



Tree Physiology: Nitrogen

December 8, 2016

Tree Physiology: Nitrogen

Gabriele Ludwig, Almond Board of California
(Moderator)

David Cory, Westside San Joaquin River
Watershed Coalition

Patrick Brown, UC Davis

Cliff Ohmart, SureHarvest





**Gabriele Ludwig,
Almond Board of California**

A close-up photograph of several green almonds on a branch, surrounded by vibrant green leaves. The background is softly blurred, showing more of the tree and a hint of a person's face in the distance. The lighting is bright and natural, highlighting the texture of the almonds and the freshness of the foliage.

**David Cory,
Westside San Joaquin River
Watershed Coalition**

Irrigated Lands Regulatory Program

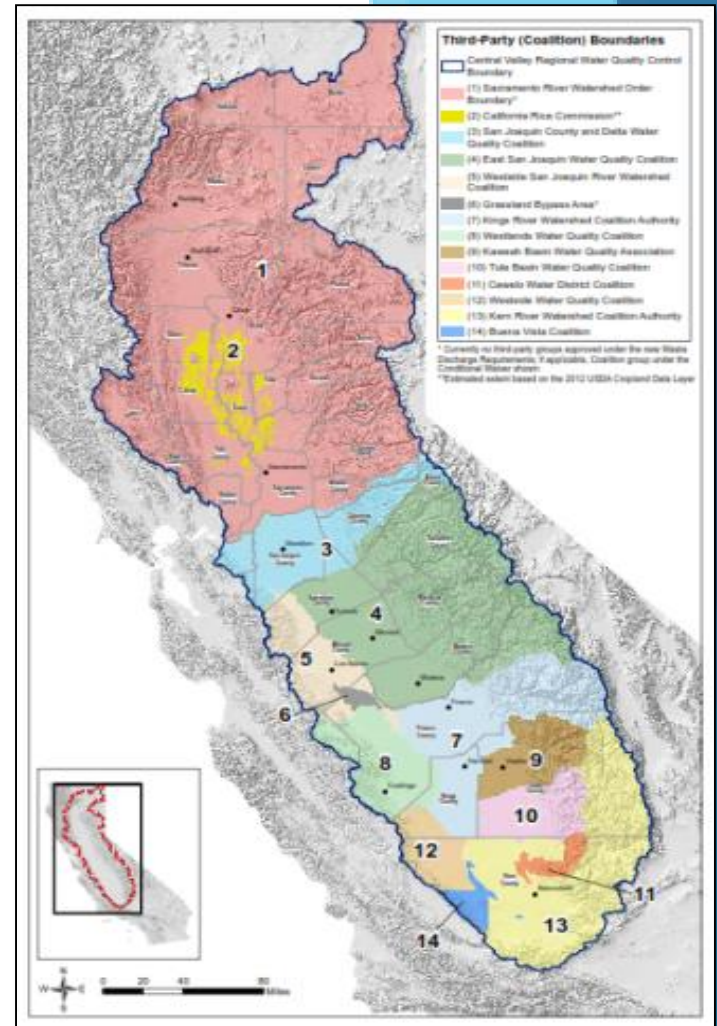
Looking Toward 2017

David Cory, Westside San Joaquin River Watershed Coalition



Central Valley Coalitions

- **Sacramento Valley Water Quality Coalition**
 - Bruce Houdesheldt
- **California Rice Commission**
 - Tim Johnson
- **San Joaquin County & Delta Water Quality Coalition**
 - Michael Wackman
- **Westside San Joaquin River Watershed Coalition**
 - Joseph C. McGahan
 - David Cory
- **East San Joaquin Water Quality Coalition**
 - Parry Klassen
 - Wayne Zipser
- **Westlands Water Quality Coalition**
 - Charlotte Gallock
- **Southern San Joaquin Valley Water Quality Coalition**
 - 7 new coalitions



Status Quo May Change

- Current requirements still in place for all CV coalitions
- State Water Board petition process may force changes but no sooner than 2017-2018
- Basic message: *Complete required reports and stay in compliance!*
 - Still pursuing those who have not joined coalitions or filed for individual permits
 - Regional Water Board actively enforcing against non-reporters
 - Farm Evaluation, Nitrogen Summary Report, Sediment & Erosion Plan

State Water Resources Control Board

- ESJWQC Waste Discharge Requirements adopted Dec 2012; petitioned immediately
- Orders Regional Water Board to modify WDR extensively
 - Process
 - Written Testimony
 - Public Hearings
 - State Board Hearing in early 2017
- Petition to Superior Court (*if we or others don't like it*)
 - Could further modify or order adoption as is
- Will apply to all Central Valley Coalition WDRs
- Go to www.esjcoalition.org General Order for process documents

State Water Resources Control Board

- Draft State Board order includes mandates to
 - Monitor all domestic wells on member parcels
 - Eliminates low and high vulnerability areas: equal reporting
 - May be additional time for smaller farms
 - Requires all member information goes to Regional Water Board
 - Farm Evaluations
 - Nitrogen Management Plans
 - Creates “Irrigation and Nitrogen Management Plan”

What Is Now Required

Member Responsibilities

- Complete Farm Evaluation*
- Complete Nitrogen Management Plan
 - In high vulnerability groundwater area; submit Summary Report to ESJ annually
 - Certified by 3rd party or grower trained and self certified
 - Low vulnerability keep on site; no certification required
- Sediment and Erosion Control Plan
 - In areas identified as high vulnerability for erosion and sediment discharge
- Participate in annual outreach events

** Enforcement fines for non-reporting are exceeding \$30,000!*

NITROGEN MANAGEMENT PLAN WORKSHEET

NMP Management Unit: _____

| | | | |
|---------------------------------|------------|----------------|-------|
| 1. Crop Year (Harvested): _____ | 4. APN(s): | 5. Field(s) ID | Acres |
| 2. Member ID# _____ | | | |
| 3. Name: _____ | | | |
| | | | |

| CROP NITROGEN MANAGEMENT PLANNING | | N APPLICATIONS/CREDITS | 15. Recommended/ Planned N | 16. Actual N |
|-----------------------------------|--|--|----------------------------------|-----------------|
| 6. Crop | | 17. Nitrogen Fertilizers | | |
| 7. Production Unit | | 18. Dry/Liquid N (lbs/ac) | | |
| 8. Projected Yield (Units/Acre) | | 19. Foliar N (lbs/ac) | | |
| 9. N Recommended (lbs/ac) | | 20. Organic Material N | | |
| 10. Total Irrigated Acres | | 21. Available N in Manure/Compost (lbs/ac estimate) | | |
| Post Production Actuals | | | | |
| 11. Actual Yield (Units/Acre) | | 22. Total Available N Applied (lbs per acre) | | |
| 12. Total N Applied (lbs/ac) | | 23. Nitrogen Credits (est) | | |
| 13. ** N Removed (lbs N/ac) | | 24. Available N carryover in soil; (annualized lbs/acre) | | |
| 14. Notes: | | 25. N in Irrigation water (annualized, lbs/ac) | | |
| | | 26. Total N Credits (lbs per acre) | | |
| | | 27. Total N Applied & Available | | |
| | | | | |
| PLAN CERTIFICATION | | | | |
| 28. CERTIFIED BY: | | 29. CERTIFICATION METHOD | | |
| | | 30. Low Vulnerability Area, No Certification Needed | | |
| | | 31. Self-Certified, approved training program attended | | |
| DATE: | | 32. Self-Certified, UC or NRCS site recommendation | | |
| | | 33. Nitrogen Management Plan Specialist | | |

Reporting A/Y

Total Appplied Nitrogen divided by Total Yield

- Summary template asks for A/Y to be calculated
- Divide “**Total Applied Nitrogen**” (commercial, compost, irrigation water N) by **Total Yield**
 - Total yield per management unit
 - Total N applied per management unit
- Coalition will calculate amount of N removed from A/Y that you report

Member Outreach on A/R

(Appplied N divided by Removed N)

Goals

- Inform members of relative performance to other like growers (Applied and Yield)
- Inform members of performance relative to UCCE recommendations for Nitrogen Appplied and Nitrogen Removed (CDFA guidelines)

Member Outreach on NMP Summary Report

Packet of information to be mailed/emailed to members by your coalition

Contents:

- Reporting Component
 - Summary of reported data (A/Y) and when possible, A/R
 - Comparison to other growers with same crop
- Education Component
 - Information on nitrogen crop consumption curves (where available)
 - Applications and yield - UCCE recommendations

Nitrogen Management Plan (NMP) Self Certification

Growers in High Vulnerability groundwater areas need either:

- CCA (Certified Crop Advisor) sign-off of NMP or
- Receive grower certification

Half-day course taught by CCA who has attend UC training on NMP

Your Coalition will announce training meetings this winter and spring

Read Watershed Coalition News For more Information on ILRP

CURES publication sponsored by Almond Board of California

(Latest Issue in your registration packet)



Coalition for Urban Rural
Environmental Stewardship
www.curesworks.org

WATERSHED COALITION

INFORMATION FOR CENTRAL VALLEY AGRICULTURE

News

FALL 2016



State Water Board Proposes Significant Changes to Irrigated Lands Program

The ink wasn't even dry on the Waste Discharge Requirements (WDR) adopted for the East San Joaquin Water Quality Coalition (ESJWQC) in December 2012 before petitions were filed against the new Order. Activist groups complained it wasn't strict enough; a water quality coalition complained it was too strict. More than three years later, the State Water Resources Control Board released on February 8, 2016 its response to the petitions in the form of a revised WDR with major proposed changes that the coalitions, farm groups and even the Central Valley Regional Water Board (Regional Water Board) are unhappy with.

The State Water Board acts as the appellate for any challenge brought against a regulation adopted by a Regional Water Board. Historically, the State Water Board rulings range from minor changes to substantial re-writes [as is the case with the ESJWQC WDR]. A revised WDR then goes through a public process where written comments and public workshops lead to new revised version. That revised version goes out for final written comments and then before the State Water Board for public hearings. Should any of the original petitioners (or the ESJWQC) be unhappy with the outcome, they can then appeal the revised Order to a Superior Court.

As of November, the revised ESJWQC WDR was working its way through the final rewrite process. The State Water Board is expected to hold a public hearing on a final revised version in early 2017.

Two extraordinary public workshops were held on October 19 and November 18 by State Water Board staff seeking clarification of comments received earlier in the year of the two public workshops held in Sacramento and Fresno and in written comments.

While it is too soon to say which of the State Water Board's proposed changes will make it into the final WDR, it is possible some will be adopted into what is being called a "precedential order" affecting all Irrigated Lands Regulatory Programs in California including the WDRs adopted for the other Central Valley coalitions. The major proposed changes include:

- Requiring all coalition members to monitor domestic wells on their parcels that serve residences, shops or other facilities. When a domestic well exceeds the nitrate drinking water standard, the member or coalition must provide notice to the Regional Water Board within 24 hours. Test results must also be included in a coalition's monitoring report.
- All members, regardless of groundwater vulnerability designation, must prepare an Irrigation and Nitrogen Management Plan and have it certified by professional (Certified Crop Advisor/CCA, agronomist, etc.), or complete a self-certification course. All members must also submit a Nitrogen Summary Report to their coalition as well as the Regional Water Board.

