Fertilizer Research Education Program Initiatives

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California Department of Food & Agriculture

FREP Initiatives

1. **Technical Education & Outreach**
   - Nitrogen Management Training Program for CCAs
2. **Accessibility of Research**
   - Searchable Online FREP Research Database
   - Crop Fertilization Guidelines
3. **Focused Research**
   - Special RFP – "Pump and Fertilize"

Technical Education: *NMTP for CCAs*

Partnerships:

- California Department of Food and Agriculture
  - Fertilizer Research and Education Program
- UC Agriculture and Natural Resources
  - California Institute for Water Resources (Organizational Lead)
  - Water Quality, Quantity and Security Strategic Initiative (Programmatic Content)
  - Cooperative Extension Specialists and Advisors
  - Campus Faculty
- California Certified Crop Advisors
- California Association of Pest Control Advisors

N Management Training Program for CCAs

Purpose of the Nitrogen Management Training Program (NMTP):

- To enhance economic and environmental benefits through improved management of agricultural use of Nitrogen and irrigation water.

N Management Training Program for CCAs

Program:
http://ciwr.ucanr.edu/NitrogenManagement/

- **Regional Trainings**
  - 4 in Central Valley
  - 1 in Salinas Valley
- **2-Day Program**
  - Day 1: General Session
  - Day 2: Concurrent Sessions
    - Annual Crops
    - Permanent Crops

N Management Training Program for CCAs

Initial trainings:

Modesto – Stanislaus Ag Center, January 14-15, 2014

Woodland – Heidrick Ag Center, February 18-19, 2014

Fresno – Ramada University Hotel, February 25-26, 2014

Salinas – Salinas Elks Lodge, March 5-6, 2014

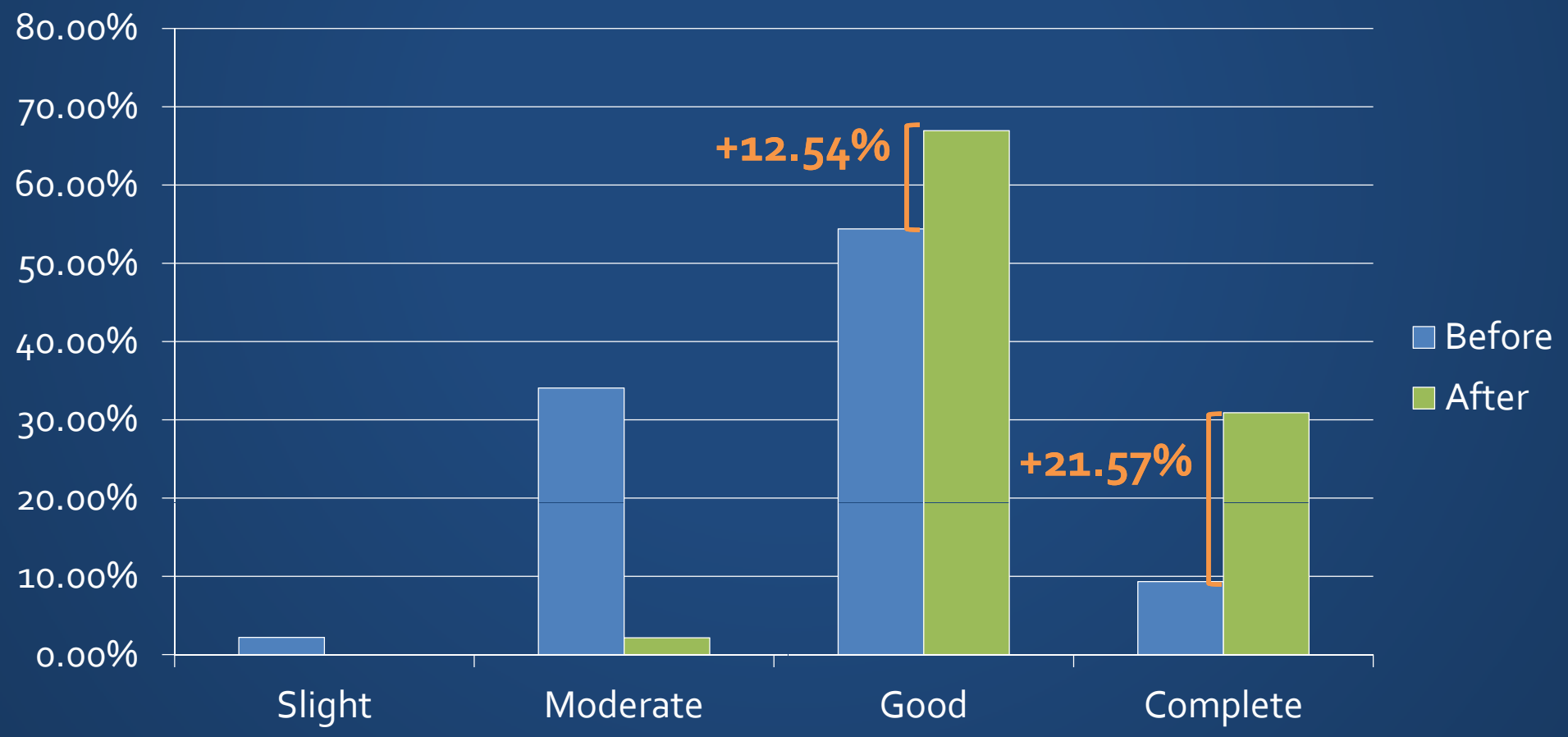
Tulare – Tulare Ag Center, March 11-12, 2014

