

Fall 1990

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From the Director

The Public's Voice in Agriculture

In two recent issues of this newsletter (Winter, Spring 1990), we reported on work groups formed by SAREP's Economic and Public Policy Advisory Group. In this issue, **Larry Yee**, Ventura County Cooperative Extension director, writes about his county's food safety study group (page 4). **Debra Van Dusen** of the UC Santa Cruz Agroecology Program describes a recent conference (page 8) on balancing social, environmental and economic issues in sustainable agriculture, while **Dave Chaney** of SAREP writes about the Rural Development Center that helps small farm families reach economic self-sufficiency (page 10). These activities show the public that we in the agricultural community are concerned about their issues.

Public Role

For those of us formed in the sciences, the specter of a meddling, uninformed public can be chilling. We honor the traditions of great scientists of the past - Copernicus, Galileo, Darwin-whose pursuit of truth brought them popular scorn and censure. The scientific method, controlled and isolated from political fray, is the context of our enterprise. So what role does the public play?

Hyman Rickover, an engineer and father of the modern navy, argued that confusion between pure science and applied science leads to a mistaken disregard for human considerations in the application of science. We have no methods to test the safety and usefulness of any given technology comparable to the methods used by science to test its hypotheses. Around every field in which science is used for human benefit, public debate is not only inevitable, but essential. In pursuit of certain truth, science cannot regard popular ideas, Rickover argued.

"But technology is action and thus potentially dangerous. Unless it adapts itself to human interests, needs, values, and principles, that is unless it is humanistic, technology will do more harm than good. For, by enlarging man's power of mind and body, it enhances his ability to do harm, even as it enhances his ability to do good," he wrote.

Agriculture is probably humanity's oldest technology. The application of our knowledge of biology, chemistry, and physics has unlocked nature's storehouse. But the instrumental use of nature to benefit humans is coming into question today in public debates, in the halls of legislatures, and in the voting booth. Despite the complexities of modern life, we can still trace the threads connecting our activities to other important patterns in the natural fabric.

Our ability to produce food and fiber for expanding populations will depend to a large extent on our ability to maintain the planet's resource base. We need to develop agricultural production systems that work in harmony with natural processes rather than disrupting them. This will require new and different approaches, information, and understanding. It also means that we in agriculture need to look at our impact on the total system and make sure we consider both human and nature's interest, values and principles. It is not enough that we understand the technical processes of our pursuits. We also must instruct the public in these issues so that they can understand the options and make informed choices. Because agriculture, like other applied sciences, must be a humane enterprise.

-Bill Liebhardt, director, UC Sustainable Agriculture Research & Education Program.

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California Farmer Survey

by Jill Auburn, SAREP

Jim Grieshop of the UC Davis Department of Applied Behavioral Sciences, and graduate students **Arnaz Raj**, **Maureen Plas**, and **Andy Karas**, worked with SAREP and the UC Small Farm Center to survey participants at seven farm conferences last fall and winter, including the 1990 annual Farm Conference in Visalia, four conferences oriented toward farmers making a transition to more sustainable methods, and two general conferences sponsored by the California Farm Bureau.

The survey asked questions about growers' concerns and practices, and asked them to mark where they believe they are on a continuum from "High Ecological" (high concern for the environment; very judicious use of inputs; minimal reliance on man-made resources; reduced use of chemicals; increased conservation of soil, water, and energy) to "High Conventional" (effective use of new and traditional technologies and practices, chemicals, and natural resources; centralized arrangements and agricultural practices for effective management and production; primary reliance on resources and practices that maintain desired level of production). Farmers' ratings in three five-year intervals show a pronounced shift toward a more ecological orientation (see Figure, page 1). While just under half rate themselves on the ecological end of the scale today (categories 1-3), and less than one-third considered themselves to be in those categories in 1985, more than 75 percent expect to be using more ecological production practices in 1995.

Grieshop and Raj are analyzing the survey data to compare these overall self-ratings with responses to questions on specific concerns and production practices. More results from the survey will be made public in the next few months. In a similar study conducted for the American Farmland Trust in 1989 (*Agriculture and the Environment: A Study of Farmers' Practices and Perceptions*, J. Dixon Esseks, editor) very little relationship was found between farmers' self-identification as "low-input," "sustainable," "organic," or "conventional," and the production methods they reported using. Will the same be true of California growers in this survey? Or do growers who describe themselves as more ecological adopt different farming practices?

