



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

Karen Ross, Secretary

October 3, 2014

To: Fertilizer Inspection Advisory Board (FIAB) Technical Advisory Subcommittee (TASC) and Interested Parties

TASC Meeting

A meeting of the TASC is scheduled for 1:00 pm, Thursday, October 30, 2014. The meeting will be held at the Stanislaus County Farm Bureau, located at 1201 L Street, Modesto, CA 95353.

A copy of the proposed agenda is attached.

Sincerely,

Amadou Ba, Environmental Program Manager
Feed, Fertilizer, and Livestock Drugs Regulatory Services
Inspection Services





**Technical Advisory Subcommittee (TASC)
Stanislaus County Farm Bureau
1201 L Street
Modesto, CA 95353**

**October 30, 2014
1:00 PM – 3:30 PM**

Jack Wackerman, *Chair*

Dennis Chessman, <i>Member</i>	Marc Los Huertos, <i>Member</i>
Rex Dufour, <i>Member</i>	Robert Mikkelsen, <i>Member</i>
Eric Ellison, <i>Member</i>	Jerome Pier, <i>Vice Chair</i>
Charles Hornung, <i>Member</i>	Steve Spangler, <i>Member</i>
Marja Koivunen, <i>Member</i>	Doug West, <i>Member</i>

1. Welcome and Introductions
2. Review and Approval of Minutes of the 7/9/14 TASC meeting
3. Department, Division, and Branch updates
4. FREP Strategic Planning for 2015
5. Forming a Working Group
6. Regular and Special Request for Proposals (RFP)
 - a. Priority Areas
 - b. Timeline
7. Additional Items
8. Next Meeting
9. Adjourn

<http://www.cdfa.ca.gov/is/meetings.html>

The conference room meets the protections and prohibitions contained in §202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Sec. 12132). Further information regarding the meeting should be directed to FREP staff at: CDFA, 1220 N Street, Sacramento, CA 95814, (916) 900-5022, FREP@cdfa.ca.gov



**Fertilizer Research and Education Program
Technical Advisory Subcommittee (TASC)**
California Department of Food and Agriculture
2800 Gateway Oaks, Conference Room 101
Sacramento, CA 95833

**July 9, 2014
8:30 PM to 1:30 PM**

MINUTES

TASC MEMBERS

Mr. Jack Wackerman, Chair
Dr. Jerome Pier, Vice Chair
Dr. Michael Cahn
Dr. Dennis Chessman
Dr. Eric Ellison
Mr. Charles Hornung
Dr. Marja Koivunen
Dr. Holly Little (*not present*)
Dr. Robert Mikkelsen
Mr. Stephen Spangler
Dr. Doug West

CDFA STAFF

Dr. Amadou Ba
Ms. Marilyn Boehnke
Mr. Mark Cady
Dr. Barzin Moradi

INTERESTED PARTIES

Ms. Mary Junqueiro
Ms. Renee Pinel
Mr. John Salmonson

WELCOME AND INTRODUCTIONS

Mr. Wackerman, Chair, called the meeting to order at 8:35 a.m. and welcomed the subcommittee. Self-introductions were made and a quorum was established.

REVIEW AND APPROVE MINUTES

Mr. Jack Wackerman requested the subcommittee review the minutes of the February 27, 2014 meeting.

MOTION: Dr. Eric Ellison moved to approve the minutes as submitted; Dr. Robert Mikkelsen seconded. The motion passed unanimously.

DEPARTMENT, DIVISION, AND BRANCH UPDATES

Dr. Amadou Ba provided the subcommittee with Division and Branch updates. He reported that the position of Deputy Secretary for Administration and Finance, which was previously held by Mr. Nate Dechoretz who retired, was filled with Mr. Kevin Masuhara. Mr. Masuhara was previously the Director for the CDFA Marketing Services Division.

Dr. Ba reported in the proposed Governor's Budget, \$20 million from Cap and Trade revenues were earmarked for the Department. Of these funds, \$5 million was expected to go to FFLDRS Fertilizer Research and Education Program (FREP) for agricultural research related to greenhouse gas emissions from fertilizer application and agriculture management practices that reduce those emissions. The Department received \$15 million, not the anticipated \$20 million; FREP did not receive any Cap and Trade funds.

Dr. Eric Ellison asked where the money went. Dr. Ba stated there was a disagreement in the Legislature over the use of the funds. The final decision was for the funds to go to areas that would actually reduce greenhouse gas (GHG) rather than to research. Dr. Ba informed the subcommittee that the Department defended the \$5 million for research, but did not succeed in swaying the Legislature.

