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COOPERATIVE EXTENSION
AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF CALIFORNIA

Sustainable Agriculture Research and Education Program
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July 28, 1997

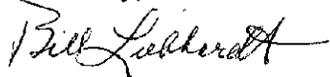
Ms. Kate Hansel
CALFED Bay-Delta Program
1416 Nineth Street, Suite 1155
Sacramento, California 95814

Dear Ms. Hansel:

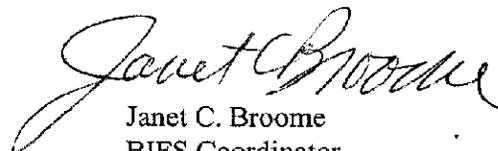
Please find enclosed 10 copies of the two page inquiry submittal along with attachments in response to the Bay-Delta Category III Request for Proposals. We are very excited about this program and the possibility of obtaining support for our proposal entitled "**Bay-Delta Estuary Pollution Prevention through Development and Demonstration of Biologically Integrated Farming Systems (BIFS).**" This funding would allow us to tie the BIFS program even more closely to improving water quality in the San Francisco-Bay-Delta Region. We have included a copy of the current Request for Proposals (RFP) of the BIFS program, as well as a copy of SAREP's current research RFP for crop and livestock production, both of which would be modified to be linked more directly to water quality objectives for the Bay-Delta. In addition, the research RFP would be linked more directly so that it would fund "piggy-back" projects within the BIFS demonstrations. We have also included some press clippings from the currently funded BIFS projects, the Lodi-Woodbridge Winegrape Commission's BIFS project and the West Side row crop rotational project.

As this is only an inquiry we have not provided all the contact information for all the partners in the project, however all have expressed interest and excitement about being involved. At this time, please direct any communications written or verbal to Janet C. Broome, BIFS Coordinator.

Sincerely,



William Liebhardt
Director



Janet C. Broome
BIFS Coordinator

INQUIRY SUBMITTAL

a. Project Title and Applicant Name

Bay-Delta Estuary Pollution Prevention through Development and Demonstration of Biologically Integrated Farming Systems

Dr. William Liebhardt, Director, and Dr. Janet C. Broome, University of California Sustainable Agriculture Research and Education Program (SAREP), University of California, Davis, CA 95616

Contact: Janet C. Broome, 916-754-8547

Paul A. Feder, Agricultural Policy Analyst, U.S. EPA Region 9 - Agricultural Initiative

Jill Klein, Community Alliance with Family Farmers

b. Project Description and Primary Biological/Ecological Objectives. This project addresses aquatic toxicity from priority pesticides and synthetic nitrogen in the San Francisco Bay-Delta through expanding a successful model of pollution prevention via partnering with the agricultural industry. It will benefit the riverine and estuarine habitats essential to Delta and river fish populations.

The University of California's Sustainable Agriculture Research and Education Program (SAREP) has extensive experience supporting sustainable agriculture research and extension in California. SAREP has found that community-based biologically integrated farming systems to be the most effective approach to changing grower behavior and improving the environmental record of agriculture. More and more members of the agricultural community have also realized the need to change their farming practices. This is a unique opportunity for CALFED to support the use of demonstration projects of Biologically Integrated Farming Systems (BIFS) that have been proven to decrease the use of farm chemicals and thereby address water quality in the Bay-Delta. The BIFS program was established by legislation (AB3383) in 1994 to extend the Biologically Integrated Orchard Systems (BIOS) model to other farming systems. The BIOS program, coordinated by the Community Alliance with Family Farmers, establishes on-farm demonstrations of University research and farmer developed practices to allow almond growers to successfully adopt diazinon-free production methods and achieve significant reductions in synthetic nitrogen and herbicides.

c. Approach/Tasks/Schedule. SAREP would use the funds to support new BIFS demonstration projects that address water quality objectives in cropping and livestock systems within the Bay-Delta. SAREP's already established review process would be used to evaluate proposals based on technical merit and relevance to improving water quality in the Bay-Delta. A revised Request for Proposals (RFP) for a new round of funding will be developed in the winter of 1997 and released in the spring of 1998. Proposals that demonstrate ability to address water quality objectives will be on the ground by August 1998 and run for three years. The funds would also be used to support critically needed research into sustainable crop and livestock production that would become new components of these farming systems in the Bay-Delta. A specially targeted RFP would be released in the spring of 1998 and proposals would be due back to SAREP in August 1998. Funded research projects linked up with community-based demonstration projects could be on the ground in the winter 1998.

d. Justification for Project and Funding by CALFED. Non-point source pollution from off-target movement of agricultural contaminants (pesticides and nitrates) is one of the main causes of water quality problems in the Bay-Delta. Since 1988, a consistent pattern of contaminant loadings from the orchard dormant spray, diazinon, along with other insecticides, have been documented into the Sacramento and San Joaquin Rivers and the S.F. Bay-Delta. In addition, confined animal operations and related land application of wastes are very significant contributors to surface and ground water contamination in the Bay-Delta region as recent articles in the San Francisco Chronicle have documented (SF Chronicle, July 7, 1997, front page).