Call for Papers, Workshops

The third conference of the Agriculture, Food and Human Values Society, "Varieties of Sustainability: Reflecting on Ethics, Environment, and Economic Equity" is scheduled May 9-12, 1991 at the Asilomar Conference Center in Pacific Grove. It is co-sponsored by the Agroecology Program at UC Santa Cruz. The conference will examine the connections among philosophical, social, and technical issues in food and agricultural systems.

Abstracts for papers, and proposals for panel discussions and workshops are invited on all aspects of sustainability. Topics may include (but are not limited to): ethics, values and ideology; human health; philosophy and epistemology; sustainable development; ecology and natural resources; culture and agriculture; public policy; labor; social movements; race, class and gender; economic systems; and research and education. The focus may be local, national, or international.

Abstracts not exceeding 200 words should be sent by November 1, 1990 to **Patricia Allen**, Agroecology Program, University of California, Santa Cruz, CA 95064. Authors will be notified of acceptance by January 15, 1991.

UC Ag Issues Center Publications

Three policy studies from the UC Agricultural Issues Center are now available. The Center was established in 1985 at the UC Davis campus as a forum for policy issues affecting California and the West.

Publications include:

- *Chemicals in the Human Food Chain*, a book based on the Center's 1987-88 major study project on sources of chemicals in food. It may be ordered from Van Nostrand Reinhold, P.O. Box 668, Florence, KY 41042-9979, for \$38.95. It evaluates the sources of both natural and artificial toxins in foods and covers pesticide use, animal production, food additives, industrial and environmental contaminants, organic and inorganic chemicals, and plant and microbial toxins.
- Proceedings from two symposia on the Center's 1988-90 major study project *California's Great Central Valley- Confluence of Change*. More than 70 university researchers and outside experts contributed to this study, which culminated in two 1990 symposia. To order the \$10 proceedings, contact UC Agricultural Issues Center, 110 University House, University of California, Davis, CA 95616, or call (916) 752-2320. It is also available from DANR Publications, 6701 San Pablo Ave., Oakland, CA 94608. Checks should be made payable to the UC Regents when ordering from either source.
- *Agriculture in California on the Brink of a New Millennium* focuses on issues facing California agriculture. Topics include farming systems, labor and competitive agricultural technology in 2010; farmland, water and air quality; marketing, trade and delivery systems; and educational and research needs. The book is available for \$10 from the Center or from DANR Publications (see addresses in paragraph above.)

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Ecological Horticulture Apprenticeship

The UC Santa Cruz Agroecology Program/UC Extension offers a six-month apprenticeship in ecological horticulture April 1-September 27, 1991 at the Farm and Garden, UC Santa Cruz. Emphasis is on "hands-on" learning with instruction in organic horticultural methods (soil fertility, cultivation, composting, propagation, irrigation, greenhouse); cultivar requirements (vegetables, herbs, flowers, fruits); pest and disease considerations, and marketing. Application deadline is December 5, 1990. The cost is \$1,000. For further information write Apprenticeship, Box A, Agroecology Program, University of California, Santa Cruz, CA 95064, or call (408)459-2321.

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Ecological Farming Conference

Economist **Hazel Henderson** will be a featured speaker at the 11th Annual Ecological Farming Conference sponsored by the Committee for Sustainable Agriculture (CSA) January 16-18, 1991, Asilomar Conference Center, Pacific Grove. Henderson is known for her work on food systems and the economics of food. Now based in Ft. Lauderdale, Florida, she is an internationally-published futurist, former director of the Princeton Center for Alternative Futures, and founder of many public interest organizations.

Other scheduled speakers are nationally-known nutritionist **Joan Gussow**, and **Marty Strange**, a founder of Walthill, Nebraska's Center for Rural Affairs, which promotes social and economic justice and environmental quality in American agriculture. Gussow is an associate professor, nutrition education at Teachers College, Columbia University and a former member of the Diet, Nutrition and Cancer Panel of the National Academy of Sciences. She is the author of *The Feeding Web*, and co-author of *The Nutrition Debate*, and will discuss sustainable diets. Strange is the author of *Family Farming*, and numerous articles including the health effects of farming practices, and the impact of state economic development policies on midwestern communities.