Dr. Ba stated the Department received \$10 million to promote efficient water use due to the drought. The money will be allotted through grant proposals to make better use of water; research falls in line behind actual efficiency.

Dr. Ba reported six of the seven positions in the Fertilizing Materials Inspection Program (FMIP) staffing trailer bill have been filled. Two of these positions are allocated for FREP. He introduced Dr. Barzin Moradi, the new Senior Environmental Scientist (Supervisor), and Mark Cady, the new Senior Environmental Scientist (Specialist). Dr. Ba further reported that interviews were scheduled to fill the Research Analyst I position vacated by Ms. Erika Lewis for the FREP.

DISCUSSION AND RECOMMENDATION OF 2014 FULL PROPOSALS

Dr. Doug West reported of the 12 proposals FREP received for 2014, six scored 80 percent or higher.

Mr. Wackerman led discussion in reviewing the 12 proposals, and the subcommittee voted on every project after discussion of the merits.

A break was taken from 10:15 a.m. to 10:30 a.m.

Four proposals were selected. The recommendations were unanimous. No priority was assigned to the project proposals. Comments and suggestions were recorded to provide feedback to the project authors.

The project proposals recommended for funding approval are:

- *Field Evaluation and Demonstration of Controlled Release N Fertilizers in the Western United States*
Charles A. Sanchez, Richard Smith, Sam Wang, and Eric Ellison
- *California Certified Crop Adviser FREP Educational Project*
Terry W. Stark and Dan Putnam
- *A Data Driven Nitrate Hazard Index and BMP Assessment Tool*
Anthony Toby O'Geen and Jan Hopmans
- *Plant Nutrients in the Classroom*
Judy Culbertson

A break was taken from 11:20 a.m. to 11:40 a.m.

FREP staff will send a letter to each of the project leaders informing them whether their proposal was selected for funding, pending the final decision of the Fertilizer Inspection Advisory Board (FIAB) and the CDFA Secretary.

REVIEW OF PROPOSED TASC BYLAWS

Dr. West reported the TASC elected to form a working group to review and revise the TASC bylaws. The working group consists of Mr. Wackerman, Dr. Robert Mikkelsen, and Dr. Holly Little. He went over the proposed amendments with the subcommittee. He reported that the proposed amendment to Article I, Section 1 of the bylaws removes the summary of Food and Agricultural Code (FAC) Section 14611 (b) and replaces it with the complete text of the current FAC Section 14611 (b).

Ms. Renee Pinel stated FAC Section 14611 (b) appears to eliminate the future opportunity to fund purely agronomic research, unless there is an environmental benefit. Dr. Ba stated it has to be changed through legislation; if TASC members have verbiage they would like to propose for the bylaws, it would be this subcommittee's task to put the changes forward.

Dr. West stated the change to Article II, Section 3 of the TASC bylaws had been discussed previously by the subcommittee. It changes the review process of project proposals and final reports from the TASC to CDFA staff, who would request advice from TASC members as needed. Reports would be provided to TASC upon request.

Dr. West reported the next proposed change is an amendment to Article III, Sections 1 and 2 of the TASC bylaws.

Mr. John Salmonson expressed his objection to the amendment recommending a Master's degree and a minimum of 5 years experience in field and statistical research. Dr. Marja Koivunen stated it would limit the pool of applicants.

Dr. West stated the members without degrees may not have adequate research background to be able to critique research proposals on their technical merit. Technical expertise is the main TASC focus, while industry representation is the focus of the FIAB. Dr. Moradi agreed that a degree is beneficial for evaluating proposals, but commented this language would exclude or make it difficult for a grower to become a subcommittee member.

Discussion ensued. Members felt the proposed language would shift the composition of the TASC from a group with diverse backgrounds in favor of appointing more academically focused. Dr. Koivunen expressed concern about the strikeout of the language regarding the members representing major segments of the industry that pay for the program. Consensus was reached that additional parameters for membership were unnecessary because the TASC and the FIAB review every resume to assess the overall strength and abilities of each candidate.

MOTION: Dr. Robert Mikkelsen moved to keep the proposed strikeout in Article III, Section 2 regarding the industry and farming community, and to keep the language as written to remove the proposed sentence recommending a Master's degree. Mr. Steve Spangler seconded the motion; the motion passed unanimously.

Dr. West reported the final proposed changes are to Article IV. In Section 1, term limits would be added to the positions of Chair and Vice-chair; in Section 2, the first phrase, "TASC meetings are considered public" would have the word "considered" removed, and Section V would be removed.