In BIOS and BIFS projects, agricultural chemical reduction is accomplished through changes in the farming system as a whole, not just adoption of individual best management practices (BMP's). These farming systems rely on biological and cultural control to protect crops from pest outbreaks, create on-farm habitats that harbor populations of beneficial species, use cover crops to provide some or all of the nitrogen needed by the crop plants, and direct attention to soil building practices on the farm. The projects extend integrated farming systems through the proven technique of farmer-to-farmer communication, with technical support provided by farm advisors, scientists, and pest control advisers. In the first round of BIFS proposals, 5 projects were submitted but there was only funds for 2 pilot demonstration projects (see attachments). The agricultural industry in California is increasingly interested in reducing its reliance on pesticides due to shared human health and environmental concerns as well as regulatory changes caused by the 1996 Food Quality Protection Act (FQPA). Due to the FQPA certain commodities may lose the use of organophosphates, carbamates, and/or B2 carcinogen pesticides, the BIFS program offers a way for these commodities to develop and implement a program to help them survive these changes.

e. Budget Costs and Third Party Impacts. \$1,500,000 for three years to be divided as \$1,000,000 for the BIFS program and \$500,000 for animal and crop production research support. This would enable funding of three new BIFS projects at \$100,000 a year for three years as well as "piggy-back research" in support of these demonstration projects. Currently, the BIFS program has funded two demonstration projects for three years with \$670,000 from State and Federal sources. Matching funds for the next round (1997/98) have been provided by UC SAREP (\$100,000) and by the U.S. EPA Agricultural Initiative program (\$200,000). Similar amounts of matching funds could be expected for each of the following years from US EPA and new funds from participating commodities would be sought.

f. Qualifications. SAREP has extensive experience in the administration of competitive grants programs, research and education, dissemination of information, and the development of educational programs. SAREP has successfully implemented BIFS projects. In the first year of the Winegrape BIFS project, 31 growers have allocated 47 vineyards as BIFS demonstration sites, a total of 2023 acres. These 31 growers manage about 50 percent of the acreage of vineyards in the Lodi-Woodbridge Crush District #11. The West Side BIFS project involves 12 growers that manage 90,000 acres of cotton and vegetable crops. Each grower has dedicated 80 acres or more to be used as demonstration BIFS fields for a total of 1,653 acres.

g. Monitoring and Data Evaluation. Individual funded projects will provide information on the farming system being implemented and where possible compare it to county averages or conventions. Monitored parameters (both baseline and in-season) include yields; key biological indicators (e.g. pests, biological control agents, and decomposers); weather data relevant to pest problems; strategies for soil fertility and crop protection, including rotational patterns for field- and row-crop farming systems; amounts and seasonal timing of pesticide and fertilizer applications. The number and quality of proposals submitted and funded will be used to evaluate the program as will the level of adoption of the farming system within the industry.

h. Local Support/Coordination with other Programs/Compatibility with CALFED Objectives SAREP is in the perfect position to coordinate State and Federal support for addressing water quality objectives of the Bay-Delta. The BIFS program, based on BIOS, uses the proven approach of farmer to farmer extension, thus participation and buy-in of the grower community is assured. CALFED objectives of water quality improvements and encouraging collaboration between federal and state programs in non-point source pollution prevention would be furthered.

**ATTACHMENT 1 -- BIOLOGICALLY INTEGRATED FARMING SYSTEMS
1997 PROGRAM ADVISORY REVIEW BOARD**

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Alternates:

For Jean-Mari Peltier:

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For Kathy Taylor:

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Attachment 2 -- Abbreviated Curriculum Vitae of Participating Personnel

William C. Liebhardt, Ph.D.