A plenary session on "Successful Farmers" will be followed by workshops on farm labor, soils, community supported agriculture, "green" consumerism, bookkeeping, affordable food pricing, large and small-scale farmers, herbs, and composting. Other workshops will focus on the roles of cover cropping in ecosystems (led by **Robert Bugg**, SAREP), plant propagation, wine grape cropping, weed control, certification standards and retailers, marketing for small farmers, seed variety selection and value-added packaging. Others will be on farmland preservation and land stewardship, storage of organic products, legislation, retail and wholesale cooperatives management, and cooking with the seasons. All sessions are directed at farmers and retailers, and many farming workshops will include transition strategies.

A poster session focusing on research is also scheduled. For information on displaying a poster contact **Jill Auburn**, SAREP, University of California, Davis, CA 95616, or call (916) 757-3278.

In addition to workshops and seminars, the conference is known for gourmet organic meals. Registration, meals and lodging are \$210 per person before December 1. For information contact CSA at P.O. Box 1300, Colfax, CA 95713, (916) 346-2777.

Videos, Information Available

Alternative Technology Transfer for Rural Areas (ATTRA), the free national telephone information service, has compiled a list of videotapes and other audio visual materials on sustainable agriculture. Many tapes include "hands-on" instruction and are suitable for grower groups as well as vocational agriculture classes. The list includes brief descriptions and ordering information for each tape. Categories include overviews, international sustainable agriculture, policy, farm management/sociology/economics, pest management, water, converting to organic/sustainable farming, organic gardening, fruit production, vegetable production, herbs, greenhouse, livestock, specialty crops, and marketing. A copy of the list as well as information on other topics is available from ATTRA, P.O. Box 3657, Fayetteville, AR 72702, (800) 346-9140. (For more information on ATTRA, see **Sustainable Agriculture News**, Volume 2, Number 2, page 3).

Large-scale Organic

A videotape of three large-scale conventional growers who are beginning to farm organically is now available. "Large-Scale Agriculture Goes Organic" was videotaped in January 1990 at the 10th Annual Ecological Farming Conference in Asilomar. **Paul Carpenter**, general manager of farms, Pure-Pak, Inc., Oxnard; **Jack J. Pandol, Jr.**, productions manager, Pandol & Sons, Delano; and **Erik D. Wilkins**, applied research, Mike Yurosek & Son, Lamont, discuss production and marketing problems in their efforts to reduce pesticide use and move toward organic production systems. The VHS videotape is available from Griesinger Films, Rt. 1, Box 1986, French Creek, WV 26218; phone/FAX (304) 924-5035, and Committee for Sustainable Agriculture, P.O. Box 1300, Colfax, CA 95713, (916) 346-2777. It is 80 minutes long and costs \$19.95 plus \$5 for shipping and handling.

Ventura Food Safety Group

Editor's Note: *SAREP funded the Ventura County Food Safety/Agricultural Sustainability Policy Project in February 1990 to continue its networking system of representatives of often opposed points of view (producers, consumers, retailers, environmentalists). The project will document the group's work as a model of the integration of sustainable agriculture with food safety policy. Member **Larry Yee**, UC Cooperative Extension director, Ventura County, writes about the Ventura County Food Safety Study Group's purpose.*

Food safety is one of the most vexing issues facing agriculture today. A variety of constituencies and interests are involved, each with a different viewpoint on the tough questions that have been raised, and each equally passionate about its position. What's interesting is that everyone seems to agree on what we want - good health, safe food, a protected environment, economic viability, and social justice. But when you start to talk about priorities, time frames, a definition of "what is safe," who and what to protect, "hackles" go up, the positions become entrenched, and the swords start to rattle and clash. Then the media jumps in and whips up public hysteria.

There's hardly a more exciting public policy arena today. In food safety and other complex and critical issues, the University can and should play an important role. In the past, applied research and extension education have been the primary functions of Cooperative Extension. Now, the difficult role of facilitation is of equal, if not more, importance.

With a small grant from the UC Sustainable Agriculture Research and Education Program, the Ventura County Food Safety Study Group was funded for one year to establish an effective process for addressing food safety concerns and problem resolution. The assumption underlying this process is that food safety and sustainable agriculture are inextricably linked. They should be considered together in the policy arena. The Ventura County effort to address these issues is unique in that all of the special interest groups are a part of the process. Our hope is that this coalition-building will improve the development of a more sustainable agriculture.

Imagine a group meeting in which representatives from production agriculture, consumer groups, environmental organizations, farm labor, retail produce and an independent testing lab are all seated around the same table. Imagine the president of the Farm Bureau sitting next to the president of Mothers and Others for Safe Food. Toss in the Green's Party, California Rural Legal

Assistance, a few others, and you have the Ventura County Food Safety Study Group - 18 different people trying to find some common ground.