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continued page 2

Patrick Brown, UC Davis





Nitrogen Management in Almonds

Patrick H. Brown

Professor

Department of Plant Sciences

University of California, Davis



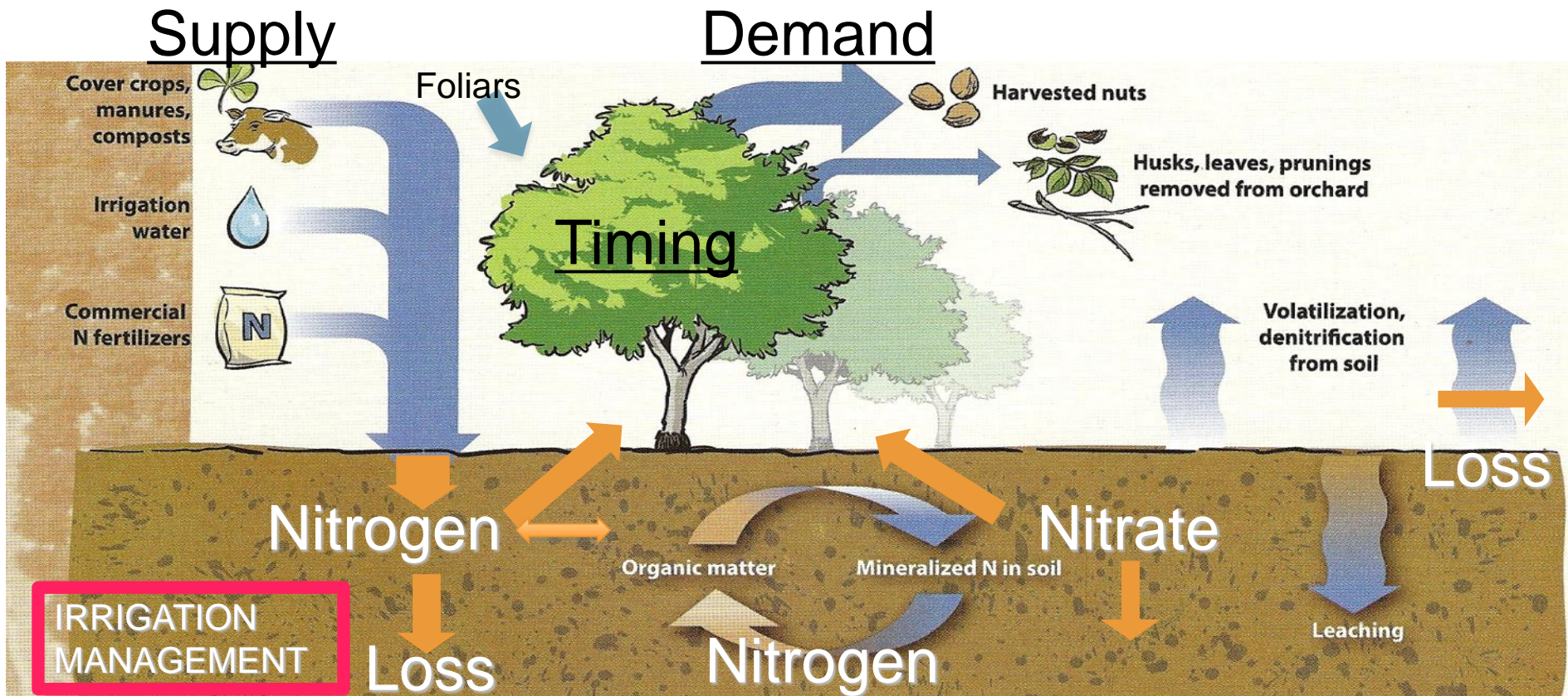
University of California
Agriculture and Natural Resources

Ideal Nitrogen Management Approach

-the 3 R's of Nitrogen-

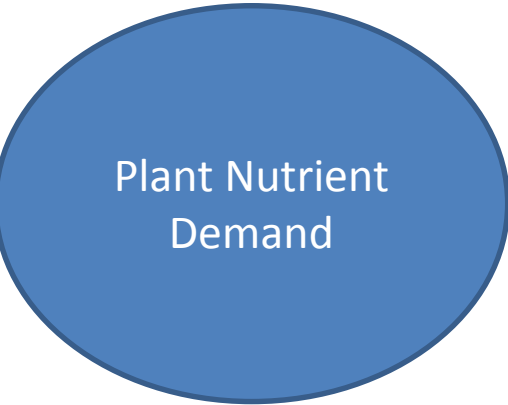
- **Apply the Right Rate**
 - MATCH THE SUPPLY OF N TO THE DEMAND FOR N.
- **Apply at Right Time**
 - TIME APPLICATIONS TO COINCIDE WITH PLANT UPTAKE.
- **In the Right Place**
 - KEEP N IN THE ACTIVE ROOTZONE AND DELIVER N UNIFORMLY/PRECISELY ACROSS ORCHARD.

The Nitrogen Cycle: A Balancing Act.



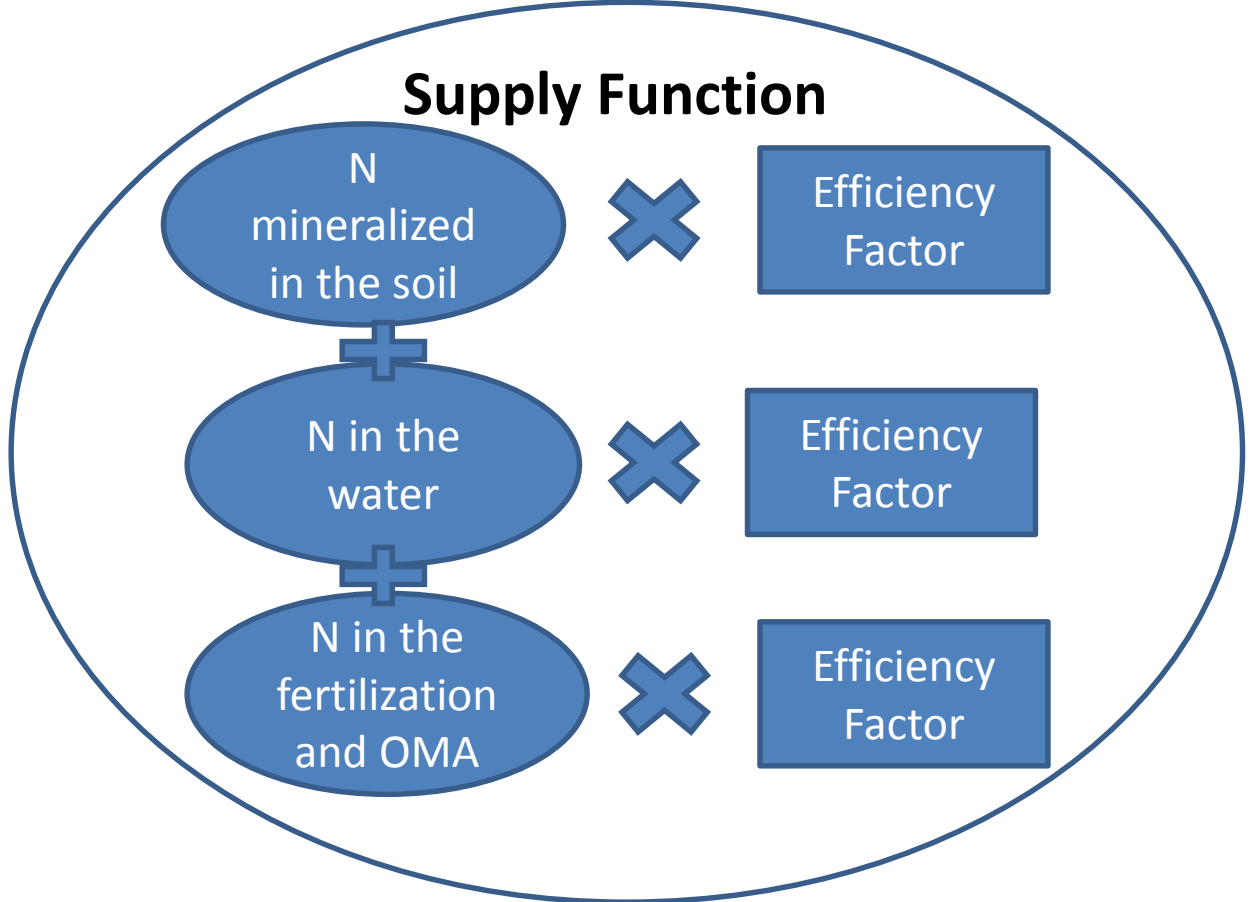
The Right Rate Equation

Demand Function



—

Supply Function

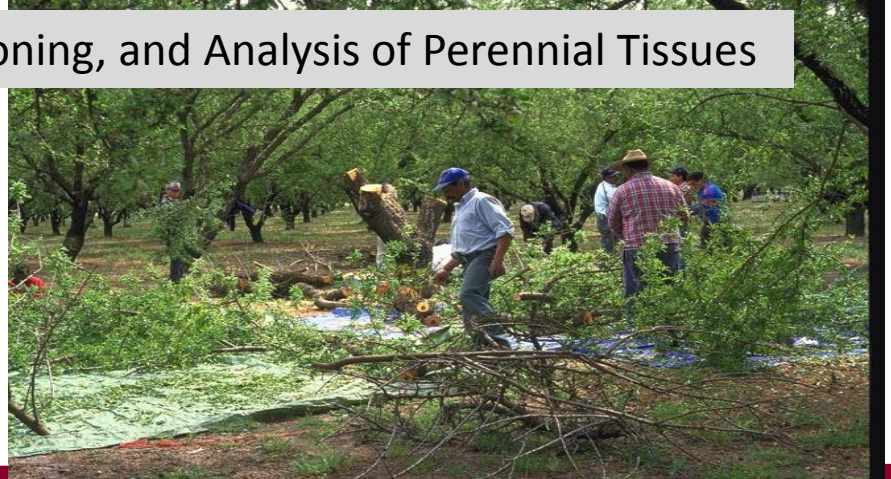


Determining Nitrogen Demand in Trees

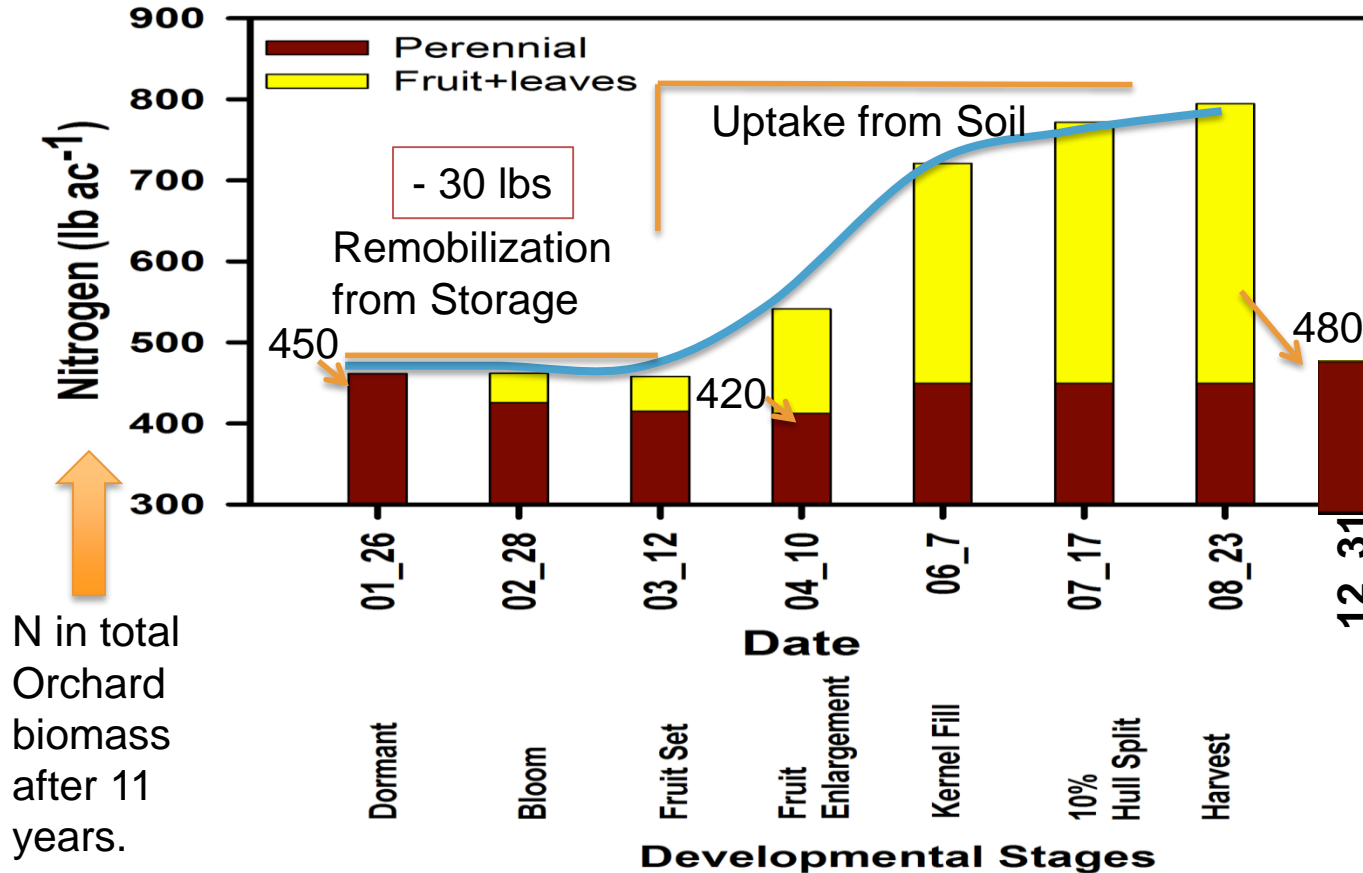
Collection, Separation and Analysis of Annual Tissues



Tree Excavation, Partitioning, and Analysis of Perennial Tissues



Total and Annual Dynamics of N in Mature Almond (data from 11-12 year old trees)



N in total Orchard biomass after 11 years.

