation and Greater Utilization of Crop Genetic Diversity by Farmers
8. French Prune Tree Refuges: Their Management and Impact on Grape Leafhoppers
9. Controlled Environment for Preservation of Fruits and Vegetables
10. Conversion to Green Manure Use in Rice Production
11. Developing Soil and Weed Management Strategies Using Living Mulches and Green Manure Crops for Vegetable Production Systems



LOW-INPUT RESEARCH PROJECTS RECEIVE FUNDING

USDA's National Low-Input Agriculture Program has recently awarded grant monies to applicants in the Western Region of the United States. On June 17th, 1988, the Western Region Administrative Council of the Low-Input Farming Systems Research and Education Program, funded the following six grants:

1. "Options for Reducing Production Inputs in the Cereal and Legume Growing Regions of the Northwest." A two-year multistate project led by Washington State University. \$208,000.
2. "Evaluation and Design of Low-Input Vegetable/Small Grain and Small Fruit Systems of Western Oregon and Washington." A two-year multistate project led by Oregon State University. \$220,000.
3. "Care and Feeding of the Soil: Introducing Legumes and other Green Manures into the Cropping Systems of the Northern Plains, Rockies, and Intermountain Regions." A one-year project conducted by the Alternative Energy Resources Organization in Montana. \$7,700.
4. "Compiling a Database of Sustainable Producers for the Southern Rockies Region." A two-year project conducted by the Telluride Institute of Colorado. \$36,000.
5. "Native Crop Research Project." A two-year project conducted by Talavaya in New Mexico. \$45,000.
6. "Comparative Study of Established Low and High Input Vegetable Production Systems in California." A two-year project conducted by the University of California. \$215,000.

FARM ADVISOR PROFILE

Manuel Jimenez, a Tulare County farm advisor since 1980, has been involved in agriculture for a lifetime. Born in Visalia, California, to a family of migrant farmworkers, Manuel first worked in the fields as a laborer. "Ever since I was five years old, as soon as I could pick up citrus or avocados off the ground-I was working." In high school, Manuel took an interest in biology, and continued to pursue this interest by going to college, financing his education with loans from farm labor contractors and National Defense student loans, as well as the income generated by his wife. "I got married right out of high school and we had four kids. It was mentally stressful to try and finish school and raise a family. I went to college off and on from 1969 to 1977, when I graduated with a B.S. degree in Agriculture from Fresno State."

Of the 5,568 farms in Tulare County listed by the Ag Census in 1982, Manuel estimates about 2,800 are small, grossing less than \$100,000 a year. Typical crops of the small grower are: sweet corn, onions, cherry tomatoes, eggplant, squash, navel and Valencia oranges, plums, nectarines, kiwi, and pomegranates. Some farmers will sell their crops directly to consumer at farmers' markets, but the

majority sell to brokers or packing houses in the area. One of the advantages of packing houses is that they provide many services for growers. In citrus for example, the packer will provide orchard care, pest control and labor. There are many small growers who have 10-40 acres of citrus, who pay a manager to operate their farm. The manager monitors the field, and decides when to spray and harvest; all the farmer needs to do is irrigate and fertilize.

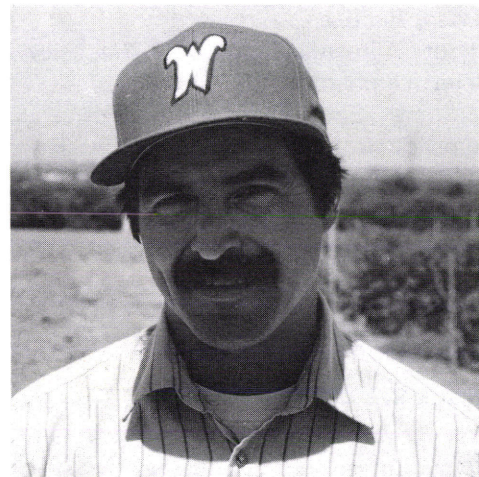
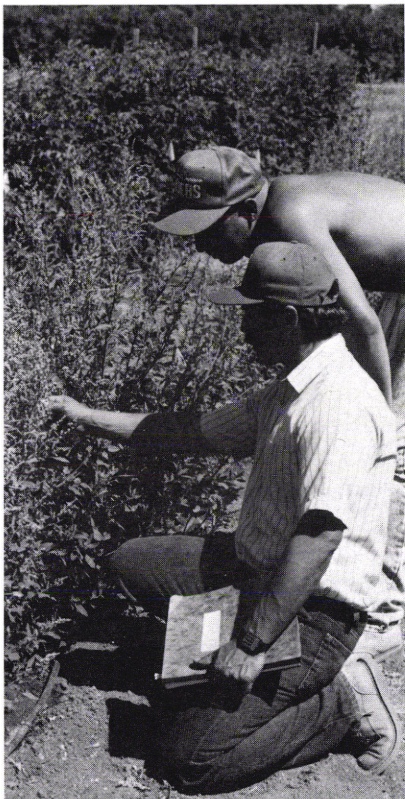
Manuel's program for small farmers in Tulare County has included:

Research: squash spacing and density tests, squash pollination, plasticulture, integrated pest management, variety trials

Seminars: regional marketing workshop, scale-related workshops on grapes, nuts, tree fruits, farm financing and loans

Radio: KGST radio broadcast on pesticide safety and marketing

Manuel feels it is his responsibility to provide growers with well researched information on marketing, educating them enough so they don't go through the mistakes that others do. "I like what I'm doing. Even though you have your hands tied on real issues than can make or break growers, when you find you can help them in small ways it's really gratifying."



ANNOUNCEMENTS

Recipes

Send your favorite recipes and family specialties, for inclusions in the book *American Pride: The Farmers Market Cookbook*. The book is being written, and will offer hundreds of recipes from farmers across the country on soups, salads, vegetable dishes, main dishes, fruits, baked goods and desserts. Send to: Susan Knopf, 220 West 13th Street, New York, NY 10011.

Pesticide Safety Slideshow

130 slides on protecting California farmworkers' health from pesticides. The 15-minute slideshow, called *Pesticides: A Guide For Farmworkers* is available in English and Spanish. It features: interviews with a poisoned worker and doctor, farmworkers' rights of protection and medical treatment, a description of how chemicals are used and applied, and how poisoning can take place. Contact: California Institute For Rural Studies, P.O. Box 530, Davis, CA 95617. (916) 756-6555.

Ecological Horticulture

The Agroecology Program/U.C. Extension is offering a 6-month Apprenticeship in Ecological Horticulture, April 1- September 30, 1989 at the Farm and Garden in Santa Cruz. Emphasis is on hands-on learning in organic gardens, orchards and row crops. Lectures and techniques cover horticultural methods (sowing, cultivation, composting, propagation, irrigation), cultivar requirements (vegetables, herbs, flowers, fruits) soil fertility management, and pest and disease identification and control. Application deadline is December 5, 1988. Contact: Lyn Garling, Apprenticeship, Box A, Agroecology Program, University of California, Santa Cruz, CA 95604. (408) 429-2321.

Farm Advisor Position

University of California Cooperative Extension is seeking a farm advisor for the counties of San Benito, Monterey, Santa Cruz, and Santa Clara. Key issues are production, marketing, small-scale farms, sustainability, and organic farms. Commodity emphasis is vegetable crops, strawberries, and specialty crops. Responsibilities include: regional program development, applied research and education, and collaboration with growers, organizations, and Extension personnel. Requirements: Masters degree or equivalent combination of education and experience in vegetable crop production and marketing; or a related field. Excellent oral and written communications skills necessary. English/Spanish fluency is preferred. Contact: Mary Louise Peters, DANR Personnel, University of California, 300 Lakeside Drive 6th Floor, Oakland, CA 94612-3560. (415) 987-0088.

PUBLICATIONS

New Seed-Starter Handbook

by Nancy Bubel

Extensive and well-documented text on propagating seeds. Includes sections on soil mixtures, containers, transplanting, hardening off, direct seeding, coldframes, greenhouses, hotbeds, fertilizing, and collecting and storing seeds. Also, includes an encyclopedia of vegetable, fruit, herb, and flower seeds which details how to propagate from seed. List of seed suppliers. Bibliography. 1988. Rodale Press Inc., Emmaus, PA 18049.