Two months after the use of Alar on apples drew widespread interest, the Cooperative Extension office in Ventura County decided to try to become more proactive. With the assistance of UC Berkeley Agricultural Economist **L. Tim Wallace**, I concluded that a new forum was needed in which strategies for improving food safety could be explored, discussed, and debated in a non-threatening and constructive way. After some hesitation, people from several organizations met and the Ventura County Food Safety Study Group was launched. The goals were to rebuild trust and respect between the different groups, and to open new lines of communication. The model used for problem resolution is a process that was developed by the Extension public policy workgroup.

Over the last fourteen months participants have learned a great deal. Progress has been slow but steady. Through three-hour meetings once a month and several field trips, misconceptions and myths have been dispelled, people are listening to each other and there is better understanding and communication among the participants. Discussions have not always been easy, but they've been lively and generally positive and constructive.

A big breakthrough came this summer when the group went on tours to actually see and experience some of the things we had been discussing. The group visited various members' production, processing, and retail food operations. These visits provided a broader perspective and understanding of the actual food system at work. In hindsight, this "reality check" should have been done earlier in the process. It will be interesting to see how the tours change the flavor of the discussions and the proposals being discussed.

While no policy recommendations on food safety have been developed, many alternatives aimed at improving the existing system have been identified and discussed. Each alternative is reviewed and evaluated against a list of criteria including environmental costs, enforceability, and improved credibility. Each is also considered from the perspective of each member of the food system (i.e., the farmer, retailer, processor). One of the more tangible alternatives, for example, is a special label that would be affixed to produce grown in Ventura county that meets all the requirements of the system developed by the study group.

Because the process is probably more important than the product, **Jim Reedy**, community resource advisor from Solano County, has been assigned to observe and record the process and proceedings.

For now, the members are hanging on to this new coalition of frequently conflicting interests, trying to build a new base for dialogue - which should result in more sustainable policy alternatives for decision-makers.

Earthworms: Renewers of Agroecosystems

by Matthew Werner,

UC Santa Cruz Agroecology Program, and

Robert L. Bugg, SAREP

The Hindu pantheon includes a multitude of deities, but the principal trinity are Brahma the creator, Vishnu the sustainer, and Shiva the destroyer. Creation, sustention, and destruction, they interconnect and operate in balance through the cycles of nature. By contrast, in western religions the destructive forces of the universe are generally seen as evil. Emblematic of these destructive forces is the worm, destroyer of all things mortal. Yet in our efforts to create a more sustainable agriculture, we may need more balance in our appraisal of the great destructive forces of nature, and of the worm in particular.

For all its destructive reputation, the worm, paradoxically, has a crucial role to play in building. As noted by Charles Darwin in his 1882 classic, *The Formation of Vegetable Mould Through the Action of Earthworms with Observations on Their Habits*, earthworms process huge quantities of plant litter and help convert it into rich topsoil, liberating nutrients for renewed plant growth. More recent studies show that earthworms can help reduce soil compaction, improving permeability and aeration. Earthworms do this through burrowing activities, ingestion of soil along with plant debris, and subsequent excretion of casts. Upon drying, these casts form water-stable soil aggregates. These aggregates are clumps of soil particles bound together by organic compounds, and their presence helps improve soil structure, retain nutrients that might otherwise be leached, and reduce the threat of erosion.

Earthworms are only part of the complex of organisms termed "decomposers" in agroecology. Other destroyers include springtails (Collembola), nematodes, bacteria, protozoa, and fungi. Earthworms themselves fall into several subgroups based on their behavioral ecology: epigeic, endogeic, and anecic.

Epigeic earthworms are those that live in the superficial soil layers and feed on undecomposed plant litter. These worms are usually small and produce new generations rapidly.

Endogeic species are those which forage below the soil surface in horizontal, branching burrows. These species ingest large amounts of soil, showing a preference for soil rich in organic matter. Endogeics may have a major impact on the decomposition of dead plant roots, but are not important in the incorporation of surface litter.

Anecic earthworms build permanent, vertical burrows that extend deep into

the soil. This type of worm comes to the surface to feed on manure, leaf litter, and other organic matter. Anecics, such as the nightcrawlers, *Lumbricus terrestris* and *Aporrectodea longa*, have profound effects on decomposition of organic matter and the formation of soil.

