



Knowledge grows

# Four-year Trial Review 2020-2024



myalmonds<sup>TM</sup>  
by Yara



INCUBATOR

Growing a Nature-Positive Food Future

- ☑ Climate Neutrality
- ☑ Regenerative Farming
- ☑ Grower Prosperity





## Knowledge grows

### 4 Year Reflection

For over four years, Yara has been implementing controlled practices with the goal to evaluate different crop nutrition management strategies that address site-specific demands to different degrees and evaluate the programmatic effect, crop response, and the associated economic and environmental impacts. These treatment protocols have been in place since the 2020 crop year with considerable variation in results due to factors like wildfire smoke, frost events, poor pollination conditions, and intense heat. We have managed these trials with the utmost care and have consistently produced valuable insights during our tenure at the Modesto Incubator Farm. We see this work as a critical service to the almond industry in light ever-evolving regulatory, environmental, and producer prosperity challenges facing our advisors and growers.





## Treatment Descriptions

### Baseline

- 4 slug UAN
- 100% K from SOP in spring

### Modified

- 2 slug UAN + 2 slug YaraLiva CAN-17
- 100% K from SOP in spring

### Improved

- 2 slug YaraLiva CAN-17 + 2 slug YaraLiva CN-9
- 100% K from SOP in spring



- 25 % N from ammonium sulfate in early spring
- Fertigated YaraLiva CAN-17 and  $\text{KNO}_3$  for remainder of N budget
- 15-20 fertigation events (continuous fertigation)
- 50% of K from SOP in spring + 50% from in-season  $\text{KNO}_3$






# 6% Increase in Nut Set over Baseline


- 12,000 flowers buds surveyed per treatment
- Impacted by carbohydrate reserves, nutritional status, water management, and abiotic conditions response

# 24% Reduction of Hull Rot from Baseline

- 4,400 nuts surveyed per treatment
- Impacted by water management, and nitrogen status early and at hull-split



A photograph of an almond orchard with rows of trees and a path covered in harvested almonds.

**18%**   
**Increase**  
**in Yield**  
over Baseline

- Each row harvested individually
- Combination of all management factors

# 15%

## Increase Grower Profitability over Baseline

- Net profit after accounting for input costs
- True measure of economic viability for long-term implementation



**+\$2,400/AC**  
TOTAL OVER BASELINE



# 35% ↓ Reduction of Shrivels and Blanks from Baseline



*Photo credit: Almond Board of California*

- 4,800 hand-cracked nuts per treatment
- Impacted by tree stress early for blanks and throughout the season for shrivels

# 7% ↓ Reduction of Doubles from Baseline



*Photo credit: Almond Board of California*

- 4,800 hand-cracked nuts per treatment
- Impacted by pre-bloom temperatures and abiotic stress response

**10%** ↑  
**Increase**  
**NUE**  
over Baseline

## Nitrogen Use Efficiency

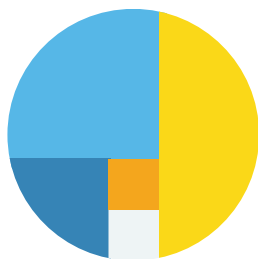
- Treatment average
- Impacted by management optimization per input source