N Management Training Program for CCAs

LOCATION	ATTENDANCE
Modesto	113
Woodland	89
Fresno	112
Salinas	104
Tulare	112
TOTAL	**530**

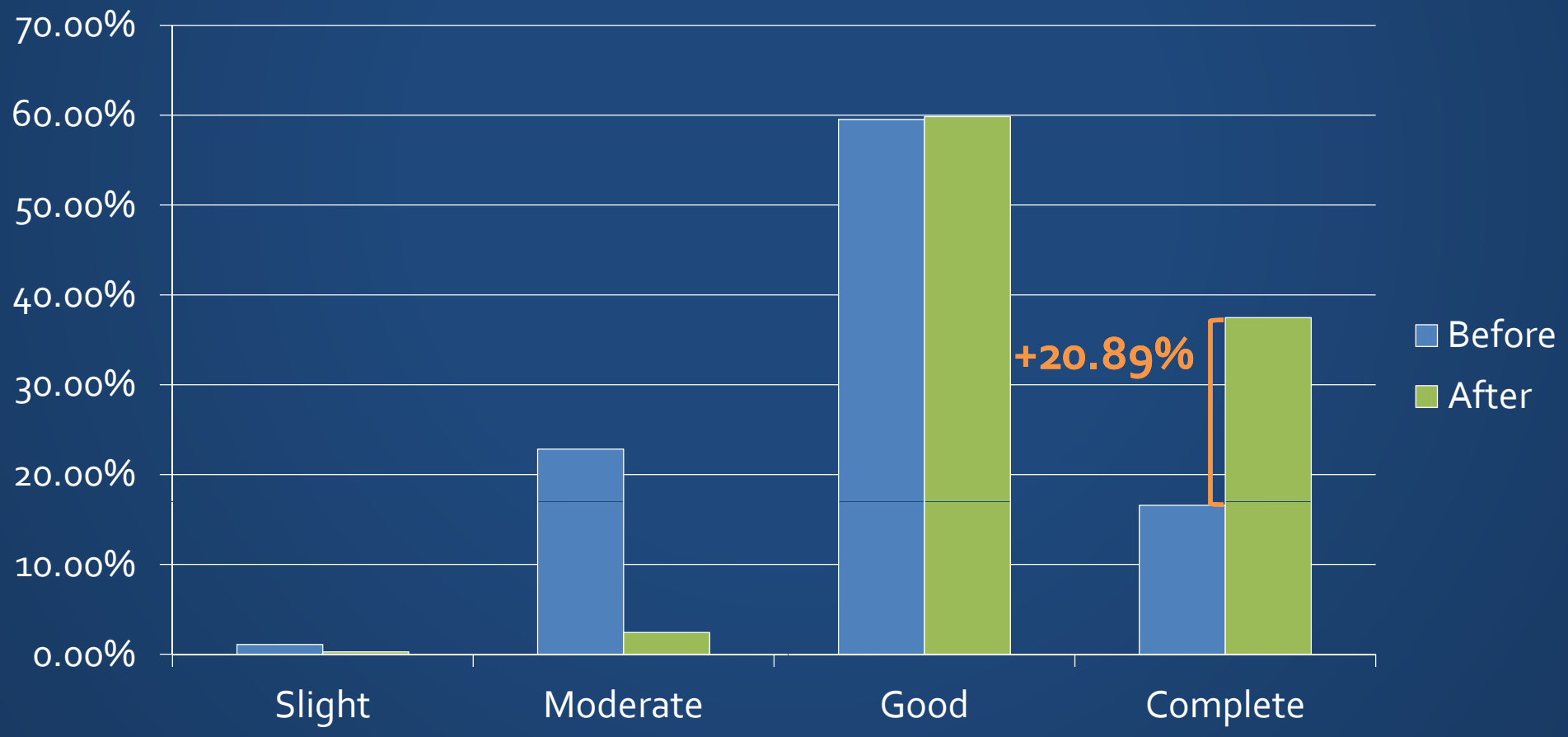
N Management Training Program for CCAs

My overall understanding of nitrogen management.