Deep tillage is generally harmful to earthworms. It can kill them outright, disrupt their burrows, lower soil moisture, and reduce the availability of surface litter. Shallow tillage, ridge-tillage, and surface management of crop residues has often led to increases in earthworm activity compared to areas where deep tillage is practiced. Earthworms favor leaf litter that has a low ratio of carbon to nitrogen, and tend to prefer residues of clovers and other legumes over residues of grass. Residues left as surface mulch are very useful in enhancing earthworm densities.

Certain pesticides are particularly harmful to earthworm populations. These include aldicarb, carbaryl, carbofuran, benomyl, and most soil fumigants. Most herbicides are probably not directly damaging to earthworms at the normal rates of use. Some inorganic fertilizers, especially ammonium sulfate, can be harmful to earthworm populations, possibly due to an acidifying affect.

Much of the research on earthworm agroecology has been conducted in areas with humid cool-temperate climates. Relatively little research has occurred in regions with Mediterranean climates. Native California earthworms particularly are still poorly documented and understood. The most complete collection of native earthworms was destroyed in the 1906 San Francisco earthquake and has never been restored.

There is still little research on the roles of earthworms in Californian agroecosystems. Preliminary observations suggest that earthworms in some California agricultural soils tend to have small populations of endogeic species that are active for short periods during the rainy season. More information is needed to take full advantage of the potential benefits of including earthworms in sustainable agriculture practices. What earthworm species/behavioral groups inhabit California ecosystems? Can earthworm species be introduced that are suited to particular agroecosystems? How does irrigation affect earthworm activity patterns? Are earthworms affected by botanical insecticides? What management practices will sustain crop productivity by promoting earthworm activity? These questions are a starting point for observation and experimentation.

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Farm Borrowers: What Is Your Environmental Liability?

Editor's Note: *The following article by Karen Klonsky, farm management specialist, and Kim Norris, research manager, both of the Department of Agricultural Economics, UC Davis, is based on information presented at a toxics liability symposium July 26, 1990 in Fresno sponsored by UC Cooperative Extension and the UC Agricultural Issues Center.*

Farm operations, like any businesses using hazardous or toxic materials, run the risk of incurring liability for clean-up of their own or neighboring properties contaminated by the storage, use, or disposal of those materials. The owner of property that has been contaminated by a tenant or previous owner can be liable for clean-up. This includes banks that have taken ownership of property in foreclosure. Any person or business entity that can be shown to have influence over the management of the business can be liable, again implicating agricultural lenders.

These new risks - a result of federal Superfund legislation - mean that most lenders now want to assess the environmental condition of the property being farmed before making a production or real estate loan. In turn, farmers applying for production or real estate loans should be prepared to answer detailed questions about the history of the farm. For example, borrowers may be asked if the property ever contained any surface or underground storage tanks, or if there are any records of chemical or waste spills.

This is new territory for ag lenders and borrowers alike. It is only in the past few years that farm property environmental questionnaires and site assessments have joined balance sheets and income statements as part of farm loan requirements. Many growers want to know how it will affect their access to credit.

Superfund Link

The main impetus for change has been the enforcement of federal Superfund legislation. *Superfund* is the term commonly used to refer to the Comprehensive Response, Compensation, and Liability Act of 1980 (CERCLA) and its 1986 extension, the Superfund Amendments and Reauthorization Act (SARA). While a number of federal and state environmental laws affect agriculture (FIFRA, RCRA, Proposition 65), Superfund has had the greatest impact on farm lending practices.

Under Superfund, there are four categories of "potentially responsible parties" who may be held accountable for the clean-up of contaminated property. To date, four court cases have upheld lender liability in two of these categories. First, if a bank takes ownership of contaminated property through foreclosure, the bank as owner is liable for clean-up, even if it did not hold

the property at the time the contamination occurred. Second, even where land is not held as collateral, a lender may be held liable for clean-up costs if it was involved in the daily operations of the business. A very recent district court decision held that a lender is liable for clean-up costs if it has the "potential to influence" production decisions that led to the contamination. Often, a bank making a production loan will make periodic site visits and be aware of the production plans of the farm operation. This can be construed as having "potential to influence" business decisions.

