

# Can fall nitrogen fertilization improve almond yield?

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## Introduction

Current nitrogen (N) management program developed by UC researchers recommends the following fertilizer N application timings/amounts:

- Feb –Mar 20% of the annual N budget
- April- May 30% of annual N budget
- May-June 30% of annual N budget
- Postharvest 20% of annual N budget.

However, if some fertilizer N remains in the roots zone, winter rain fall can leach it down out of the root zone and into groundwater; wasting grower money and harming groundwater.

How important is a post-hull split nitrogen application for successful almond production? We are unaware of any research results directly supporting a yield benefit from post-hull split N applications in almond. [Fall N application did not improve peach yield the following year in UC research conducted by Drs. DeJong and Weinbaum in the 1990's.] Because of the leaching risk, post-hull split N application in almond may be more environmentally risky than spring applications. If post-hull split N application has no yield benefit the following spring, this practice may need to be reconsidered. If it has significant benefit, this needs to be documented in light of the leaching risk and steps taken to minimize potential leaching loss. Such steps might include adjustment of timing, rate, and application practices.

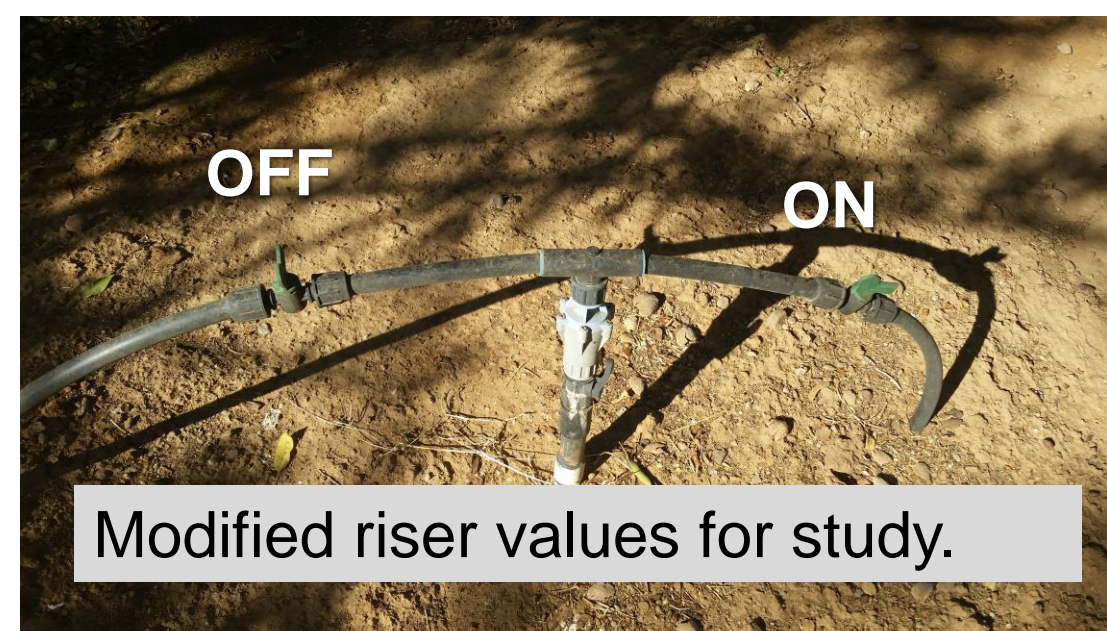
Thanks to Stan Cutter, Ubaldo Salud, and Gerry Hernandez

## Methods

The study block is a 9<sup>th</sup> leaf orchard, 75% Nonpareil, 25% Fritz, with every 4<sup>th</sup> tree down the row a Fritz. Trees are on Lovell rootstock and irrigated with double line (buried) drip. Yield ranges from 2600-3100 pounds/acre in the last several years.

For this study, eight rows of 30 trees each were used. The hoses at the risers were modified so that one valve could turn off irrigation flow to one half of the row. Eight half-rows were shut off while UN32 at a rate of 30 lbs/acre was injected to the remaining eight half rows in mid to late October, 2013, 2014, and 2015. Injection was delayed until Fritz harvest was over for fear of increasing the “barking” risk to those trees. 30 lbs N = 12% annual N budget.

Each half row was harvested separately starting in 2014 and kernel weight determined for all the Nonpareil an Fritz trees in each row.



## Results

No statistically significant yield benefit from fall applied fertilizer N was measured in 2014 or 2015 for either Nonpareil or Fritz, when yield for the eight half rows were averaged and compared. (Table 1)

Variety	+N -N	Year	Average yield per half row of trees (kernel lbs)	Stats
Fritz	+N	2014	60 lbs	P=0.61
Fritz	-N	2014	57 lbs	
Fritz	+N	2015	64 lbs	P=0.14
Fritz	-N	2015	57 lbs	
Nonpareil	+N	2014	244 lbs	P=0.14
Nonpareil	-N	2014	220 lbs	
Nonpareil	+N	2015	266 lbs	P=0.19
Nonpareil	-N	2015	248 lbs	

While the 2015 NP crop was larger, on average, than the 2014 NP crop, for each individual row half, the larger the 2014 crop, the smaller the increase in yield in 2015. For the half rows receiving fertilizer N, the amount of yield gain from 2014 to 2015 was significantly more than for those half rows getting no N. What's that really mean? **Adding fall N seems to increase yield potential, but the relative amount of gain is linked to cropping history of the trees measured, not the average production in the orchard or treatment.** We're continuing the study, plus adding another site in Colusa Co.

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