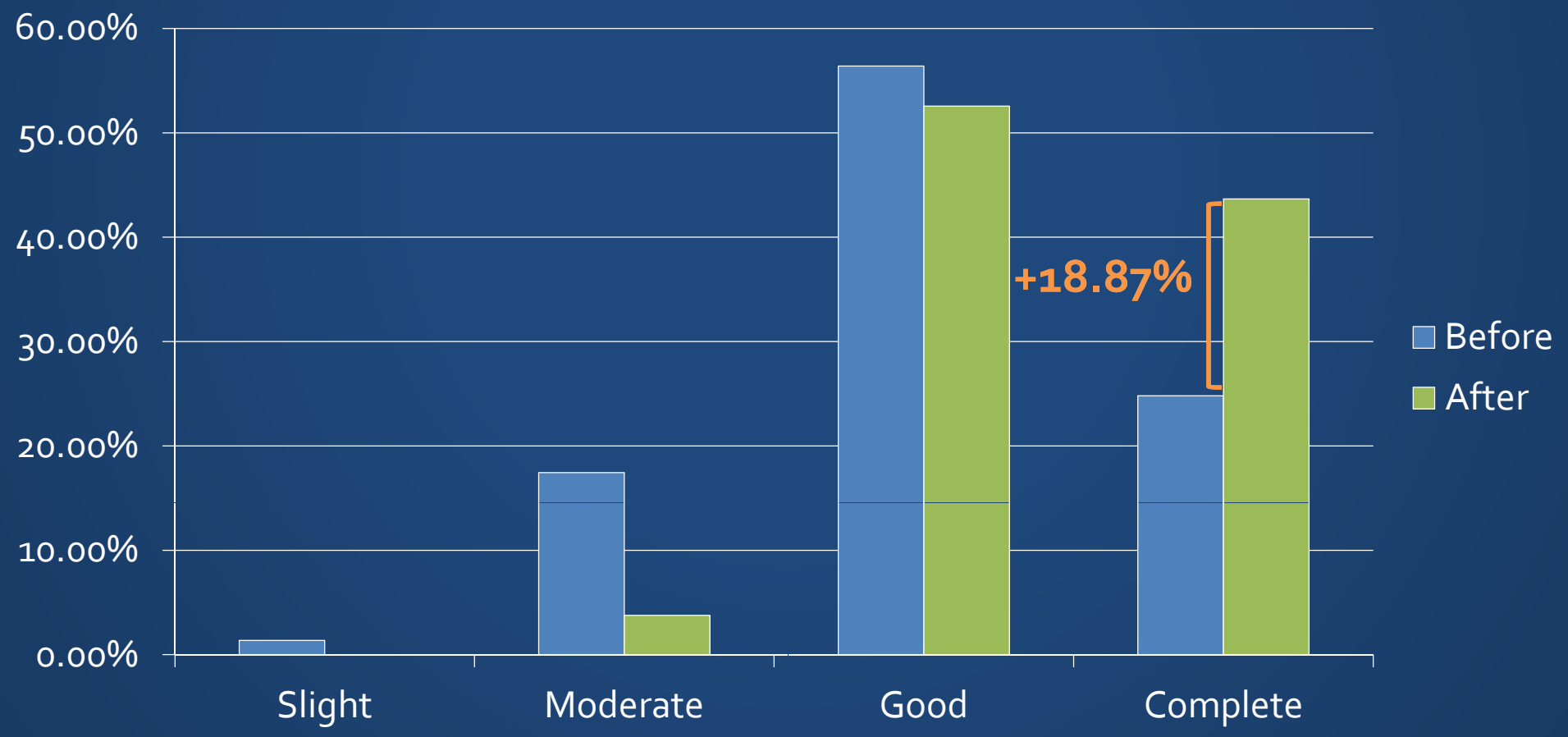
N Management Training Program for CCAs

My understanding of the nitrogen cycle in crop production.



