

# **Irrigation and Nutrient Management Conference and Trade Fair**

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## **Project Leader**

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## **Objectives**

The objectives of this project are to:

1. Survey innovative growers and identify some of the problems they face regarding irrigation and nutrient management, and identify how some of these needs can be met.
2. Conduct an annual Irrigation and Nutrient Management Conference and Trade Show. The workshops present findings regarding the practical on-farm implementation of irrigation and fertility management best management practices. The trade show is a showcase of relevant technologies available to implement many of the BMPs discussed in the conference sessions.
3. Evaluate the conference effectiveness and the audience response.

## **Summary**

The fourth Irrigation and Nutrient Management Conference and Trade Fair was presented to a capacity audience in Salinas on February 28, 1996.

The conference is designed to transfer practical knowledge to area growers about the issues and practices of irrigation and fertility management. The conference focuses on practical information and new technologies designed to cost effectively manage water and fertilizer inputs. There is an emphasis on involving experienced growers and other key industry personnel in this information exchange and technology transfer.

The conference is the result of coordinated effort between the following cosponsors:  
Fertilizer Research and Education Program  
Monterey County Water Resources Agency  
Irrigation Training and Research Center, Cal Poly

University of California Cooperative Extension  
University Extension, UC Davis

The conference is targeted towards all growers in the Salinas Valley and nearby regions who are interested in improving their on-farm irrigation and fertility management. Many growers from outside the Salinas Valley also attend the conference. Areas represented include the coastal valleys (Pajaro, Santa Clara, San Juan, and Santa Maria) as well as the Central Valley. There has also been significant attendance from agricultural support industries such as local and regional irrigation and fertilizer companies as well as crop consulting firms.

University Extension administered a survey of participants. Thirty four percent of the attendees completed the survey. Overall the response was very positive. Ninety two percent of the survey responses rated the conference as either good or excellent. Recommendations from the attendees will continue to be incorporated into the structure and subjects covered in subsequent conferences.

### **Work description**

Task 1: Irrigation and Nutrient Management Conference and Trade Show.

The Irrigation and Nutrient Management Conference and Trade Show, held in Salinas on February 28, 1996 is designed to facilitate information sharing among growers, crop consultants, agricultural support industries, and researchers about on-farm water and fertility management techniques.

Subtask 1.1: The project members surveyed growers to identify some of the problems they face regarding irrigation and nutrient management. Identifying how some of these needs can be met is key to developing the conference topics and agenda. Survey responses from previous years' conferences also helped identify topics to be addressed as well as format considerations.

Subtask 1.2: Planning of conference topics, agenda, and speakers. The conference is designed to collect and disseminate up-to-date information regarding fertility (emphasis on nitrogen management) and irrigation management. Topics are selected from both formal and informal suggestions including recent and current research efforts, and feedback from the course evaluations.

Subtask 1.3: Conduct the Irrigation and Nutrient Management Conference and Trade Show.

The workshops presented findings regarding the practical implementation of irrigation and fertility management best management practices. The trade show exhibits displayed relevant technologies available to implement many of the BMPs discussed in the conference sessions.

Subtask 1.4: Conference effectiveness was evaluated using the course survey developed by University Extension.

### **Results, discussion, conclusions, and evaluation**

The main session conference topics included:

Nitrogen management through intensive on-farm monitoring

Case study analysis of total farming inputs with drip irrigation

Moderated industry panel discussions regarding filtration for drip irrigation

Concurrent session presentations included:

Irrigation and fertility management of wine grapes

Irrigation management

Potassium fertilization

Influence of grape rootstock on nutrient uptake of grapevine

Use of quick tests for nitrogen and potassium

Introduction to quick tests

New quick test sufficiency levels for vegetables

Interpreting and reacting to quick tests

Compost and soil organic matter

Overview of the use of compost

Crop and soil nitrogen dynamics in organic low input , and conventional farming systems

Use of compost for alternative non-chemical plant disease management

Irrigation water quality

Evaluation of water quality for crop production

Water treatment for drip systems

Application of soil amendments through irrigation water

Fertility management

Soil nitrogen dynamics in vegetables

Factors affecting the available of phosphorus to row crops and wine grapes

Determining potassium fertilizer needs

Sixty of the 179 attendees completed the course evaluation forms. Of these, ninety two percent rated the conference as either good or excellent. As in past years, the most highly rated aspect of the conference were the panel discussions moderated by Dr. Charles Burt.