From dormancy to mid-March there is very little N uptake.

Uptake commences at mid-leaf out and is essentially complete by hull split.

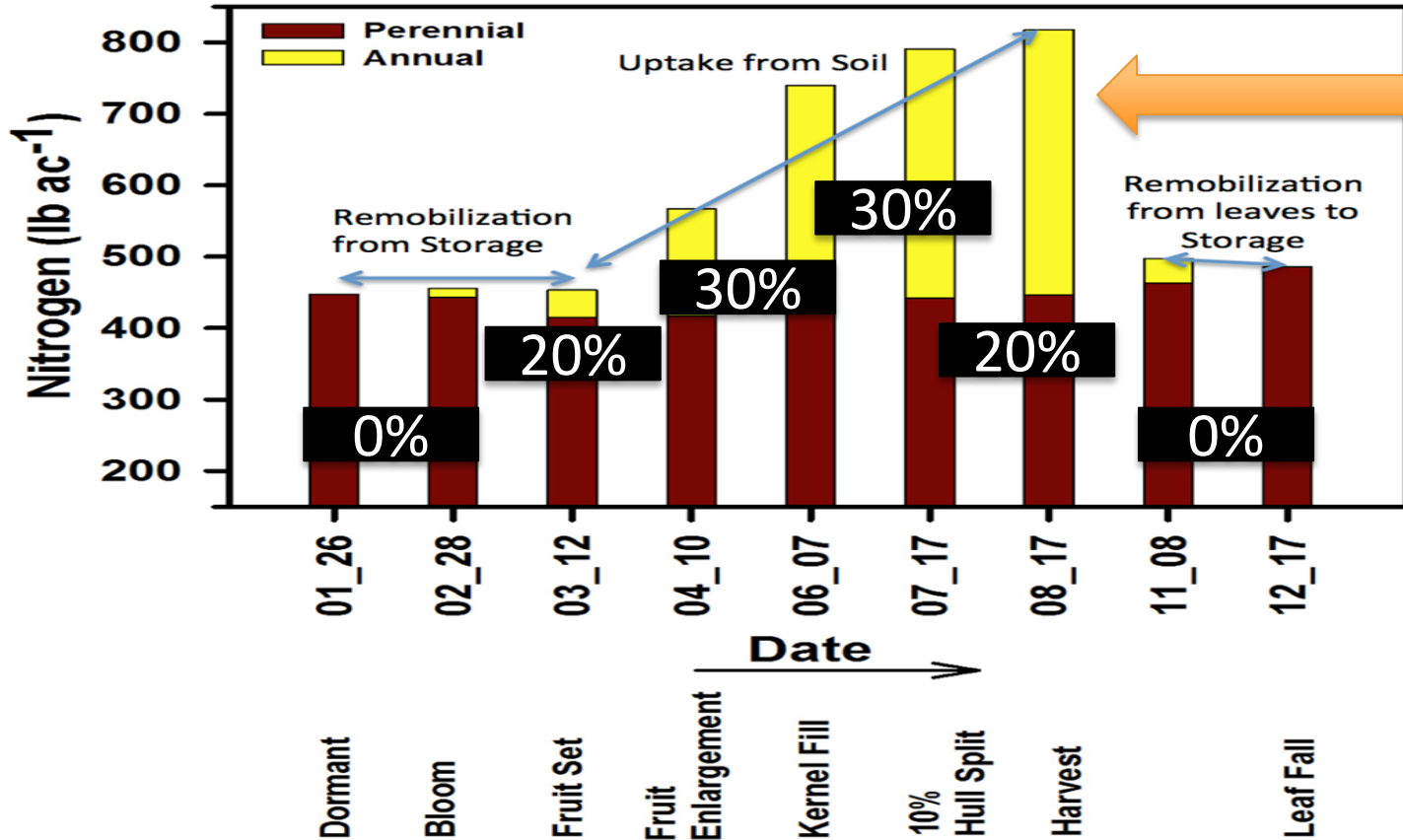
Perennial Organ N:

In 11 year old tree - 420 lbs N acre in total orchard biomass (5-45 lbs N/Yr/Acre in years 1-12)

30 lbs of N is remobilized in Feb-Mar to feed flowers, leaves and fruit set.

30lbs N accumulated in new perennial growth (5-35 lbs N/Yr/Acre from year 8-20).

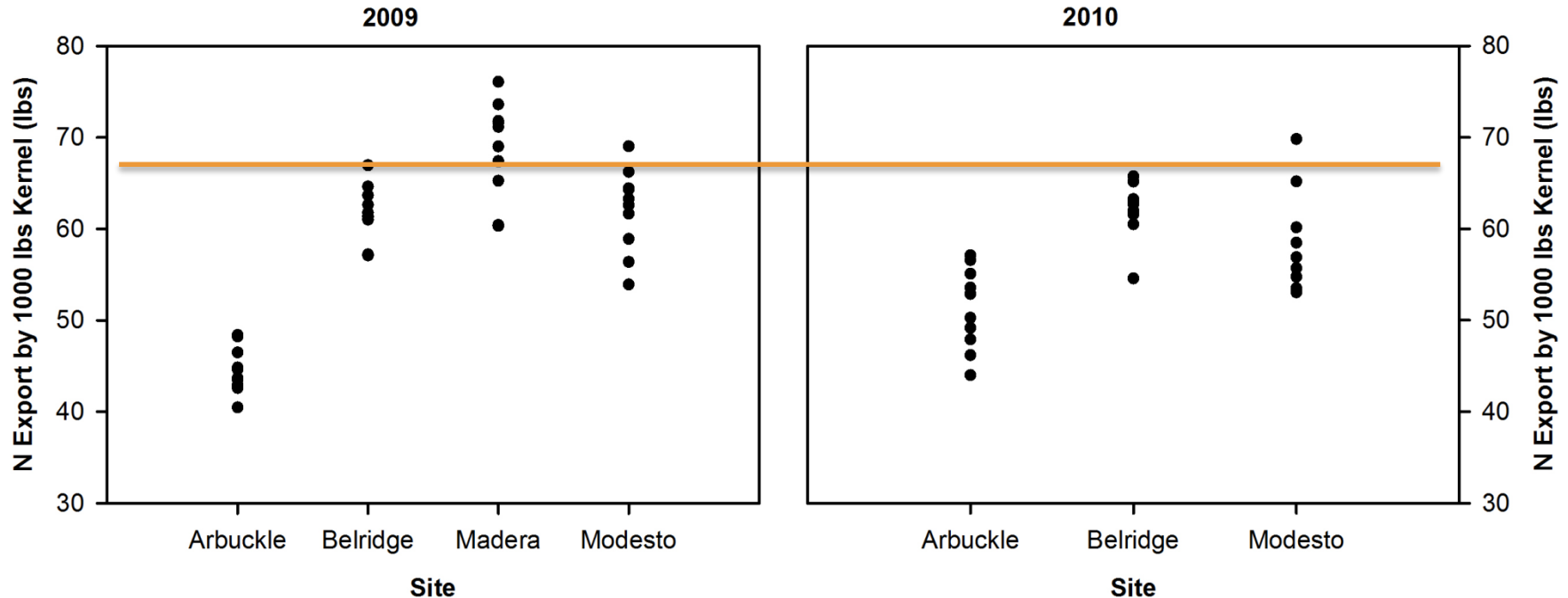
Right Rate and Timing



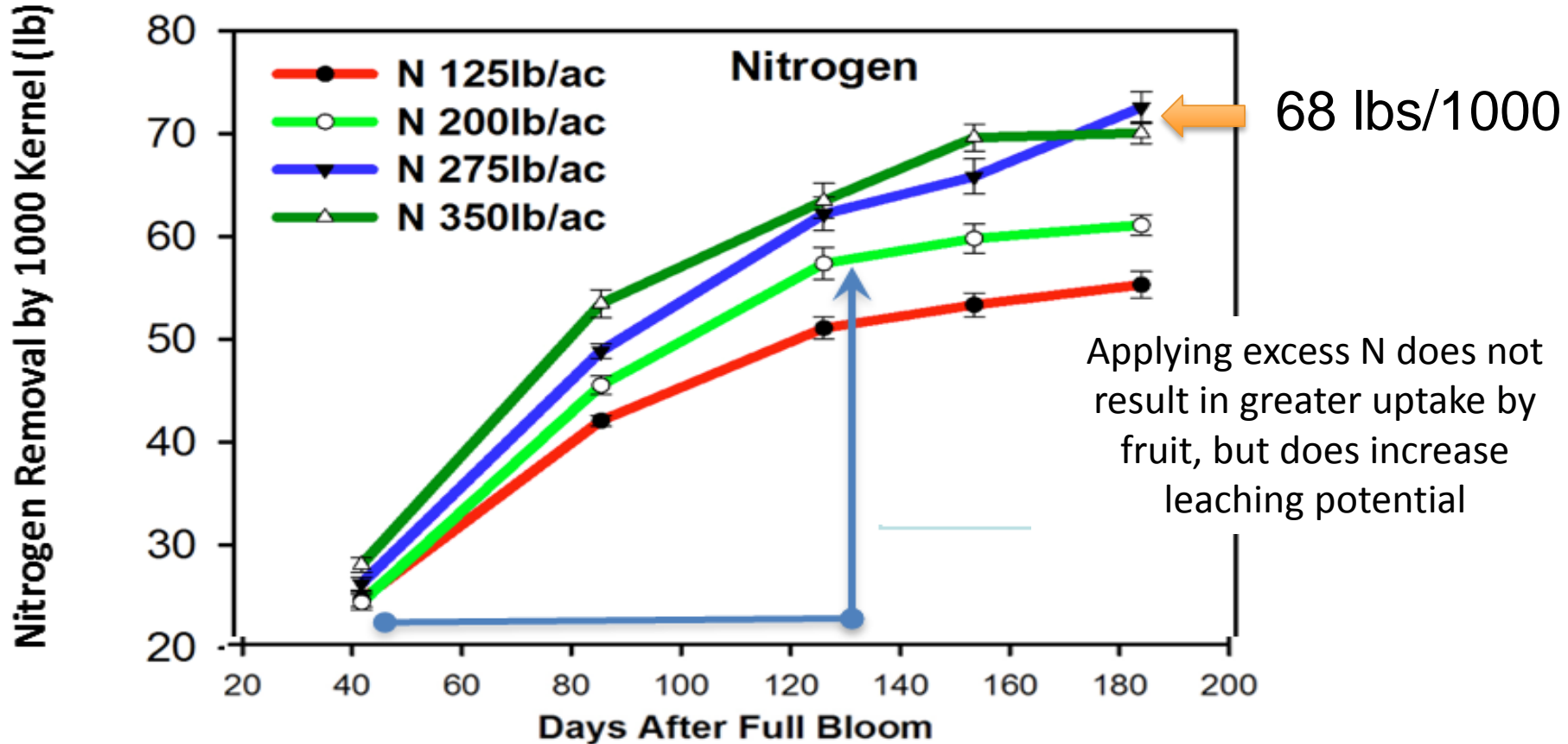
Nut yield is the primary N demand in Almond