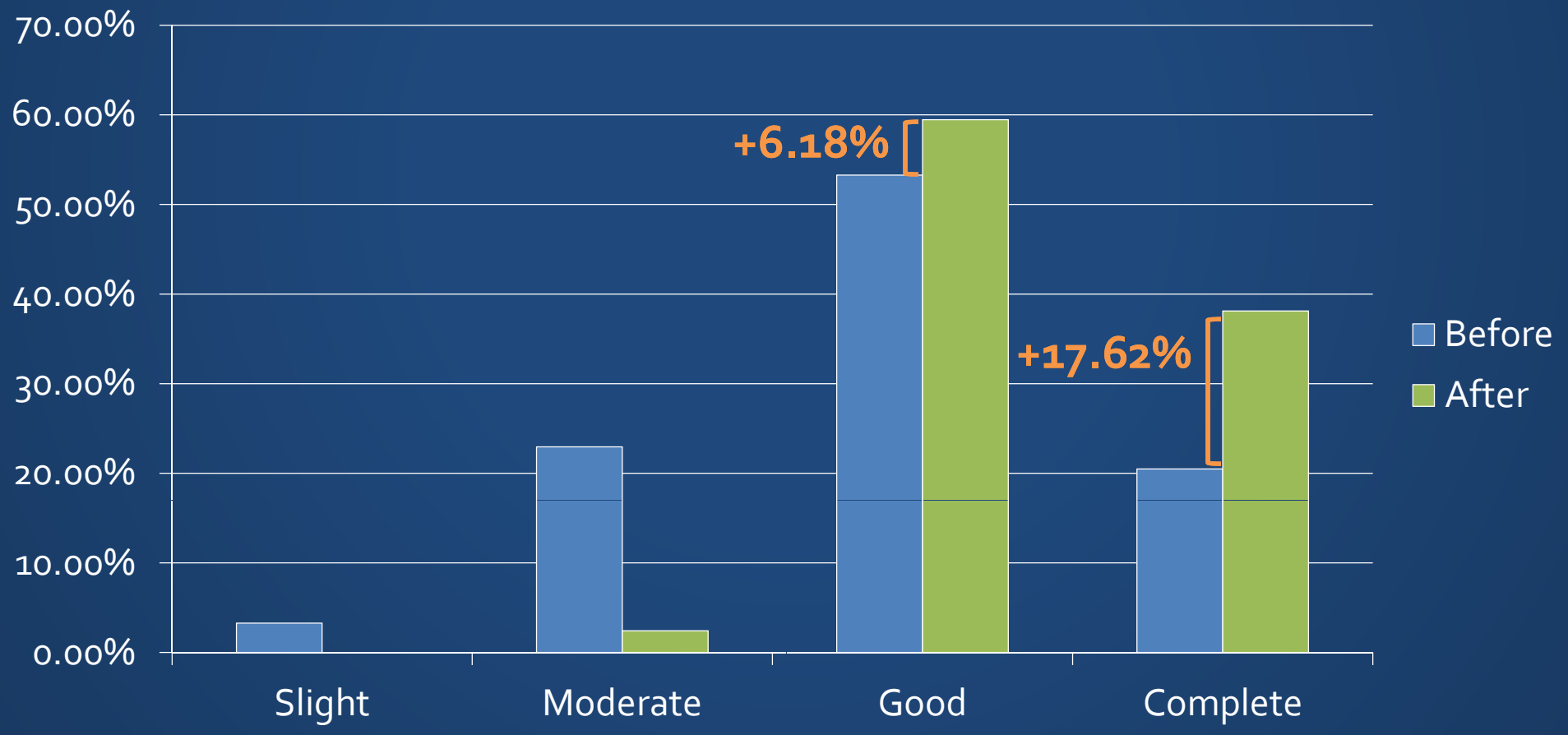
N Management Training Program for CCAs

My understanding of nitrogen sources in crop production.