The vast majority of respondents indicated that the conference met their expectations (84%), enhanced their knowledge (86%), expect to use the information in their work (79%), and would recommend this conference to others (82%).

One of the challenges in developing the conference program, is to present a wide enough variety of topics to be of use and interest to a diverse audience and provide sufficient time for adequate discussions.

It was especially apparent in the panel discussions that there was much more information to be discussed than there was scheduled time. The fact that audience questions sometimes delayed the scheduled program indicates that the audience is indeed interested, and that in the future more time needs to be scheduled for question and answer periods.

The trade fair featuring irrigation and fertilizer products and management services is an integral component of the trade fair. Although a few attendees complained that the trade fair breaks were too long, the majority of respondents expressed that the trade fair and the interaction with exhibitors and other attendees was a useful part of the day. The use of concurrent sessions allows a wider variety of topics to be presented and also allows the audience to pick and choose which sessions to attend. There is however the problem when simultaneous sessions are of interest to a participant. Summaries in the course materials help to fill in some of these gaps. In the future, speaker times in the concurrent sessions should be listed in the program, and the audience should be encouraged to move between concurrent sessions to make the best use of their time.

Although the conference is targeted towards the Salinas Valley, many participants came from out of the area. While it is encouraging that the conference has developed a statewide reputation, more attention needs to be paid to marketing towards the target audience of local growers.

#### Breakdown of all attendees:

##### Percent From

31	Monterey County.
18	Cal Poly, SLO
15	San Joaquin Valley
13	South Coast
10	Sacramento Valley
9	Central Coast
4	North Coast

#### Occupation of responding attendees:

##### Percent Occupation

44	Growers
20	Related agribusinesses
20	Students
16	Public agencies

In an effort to build upon the success of past conferences the following areas have been identified as having room for improvement:

- More advertising to attract local farmers
- More grower/industry presentations
- Keep presentations informative but not too complex (practical)
- Maintain a realistic time frame for all presentations especially the panel discussions
- Improve visual aids (difficult because of the large room for the general session)
- More information to be included in course materials (better handouts)
- Other topics to be addressed:
  - Fertigation
  - Irrigation scheduling
  - Sprinkler/furrow irrigation system management

### **Summary of course evaluations**

Specifically, many of these needs address how to reduce 'insurance' applications of water and fertilizer. Many of these topics address the need and practice of crop monitoring to determine actual nutrient and water requirements and how to most efficiently apply these inputs for the optimal agronomic effect with the minimum adverse effect to the environment (specifically, reduced leaching of nitrates to the ground water).

As part of its water quality planning program, the Monterey County Water Resources Agency has led a coordinated research and outreach effort to reduce nitrate leaching through improvements to irrigation efficiency and fertilizer management.

The Salinas Valley is almost entirely dependent upon local ground water sources for all water needs. The Salinas Valley ground water basin supports one of the most productive agricultural industries in California. The Salinas Valley is an intensively farmed area with agricultural production valued in excess of 1.8 billion dollars in 1994, reflecting Monterey County's status as fourth in the state in the value of agricultural production.

Mild winters allow for nearly year-round production of some crops and rotations of two or more crops per year are common. Most vegetable crops are shallow rooted and have high fertility requirements for top quality and yields.

Nitrate levels in the Salinas Valley ground water basin pose a threat to municipal drinking water supplies. The beneficial uses of ground water in the Salinas Valley have been impaired because of this nitrate contamination. Monterey County also contains one of the highest concentrations of small water systems used for drinking water and levels of nitrate in well water have caused many of these wells to be shut down. Agricultural crop production has been identified as the primary source of nitrate loading to ground water, representing 83 percent of the total nitrate load.

The Monterey County Water Resources Agency monitors over 200 wells for water quality, including nitrate concentration. The percentage of these wells which exceed the maximum contaminant level (MCL) varies depending on characteristics of the different hydrologic sub-areas, with more wells exceeding the MCL in the unconfined portions of the aquifer. In 1988 the percentage of wells that exceeded the MCL ranged from 18 to 52 percent (MCFC WCD, 1988). Preliminary information being compiled for the 1995 update of "Nitrates in Ground Water" indicates that nitrate concentrations in the ground water are remaining fairly constant, however, the areas affected are increasing.