MOTION: Dr. Robert Mikkelsen moved to adopt the amendments in Article IV as proposed; Mr. Steve Spangler seconded the motion. The motion passed unanimously.

ADDITIONAL ITEMS

Dr. West informed the subcommittee the 2014 FREP and Western Plant Health Association Annual Conference "Managing Agricultural Nutrients: Challenges of Nutrient Efficiency for the Future," will be held October 29-30, 2014 at the Doubletree Hotel in Modesto, CA.

Dr. West reminded the TASC members that research priorities need to be set, which will be released in December 2014 for the next Request for Proposals (RFP). The members added a new priority to the 2014 priorities: Fertilizer Optimization through Irrigation Management.

NEXT MEETING

The next meeting will be to discuss and recommend 2015 research concept proposals. It is scheduled for February 18, 2015, in Sacramento.

Mr. Wackerman adjourned the meeting at 1:30 PM.

Respectfully submitted,



Dr. Amadou Ba
Environmental Program Manager II

10-6-14
Date

AVAILABLE 2014 FERTILIZER RESEARCH FUNDING

FINANCIAL SUMMARY

	ACTUALS FY 13/14	PROJECTED FY 14/15
Beginning Balance as of 07/01/13:	\$7,515,452	\$8,353,426
Projected Mill Revenue	\$5,412,167	\$6,220,560
Projected Registration Revenue	\$882,345	\$222,000
Projected Licensing Revenue	\$91,800	\$289,600
Total Available Resources	\$13,901,765	\$15,085,586
Operational Expenses	\$ 5,548,339	\$6,343,129
Contracted Obligations		\$2,857,236
6-month Reserve	\$2,774,170	\$3,171,565
2013 Carry Out	\$5,579,256	
Funds Available for Research:	\$2,713,656	\$2,713,656

* FY 2014/15 based on current contract obligations and does not include future contract obligations

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FREP Strategic Planning

October 14, 2014
FREP team

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**CDFA
Fertilizer Research and Education Program**

MISSION
To advance the environmentally safe and agronomically sound use of fertilizing materials in California through guiding and funding research and sharing and spreading the knowledge base

VISION
To maximize California high-quality crop production while minimizing unwanted environmental impacts by becoming a primary resource for nutrient management planning.

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CDFA
Fertilizer Research and Education Program



GOALS:

- Continue to fund research that closes the knowledge gap in crop nutrient use and efficiency
- Organize research results to make it accessible to a wide range of stakeholders
- Transfer knowledge and expertise to growers and decision makers on the ground
- Support the creation of site specific solutions to widespread nutrient management challenges
- Help the Ag industry (as a whole) manage fertilizers in a manner that is agronomically sound and protects the environment
- **BE RECOGNIZED!**

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Barriers to fast utilization of research results by end users (growers)

- Research results are obtained under specific experimental conditions (soil type, crop type, etc.) which are usually different than a specific grower's conditions, reducing the transferability of the results
- Advisors and CCAs need to make assumptions and be cautious when recommending/designing a specific practice → generalization
- Since many parameters (soil type, crop type, irrigation/fertigation, etc.) are acting simultaneously it is difficult to predict/estimate/guess the outcome of such multi-factorial systems
- Advisors usually have expertise in primarily one or two aspects of the soil-crop system (e.g. soil, crop nutrients, irrigation, etc.)

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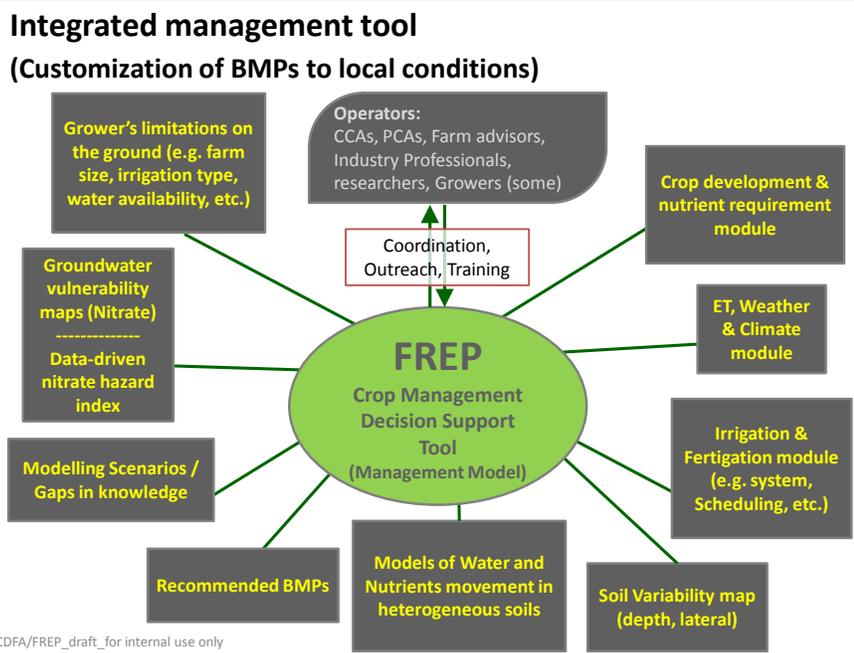
Barriers to fast utilization of research results by end users (growers)