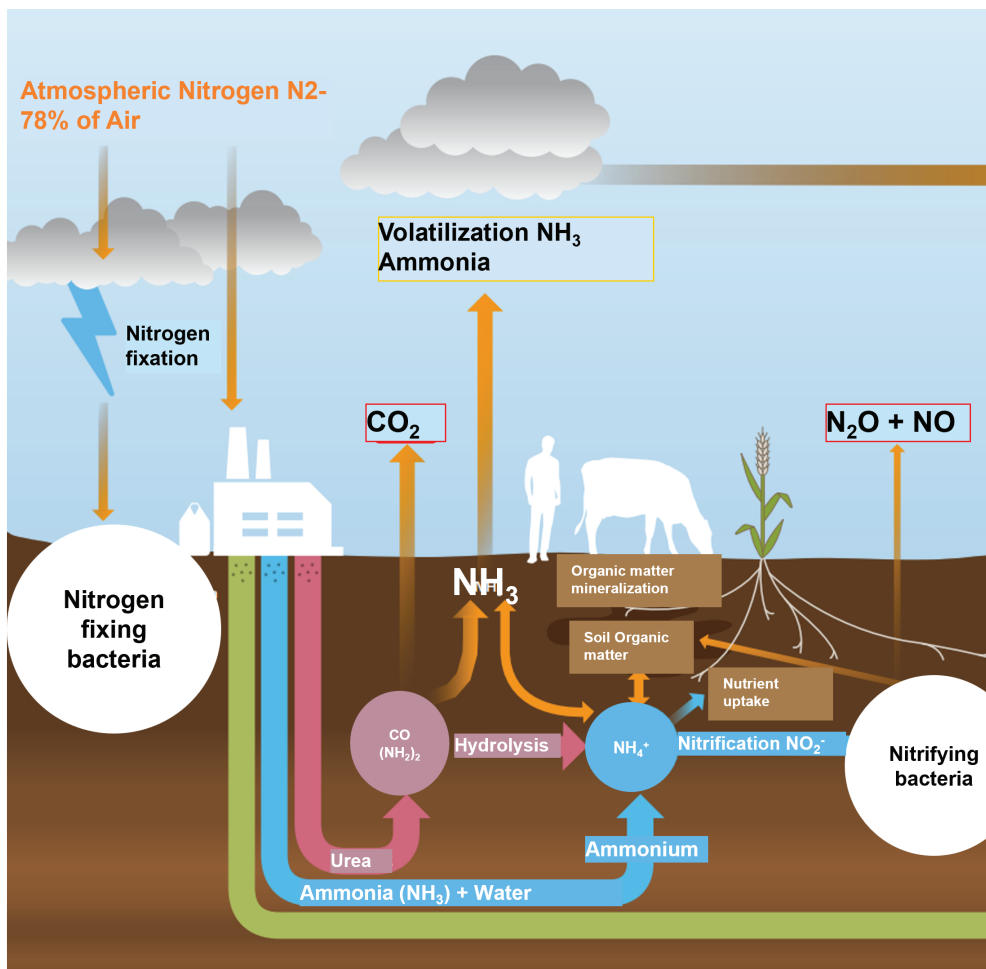


**14%** ↑  
**Increase**  
**Water**  
**Productivity**  
over Baseline

## Water Productivity

- Treatment average
- Impacted by root health, nutritional status, and crop demand