Director

U.C. Sustainable Agriculture Research and Education Program

University of California

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916-752-2379

wcliebhardt@ucdavis.edu

Education: Ph.D., Soils, University of Wisconsin
M.S., Soils, University of Wisconsin
B.S., Agronomy, University of Wisconsin

Employment:

1987-present: Director: University of California Sustainable Agriculture Research and Education Program, Davis, California. Primary responsibility is to develop and implement sustainable agriculture priorities within the University of California system and in the state at large.

1981-1987: Assistant/Associate & Director of Research: Rodale Institute Research Center, Kutztown, Pennsylvania. Responsibilities were to direct research and outreach activities in agronomy, horticulture, entomology and new crops; supervise the laboratory, secretarial, and farm support staff on a 325-acre research facility.

1970-1981: Assistant/Associate Professor: University of Delaware Newark, Delaware. Responsibilities included research and teaching in the area of soil fertility, soil testing, solid waste management and water quality relationships. Taught undergraduate and graduate level courses in soil

Research Activities:

Activities have generally been in the area of soil testing research and outreach, cropping systems management, and farming systems comparison.

Selected Publications:

Doran, J.W., D.G. Frazer, M. Culik, and W.C. Liebhardt. 1987. Influence of alternative and conventional agricultural management on soil microbial processes and nitrogen availability. *American Journal of Alternative Agriculture* 2:99-106.

Francis, C., C. Edwards, J. Gerber, R. Harwood, D. Keeney, W.C. Liebhardt, and M. Liebman. 1995. Impact of Sustainable Agriculture on U.S. Land Grant Universities. *Journal of Sustainable Agriculture* 5:19-34.

Liebhardt, W.C. 1981. The basic cation exchange saturation ratio concept and lime and potassium recommendations on Delaware's Coastal Plain soils. *Soil Science Society of America Journal* 45:544-549.

Martin, H.W. and W.C. Liebhardt. 1994. Tomato response to longterm potassium and lime application on a sandy ultisol high in nonexchangeable potassium. *Journal of Plant Nutrition* 17:1751-1768.

Liebhardt, W.C., R.W. Andrews, M.N. Culik, R.R. Harwood, R.R. Janke, J.K. Rodke, and S.L. Rieger-Schwartz. 1989. Crop production during conversion from conventional to low-input methods. *Agronomy Journal* 2:150-159.

JANET C. BROOME
SAREP
University of California
One Shields Avenue
Davis, California 95616

EDUCATION

Ph.D., Plant Pathology, University of California, Davis, 1994.
M.S., Plant Pathology, University of California, Davis, 1990.
B.A., Biological Sciences, Swarthmore College, 1984.

EMPLOYMENT

Biologically Integrated Farming Systems (BIFS) Coordinator and Analyst in Ecologically Based Pest Management, University of California Sustainable Agriculture Research and Education Program, July 1997-present. Coordinate the BIFS competitive grants program (\$670,000 to date) to support demonstration projects for agricultural chemical reduction. Development and extension of ecologically based pest management practices and systems.

Environmental Research Scientist, 1994-1997. California Environmental Protection Agency, Department of Pesticide Regulation, Environmental Monitoring and Pest Management Branch, Sacramento, Ca. Developed tools and models that aid in pest management decision making. Evaluated and developed alternative pest control practices that reduce reliance on pesticides in California. Developed and implemented a new competitive grants program (\$600,000/year) to encourage the use and demonstration of environmentally sound pest management. Analyzed the pesticide use database from 1990 to present for trends and patterns in pesticide use in California agriculture. Developed a statewide weather monitoring network and plant disease model database in collaboration with the University of California, Statewide Integrated Pest Management Project.

Doctoral candidate, 1990-1994. Dr. J.J. Marois, Department of Plant Pathology, University of California, Davis, Ca. Investigated cultural control of Botrytis bunch rot of table grapes in Chile through canopy management. Quantified the effects of microclimate on disease development. Created an environmentally driven spray forecasting model for control of Botrytis bunch rot.

Postgraduate Researcher, 1989-1990. Dr. J.J. Marois, Department of Plant Pathology, University of California, Davis, Ca. Investigated biological control of Botrytis cinerea on greenhouse roses, strawberries and wine grapes. Validated an environmentally driven spray forecasting system for powdery mildew of grapes in California.

Graduate Research Assistant, 1987-1989. Dr. J.J. Marois, Department of Plant Pathology, University of California, Davis, Ca. Developed cultural controls of Verticillium wilt of cotton using cover crops and nutrient amendments. Investigated the population dynamics of Verticillium dahliae and cotton roots.