Nitrogen Export in Almond Fruit

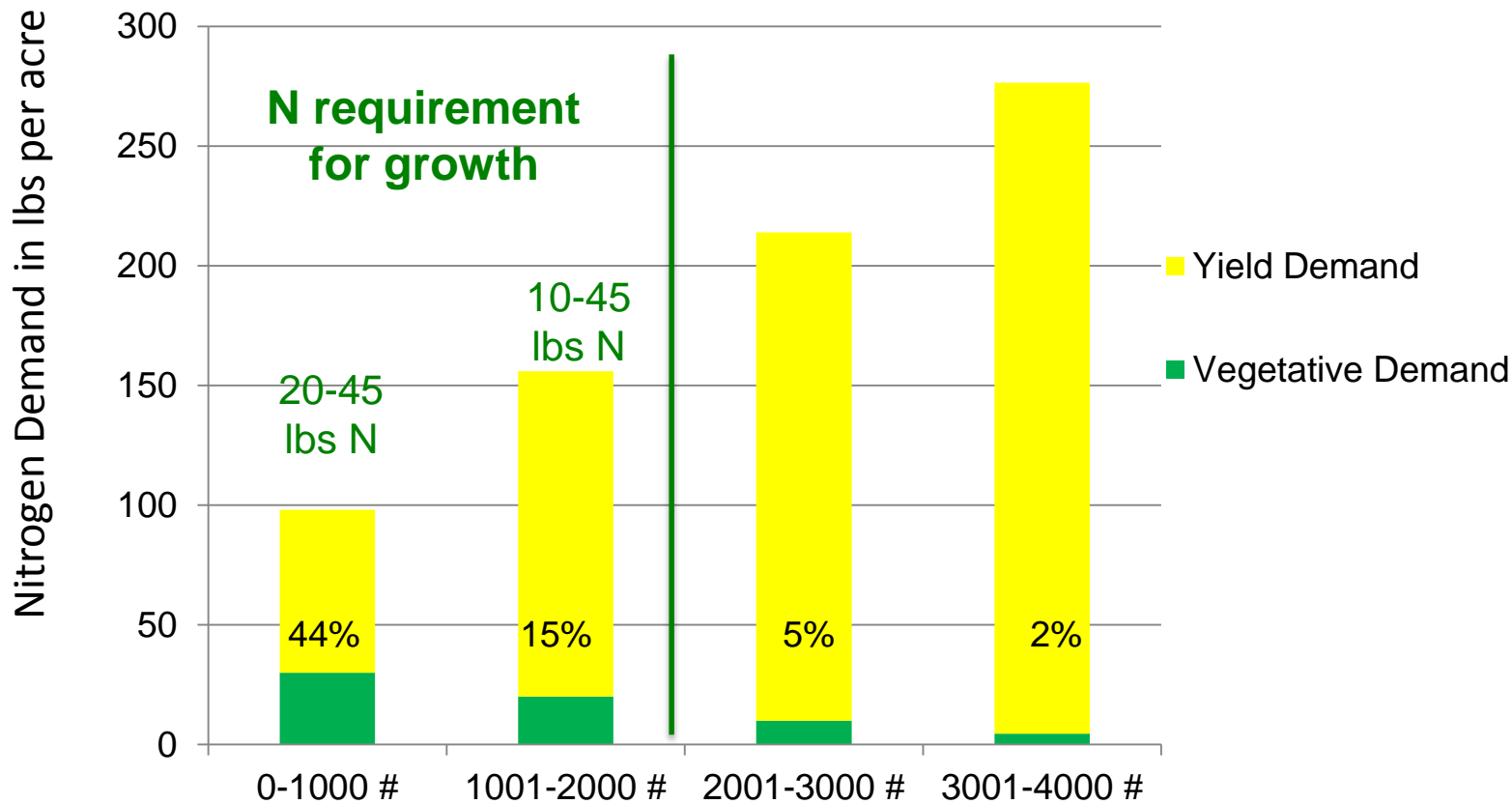
68 lbs per 1000 lb yield
(includes N in fruit and kernels and trash).



Right Rate and Timing: Almonds



If Yields are >2000 lbs then Nitrogen for Tree Growth is Included in the 68 per 1000 Allocation.

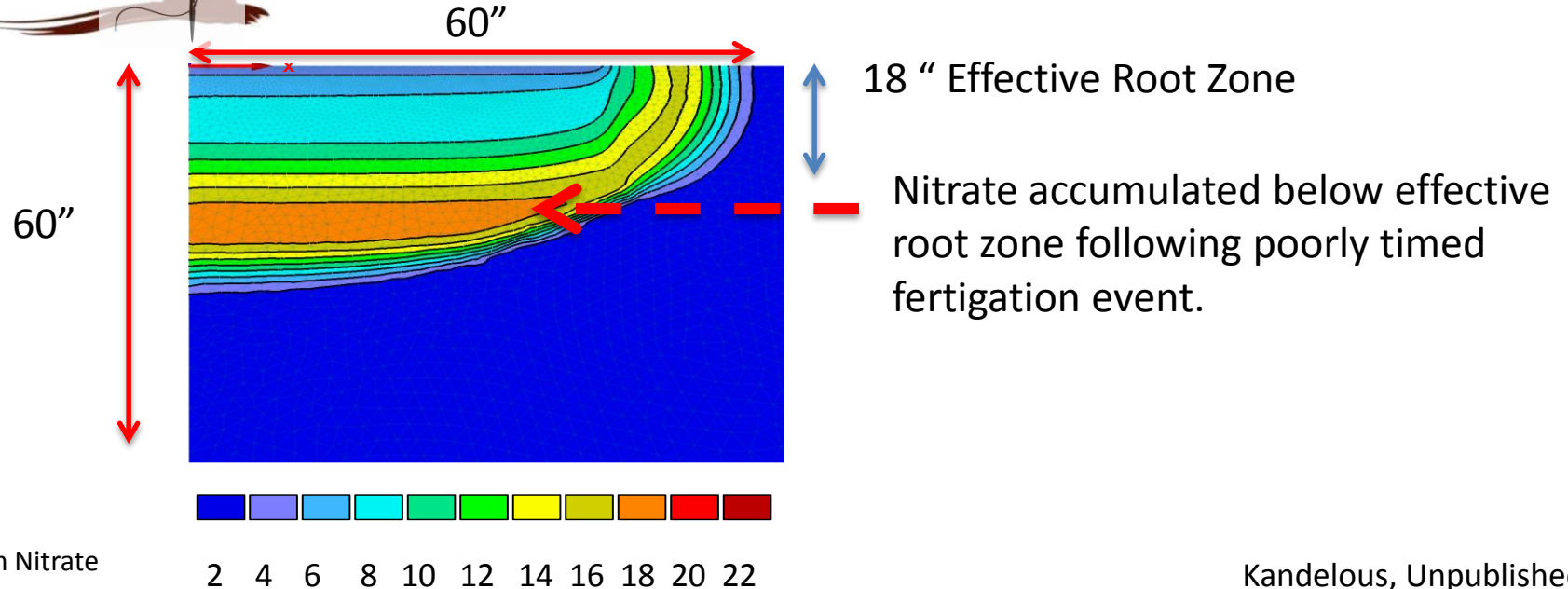


Right Place: Impact of Fertigation Timing on Nitrate Uptake by the Tree

Bad Example: N injected in first 3 hours of 12 hour irrigation.



How you irrigate and fertigate determines where in the root zone N is deposited.



An aerial photograph of an almond orchard. The orchard is divided into long, straight rows of trees. Several irrigation canals, some blue and some grey, run through the orchard, providing water to the trees. The background shows more of the orchard and some green fields.

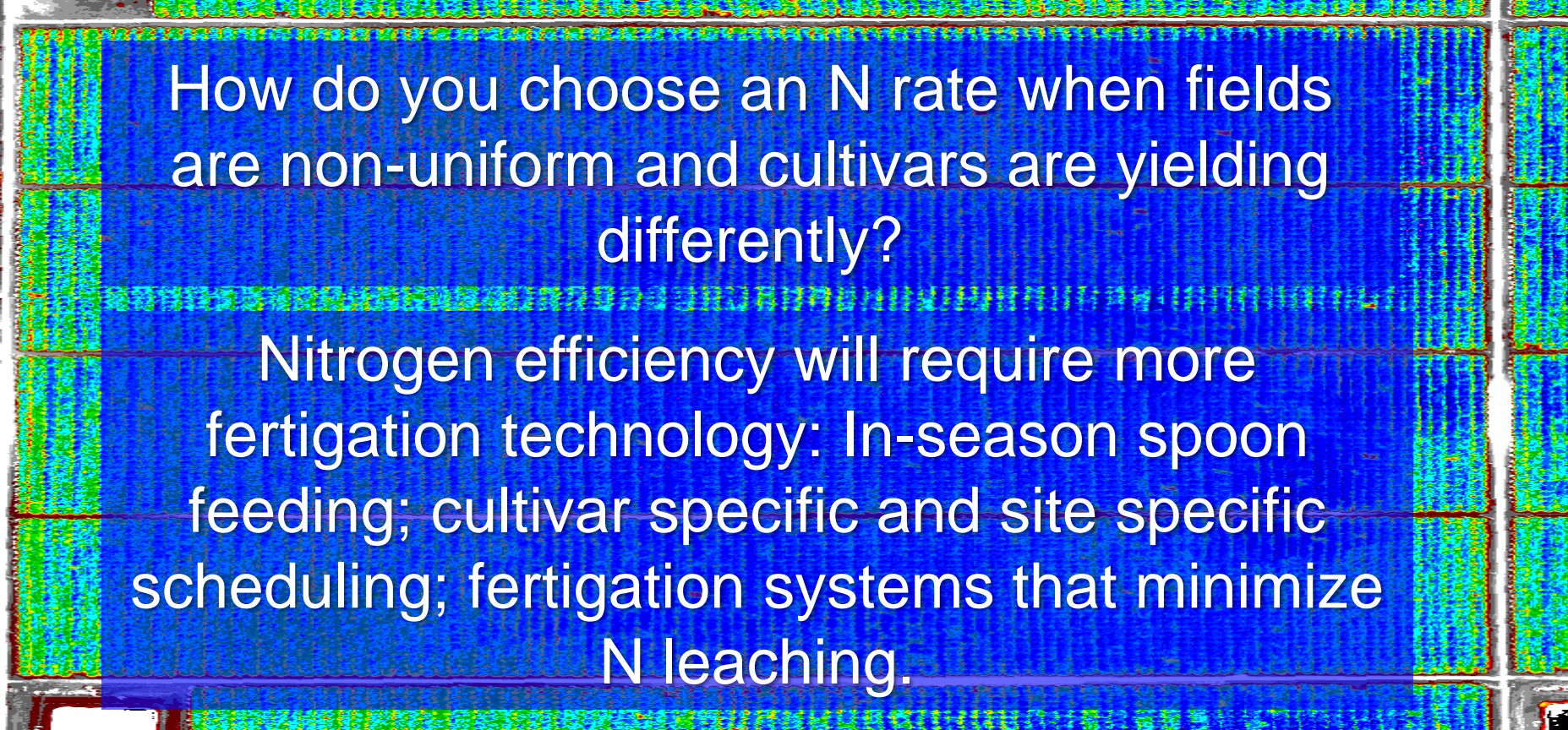
Irrigation Uniformity =
Nitrogen Uniformity...

And has a big impact on water
use, nitrogen efficiency, and yield.

Measure your distribution
uniformity and improve it!