- Growers have on-the-ground realities that limit application of some specific BMPs, including economic, land tenure and infrastructural considerations
- Considering the diversity of growers, knowledge transfer is problematic and needs to be formatted and presented separately for different audiences
- Many growers have very limited contact with the purveyors of the information
- Growers need customized solutions to their specific farm (local conditions)

The long-term strategy of FREP is based on building a decision making tool by putting all the relevant information into one comprehensive framework coupled with robust and dynamic outreach and education program

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**Special RFP\
Initiatives:**

- Nitrous Oxide Research
- Nitrogen Management Training Program for Growers
- Demonstration Projects on the Multiple Benefits of Nitrogen Management Practices with Growers
- Understanding and Quantification of the Movement of Nitrates in deep soil
- Development of Easy-to-Use Measurement Technologies for field-scale measurement of nitrate Leaching Below the Crops Root-Zone
- Developing integrated water and nutrient management tools

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**Regular RFP\
Priorities:**

- Developing integrated water and nutrient management tools
- Education and outreach
- Developing new Best Management Practices
- Field-scale demonstration of recommended Best Management Practices (BMPs) related to fertilizing materials
 - Increasing application frequency
 - Leaf sampling
 - Slow release fertilizers
 - Nitrification inhibitors
 - Advanced irrigation management
 - Comparison of irrigation technologies
 - Nitrate recovery with cover crops
- Filling knowledge gaps for nitrogen management in specific crops in the San Joaquin Valley
 - Corn
 - Pima Cotton
 - Processing Tomatoes
 - Walnuts
 - Citrus

**California Department of Food and Agriculture
Fertilizer Research and Education Program**

Research and Education Priorities

Developing integrated water and nutrient management tools

As the concerns raise over shortage of fresh water and environmental effects of agriculture in California, a major challenge facing the agriculture industry is to optimize the use of fertilizers and water. This needs to be done in such a fashion that sustainable crop yield and soil productivity is maximized while the leaching of nitrate to groundwater, gaseous N losses, runoff, and salt accumulation are minimized. Overcoming this challenge requires integration of various aspects of agriculture, including crop development, soil fertility, soil and water monitoring technologies, irrigation, and fertigation management practices into decision support tools for growers and decision makers. Such management tools should provide a platform for customizing management practices to local conditions on farm as well as cope with droughts.

Education and outreach

Development of educational materials and methods to increase awareness and implementation of agronomically sound use of fertilizing materials is encouraged. Extension efforts to disseminate effective best management practices and to develop and help implement nutrient management plans on grower's fields are of high priority.

Developing new Best Management Practices

Innovative management practices need to be developed that are compatible with sustainable agriculture and provide solutions to agricultural challenges in California. These include:

- Evaluating strategies to increase crop N use efficiency
- Minimizing nitrate movement below the root zone
- Minimizing nitrous oxide emissions related to fertilizer use

Field-scale demonstration of recommended Best Management Practices (BMPs) related to fertilizing materials

Demonstration projects are a key strategy to ensure results from basic experimental research trials are implemented and adopted by growers at the farm level. Demonstration projects must involve scientific experts from the University system, agriculture industry experts, actual field plots, and already completed FREP and non-FREP findings. All demonstration projects are encouraged to include grower participation in management and decision making. Demonstration projects at multiple locations across the state are encouraged. Management practices that have already shown to be effective, are simple, and have multiple benefits have a good chance of adoption by growers. Potential treatments include, but are not limited to:

- Increasing application frequency
- Leaf sampling
- Slow release fertilizers
- Nitrification inhibitors
- Advanced irrigation management
- Comparison of irrigation technologies
- Nitrate recovery with cover crops

Filling knowledge gaps for nitrogen management in specific crops in the San Joaquin Valley

- **Corn:** Very little California information is available for corn.
- **Pima cotton:** Anecdotal evidence indicates that Pima nutrient requirements differ from that of Acala types.
- **Processing tomatoes:** Most research has been done on furrow irrigated tomatoes before the adoption of buried drip.
- **Walnuts:** Determine temporal soil N status (quantity of additions and losses), validate leaf nutrient CVs for the most popular walnut cultivars, improve leaf sampling protocols, develop a monthly nutrient demand model for walnut and develop BMPs to share the findings.
- **Citrus:** Determine temporal soil N status (quantity of additions and losses), validate leaf nutrient CVs for citrus, improve leaf sampling protocols, develop a monthly nutrient demand model for citrus and develop BMPs to share the findings.