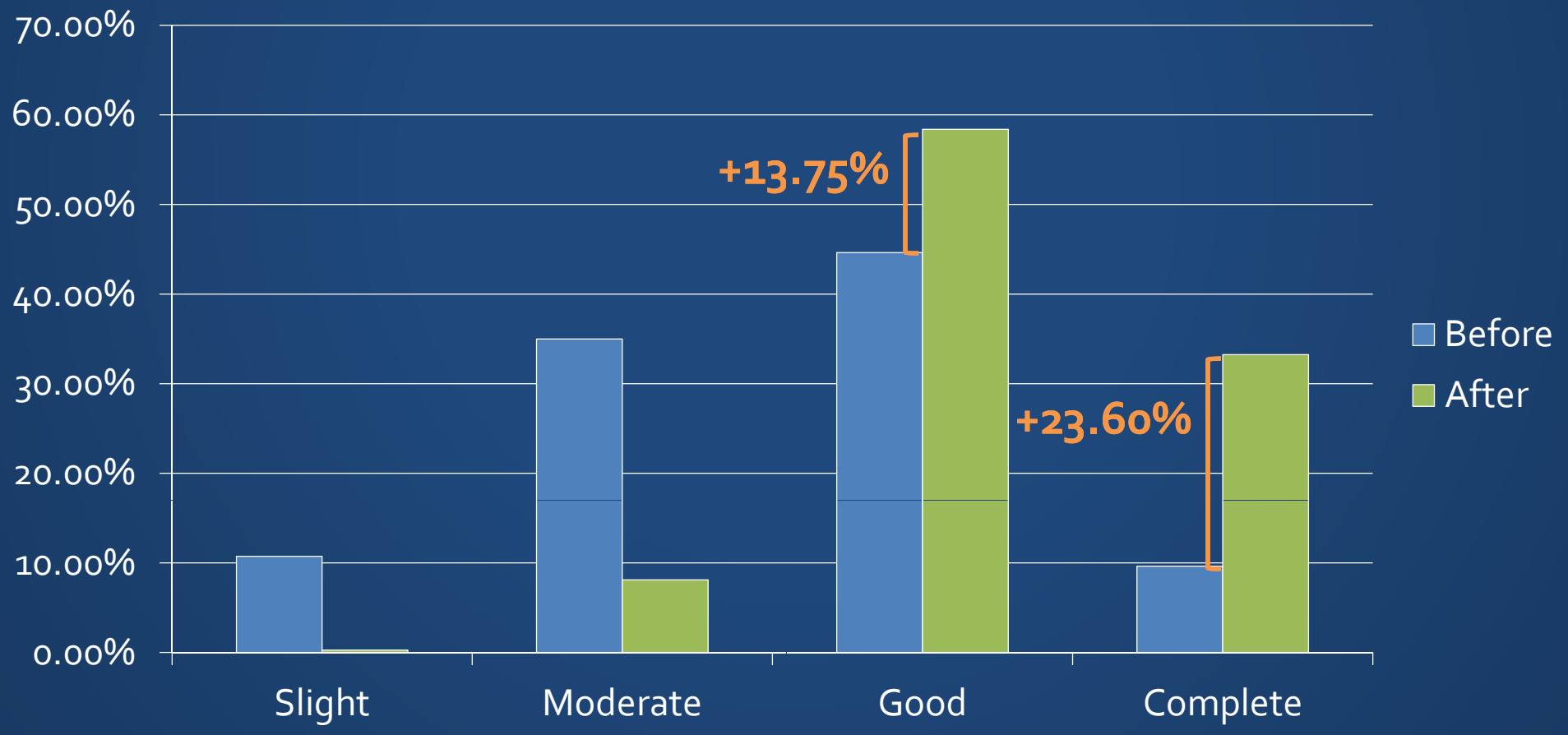
N Management Training Program for CCAs

My understanding of irrigation management and its relationship to nitrogen fertilization.