For more information visit:
<http://www.almonds.com/irrigation>

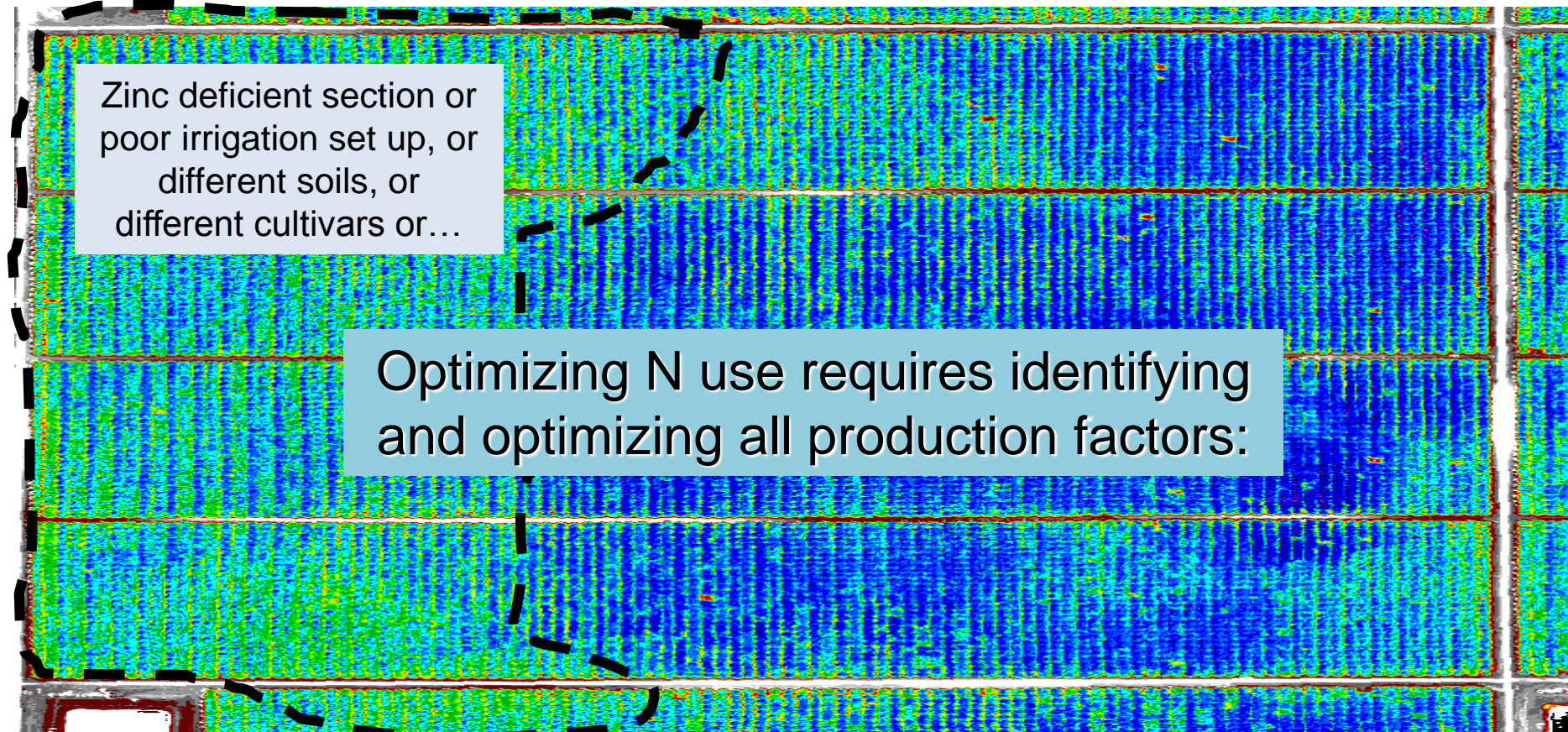
Right Place: Fields vary in their productivity due to soils, poor irrigation design, other deficiencies or other production constraints.



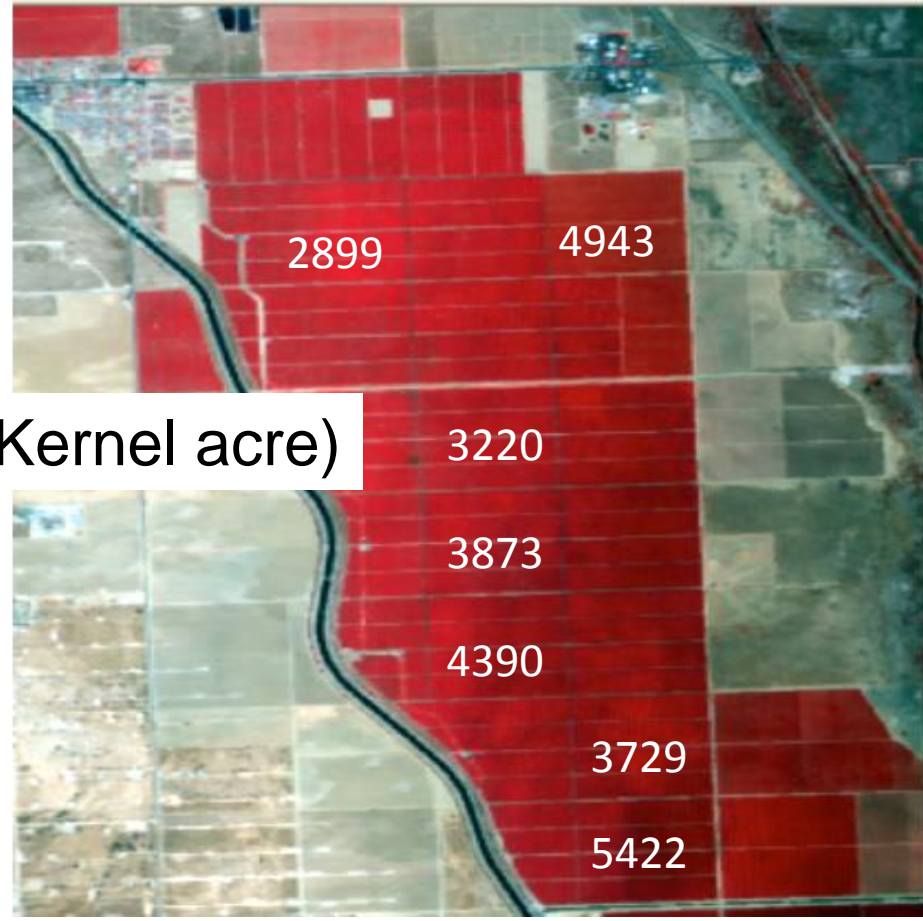
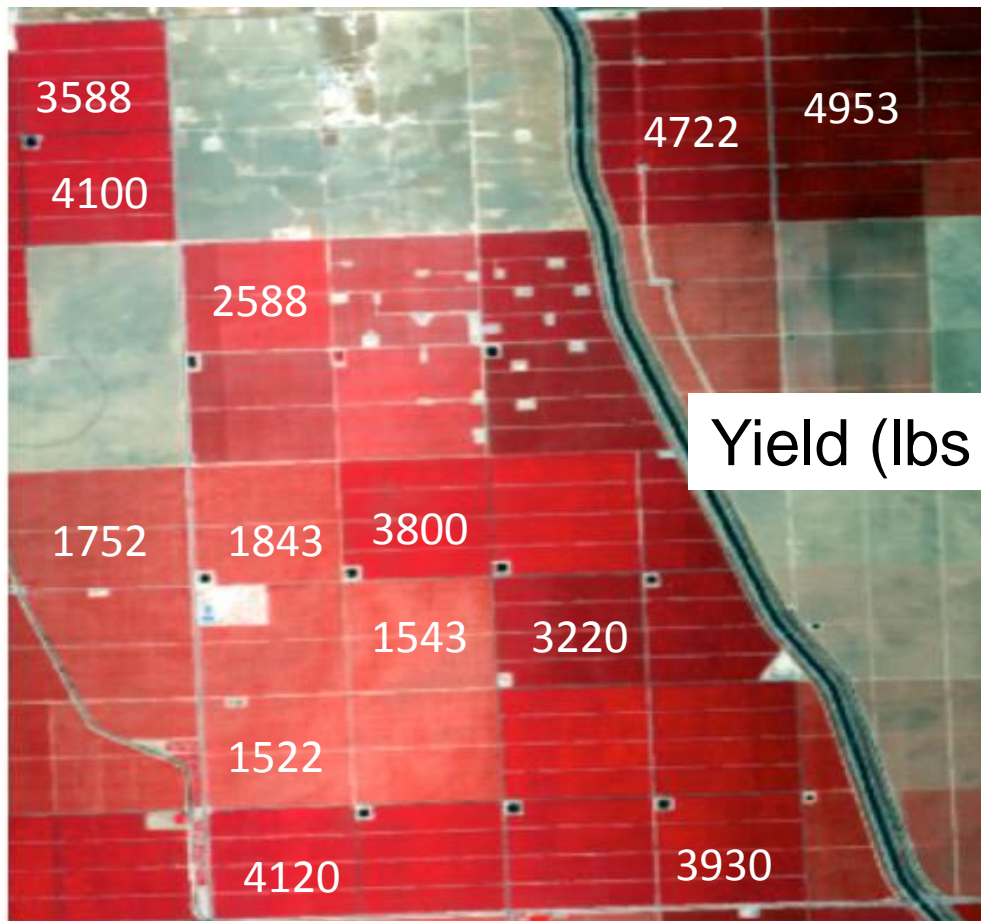
How do you choose an N rate when fields are non-uniform and cultivars are yielding differently?

Nitrogen efficiency will require more fertigation technology: In-season spoon feeding; cultivar specific and site specific scheduling; fertigation systems that minimize N leaching.

Optimizing N use efficiency requires Optimal Management of all Inputs: e.g. Zinc deficiency can limit crop response to N

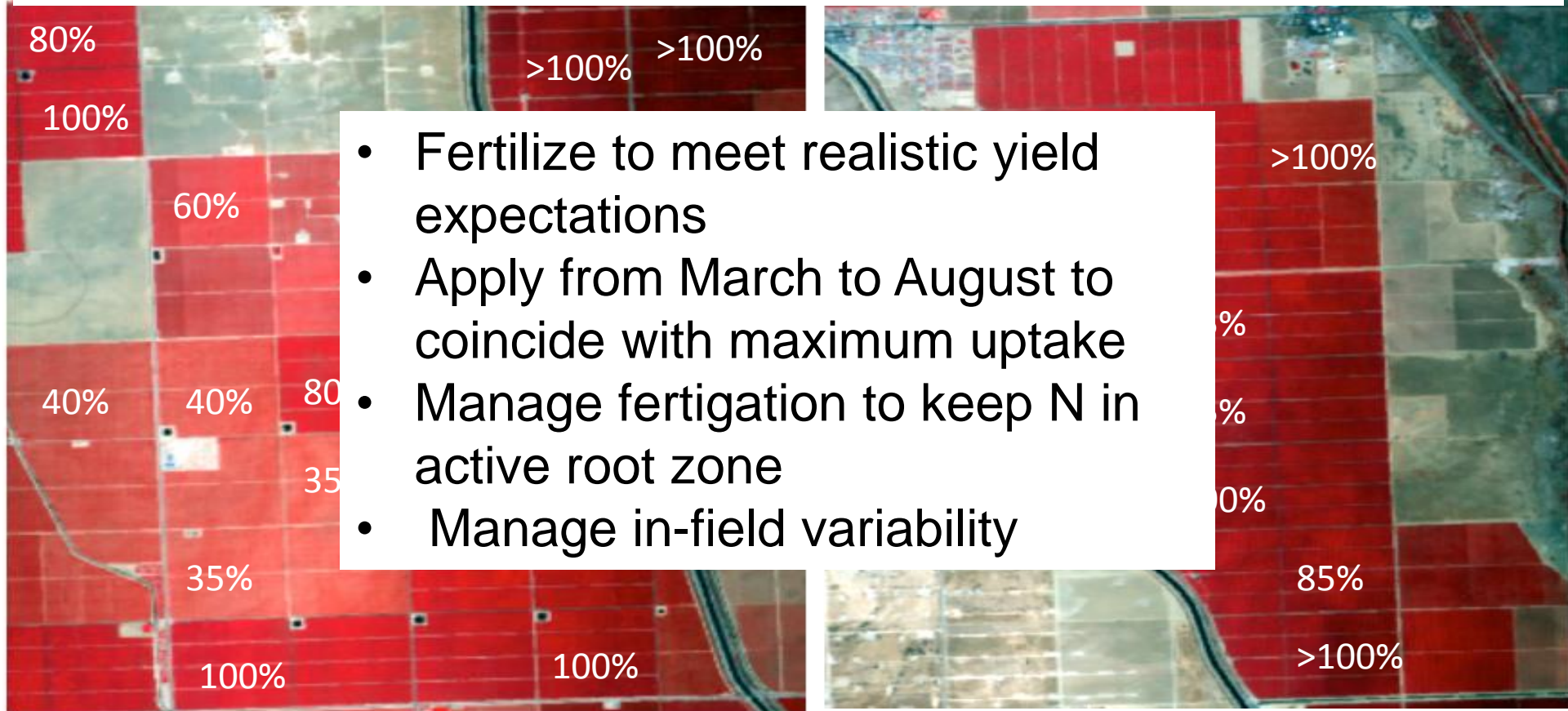


Right Place: Different Fields have Different Demands



Yield (lbs Kernel acre)

If all Fields Receive Same Fertilization: Nitrogen Use Efficiency will Differ Dramatically



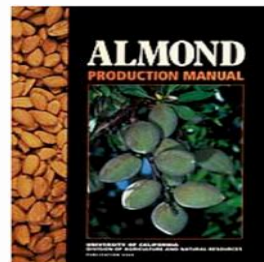
Plant Tissue Testing:

A useful tool but NO LONGER your main tool.