Research Assistant, 1986-1987. Dr. J.E. DeVay, Department of Plant Pathology, University of California, Davis, Ca. Investigated the use of soil solarization for control of root knot nematode and *Pythium* sp. in carrots. Performed soil assays for Statewide program in breeding for resistance to *Verticillium* wilt of cotton.

Research Assistant, 1986. Dr. R. Washino, Dept. of Entomology, University of California, Davis. Investigated the effect of weeds on mosquito development in rice fields, and the biological control of mosquitoes with the fungal parasite *Lagenidium giganteum*.

Principle Investigator, 1984-1985. Plant Protection program, West German Technical Mission, GTZ. Developed an ELISA diagnostic assay and a suitable media for the culture and study of the corn stunt pathogen. Nicaragua, Central America.

PUBLICATIONS - Selected list

Broome, J.C., Marois, J.J., and Latorre, B.A. 1997. Effect of leaf removal and fungicides on the incidence and severity of *Botrytis* bunch rot in Thompson seedless table grapes in Chile. Plant Disease, in preparation July, 1997.

Broome, J.C., Marois, J.J., and Latorre, B.A. 1997. Effects of leaf removal on Thompson seedless table grapes grown in the Chilean arbor: grape composition, cuticle and epicuticular wax thickness, berry color and bud necrosis, *Am. J. Enol. and Vit.*, submitted June, 1997.

Broome, J.C., Marois, J.J., Cassman, K.G. and Brouder, S.A. 1997. Soil nutrient effects on population dynamics of *Verticillium dahliae* and roots of *Gossypium hirsutum*," *Soil Biology and Biochemistry*, in preparation July 1997.

Akers, P., Wilhoit, L., Broome, J.C., Hobza, R., Teso, R., and Supkoff, D. 1995. An Inventory of Pest Management Practices in the Lompoc Valley, Second Edition, Department of Pesticide Regulation, Pest Management, Analysis and Planning, 95-02.

Broome, J.C., English, J.T., Marois, J.J., Latorre, B.A., and Aviles, J.C. 1995. Development of an infection model for *Botrytis* bunch rot of grapes based on wetness duration and temperature, *Phytopathology*, 85:97-102.

Broome, J.C., Marois, J.J., 1994. Plant Disease Control - Principles and Practice, Book review, *Mycopathologia* 126:193-194.

Broome, J.C., Marois, J.J. 1994. Integrated control of *Botrytis* bunch rot and powdery mildew of grape. Proceedings of the VII Latin American Congress of Phytopathology, Jan. 10-14, 1994, Santiago, Chile. p. 249-252.

Papalomatus, E.J., Bassett, D.M., Broome, J.C., and DeVay, J.E. 1992. Incidence of *Verticillium* wilt and yield losses of cotton cultivars (*Gossypium hirsutum*) based on soil inoculum density of *Verticillium dahliae*. *Phytopathology* 82:12:1417-1420.

Marois, J.J. and Broome, J.C. 1992. Interactions among fertilizer, roots and pathogen populations. Proceedings of the California Plant and Soil Conference: " Decisions-making in an uncertain environment". California chapter of the American Society of Agronomy, Fresno, Jan. 28-29, 1992. p. 33-37.

Marois, J.J., English, J.T., and Broome, J.C. 1990. "Integration of biological control of plant pathogens into IPM programs", Proceedings of the Beltwide Cotton Prod. Res. Conf., National Cotton Council of America, 50th Cotton Disease Council, pp. 19-23.

Marois, J.J. and Broome, J.C. 1990. "Biological control of Botrytis cinerea on roses," in the Proceedings of the Sixth Conference on Insect and Disease Management on Ornamentals, Feb. 18-20, San Jose, Ca. The Society of American Florists. pp. 73-81.

Broome, J.C. 1991. Forecasting system for Botrytis bunch rot of grapes. In the publication "Current knowledge surrounding Botrytis cinerea in table grapes for export". Proceedings from a Program for Technology Transfer of the Chilean National Institute for Agricultural Investigations (INIA), Santiago, Chile. In Spanish.

RECENT FUNDING

US Environmental Protection Agency, Risk Reduction and Innovation in Pest Management, 1995-1997, \$ 85,000 per year for two years, for a total of \$170,000.

US Environmental Protection Agency, Pollution Prevention Incentives for States, 1995, \$ 160,000 for three years.

Organization of American States Fellowship, 1990-1992, \$ 10,000 per year.