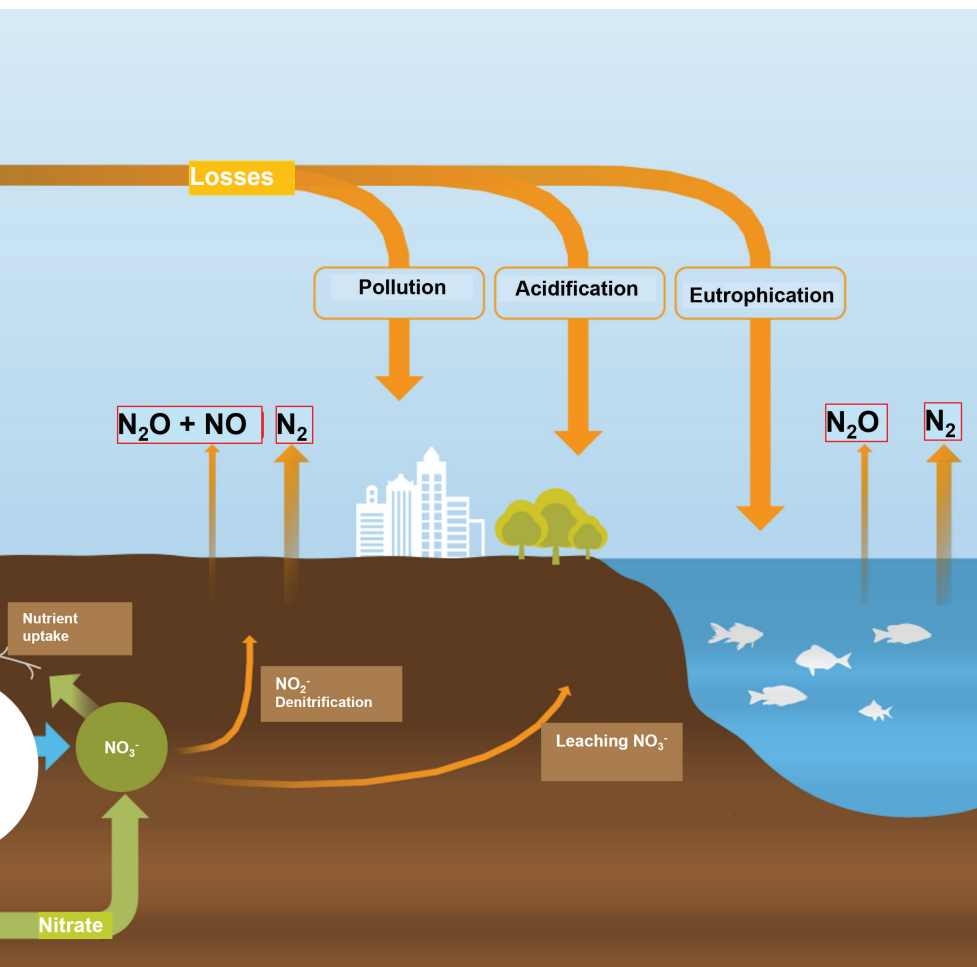




## Carbon Footprint

### CFP of Fertility Management

- Fertility management represents approx. 30% of the total almond production CFP
- Impacted by production CFP of inputs, input management, water management, and yield



*Nitrogen cycle showing volatilization losses via different N forms.*

**29%**  
**Reduction in**  
**Carbon Footprint**  
from Baseline





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## Key Value Drivers for myalmonds<sup>TM</sup> by Yara

### Nitrate Nitrogen

- Plant available
- Predictable in movement with water
- Mitigates soil acidification
- Supports cation uptake
- CO<sub>2</sub> release from application eliminated
- Lower factory gate CFP options available

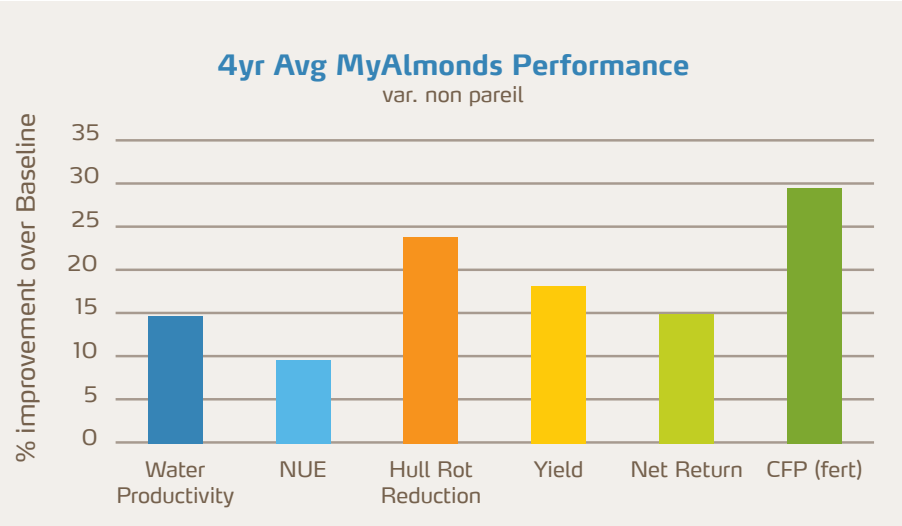
### Continuous Fertigation

- Full season application schedule
- Reduces need for post-harvest applications
- More opportunities for in-season adjustments
- Improved nutrient balance to crop demand
- More closely matches crop demand schedule
- Optimized NUE



## Executive Summary

The myalmonds program, built upon a foundation of continuous fertigation and nitrate-based inputs, has outperformed the baseline, and all other treatment variations in all metrics over the last 4 years. The myalmonds management solution generated nearly 5,000 kernel pounds more than the baseline program over these 4 years while simultaneously reducing the fertilizer carbon footprint by over 4,000 lbs CO<sub>2</sub>eq. Notably, the baseline program would have also required an additional 17 inches of water to match the yield output of the myalmonds program. That equates to more than 400,000 gallons of water. But environmental stewardship alone does not ensure viability. The critical factor here is that all of this was accomplished while simultaneously generating over \$2,400/ac greater net profitability for the grower. These results combined represent a truly sustainable production solution.





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Our goal is to support  
comprehensive nutrition  
management programs  
in collaboration with our  
industry partners



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Learn more about the work being done  
at the *Modesto Incubator Farm*