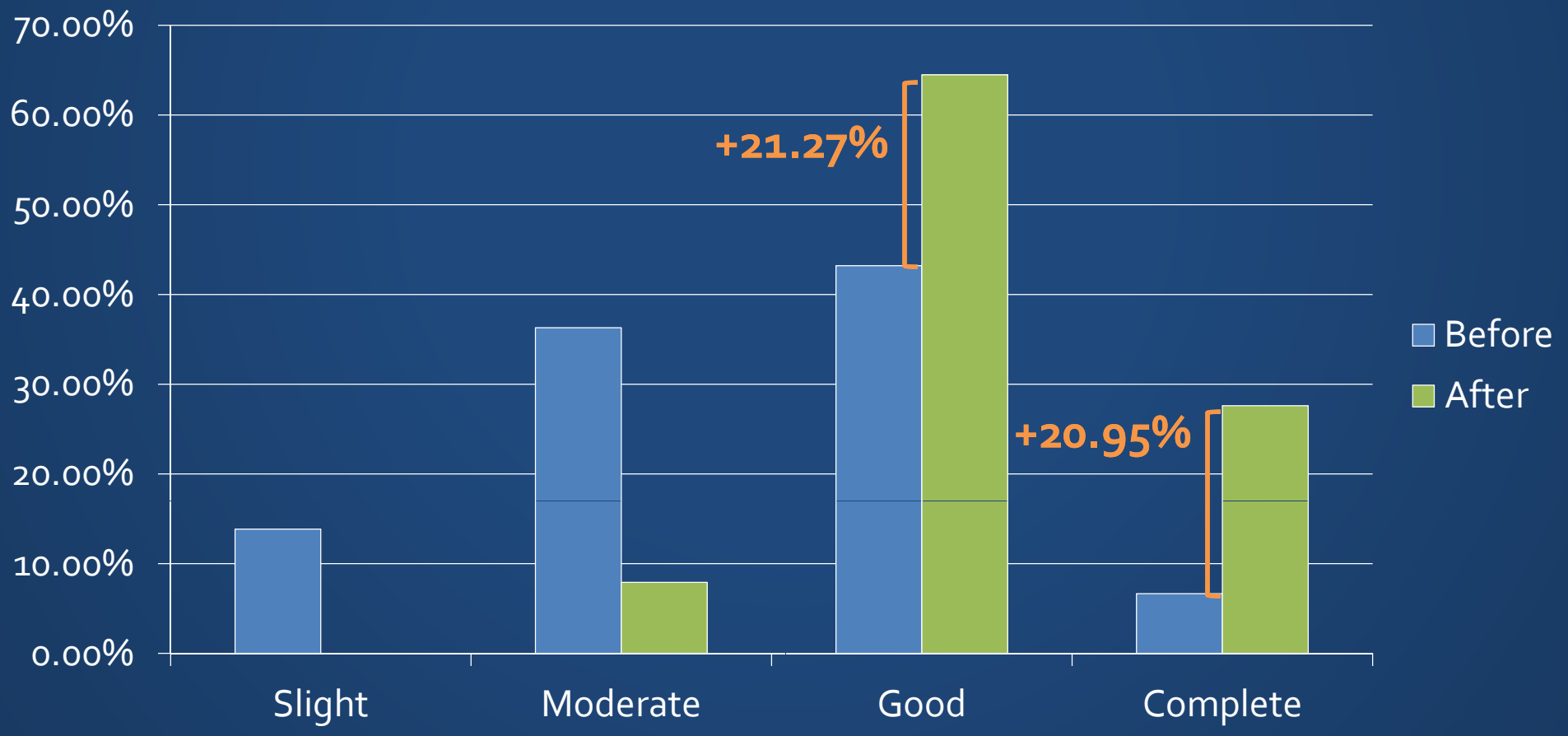
N Management Training Program for CCAs

My understanding of the process of nitrogen budgeting.