Table 26.2 Critical nutrient levels (dry-weight basis) in almond leaves sampled in July.

| | | |
|-----------------|--|-----------|
| Nitrogen (N) | | 2.0% |
| Deficient below | | 2.2–2.5% |
| Adequate | | |
| Phosphorus (P) | | 0.1–0.3% |
| Adequate | | |
| Potassium (K) | | 1.0% |
| Deficient below | | 1.4% |
| Adequate over | | |
| Calcium (Ca) | | 2.0% |
| Adequate over | | |
| Magnesium (Mg) | | 0.25% |
| Adequate over | | |
| Sodium (Na) | | 0.25% |
| Excessive over | | |
| Chlorine (Cl) | | 0.3% |
| Excessive over | | |
| Boron (B)* | | 30 ppm |
| Deficient below | | 30–65 ppm |
| Adequate | | 300 ppm |
| Excessive over | | |
| Copper (Cu) | | 4 ppm |
| Adequate over | | |
| Manganese (Mn) | | 20 ppm |
| Adequate over | | |
| Zinc (Zn) | | 15 ppm |
| Deficient below | | |



*Critical values for boron deficiency and toxicity are currently being revised. Hull boron >300 ppm is excessive. Leaf sampling is not effective to determine excess boron.

Sampling Criteria: Almond

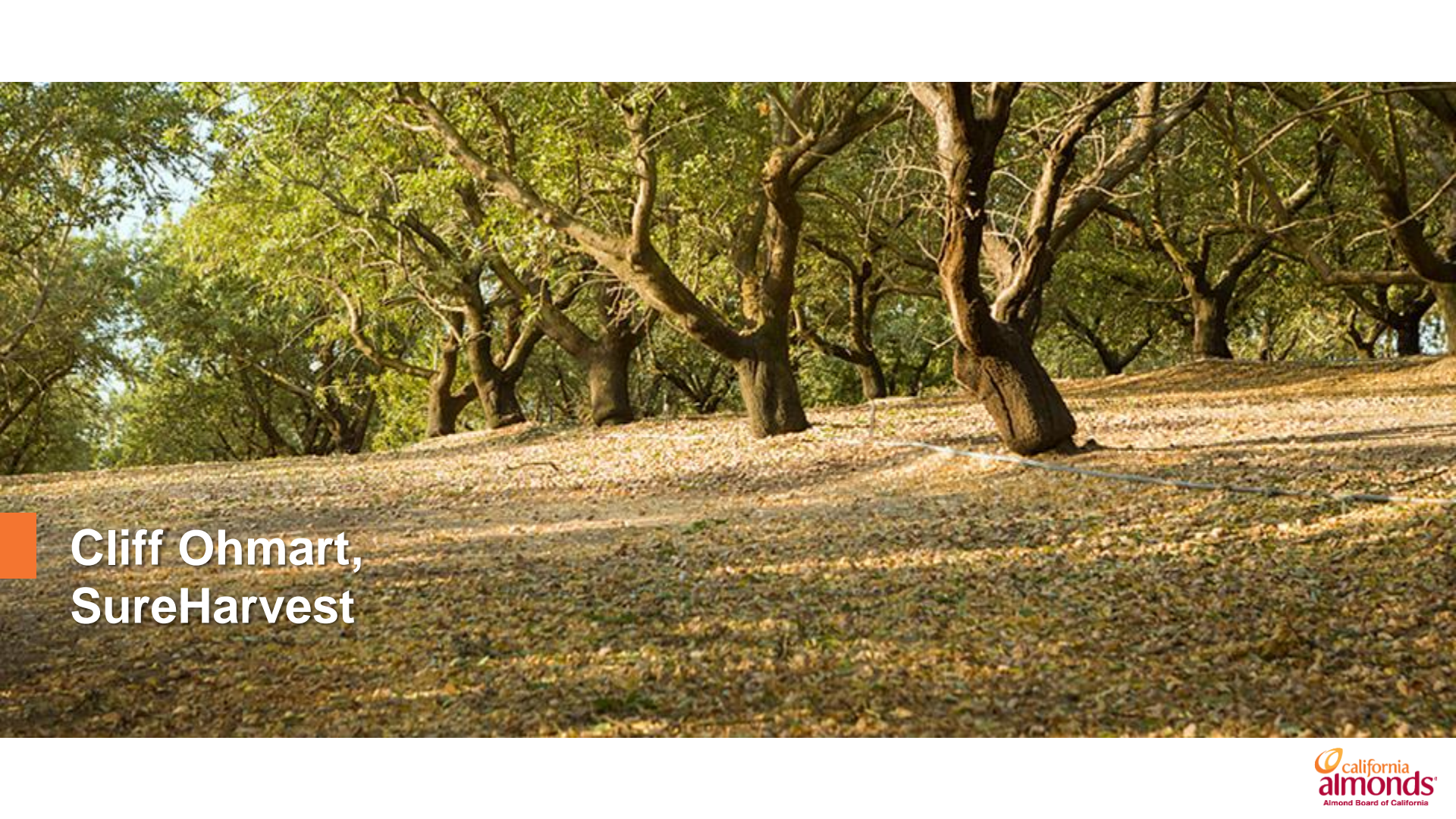
(repeated in every orchard or orchard zone that you wish to manage)

- Collect leaves/leaflets from non-fruiting shoots from 18 to 28 trees in one bag per management zone.
- Each tree sampled at least 30 yards apart.
- In each tree collect leaves around the canopy from at least 20 well exposed leaves/leaflets located between 5-7 feet from the ground.
- In April/May, collect samples at 35-45 days after full bloom.
 - Submit to a lab that uses UCD-ESP/ Almond board CASP program
- In July, collect samples using same method as April
 - Use crop production manuals to interpret July samples.

Managing N in Almond, Pistachio, and Walnut:

- Develop pre-season N fertilizer plan on expected yield LESS N in irrigation, soil residual N, and other inputs.
 - 1000 lbs almond kernel removes 68lb N
 - Add 15-40 lbs. N for developing orchards or vigorous trees with current season yield <2000 kernel lb.
- Conduct a leaf analysis following full leaf out.
- In April-May, review leaf analysis results and updated yield estimate, then adjust fertilization for remainder of season.
- Fertilize between March and Hull-Split in as many split applications as possible
- Manage fertigation to keep N in root zone – Manage variability.
- Take leaf sample in July, reassess yield, adjust final fertilization.

Every field, every year, is a unique decision

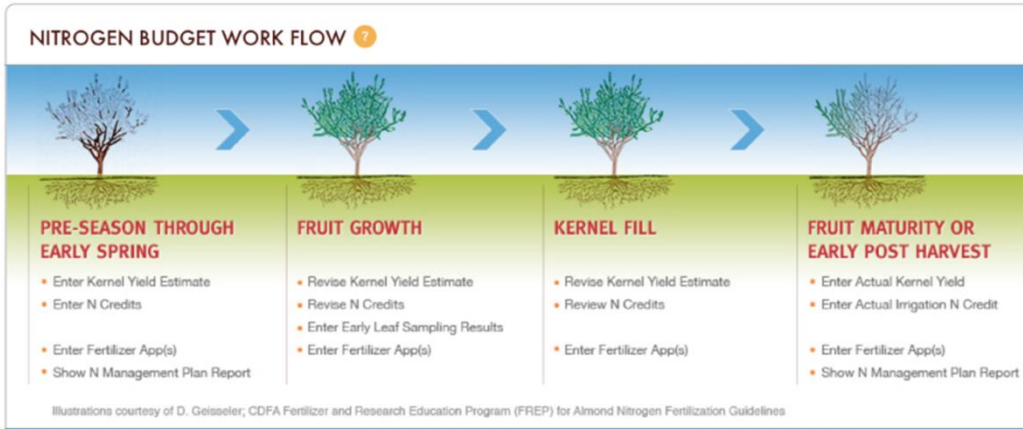


**Cliff Ohmart,
SureHarvest**

California Almond Sustainability Program – Nitrogen Management Calculator

Cliff Ohmart – SureHarvest

<http://www.sustainablealmondgrowing.org>

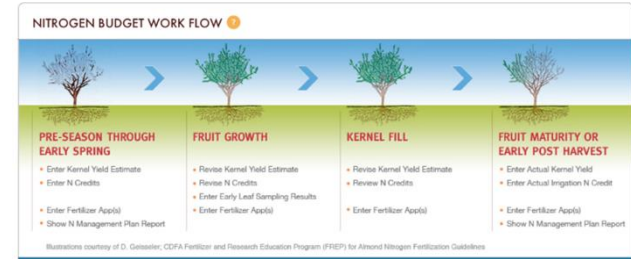


Advantages for Using CASP Nitrogen Management Calculator

- Calculate fertilization rates based on UC nitrogen management research
 - 4 Rs of nutrient management (Right source, rate, timing & location)
 - Based on crop demand
 - Results in efficient fertilizer use
- Library of fertilizers in pull down menus for easy rate calculations
- Calculates nitrogen contributions from non-fertilizer sources
- Recalculates fertilizer rates as applications made during the season
- Can clone N budget from one orchard to another within and between years
- Generates ILRP nitrogen management report for your files at beginning and then end of season
- If user has account, data can be saved for calculations throughout the season and available for review in the future

Data Required for Nitrogen Management Calculator

- Beginning of season:
- Crop year
- Orchard name
- Previous yield (last year, 2 years ago, 3 years ago – if possible)
- Post bloom estimated kernel yield/acre
- Estimated irrigation from ground water applied/acre
- Lab results for nitrate concentration in ground water
- If manure applied post harvest – type & tons/acre (same from 2 years ago if possible)
- If compost applied – type, tons/acre & %N content
- If legume cover crop – quality & method of incorporation
- N carry over – Lbs of N per acre available from soil test



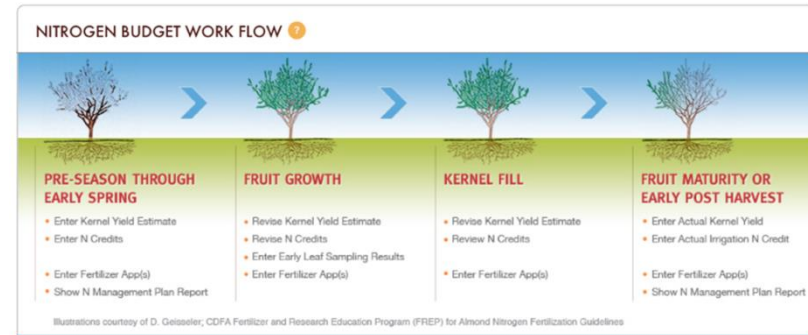
Data Required for Nitrogen Management Calculator – Fertilizer

Beginning of season:

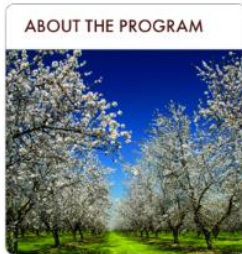
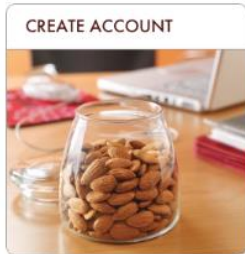
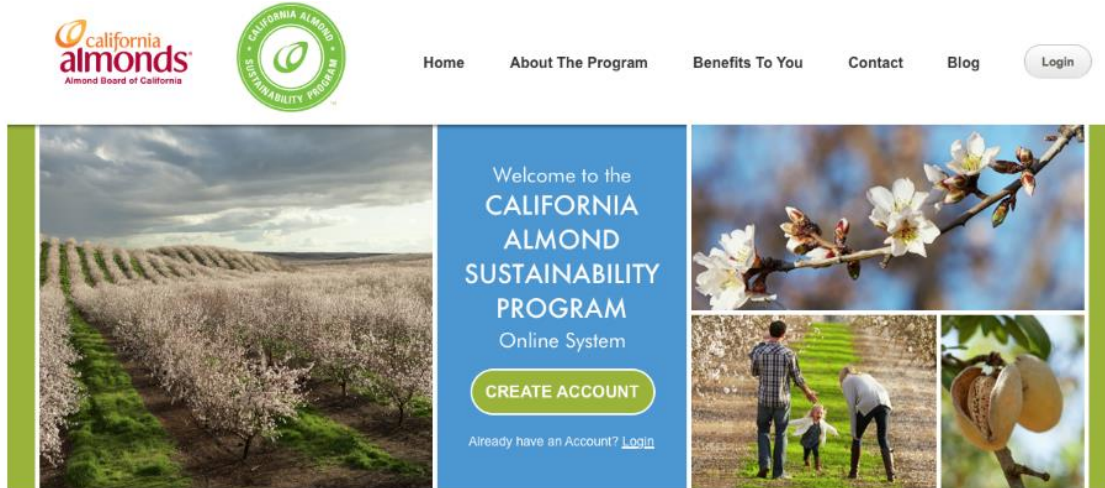
- Timing of application (4 seasonal stages of growth from UC model)
- Name of product (from pull down list)
- Rate per acre
- Application method

End of season:

- Actual kernel yield/acre
- Actual ground water irrigation applied per acre



Accessing N Management Calculator via CASP Home Page



A "USER LOGIN" form with the following fields and options:

- Username: I forgot
- Password: I forgot
- Remember Login
- Login button

Log In

Opens to User Homepage with Important Links

Nitrogen Management
Calculator Links

The screenshot shows the user homepage for the California Almonds Almond Board of California. The navigation bar includes 'Home', 'Assessments', 'Tools', 'Reports', 'Events', and 'Help'. A green box highlights the 'Tools' dropdown menu, which contains 'N Calculator' and 'Irrigation Calculator'. A green arrow points from this menu to the 'Tools' section in the 'QUICK LINKS' widget. Another green arrow points from the 'Tools' section to the 'N Calculator' and 'Irrigation Calculator' links. The 'QUICK LINKS' widget also includes sections for 'Assessments', 'Reports', 'Events', and 'Help'. The 'NEWS' section features a 'NEW Irrigation Calculator' article with a table of data and a 'Nitrogen Budgeting and ILRP' article with a map and a table. A video player for 'Nitrogen Budgeting | California Almonds' is located at the bottom of the page.

HOME

Tools Reports

N Calculator
Irrigation Calculator

Take A Tour

QUICK LINKS

Assessments
[Go to Assessments](#)
[Clone Assessments](#)

Tools
[N Calculator](#)
[Irrigation Calculator](#)

Events
Help

Reports
[Action Plan Notes](#)
[Assessment Answers](#)
[Assessment Comparison](#)
[ILRP Compliance Map](#)
[Nitrogen Management Plan](#)
[Post Month Continuing Education](#)
[Certificate of Comp](#)

UPCOMING EVENTS

[Lorem ipsum dolor sit amet, consectetur adipiscing elit](#)
Friday, November 18, 2016

[Aliquam ut nunc lobortis](#)
Saturday, November 19, 2016

[Curabitur consectetur velit et dui sagittis semper](#)
Saturday, November 19, 2016

[View All Upcoming Events](#)

NEWS

NEW Irrigation Calculator
CASP Irrigation Calculator automates CIMIS data downloads to calculate weekly run times to meet Etc.

| Week | Run Hrs | Min E1 |
|-------|---------|--------|
| 11-27 | 70 | 21.7 |
| 12-04 | 80 | 21.7 |
| 12-11 | 80 | 21.7 |

Nitrogen Budgeting and ILRP
Create ILRP: Part D - Farm Map & ILRP; Nitrogen Management Plan

[My Macs help](#) [N Budget help](#)

Nitrogen Budgeting | California Almonds

Click on N Calculator Link to Start

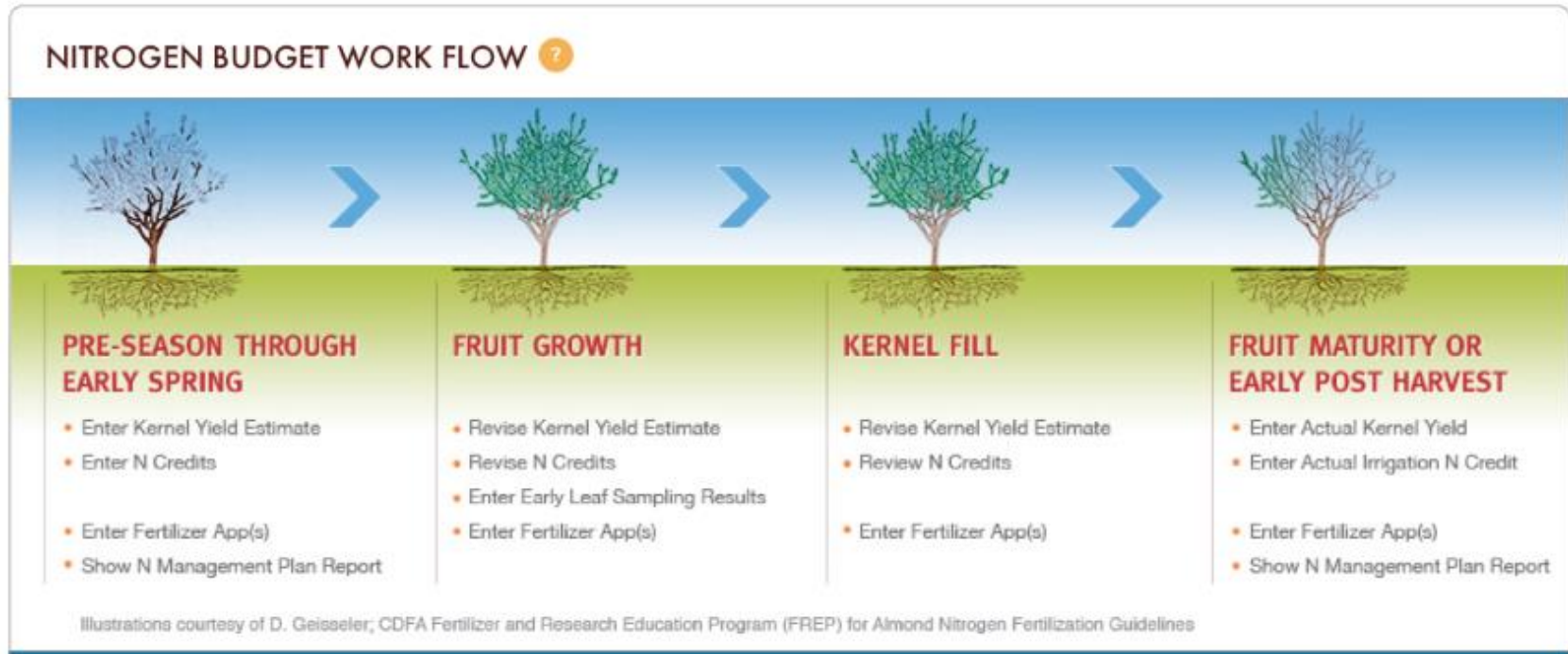
QUICK LINKS

| | |
|--|--|
| Assessments Go to Assessments Clone Assessments | Reports Action Plan Notes Assessment Answers Assessment Comparison ILRP Compliance Map Nitrogen Management Plan Pest Mgmt Continuing Education Certificate of Comp |
| Tools N Calculator Irrigation Calculator | |
| Events | |
| Help | |



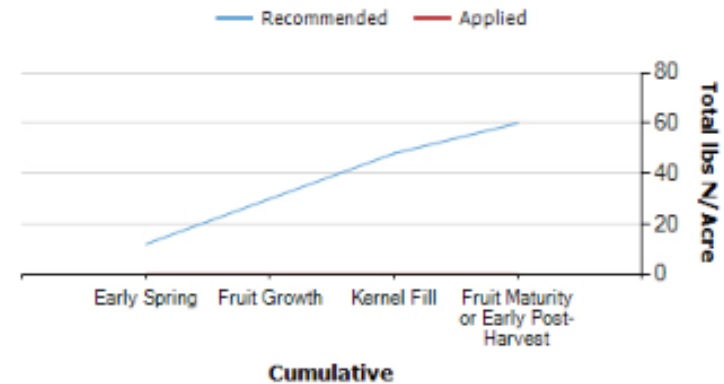
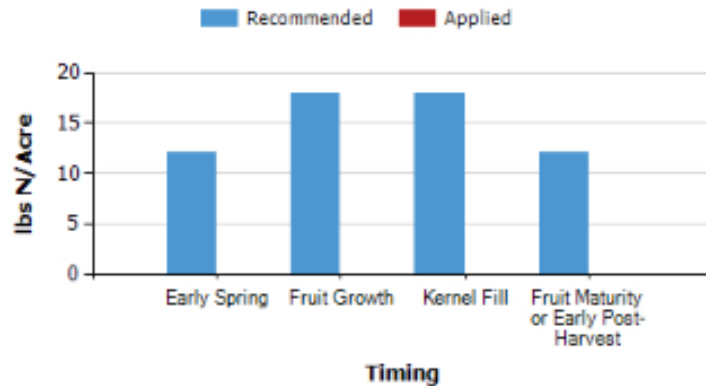
Model Based on UC Davis Research

- 4 growth stages when fertilizers are best applied



Fertilizer Recommended & Applied Tracked Graphically

Crop Year: 2015 Orchard: Block 1 Organization: AAATEST production Business: AAATEST production



Tabs for Working with Each Type of Nitrogen Source

KERNEL YIELD IRRIGATION N-CREDIT MANURE N-CREDIT COMPOST N-CREDIT COVER CROP N-CREDIT OTHER N-CREDITS FERTILIZER APPLICATION LEAF FACTOR WATER COALITION INFORMATION

Save Budget

Close Budget

Delete Budget

[NEXT TAB >](#)

REPORTS

Show PDF Summary

re-Application Predicted Kernel Yield ?

1st year's yield (this year's pre-application predicted yield):

years ago yield:

years ago yield:

fruit Growth or Kernel Fill Revised Estimate ?

use in Calculations

post bloom estimated yield:

post-Harvest Actual Kernel Yield ?

use in Calculations

this year's actual yield:

Tabs for Working with Each Type of Nitrogen Source

The image displays a web application interface for managing nitrogen sources. At the top, there is a horizontal row of tabs: **KERNEL YIELD**, **IRRIGATION N-CREDIT**, **MANURE N-CREDIT** (highlighted with a green box), **COMPOST N-CREDIT**, **COVER CROP N-CREDIT**, **OTHER N-CREDITS**, **FERTILIZER APPLICATION**, **LEAF FACTOR**, and **WATER COALITION INFORMATION**. Below the tabs are three buttons: **Save Budget** (green), **Close Budget** (grey), and **Delete Budget** (grey). A **NEXT TAB >** link is also present. A blue **REPORTS** section contains a **Show PDF Summary** button. A green arrow points from the **MANURE N-CREDIT** tab to a detailed view of this tab on the right. This detailed view includes a sub-header with **Kernel Yield**, **Irrigation N-Credit**, and **Manure N-Credit** (the latter is selected). Below the sub-header are three buttons: **< Previous Tab** (grey), **Save Budget** (orange), and **Close Budget** (grey). The main content area contains four input fields with dropdown menus and help icons: **Last year's post-harvest manure type:**, **Last year's post-harvest manure tons/acre:**, **Two years prior post-harvest manure type:**, and **Two years prior post-harvest manure tons/acre:**.