In this environment the lender faces three kinds of risk, known as the three C's: credit, collateral and clean-up. Credit risk is the risk that the borrower may become financially unable to service its debt if hazardous waste clean-up is required. Collateral risk is the risk that the value of property securing the loan will be impaired if environmental contamination is discovered on that property or adjoining property. Clean-up risk is the risk that the lender will be held liable for part or all of the cost of cleaning-up a contaminated property, whether or not that lender was responsible for the mess. It is also possible that the cost of a hazardous waste clean-up may exceed the value of the property. To protect themselves from these risks and liabilities, lenders increasingly are using farm property environmental questionnaires and environmental site assessments to determine the likelihood of environmental hazards.

Assessing Risk

Banks generally use two methods to assess environmental risk. The first is an environmental questionnaire. These questionnaires are used to collect information about past uses of the property, the presence of underground storage tanks, sumps, holding ponds, storage facilities for toxic substances, and cleanup and disposal practices. Answers to the questions may flag the need for an environmental site assessment (ESA).

An environmental site assessment is a study of the nature and extent of toxic conditions conducted by a qualified third party. An ESA consists of three phases. The first phase usually includes site inspection, public agency file review, review of site history, regulatory compliance investigation, and aerial photo review. The public agencies that may be asked for information are the environmental health division of the county health services agency, the appropriate regional office of the California Department of Health Services, Toxic Substances Control Division and the appropriate Regional Water Quality Control Board. Other sources of information include the county agricultural commissioner's office, local planning and building departments, and the county assessor's office and records office. The results of the Phase 1 inspection will determine whether or not Phase 2 is necessary.

A Phase 2 ESA includes 1) checking for PCB in transformers and asbestos in buildings; 2) sub-surface testing for toxic substances; 3) testing of surface water, runoff and sub-surface water; and 4) a plan for clean-up if necessary. The final phase is the clean-up itself. Usually the environmental consultant who conducted the ESA will also carry out the cleanup. Clean-up may entail the disposal of empty containers or the removal of contaminated soil. These activities can only be carried out by licensed businesses, and brought to licensed waste disposal sites.

Borrower Implications

Bankers do not use a standard set of guidelines in deciding whether or not to require an environmental questionnaire or site assessment. Each bank has to develop its own environmental risk policy. These additional requirements for a loan add to the cost of doing business. While there are no industry-wide numbers to report, numerous agricultural lenders have assumed

responsibility for hazardous waste clean-up on foreclosed properties. For example, Farmers Home Administration in California has spent \$13 million since December 1987 to clean up 17 contaminated properties.

It is not clear to what extent these costs are being passed on to borrowers in today's competitive loan market. It is clear that banks do not want the requirements for questionnaires or ESAs to be a competitive tool. However, large and small farm lenders are using farm property environmental questionnaires and site assessments to reduce the risk of potential liability. In so doing, they are in the position of policing agriculture and influencing on-farm toxic management systems.

Scrutinize Real Estate

Anyone involved in a real estate transaction or long-term agricultural lease should determine the environmental condition of the property involved. If you are selling land you will want a clean bill of health going into any sales negotiations so that environmental condition of the property does not become a sticky bargaining point. Also, if there is a contamination problem on the property in the future, you will want to be able to prove that the property was clean when you sold it. If you are buying property, you should find out about any potential problems before you take ownership. If there is a problem, clean-up costs can be built into the sales agreement. The same logic applies to entry into a long-term agricultural lease.

For more information on how to investigate the background of a particular piece of property request *Sources of Information for Farm Property Environmental Reports* by Karen Klonsky and Kim Norris, available from the authors at the Department of Agricultural Economics, University of California, Davis, CA, (916)752-4424.

Social, Economic Issues Focus of Sustainable Conference

Editor's Note: *The UC Santa Cruz Agroecology Program hosted a June conference aimed at broadening the concept of sustainable agriculture to include social needs and human welfare, in addition to environmental issues. It attracted 160 researchers, farmers, policymakers, public interest group representatives, and consumers. The following is a summary of an article on the conference by Debra Van Dusen, Agroecology Program agricultural issues assistant analyst. The full article will appear in the Summer 1990 issue of the Agroecology Program newsletter Cultivar. A paper summarizing the findings of the conference will be available this winter from Barbara Laurence Agroecology Program, University of California Santa Cruz, CA 95064, (408)459-3240.*

The conference *Sustainable Agriculture: Balancing Social Environmental and Economic Concerns* was created to "make visible some of the most pressing social issues that we confront in the food and agriculture system," said **Patricia Allen**, senior analyst with the Agroecology Program and one of the event's primary organizers. The two main themes of the conference were redefining sustainable agriculture to explicitly include the social component, and exploring issues which need to be resolved if social and ethical concerns are to become an active part of agricultural sustainability.