Wine district gets \$100K state grant

By T.J. BURNHAM
For the Capital Press

LODI, Calif. — With a "new" \$100,000 to spend — perhaps \$300,000 over the next three years — to tell its integrated pest management story to district growers, the Lodi-Woodbridge Winegrape Commission will christen an unprecedented local education program.

The \$100,000 per year California Department of Pesticide Regulation/U.S. Environmental Protection Agency grant is one of only

two such awards in California. San Joaquin row crop farmers received a \$86,000 fund to demonstrate their own integrated farming systems.

What the local industry will do with the University of California Sustainable Agriculture Research and Education Program-administered funds, said commission executive director Mark Chandler, is set up two "prototype" vineyard sites to serve as classrooms for other growers.

The vineyards include grower John Kautz's 80-acre Zinfandel plot and a 120-acre Cabernet Sauvignon

planting owned by producers Brad and Randy Lange. "Basically, this is an expansion of what we have been doing in the past," said Chandler, "although this program will be far more specific."

Visitors to the sites will look over the IPM practices in place and determine whether they are suitable for their individual vineyards. Already more than 30 cooperators representing 2,000 acres in the district have signed on to incorporate at least one of the practices that have been ongoing at the prototype farms, Chandler said.

The fund allowed the commission to expand its contract with an IPM-implementation firm, Scientific Methods Inc., which Chandler said has successfully integrated farming technology into California almonds and tomatoes, as well as apples in Washington.

"In addition, we will be conducting monthly IPM seminars on a far more organized fashion than we have in the past," he added. "But one of the most important new programs will be our neighborhood grower meetings."

(See GRANT on Page 2)

September 29, 1995

*** CAPITAL PRESS

Grant

(Continued from Page 1)

These sessions, he said, bring IPM to growers "on their turf," organizing small groups of producers and pest control advisors — 10 to 12 at a time — to meet with commission personnel and statewide IPM authorities.

"The object of these meetings will be to kick around ideas that may help minimize fears some growers feel in adopting new IPM techniques," said Chandler. "Our hope is to reach every grower in the district."

Many part-time vineyard operators who work elsewhere during the day will be able to attend the sessions, which will be scheduled in "Grange halls, fire department offices, high schools and local coffee shops — wherever it is convenient for them to come" throughout the 45,000-acre district, Chandler said. "We are targeting the entire industry."

The commission is well-known for its educational outreach efforts, and the new money will allow a substantial increase in that effort, Chandler said.

"Conventional agriculture is looking for that 'shining example' of a districtwide commodity-based IPM program that demonstrates how it is done. We hope to

be that example." The outreach could include growers from other winegrape districts as well.

The Lodi-Woodbridge, a self-help industry effort since 1991, has adopted a strong IPM-sustainable

Lodi to host wine, art exhibit

LODI, Calif. — Visitors can get a first-hand look at the Lodi-Woodbridge wine area and talk with commission leaders during a special arts events Oct. 7-Nov. 5 at Micke Grove Park in Lodi.

"Timeless Traditions in Wine and the Arts," sponsored by the commission and San Joaquin County Historical Society and Museum, will feature an exhibition of ancient Greek and Roman wine vessels.

Included during this special celebration will be a bacchanal featuring Narsai David as master of ceremonies from 6 to 9:30 p.m. Oct. 7, focusing on food and wine tastings from local restaurants and wineries, offered at a cost of \$35 per person, with advance reservations required.

On Oct. 8, the grand opening of olive and wine day will feature San Francisco chef and author

agriculture approach since its beginnings. Such biologically integrated farming systems enable farmers to maintain yields and quality while greatly reducing their reliance on agrochemicals, in-

Viana La Place conducting cooking demonstrations using olives, olive oils and wine.

Other events are included at a cost of \$8 for adults, \$6 for students and \$3 for children.

The Bakkhai by Euripides, a Greek drama and cast party, is scheduled for Oct. 13 at 7 p.m., featuring the University of Utah Classical Greek Theatre Group.

Costs are \$12 for adults, \$6 for students, \$3 for children, and \$20 to attend the cast party.

A bocce ball tournament and exhibition is scheduled for Oct. 14 from 10 a.m.-4:30 p.m.

Viewing hours for the wine vessels exhibit will be Friday, Saturday and Sunday during the Oct. 7-Nov. 5 period, from 10 a.m. until 4:30 p.m. in the museum at the park.