The mission of the MCWRA is consistent with the goals of FREP. The Monterey County Water Resources Agency provides flood control and manages, protects, and enhances the quantity and quality of water for present and future generations of Monterey County. The MCWRA is committed to facilitating improved irrigation and fertility management through educational programs. The Irrigation and Nutrient Management Conference is an integral part of this effort. Several educational materials developed by FREP have been included in the conference materials including the Best Management Practices for Irrigating and Fertilizing Cool Season Vegetables booklet and the Drip Irrigation and Fertigation Management of Vegetable Crops videotape and study guide.

The challenge is how to reduce nitrate leaching while maintaining the economic viability of the local agricultural industry. Because of the diversity and complexity of Salinas Valley farming systems, no one simple solution to the nitrate problem is feasible. Previous studies of this problem have developed recommendations which emphasize research programs and pilot demonstration projects to document best management practices (BMPs) directed at reducing nitrate loading from agricultural sources to the greatest extent economically feasible. Another priority area is to develop and transfer information on these BMPs to the agricultural community to promote more efficient use of fertility and water inputs in crop production.

Because of high crop values and the need for high-quality products, growers in the Salinas Valley cannot take the risk of under-irrigating or under-fertilizing their crops. Farmers implement best management practices to improve their productivity and profitability. 'Prescription farming,' the application of water, fertilizer and other chemical inputs on an as-needed basis in response to environmental conditions, rather than by a routine schedule, is one way to describe many of these BMPs. How to determine many of these 'prescriptions' are common topics of discussion at this conference. When farmers apply these 'prescriptions' they can limit their production inputs and enhance their productivity.

Reductions in nitrate leaching are possible through improvements to on-farm management practices. These practices include specific irrigation and fertility management practices to supply the actual crop water and nutrient needs, thereby reducing excess applications during the cropping season. Other practices such as nitrate trapping (non legume) cover crops have potential to reduce nitrate leaching

during the fallow season when mild winter temperatures allow rapid mineralization of the soil organic fraction.

It can be difficult to measure the impact of such educational projects and progress towards long-term solutions are not readily seen in a short time frame. However, the project leader and cooperators have frequent contact with the agricultural community and have seen significant progress in the adoption of irrigation and fertility management strategies since the first time the conference was held in 1992. Some of this progress can also be seen in the increasing level of sophistication of topics requested by the attendees to be addressed at future conferences.

The Irrigation and Nutrient Management Conference has been a forum for presenting the results from several FREP-sponsored research projects including Improvement of N Management in Vegetable Cropping Systems in the Salinas Valley and Adjacent Areas (Pettygrove, et al., 1994) and Development and Promotion of Nitrogen Quick Tests for Determining Nitrogen Fertilizer Needs of Vegetables (Smith and Schulbach, 1995). The conference has been a principle vehicle for the dissemination of pertinent information resulting from current research projects.

The Irrigation and Nutrient Management Conference has become a leading forum for the exchange of information ideas between the production, support, and research sectors of the agricultural industry. The conference has become known for its innovative approach of addressing agronomic challenges with practical hands-on solutions. The inclusion of innovative growers and agricultural consultants in addition to university researchers on the agenda has been a very successful and well-received approach. There is a high level of audience participation solicited in the program to ensure that the various needs of the audience are met.

Information collected in the course of planning the conference as well as ideas that have emerged in the moderated panel discussions have been incorporated in several other educational materials including The Salinas Valley Pipeline irrigation newsletter (published by Monterey County Cooperative Extension and MCWRA) and the Drip and Microirrigation manual published by the ITRC.

### **Project Management, Evaluation and Outreach**

The project leader and cooperators work together in planning the conference agendas, reviewing evaluation forms and incorporating participants' suggestions into future programs. Information developed in the course of the background research for planning conference subjects as well as ideas that emerge in the course of discussion are often incorporated into other educational materials including publications by the three main sponsors, specifically the Salinas Valley Pipeline irrigation newsletter (published by Monterey County Cooperative Extension and MCWRA) and the Drip and Microirrigation and the Chemigation manuals published by the ITRC.