**California Department of Food and Agriculture
Fertilizing Materials Inspection Program and Fertilizer Research and Education Program**

Fertilizer Research Initiatives on Nitrogen

The Fertilizer Materials Inspection Program and the Fertilizer Research and Education Program have budget in reserves that should be allocated within the current fiscal year for projects that address nitrogen fertilizer management, nitrates in groundwater, and nitrous oxide greenhouse gases. Listed below are several potential areas of research and education opportunities that would support addressing environmental issues related to nitrogen fertilizer use in the state.

Nitrous Oxide Research

Nitrous oxide is a greenhouse gas from nitrogen fertilizers that is significantly more potent than carbon dioxide. Comprehensive research has been completed on nitrous oxide emission factors for the top 10 crops in California. The findings of this research can be used to test models that predict nitrous oxide emissions from different crops grown on various soil types under various irrigation/fertigation management practices in California. Mitigation practices need to be developed based on the results of these findings. Additional research is needed on N_2O to N_2 conversion rates and N_2O emission under various fertilizer applications to calibrate and improve the performance of current models. Reliable models that predict nitrogen emissions from agricultural lands under real world scenarios and effective science-based management practices are needed to encourage voluntary adoption of best management practices by growers and for use in potential nitrogen market trading systems in California.

Nitrogen Management Training Program for Growers

The Waste Discharge Requirements General Orders for the Central Valley allows growers to self-certify their own nutrient management plans if they attend a California Department of Food and Agriculture or other Executive Officer approved training program. CDFA has taken the lead on developing a grower training program based on the Certified Crop Advisor training funded by FREP. Additional funds are required to further develop the grower education component.

Demonstration projects on the Multiple Benefits of Nitrogen Management Practices with Growers

Demonstration projects are a key strategy to ensure FREP funded scientific research results are implemented and adopted by growers at the farm level. There is a need for several demonstration projects in both the Northern and Southern parts of the state. Demonstration projects must involve scientific experts from the University system, actual field plots, already completed FREP findings, or other well documented nutrient management research and close involvement of growers and other field professionals. Management practices with multiple benefits have a good chance of adoption compared to a management practice with a single benefit. This aspect of the research initiatives should be completed in coordination with the CDFA Environmental Farming Act Science Advisory Panel. The Science Panel is currently evaluating the multiple benefits of management practices and has encouraged the implementation of demonstration projects to show proof of concept.

Understanding and Quantification of the Movement of Nitrates in deep soil

There is a significant information gap in understanding nitrogen behavior, movement and distribution from nitrogen fertilizers as it moves from the soil down to groundwater aquifers. This lack of information has led to incomplete analyses of the quantity of nitrates from nitrogen fertilizers ending up in groundwater aquifers and the amount of nitrogen lost to the atmosphere as N_2O and N_2 . Well-defined scientific studies are required to understand the movement and distribution of nitrate at great soil depths in several locations throughout California's major agricultural regions (e.g., Central Valley and Central Coast).

Development of Easy-to-Use Measurement Technologies for field-scale measurement of nitrate Leaching Below the Crops Root-Zone

At present, growers lack adequate technologies and tools to detect nitrogen movement past the crop

root zone. Development of cost-effective probes for sensing and measuring field-scale nitrogen movement past the root zone in relation to irrigation and fertigation practices is needed to effectively quantify and manage nitrogen use and application in agricultural operations

Developing integrated water and nutrient management tools

As the concerns raise over shortage of fresh water and environmental effects of agriculture in California, a major challenge facing the agriculture industry is to optimize the use of fertilizers and water. This needs to be done in such a fashion that crop yield and soil productivity is maximized while the leaching of nitrate to groundwater, gaseous N losses, runoff, and salt accumulation are minimized. Overcoming this challenge requires integration of various aspects of agriculture, including crop development, soil fertility, soil and water monitoring technologies, irrigation, and fertigation management practices into decision support tools for growers and decision makers. Such management tools should provide a platform for customizing management practices to local conditions on farms, as well as cope with droughts.