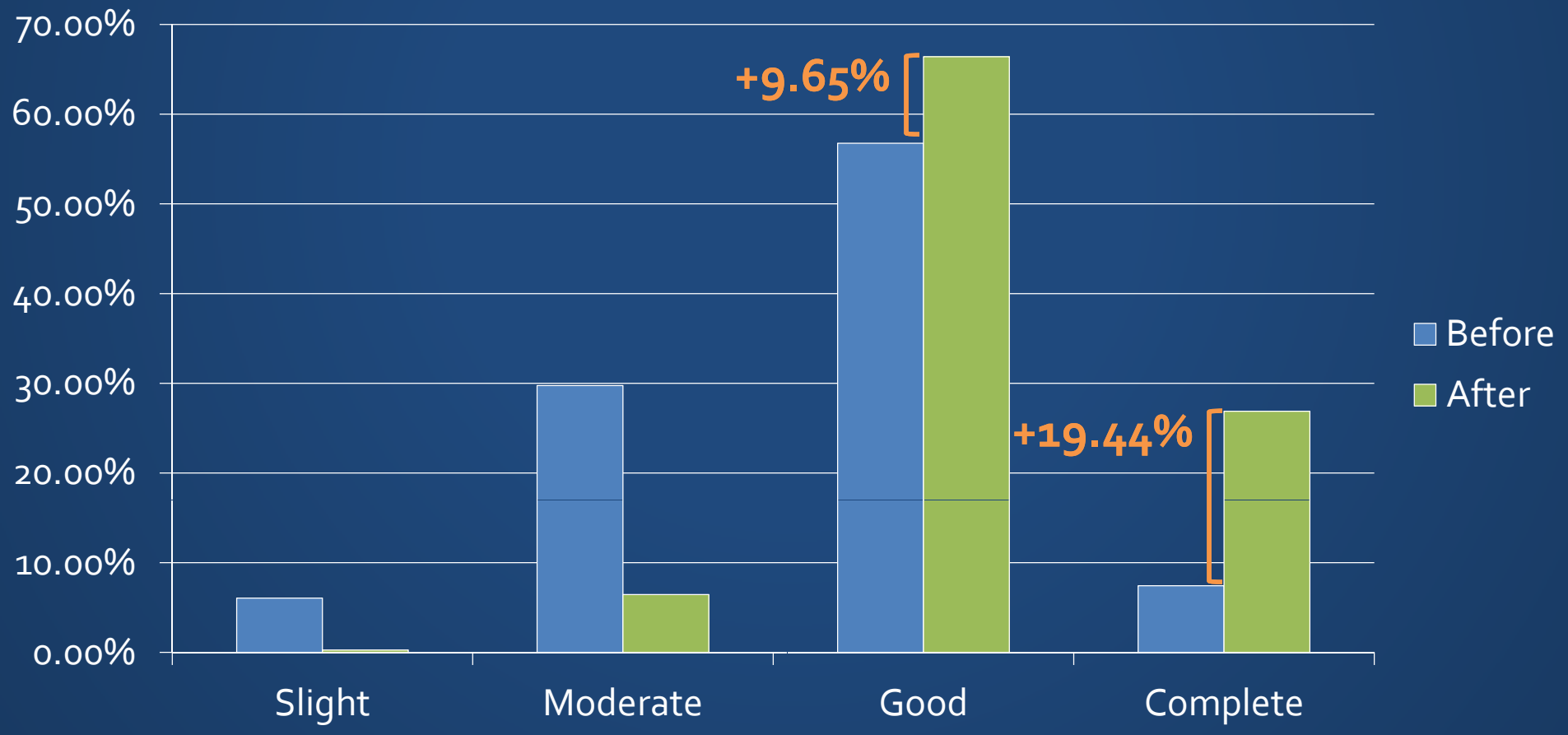
N Management Training Program for CCAs

My understanding of nitrogen management tools and resources.



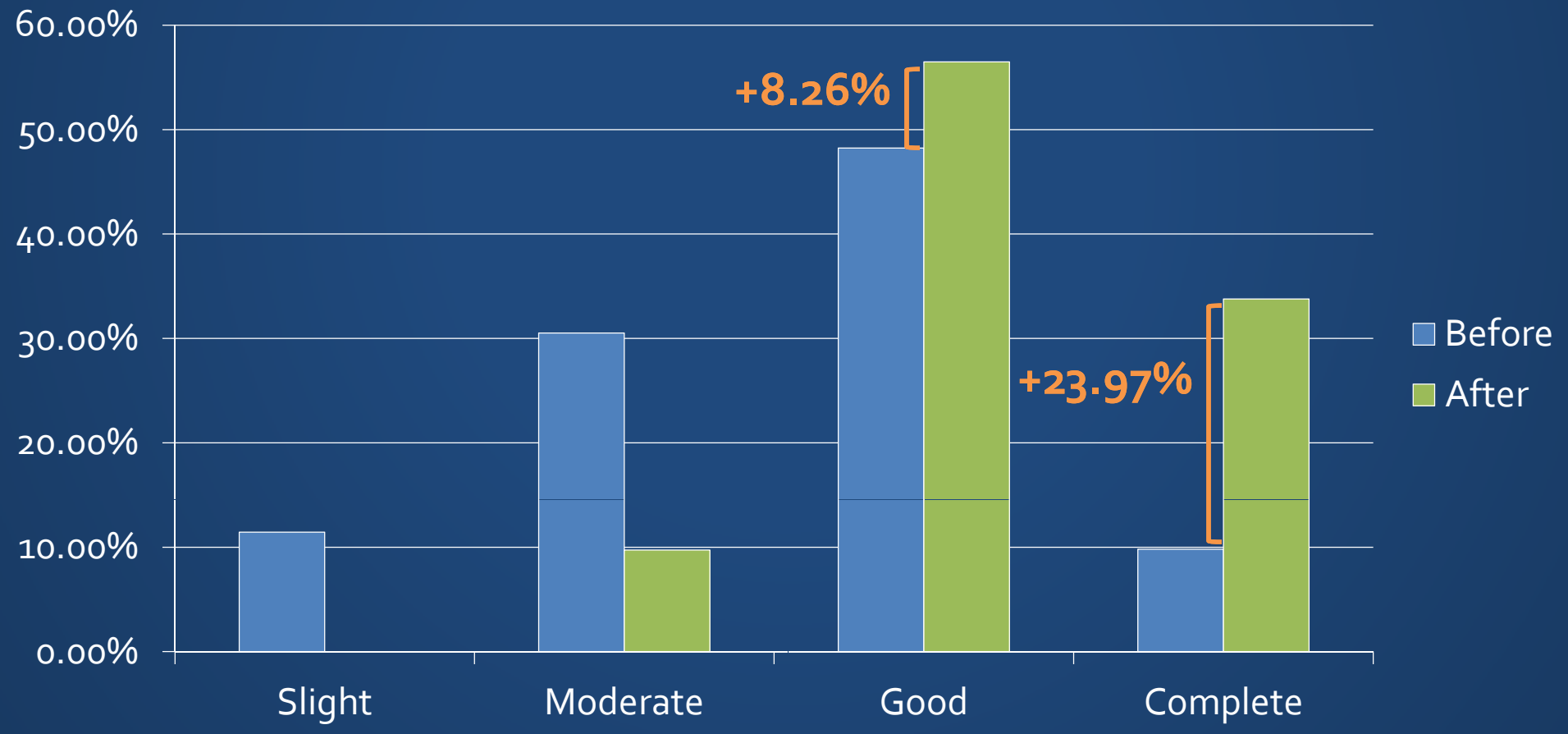
N Management Training Program for CCAs

My understanding of nitrogen management in annual or permanent crops.



