

## California Department of Food and Agriculture FERTILIZER RESEARCH AND EDUCATION PROGRAM

### 2015 DEMONSTRATION OF A COMBINED NEW LEAF SAMPLING TECHNIQUE FOR NITROGEN ANALYSIS AND A NITROGEN APPLICATIONS APPROACH IN ALMONDS

The Fertilizer Research and Education Program (FREP) of the California Department of Food and Agriculture (CDFA) is initiating a series of demonstration trials to showcase recommended best management practices and new techniques in fertilization and irrigation. These demonstrations will be conducted in grower fields under typical grower conditions and will be located in several different areas throughout the geography of interest. FREP is soliciting submission of proposals from interested parties to conduct and manage several trials to be established throughout the Central Valley.

#### Objective

- Demonstrate the new leaf sampling and nitrogen (N) application approaches in almonds in comparison to typical grower practices.
- Create a platform promoting widespread adoption of best nutrient management practices by almond growers throughout the region.

#### Proposed Demonstration Trial Locations

One trial will be established in each of the following six areas:

- Butte, Colusa, Glenn counties area
- Yolo County
- Stanislaus County
- Madera County
- Western Fresno County
- Southwestern Kern County

The grant will be awarded to a single grantee, or a consortium of grantees, who will manage or coordinate the management of all six locations.

#### Treatment List

1. Standard grower practice for leaf sampling and N application management.
2. New leaf sampling protocol and N application management, using the handout: *Almond Early-Season Sampling and In-Season Nitrogen Application Maximizes Productivity, Minimizes Loss* (found at [http://fruitsandnuts.ucdavis.edu/Weather\\_Services/Nitrogen\\_Prediction\\_Models\\_for\\_Almond\\_and\\_Pistachio/](http://fruitsandnuts.ucdavis.edu/Weather_Services/Nitrogen_Prediction_Models_for_Almond_and_Pistachio/)) as a guide. Select *Guidelines for Early Season Sampling and In-Season Nitrogen Budgeting*. This publication will provide in-depth information about leaf sampling and N budgeting.

#### Duration of Demonstration

This will be a three-year project.

## **Deliverables**

The grantee will submit two reports per year and a final report at the end of the trial, which will include all data collected and comprehensive data analysis. The project manager must be available to tour the locations and discuss interim results and activities with FREP personnel and, through FREP, other interested parties. FREP will be responsible for all field days and other outreach activities. Grower cooperators must be amenable to allowing these outreach activities (field days, etc.), and sharing production practices and yield information.

In order to assure the relevancy of this project to growers, sufficient data will be collected to complete the Central Valley Regional Water Board Nitrogen Management Plan Template. This includes all nutrient management planning information and the actual nitrogen applied and credited from all sources. The Nitrogen Management Plan Template is included in this Regional Water Board packet:

[http://www.waterboards.ca.gov/centralvalley/water\\_issues/irrigated\\_lands/forms/nitrogen\\_mgt\\_plan/2014\\_1223\\_nmp\\_temp\\_eo\\_iss.pdf](http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/forms/nitrogen_mgt_plan/2014_1223_nmp_temp_eo_iss.pdf).

All significant orchard management information and basic orchard conditions will be reported, including, but not limited to, location, age, tree spacing, varieties and variety pattern, soil type, a detailed analysis of the irrigation system (including system type, distribution uniformity, output, monitoring and maintenance practices, and other design details), and any other pertinent information. The detailed record of plant nutrition and soil fertility practices will be reported for each of the two treatments, including fertilizer application timing, quantity, materials and methods, as well as leaf and soil sampling and analysis information. Other practices to be reported include pest management, irrigation timing and amounts relative to evapotranspiration, and field observations. Yield data (kernel yield and grading) for the two treatments will also be documented.

The plots must be of reasonable size for measuring yield. It must represent the average orchard conditions and have a reasonably well-maintained micro-irrigation system.

## **Methods**

Soil samples will be taken from the plot areas before any fertilization programs are initiated (it must be known when the grower's first application will be made) to determine the baseline soil nitrogen status. A yield prediction must be made in January or February to help determine the seasonal nitrogen fertilizer rate. This will be important when determining amounts of nitrogen to be applied at each fertilization event and also when making the in-season estimate for corrections based on the leaf analysis. Four nitrogen fertilizer applications will be made in treatment 2 at the following timings and rates:

1. Early-Spring Application (end of bloom through full leaf expansion). 20% of total annual demand.
2. Fruit Growth Application (from full leaf expansion through shell hardening). 30% of total annual demand.
3. Kernel Fill Application (shell hardening through early hullsplit). 30% of total annual demand.
4. Fruit Maturity/Early Postharvest Application (hullsplit through early postharvest). 20% of total annual demand.

Following the publication, "*Guidelines for Early Season Sampling and In-Season Nitrogen Budgeting*," for information about leaf sampling in treatment 2 and, employing the leaf sampling results, the determinations will be made to optimize the annual N fertilization plan by adjusting the kernel fill and the fruit maturity/early postharvest applications.

The final fertilizer application may not be necessary, depending on the nitrogen level in the leaf analysis. All application amounts and timing will be recorded and included in reports.

### **Proposal Submission**

To submit a proposal, send an electronic copy of your proposed budget (use the FREP budget template), budget narrative and CVs with relevant experience for all of the personnel who will be significantly involved in the project to [FREP@cdfa.ca.gov](mailto:FREP@cdfa.ca.gov). Proposals should be a maximum of 15 pages, excluding CVs, budget, and budget narrative. The FREP budget template and the 2015 Grant Procedures Manual, which contains information about travel per diem and other topics, are available at the "Special Request for Proposals" link on the FREP website at <http://www.cdfa.ca.gov/is/ffldrs/frep.html>.

**Proposed budgets are due by 5:00 p.m., March 3, 2015. NO EXCEPTIONS GRANTED.**

Proposals that are incomplete or late will be returned and eliminated from consideration. Proposals must be submitted via e-mail; mailed and faxed copies will not be accepted. FREP staff will reply with a confirmation e-mail when proposals are received; contact us by calling (916) 900-5022 if you have not received a confirmation e-mail within two business days of your submission. FREP is not responsible for incomplete email transmissions.

### **Grant Cycle Timeline**

Full proposals due: March 3, 2015

Award notification: June 1, 2015

Project start date: July 1, 2015