1988 Certification Handbook

by California Certified Organic Farmers

Gives an overview of the history of C.C.O.F., the California Organic Food Act, the California Health and Safety Code (Section 26569.11), membership and decision-making structure, and certification policy. Covers certification procedure such as: farm inspections, recordkeeping; and soil, water and crop samples; and certification standards such as: conversion/transition periods, soil fertility management, toxic residues and contamination, boundaries and buffer zones, seeds and transplants, and livestock production. Also includes a list of permitted, restricted and prohibited materials. California Certified Organic Farmers, Box 8136, Santa Cruz, CA 95061.

Growing and Using Herbs Successfully

By Betty Jacobs

Written by a commercial herb producer, the book covers production and marketing advice for 64 herbs. Topics: Growing from seed, propagating from layering and stem cuttings, how and when to harvest, drying, storing, and freezing. Also includes practical marketing suggestions and on-farm processing for value-added herb products. 1981. Story Communications Inc., Schoolhouse Rd., Pownal, VT 05261.

Sustainable Agriculture Information

The U.C. Sustainable Agriculture Research and Education Program is now offering a variety of publications and reference material:

An Overview of Program

Copy of Legislative Act

Sustainable Agriculture Guide

Summaries of 1987/88 Grant Projects

To order this material and to get on the mailing list contact: Lyra Halprin, U.C. Sustainable Agriculture Research and Education Program, Agronomy Extension, University of California, Davis, CA 95616.

CALENDAR

CALIFORNIA

Farmer To Consumer Conference

October 15, Sacramento

The Farmer To Consumer Conference is sponsored by the UC Small Farm Center. Topics include: farmland preservation, regional market development, organic farming, specialty crops, value-added products, postharvest handling, marketing channels, direct marketing, marketing organic vegetables, U-pick operations, and low-input sustainable agriculture. A tour of a large distributor called General Produce Company, and Silverbend farm, is also included. The lunch will have produce grown by local farmers. Contact: Linda Vieira, Secretary, Small Farm Center, University of California, Davis, CA 95616. (916) 752-6690.

Prune Production Course

October 31-November 4, Davis

Course is designed by the UCD Pomology Department and Cooperative Extension prune farm advisors. The program features 30 instructors on all aspects of prune production: production, handling, and marketing. Topics: rootstock, establishing the orchard, soils, irrigations systems, pollination, flower and fruit development, tree nutrition, fertilizers, diseases, pests, harvesting, processing, and marketing. Contact: Steve Southwick, pomologist, Department of Pomology, University of California, Davis, CA 95616. (916) 752-2783.

Pistachio Production Seminar

November 15-17, Coalinga

Provides basic information on how to establish a pistachio orchard in its first five years of production. Lectures by UC faculty and Cooperative Extension farm advisors. Contact: Bill Olson, farm advisor, Butte County Cooperative Extension, 2279 Del Oro Avenue, Suite B, Oroville, VA 95965. (916) 538-7201.

National Direct Marketing Conference and Farm Conference '89

February 2-5, 1989, Oakland

The California Farm Conference will host the National Direct Marketing Conference in 1989. Note that it will be held in Oakland rather than in Visalia as originally planned. Contact: Claudia Myers, Small Farm Center, University of California, Davis, CA 95616. (916) 752-6690.

NATIONAL

First National Symposium-New Crops

October 23-26, Indianapolis, IN

The symposium will provide a forum for leading authorities from industry, government, agricultural experiment stations, and academia; to discuss the present status and future of new crop development in North America. Contact: Department of Horticulture, Purdue University, West Lafayette, IN 47907

INTERNATIONAL

International Conference of Sustainable Agricultural Systems

September 19-23, Columbus, OH

The conference will cover: reducing input costs, enhancing long-term agricultural productivity, reducing ecological risks, integrating technology into farming systems, administration of aid to developing countries, technology transfer, and research/education programs on sustainable agriculture. Contact: Clive Edwards, Chair, Department of Entomology, Ohio State University, 1735 Neil Avenue, Columbus, OH 43210.

Farming Systems Research/Extension Symposium

October 9-12, Fayetteville, AR

Sponsored by the University of Arkansas International Agricultural Programs Office and the Winrock International Institute for Agricultural Development, the symposium will address the regional farming concerns of developing countries including Africa, Asia/Near East, and Latin America. Contact: Pam Styles, Coordinator, International Agricultural Program, 300 Hotz Hall, University of Arkansas, Fayetteville, AR 72701. (501) 575-6727.