Many meanings of sustainability center around environmentally-benign farming practices, including biological control or organic farming methods. Some emphasize land stewardship and preservation of the family farm. For many researchers, it means a systems perspective that includes not only farm practices, but the complex set of interactions that tie them to the environment and to agriculture's larger socioeconomic context. A major challenge to implementing sustainability is not only to resolve differences in how the concept is defined and consequently how its goals and policies are structured, but to recognize how social and ethical issues factor into the equation.

Social, Ethical Concerns

Although social and ethical issues are not as frequently addressed as environmental and economic ones, they are considered essential by a growing number of people in the food and agriculture system. One reason is that agriculture's goal of feeding the world's people is often confounded by social, political and ethical factors that limit people's access to food - factors that result in poverty, and lack of access to land and farm credit. Increasingly, agricultural practices that perpetuate inhumane and substandard conditions for humans and other species are seen in the same light as harmful environmental practices. The most commonly recognized problems of agriculture, including polluted groundwater, depletion of nonrenewable resources, and adverse affects on rural communities, cannot be resolved solely by adopting

environmentally-benign farming practices. Too often purely technological solutions are proposed in the name of sustainability without considering how such technology will actually be used, who will benefit from it, and who will not.

Bill Friedland, UC Santa Cruz Social Sciences Division dean and professor of community studies and sociology, noted that sustainability is inextricably bound with forms of human organization. "It's human beings that either create, or uncreate sustainability," he said, noting that processes such as desertification and global warming are due not to the functions of the biosphere, but rather how humans organize themselves and influence those functions as a result.

Identifying Issues

Conference discussions about defining sustainable agriculture centered around defining who and what will be sustained, and at what levels. Most participants agreed that under optimal conditions, all human beings (present and future) should be assured adequate and nutritious food, obtained without degrading the earth's natural resources and with minimal interference in natural ecosystems and other species' life cycles. Several principles were identified:

- Respecting the lives of others and their right to a decent standard of living. Until we broaden the definition of "community," our decisions will continue to contribute to cultural destruction, poverty, and hunger in other societies.
- Respecting the biosphere. The trend toward cost accounting in managing natural resources as assets that can be depreciated is a step toward more conservation-oriented management. Natural resources must also be valued as more than economic assets.
- Understanding sustainable agriculture as an intricate system. Applied research and policymaking in sustainability must move beyond the farm level to an understanding of how sustainability operates in bioregions, nations and international food systems.

New Issues, Questions

Dick Norgaard, UC Berkeley Energy and Resources Group, noted that the conference was "about equity, social justice, and spreading the benefits of a sustainable agriculture across more people. It's not simply about sustaining soil."

To achieve this goal, two concepts are important: *empowering people to take action* by increasing their access to the information and resources necessary to control the conditions of their livelihoods; and *democratizing the decision-making process* of agriculture so that the concerns of all members of society are fairly represented when policies affecting their welfare are created.

Many ideas and questions were offered at the conference that related to these processes. Economic issues raised included the concentration of agriculture, government subsidies, externalized costs, comparing sustainable and

conventional methods, equal access to foods grown with fewer pesticides, international trade relations and rural poverty, and the free market economy and sustainability. Land use issues discussed included land tenure, urban development, farm size, and access to land. Research questions raised included interdisciplinary focus, broadening the research agenda, conserving indigenous knowledge, and recognizing the role of values in science.

Conclusions

Although questions raised at the conference are not new, what is new are attempts by many individuals and groups to integrate them into the research departments and policymaking arenas where most agricultural technologies and strategies are developed and implemented. That initiative, according to Norgaard, is increasingly being taken not by government and public research institutions, but by nongovernmental organizations. Yet as **David Goodman**, a conference speaker from the Department of Economics, University College, London observed, "We need to be prepared to host this more radical questioning of the food system." There is a critical need for government and university institutions, with their powerful resources, to be among those moving to address these issues.

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Training Courses Move Small Farmers Out on Their Own

by Dave Chaney, SAREP

A field day July 12 at the Rural Development Center (RDC) in the Salinas Valley spotlighted a unique program that gives small farmers' technical assistance and land, and also fosters a partnership between the farmers and the researchers who aid them. The researchers use the farmers' needs as the basis for on-farm field experiments.