For additional information, call the commission at (209) 367-4727.

cluding pesticides and synthetic fertilizers, according to SAREP director Bill Liebhardt.

Growers integrate into their production systems biological and cultural control of pests, provide farm habitats for beneficial insects, and emphasize soil-building practices, including cover crop use, to provide all or part of the nitrogen needed by the vines.

Chandler said the commission leads the state in implementation of IPM in winegrape vineyards. That effort has been enhanced by other grants, including a \$150,000 Kellogg Foundation prize and \$56,000 from the California Energy Commission.

Last year, the Lodi-Woodbridge unit was lauded for its IPM efforts by the DPR, which named the commission the first recipient of its IPM Innovator Award recognizing efforts to develop environmentally friendly pest management systems.

The \$100,000 payments in the two years following the initial outlay remain contingent on budget.

Lodi-Woodbridge district, with about 600 growers, has become a major wine production area that today produces grape crops valued at \$115 million a year.

Biologically managed soil being tested on west side

On the west side of the San Joaquin Valley, farmers have been subjecting their farmland to an intense rotation of crops — cotton, tomatoes, onions and more. Now 16 of these farmers have teamed up with University of California scientists to take another look at soil amendments used by the farmers' forefathers.

Before chemical fertilizers became widely available during World War II, Valley farmers, like farmers had for centuries before them, amended soil with cover crops, manures and composts. Cheap, easy-to-use and effective chemical fertilizer simplified farming, but came at a cost. While the chemical fertilizer does an excellent job delivering nu-

trients, it does nothing to return organic matter to the soil.

"The historical element that really caught our attention, and that was one of the rationales for this project, was the shift in cropping patterns that's occurred in the last 30 years or so," says vegetable crops specialist and co-project leader Jeff Mitchell. "In 1965, crop records show that more than 60% of the acreage in the west side was planted to wheat, barley and safflower. That percentage is now less than 8%."

Instead farmers today grow higher value crops, such as vegetables and cotton, that require more soil tillage, irrigation, weed and insect management.

"Farmers involved with this project believe that intensification of production has led to some soil quality problems," Mitchell says.

Beginning this year, 13 of the participating Westside farmers dedicated 40 acres or more of their farms to compare biologically integrated soil building and pest management systems with conventionally managed systems. Whenever appropriate, cover crops and composted organic materials are being integrated into rotations on 20 acres, while chemical fertilizers are used on the adjacent 20 acres. On the 20 "biologically managed" acres, farmers will seek to reduce the use of disruptive pesticides and increase use of biological pest control approaches.

Westside farmer John Diener has already been experimenting on his farm with cover crops, composts and biological pest control, particularly on a 450-acre parcel certified organic and on another 150-acre area in the midst of transition to organic.

Implementing the biologically integrated systems that are the focus of the study will not necessarily result in organic production. In the course of the study, the scientists and farmers will determine what "organic" practices can be used on conventional farms to improve production and soil health while maintaining economic viability. However, as a mentor farmer on the project, Diener was able to share some of his own struggles with biological systems.

"Many more weeds invaded fields

treated with steer manure than with poultry manure," he says. He's tried bat guano with success, and vetch cover crops without success. "We grew our most nitrogen deficient crops behind vetch," according to Diener.

But Diener says his experiences provide only anecdotal evidence. "That's why we wanted to get the brainpower involved," he explains. "In the organic business, there's a lot of snake oil salesmen. The University can help us sort the witchcraft from reality."

During the three-year study, scientists will closely monitor chemical, physical and biological attributes of the soil; soil organic matter; cost of conventional vs. biological management; nutrient use efficiency; disease, weed and insect pest problems; and crop yield. Baseline and first-year data have already been collected.

"We'll also look at the perceptions of the farmers themselves," Mitchell says. "We'll use surveys to gauge their observations while we monitor the fields scientifically."

A multi-disciplinary team of UC scientists has been assembled to work with the farmers. They are Mitchell, IPM weed scientists and co-project leader Timothy Prather, post-doctoral researcher and project coordinator Raymond Bader, post-graduate researcher Rolando Cifuentes, IPM nematologist Peter Goodell, farm advisors Richard Coviello (entomology), Kurt Hembree (weed science) and Don May (vegetable crops), and a number of technical advisors from UC Davis.

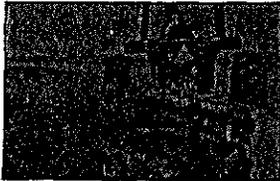
The project is funded with \$91,000 per year for three years provided jointly by the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation. The grant is administered by the Davis-based UC Sustainable Agriculture Research and Education Program.

