

## Peters, Ashley@Waterboards

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**From:** Tristao, Dennis <dtristao@jgboswell.com>  
**Sent:** Friday, March 03, 2017 4:57 PM  
**To:** Peters, Ashley@Waterboards  
**Cc:** Rodgers, Clay@Waterboards  
**Subject:** Nitrogen concentrations in harvested plant parts - A literature overview  
**Attachments:** CASafflowerPMSP2016.pdf; Safflower%20Crop%20Profile%203-1-2016%20MB.pdf

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March 3, 2017

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Sent Via Electronic Mail

**SUBJECT:** Nitrogen concentrations in harvested plant parts - A literature overview

The California Safflower Growers Association appreciates the opportunity to comment on Dr. Dan Geissler's report "Nitrogen concentrations in harvested plant parts - A literature overview", thank you. Our Association is composed of growers, processors and seed distributors of Safflower seed in California; we represent the largest percentage of Safflower growers by acreage in the Southern San Joaquin Valley. Our representatives have also participated as stakeholders in this issue since at least 1999, when Senate Bill 390 was signed. As such, since that time we have followed and have been active in the development and passage of the waivers and the waste discharge orders pertaining to the irrigated lands regulatory program together with the formation and activities of the coalitions. Our comments on the report are as follows:

- On the introduction on page 5, it is stated that "As part of developing the Central Valley Irrigated Lands Regulatory Program (CVILRP), agricultural water quality coalitions (Coalitions; exclusive of irrigated agriculture covered under the Dairy or California Rice Commission orders) have developed an approach to providing the Central Valley Regional Water Quality Control Board (CVRWQCB) with information on nitrogen (N) balances in agricultural fields. The ratio of N applied to N removed, having been recommended by the Expert Panel convened by the State Water Resources Control Board, is a key metric for the CVRWQCB (ITRC, 2014; CVRWQCB, 2013). The approach involves growers reporting applied N and the quotient N applied/yield to the Coalitions. The Coalitions in turn will transform these data to the quotient N applied/N removed, and report various statistics related to N applied, and to the quotient of N applied/N removed to the CVRWQCB. To make these transformations, the Coalitions need reliable values of N concentrations in the harvested parts of crops.." While we agree with the expert panel that ratio of N applied to N removed is a key method, as we reviewed the report it has become apparent that developing the metric requires much more analysis and research for many crops in the San Joaquin Valley, as explained further below.

- The email notice distributed by the agency on February 1, 2017 states in part: "The final report identifies the best available N removed estimates in the harvested parts of crops for close to 99% of the crop acreage in the Central Valley. The information provided in this report may be used by Coalitions to transform crop yield data to N removed, which is needed to analyze and report N applied over N removed ratios." The cover letter drafted by the coalitions states in part "The final report identifies the best available N removed estimates for close to 99% of the crop acreage in the Central Valley as identified in bullet #2 above." In turn, The author states on page 6 "Calculating the amount of N removed based on yield and average N concentration has some limitations unrelated to the quality of the data: (i) As N concentrations in harvested crop parts can vary considerably from one year to the next, the calculated value for N removed is only accurate on a multi-year basis, but may not be accurate for a specific year. (ii) For most crops where marketable yield is reported and cull or trash is removed in a processing facility, the calculated amount of N removed underestimate the actual amount, the difference being the N in cull or trash. (iii) For perennial crops, N accumulation in perennial tissue (e.g. trunk, roots, or branches) is not included in the value." This leads to the reader's conclusion that nitrogen removal rates cannot, nor should they be, based upon a single year report but rather should be based on a range, and further, the values expressed may be deficient in accounting for the amount of crop material produced, potentially leading to an artificially low nitrogen removal value.
- On page 8 of the report the author states " One point that needs to be kept in mind is that variety trials may underestimate the variability encountered among growers' fields, as the crops in the trials are grown under rather uniform conditions which do not reflect the broader range of management practices found in commercial fields." This comment supports the need for actual on-field research to develop a robust data set quantifying the nitrogen removed (and applied) rates for the various crops, preferably in the San Joaquin Valley.
- Tables 1, 2, and 3 beginning on page 2 highlight the author's discussion on page 7 that "To facilitate comparison of different commodities, we calculated the **coefficient of variation (CV)**, which is expressed as the SD in % of the mean. Using CV instead of SD simplifies comparison of the variability among datasets with different means, even though variability of any dataset depends on the design of the study and the number of factors included. For example, we would expect the variability to be smaller for a variety trial that is completed at one site for one year compared with a variety trial that includes multiple sites and years." We see a CV range amongst the crops varying from 3.75 to 114 %, which again points to the variability of the data. We viewed Table 4, on page 10, "The major factors affecting "N" concentrations in the Harvested Parts of Crops" as an accurate representation of factors explaining the variability and appreciate the author's analysis.
- The California Safflower grower Association appreciates the author's analysis on page 47 relating to our commodity. We note, as did the author, that only one study was performed in California, from one site, over a two year period with 12 observations; the total number of observation for the analysis was 149. Regarding the California study, the author notes " The N concentration in this study was lower than the average across all studies included in this analysis. Therefore, the average value reported here may not be representative of N concentrations in safflower seeds from California." This assertion leads to the need for a more robust data set from Safflower regions in California.

Our opinion is that while the report presents an "applied to removed" ratio for crops as required by the contract, the Agency is cautioned not to use this as a compliance metric. As demonstrated in the report itself, additional study is needed in this area. We see this as an opportunity to cooperate with our coalitions and the research community, including Dr. Geisseler, in developing a more robust data set for analysis. And further, that a metric process such as this may be developed/ incorporated in the CDFR/UC Davis California Fertilization Guidelines (found at <https://apps1.cdfa.ca.gov/FertilizerResearch/docs/Guidelines.html>) as opposed

to being used as compliance metric. We, as a commodity group, also look forward to participating the “Management Practices Evaluation Program”, also known as “MPEP” to identify those practices that are protective our ground water resource while at the same time recognizing the diversity of conditions and crops in our valley. To that end, the California Safflower Grower Association has cooperated in the development of two recent publications, “An Area-Wide Pest Management Strategic Plan for Safflower Production in the Southern San Joaquin Valley of California” ,April 2016; and “A Crop Profile for Safflower Production in California”, March 2016. Both which are attached and publically available at:

<https://ipmdata.ipmcenters.org/documents/cropprofiles/Safflower%20Crop%20Profile%203-1-2016%20MB.pdf>

<https://ipmdata.ipmcenters.org/documents/pmsps/CASafflowerPMSP2016.pdf>

Again, thank you for the opportunity for comment.

Sincerely,

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Executive Director

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