Mike Gonzalez, RDC agronomist, explained that the goal of many California farmworkers is to operate their own farm business. He noted that producing and marketing one's own crop allows farmers to establish their own schedules and working conditions, and may provide a unique opportunity for the farm family to work together for economic self-sufficiency. The 115 acre RDC, a project of the Association for Community Based Education of Washington, D.C., provides the land and administration for the program, while funding for the research and demonstration projects at the site comes from many sources, including the California Energy Commission and Jessie Smith Noyes Foundation.

Small farmers apply for the opportunity to participate in the RDC program. The RDC provides land, training and technical assistance over a three-year period for those selected; other inputs are purchased by the farmers themselves. Participants build agricultural and business-related skills as they plant, care for, harvest and market their own crops, Gonzalez said. By the end of their third year, participating farmers have gained self-esteem as well as the training and experience required to either go into business for themselves or to move on to other more advanced farm-related employment, he said.

About 50 farm families from Monterey, San Benito, and Santa Cruz counties have participated in the first four years of the RDC on-site program. Gonzalez said many other small farmers in the region have received RDC support off-site.

Weekly workshops are an important component of the RDC training program, Gonzalez said. Courses are offered on a variety of topics including new and specialty crops, farm finance, marketing, irrigation, vegetable cropping, compost, and farm equipment. They are supported by a UC Cooperative Extension grant and special assistance from the UC Small Farm Center. RDC staff work closely with the participating farmers to identify information needs and priority topics.

Paul Gersper, UC Berkeley soil science associate professor and RDC workshop coordinator, said the contribution of Cooperative Extension staff time has been an invaluable resource. Farm advisors **Richard Smith**, San

Benito County, and **Harry Agamalian** and **John Inman**, Monterey County, and many other county and campus-based experts throughout the state have conducted courses.

As part of the RDC training program, several research projects are being conducted to meet specific information needs of small-scale farmers in the Salinas Valley. Many small farmers in this area combine traditional Hispanic approaches to agriculture with their experience working on conventional vegetable farms in California, according to Gonzalez. He said the aim of the research projects is to improve these practices to develop energy-saving vegetable cropping systems that are also culturally acceptable.

At the field day Associate Professor **Miguel Altieri**, UC Berkeley Division of Biological Control, emphasized the participatory nature of the RDC research program. Altieri said it is essential for research to begin with the small farmer's actual circumstances. After evaluating the farmer's practices, a list of constraints and limitations can be drawn up. Altieri said low-input management practices are then proposed to reach a desired benefit. The proposed low-input practices in turn become the basis for on-farm field experiments. For instance, it is common for Mexican farmers to plant polycultures of zucchini and tomato. Though the polyculture offers farmers several advantages (e.g., enhanced biological pest management and spreading of economic risk), these systems tend to have low marketable yields. To address these constraints and improve the overall energy efficiency of the system, Altieri and Gersper, along with **Javier Trujillo**, UC Berkeley entomology, and **Marta Astier** and **Will Bakx**, UC Berkeley soil science, have been researching the possibility of using compost and cover crops in the zucchini-tomato polyculture. From yield data, insect monitoring, and soil sampling over the past year they were able to draw several conclusions:

- Tomatoes grown with compost had higher yields than the unfertilized control regardless of the cropping design or the cover crop used; on the other hand, zucchini showed very little response to compost compared with the control.
- At mid-season, populations of the green aphid were higher in tomato monoculture than in the tomato-zucchini polyculture; there were no significant differences at other times during the growing season.
- By the end of the growing season, the zucchini monoculture had higher populations of the convergent ladybeetle than did the zucchini-tomato polyculture.
- The zucchini-tomato polyculture used resources more efficiently than did the monoculture of each crop. This was indicated by a land equivalent ratio of 1.48. This means that 1.48 acres would be needed to produce in monoculture the amount of zucchini and tomato that was harvested in one acre of polyculture.

A demonstration project is planned in the next year to test these results further. Throughout the field day, researchers stressed that their projects are developed and conducted in conjunction with farmers. In the case of the compost/cover crop experiment, replicated plots laid out and managed by researchers were planted next to farmers' fields. In their own fields, farmers

managed simpler, one-treatment experiments (e.g., compost vs. no compost) as part of their everyday activities. This participatory approach enhances the relevancy of the project and makes the extension/education component more effective, Gonzalez said.

For more information contact Gonzalez at the Rural Development Center, P.O. Box 5415, Salinas, CA 93915, (408) 758-1469.

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