The participating farmers cover the cost of cover-crop seed, tractor work, compost and other materials necessary to participate in the study.

"While we are still in the formative stages of this project, we're already bringing farmers together," Mitchell observes. "We feel that step is already reaping benefits for the growers and the west side farms." ♦

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With cotton, barley crops Westside project tests alternative practices

By Dan Bryant
Farm Press Editorial Staff

RON JONES is among a group of San Joaquin Valley growers willing to take risks with alternative farming practices to solve problems common to the valley's Westside area.

Jones, owner of J & J Farms at Mendota, recently hosted a field meeting where he talked about his goals with double-cropped barley for soil improvement and with composted gin trash for fertility in pima cotton.

He is devoting 160 acres to various trials with cotton, tomatoes, and melons during the three-year Westside Demonstration Project.

Project coordinator Jeff Mitchell, University of California vegetables specialist at the Kearney Agricultural Center, Parlier, said Jones is one of 14 growers who have set aside a total of early 90,000 acres for project trials. Locations extend from Jones' operation, the northernmost, to south of Huron.

"The project," Mitchell said, "is essentially a demonstration with evaluations in a cooperative manner. We are not telling farmers what to do on their

of results.

The team analyzes data to see if trends emerge, and the information is then disseminated through meetings and field tours.

Growers between Mendota and Huron are curious to know the effects on soil of a shift to more acreage in cotton, processing tomatoes, onions, garlic, and lettuce during the past 30 years, Mitchell explained.

Less acreage has been planted to safflower, barley, and wheat, all of which traditionally contributed substantial crop residues to the soil.

Jones said he decided to use the 160 acres, tilled for drainage, in hopes of finding ways to improve management of salt accumulation.

He planted a mix of 70 percent barley, 15 percent vetch, and 15 percent sudangrass last September as a cover crop on 75 acres coming out of processing tomatoes. He intended to disk it under in December and plant cotton this season.

"But the weather didn't cooperate, so we kept the cover crop," he said, adding that the field was then scheduled for harvesting in mid-May and planting to melons in mid-June.

He let the field dry out completely so he wouldn't have to windrow the vetch, which he hoped would add some nitrogen. He incorporated the residue into the field instead of burning it.



MENDOTA GROWER Ron Jones, left, cooperates in novel farming practices with UC specialists such as Pete Goodell, here sampling for beneficial insect colonization on young cotton.

ranches. Participating farmers call the shots and make the decisions on what goes on in their dedicated plots."

The project follows the concept of the biologically integrated orchard systems (BIOS) research. Mitchell, other UC specialists, and specialists of the federal Natural Resources Conservation Service suggest options farmers can use, make evaluations in the field, and advise the participants

COTTON REPORT

"We want to find out if we have enough time to get the barley off and plant the next crop. In any case, we'll be learning things this year. We'll evaluate it and try again next year, maybe with the same practice or maybe with

"We're trying to squeeze in rotation crops...and start making money with the next crop."

some adjustments," he said.

Mitchell said the dry matter from a barley harvest could amount to about five tons per acre. If the crop were harvested green, it would only contribute one-tenth the biomass. By comparison, a lettuce field typically contributes about one ton of residue per acre.

Meanwhile, Jones will be keeping an eye on the melons and how the double cropping routine affects drainage. J & J Farms used to grow barley on half its acreage, but in recent years the economic hasn't allowed barley in the crop mix.

"We're trying to squeeze in rotation crops to get the benefit from them, get them out, and start making money with the next crop."

In 75 acres adjacent to the barley, he planted pima cotton under a 3-year

trial for Cotton Incorporated using composted gin trash. Compost rates of two to 10 tons per acre will be compared with conventional fertilizer containing 150 pounds of nitrogen per acre. The three seasons will be evalu-

ated for nitrogen applied and yields.

Jones said he was also interested in using products to improve microbial activity in the soil. An analysis showed fungal activity is deficient.

"We are trying to relate analytical information," said Mitchell, "with the farmer's own sense of improvement in tillth or other quality of the soil. And we do recognize these soil-building practices will take considerable time."

Pete Goodell, a UC integrated pest management specialist, is also monitoring Jones' pima. Among his trials is sampling young stands of cotton with a converted residential leaf-blower instead of a conventional sweep net. The object is to determine how quickly arthropods move into new cotton fields.