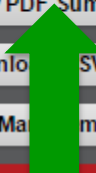
Nitrogen Management Calculator Reporting for ILRP

Reports

Show PDF Summary

Download CSV File

Show Nitrogen Management Plan Report



NITROGEN MANAGEMENT PLAN WORKSHEET

| | | | |
|---------------------------|----------------------|--------------------------|----------------|
| 1. Crop Year (Harvested): | 2014 | 4. APN(s) | 5. Field(s) ID |
| 2. Member ID #: | MEMB ID: ABC-123-def | 123-45-678 123-45-679 | Gratton Ranch |
| 3. Name: | Jessie A Moreno | | |

| CROP NITROGEN MANAGEMENT PLANNING | | N APPLICATIONS/CREDITS | 15. Recommended / Planned N | 16. Actual N |
|-----------------------------------|-----------------|---|-----------------------------|--------------|
| 6. Crop | Almonds | 17. Nitrogen Fertilizers | | |
| 7. Production Unit | Pounds (kernel) | 18. Dry/Liquid (lbs/ac) | 290 | 233 |
| 8. Projected Yield (Units/Acre) | 3500 | 19. Foliar N (lbs/ac) | 0 | 64 |
| 9. N Recommended (lbs/ac) | 340 | 20. Organic Material N | | |
| 10. Acres | 24 | 21. Available N in Manure/Compost (lbs/ac estimate) | 20 | 20 |
| Post Production Actuals | | 22. Total N Applied (lbs per acre) | 310 | 317 |
| 11. Actual Yield (Units/Acre) | 3500 | 23. Nitrogen Credits (est) | | |
| 12. Total N Applied (lbs/ac) | 322 | 24. Available N carryover in soil (annualized lbs/acre) | 10 | 10 |
| 13. ** N Removed (lbs N/ac) | | 25. N in Irrigation water (annualized, lbs/ac) | 7 | 5 |
| 14. Notes: | | 26. Total N Credits (lbs per acre) | 17 | 15 |
| | | 27. Total N Applied & Available (lbs per acre) | 327 | 268 |
| PLAN CERTIFICATION | | | | |
| 28. CERTIFIED BY: | | 29. CERTIFICATION METHOD | | X |
| | | 30. Low Vulnerability Area, No Certification Needed | | |
| | | 31. Self-Certified, approved training program attended | | |
| DATE: | | 32. Self-Certified, UC or NRCS site recommendation | | |
| | | 33. Nitrogen Management Plan Specialist | | |

** Your Coalition will provide the method to be used to estimate N Removed.

Nitrogen Management Calculator Reporting: Details

| CROP NITROGEN MANAGEMENT PLANNING | |
|-----------------------------------|-----------------|
| 6. Crop | Almonds |
| 7. Production Unit | Pounds (kernel) |
| 8. Projected Yield (Units/Acre) | 2550 |
| 9. N Recommended (lbs/ac) | 248 |
| 10. Acres | 24 |
| Post Production Actuals | |
| 11. Actual Yield (Units/Acre) | |
| 12. Total N Applied (lbs/ac) | |
| 13. ** N Removed (lbs N/ac) | |
| 14. Notes: | |

| NITROGEN MANAGEMENT PLAN WORKSHEET | | | |
|--|--|---|----------------|
| 1. Crop Year (Harvested): | 2014 | 4. APN(s) | 5. Field(s) ID |
| 2. Member ID#: | | | Gratton Ranch |
| 3. Name: | | | |
| CROP NITROGEN MANAGEMENT PLANNING | | N APPLICATIONS/CREDITS | |
| 6. Crop | Almonds | 15. Recommended / Planned N | 16. Actual N |
| 7. Production Unit | Pounds (kernel) | 7. Nitrogen Fertilizers | |
| 8. Projected Yield (Units/Acre) | 2750 | 8. Dry/Liquid (lb/ac) | 240 118 |
| 9. N Recommended (lb/ac) | 268 | 9. Folar N (lb/ac) | 0 0 |
| 10. Acres | 24 | 8. Organic Material N | |
| Post Production Actuals | | 1. Available N in Manure/Compost (lb/ac estimate) | 0 0 |
| 1. Actual Yield (Units/Acre) | 2750 | 2. Total N Applied (lb per acre) | 240 118 |
| 2. Total N Applied (lb/ac) | 118 | 3. Nitrogen Credits (est) | |
| 3. ** N Removed (lb N/ac) | | 4. Available N carryover in soil (annualized lb/ac) | 7 7 |
| 4. Notes: | | 5. N in irrigation water (annualized, lb/ac) | 19 19 |
| | | 6. Total N Credits (lb per acre) | 26 7 |
| | | 7. Total N Applied & Available (lb per acre) | 268 125 |
| PLAN CERTIFICATION | | | |
| 28. CERTIFIED BY: | 29. CERTIFICATION METHOD | | X |
| | 30. Low Vulnerability Area, No Certification Needed | | |
| | 31. Self-Certified, approved training program attended | | |
| DATE: | 32. Self-Certified, UC or NRCS site recommendation | | |
| | 33. Nitrogen Management Plan Specialist | | |
| ** Your Coalition will provide the method to be used to estimate N Removed. | | | |
| Numbering in this Nitrogen Management Plan differs slightly from the template approved by the Central Valley Water Board 23 December 2014. | | | |
| 1 of 1 2/23/2015 4:23:00 PM Organization: ABC Orchards Enterprise; ABC Orchards | | | |

Nitrogen Management Calculator Reporting: More Details

| NITROGEN MANAGEMENT PLAN WORKSHEET | | | | |
|------------------------------------|-----------------|--|-----------------------------|--------------|
| 1. Crop Year (harvested): | 2014 | 4. APN(s) | 5. Field(s) ID | |
| 2. Member ID #: | | | Oriston Ranch | |
| 3. Name: | | | | |
| CROP NITROGEN MANAGEMENT PLANNING | | | | |
| CROP NITROGEN MANAGEMENT PLANNING | | N APPLICATIONS/CREDITS | 15. Recommended / Planned N | 16. Actual N |
| 6. Crop | Almonds | 7. Nitrogen Fertilizers | | |
| 7. Production Unit | Pounds (kernel) | 8. Dry/Liquid (lbs/ac) | 240 | 118 |
| 8. Projected Yield (Units/Acre) | 2750 | 9. Foliar N (lbs/ac) | 0 | 0 |
| 9. N Recommended (lbs/ac) | 268 | 10. Organic Material N | | |
| 10. Acres | 24 | 1. Available N in Manure/Compost (lbs/ac estimate) | 0 | 0 |
| Post Production Actuals | | 2. Total N Applied (lbs per acre) | 240 | 118 |
| 11. Actual Yield (Units/Acre) | 2750 | 3. Nitrogen Credits (est) | | |
| 12. Total N Applied (lbs/ac) | 118 | 4. Available N carryover in soil (annualized lbs/acre) | 7 | 7 |
| 13. ** N Removed (lbs N/ac) | | 5. N in Irrigation water (annualized, lbs/ac) | 19 | 19 |
| 14. Notes: | | 6. Total N Credits (lbs per acre) | 26 | 7 |
| | | 7. Total N Applied & Available (lbs per acre) | 268 | 125 |
| PLAN CERTIFICATION | | | | |
| 28. CERTIFIED BY: | | 29. CERTIFICATION METHOD | X | |
| | | 30. Low Vulnerability Area, No Certification Needed | | |
| | | 31. Self-Certified, approved training program attended | | |
| DATE: | | 32. Self-Certified, LIC or NRCS site recommendation | | |
| | | 33. Nitrogen Management Plan Specialist | | |

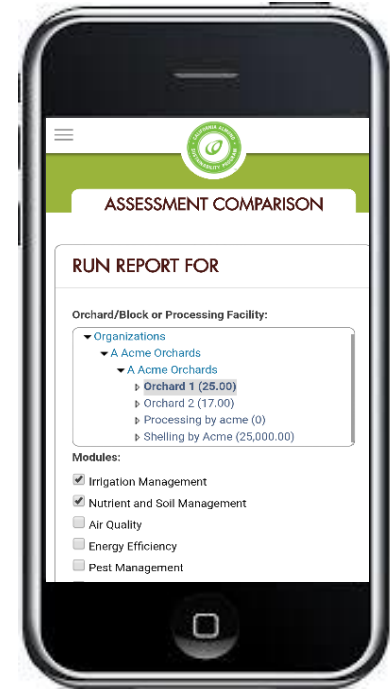
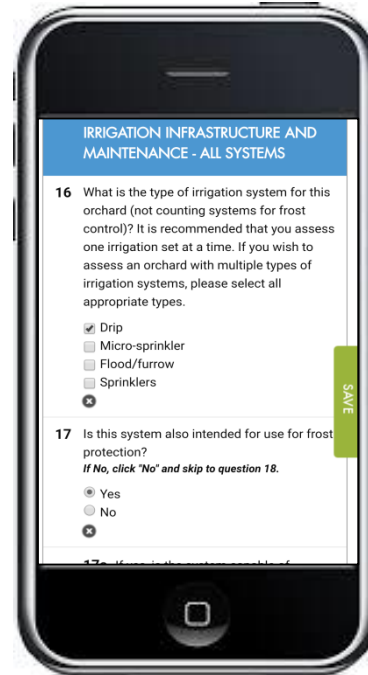
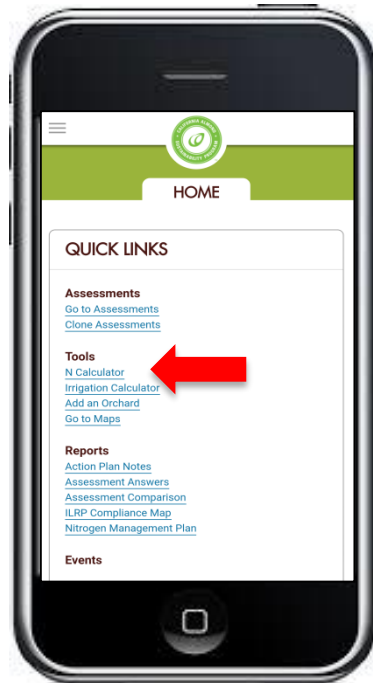
** Your Coalition will provide the method to be used to estimate N Removed.

Numbering in this Nitrogen Management Plan differs slightly from the template approved by the Central Valley Water Board 23 December 2014.
1 of 1 - 2/23/2015 4:23:00 PM - Organization: ABC Orchards - Enterprise: ABC Orchards

| N APPLICATIONS/CREDITS | 15. Recommended / Planned N | 16. Actual N |
|---|-----------------------------|--------------|
| 17. Nitrogen Fertilizers | | |
| 18. Dry/Liquid (lbs/ac) | 234 | |
| 19. Foliar N (lbs/ac) | 0 | |
| 20. Organic Material N | | |
| 21. Available N in Manure/Compost (lbs/ac estimate) | 0 | |
| 22. Total N Applied (lbs per acre) | 234 | |
| 23. Nitrogen Credits (est) | | |
| 24. Available N carryover in soil (annualized lbs/acre) | 10 | |
| 25. N in Irrigation water (annualized, lbs/ac) | 0 | |
| 26. Total N Credits (lbs per acre) | 10 | |
| 27. Total N Applied & Available (lbs per acre) | 244 | |

CASP is Accessible using Mobile Devices

Mobile login, navigation, assessment, reporting, and calculators



A close-up photograph of a glass jar filled with almonds. In the foreground, a small white dish contains a dollop of almond butter. The background is a warm, golden-yellow color.

Questions?