He is watching thrips, big-eyed bugs, and minute pirate bugs, and

how beneficials colonize as a control for lygus bugs just prior to cotton squaring and during the earliest stage of squaring.

Another of his trials is investigating releases of predatory mites, which he said warrant a look in annual crops after successful performance in permanent crops.

Goodell is also testing novel approaches, one being "Enviro-Feast," an insect attractant manufactured by Rhone-Poulenc in Australia. The protein-based product draws in beneficial species and increases their reproductive rate for greater numbers early in the growing season.

Another investigation is with cowpeas planted at the same time as cotton. They would hopefully be more attractive than cotton to lygus and act as an upwind buffer from a source of the bugs.

"We're doing narrow and intense sampling in portions of fields in the project and comparing our results with what the cooperating growers' PCAs find," Goodell said. "The idea is to come up with the best decisions to improve reliance of biological components."

Jones, optimistic about the project, said, "We're not trying to go totally organic here, we're just trying to figure out how to help the land. And the nice thing about it is the UC people are out there evaluating what we do."

The University of California Sustainable Agriculture Research and Education Program (UC SAREP)
The United States Environmental Protection Agency (U. S. EPA) - Region 9
and
California Department of Pesticide Regulation (D.P.R.)
Announce

A Request For Proposals

**EXTENDING BIOLOGICALLY INTEGRATED FARMING SYSTEMS (BIFS)
FOR • FIELD CROPS • ROW CROPS • ORCHARDS • VINEYARDS**

Proposals Due: April 9, 1997

Mail Proposals To:

U. C. Sustainable Agriculture Research and Education Program (UC SAREP)
University of California
Davis, CA 95616-8716
916-752-7556

Funding Notification: May 9, 1997

An increasing number of California farmers representing many commodities and counties have been able to maintain yields and quality while greatly reducing their reliance on agrichemicals, including pesticides and synthetic fertilizers. These farmers integrate the following elements into their production systems:

1. Biological and cultural control of pests;
2. On-farm habitats for beneficial insects, mites, and spiders;
3. A strong emphasis on soil-building practices, often including biological nitrogen fixation to supply all or part of the nitrogen needed by crop plants;
4. Reduced reliance on agricultural chemicals.

~~We call such production systems Biologically Integrated Farming Systems (BIFS). Many BIFS also employ additional tools, such as field monitoring for pest and beneficial organisms, collection of weather data, reliance on research-based action thresholds for decision making, use of selective biorational pesticides, and soil, water, and plant tissue testing. BIFS are not necessarily limited to organic farming systems. Under BIFS management, agrichemical programs are crafted so as to interfere minimally with the integration of the elements mentioned above.~~

As described in the original state enabling legislation (Assembly Bill 3383), the projects will enable farmers to emulate regionally successful BIFS methodology. In essence, each funded project would be expected to transfer BIFS technology to 10-30 interested farmers, through technical support and farmer-to-farmer information sharing. The state legislature recognizes that a team outreach approach may help farmers learn and adapt integrated farming practices to local conditions most efficiently. To accomplish this, a "management team" of persons experienced in BIFS would provide technical support to a class of participating farmers. Such

management teams should involve farmers, scientists, extension workers, and pest control advisers.

Eligibility

UC SAREP staff and members of Assembly Bill 3383 Program Advisory Review Board are not eligible to participate as Principal Investigator, Other Investigator, or Cooperator on any proposal for funding under this program. Proposals that involve the persons mentioned will not be considered. The following persons are members of the AB 3383 Program Advisory Review Board:

Sherman Boone	Larry Plumb
Bob Curtis	Steve Shaffer
Paul Gosselin	Mike Spezia
Lonnie Hendricks	Judy Stewart-Leslie
Jill Klein	Kathy Taylor
Gregory Nelson	Susan Temple
Jean-Mari Peltier	Steve Weinbaum

Only individuals and institutions based in California may receive funding. The following people or groups are eligible to apply as principal investigator for a BIFS grant: farmers and other private individuals, both for-profit and non-profit corporations, including commodity boards, Resource Conservation Districts, United States Department of Agriculture Natural Resources Conservation Service employees, University of California Cooperative Extension Farm Advisors, Cooperative Extension Specialists, Area IPM Advisors, and faculty of any accredited institution of higher learning in California.

Funding

State legislation (Assembly Bill 3383) and financial support from the United States Environmental Protection Agency Region IX and the California Department of Pesticide Regulation enabled the University of California to fund two pilot demonstration