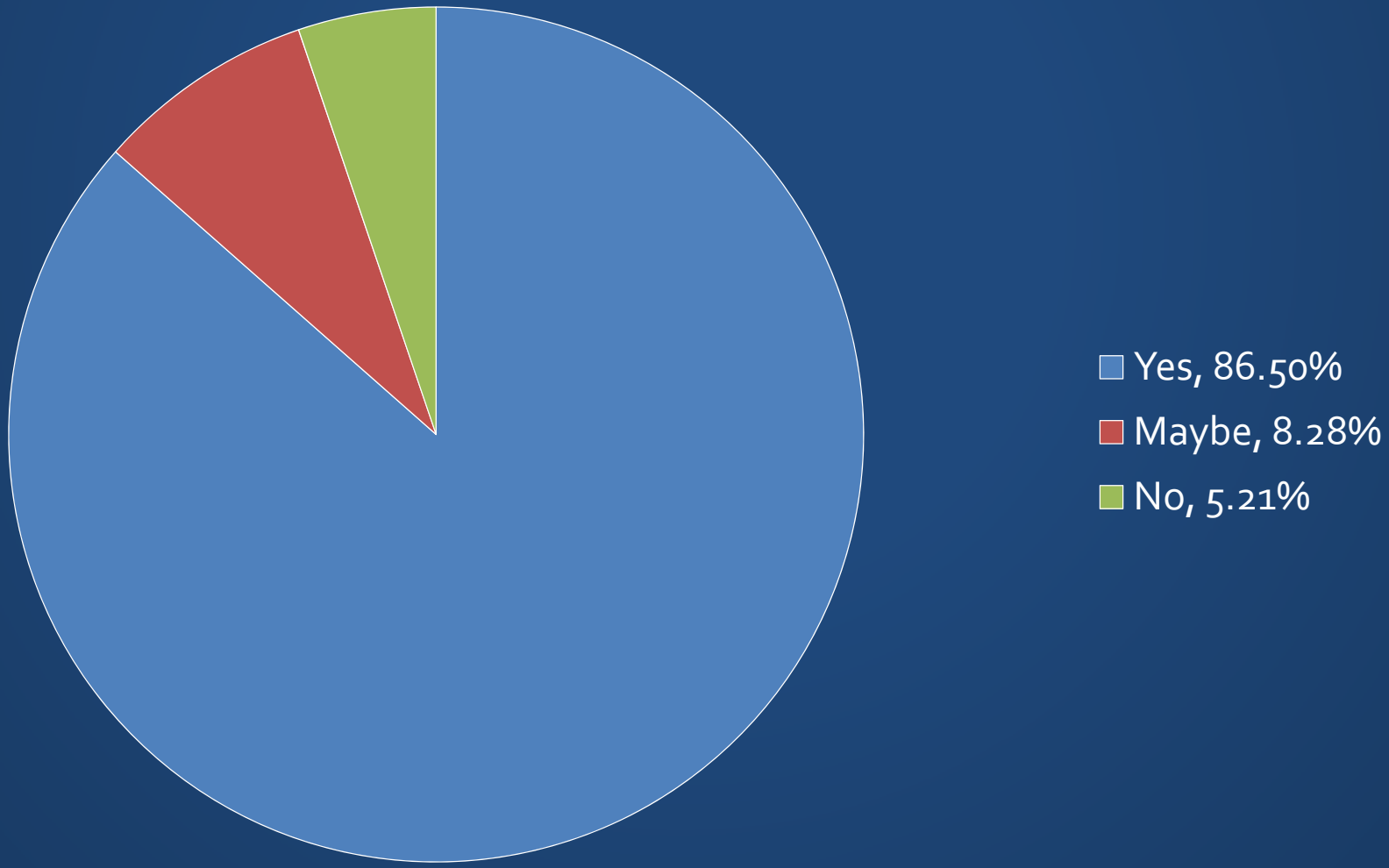
N Management Training Program for CCAs

My capacity to advise in the development of a nitrogen management approach



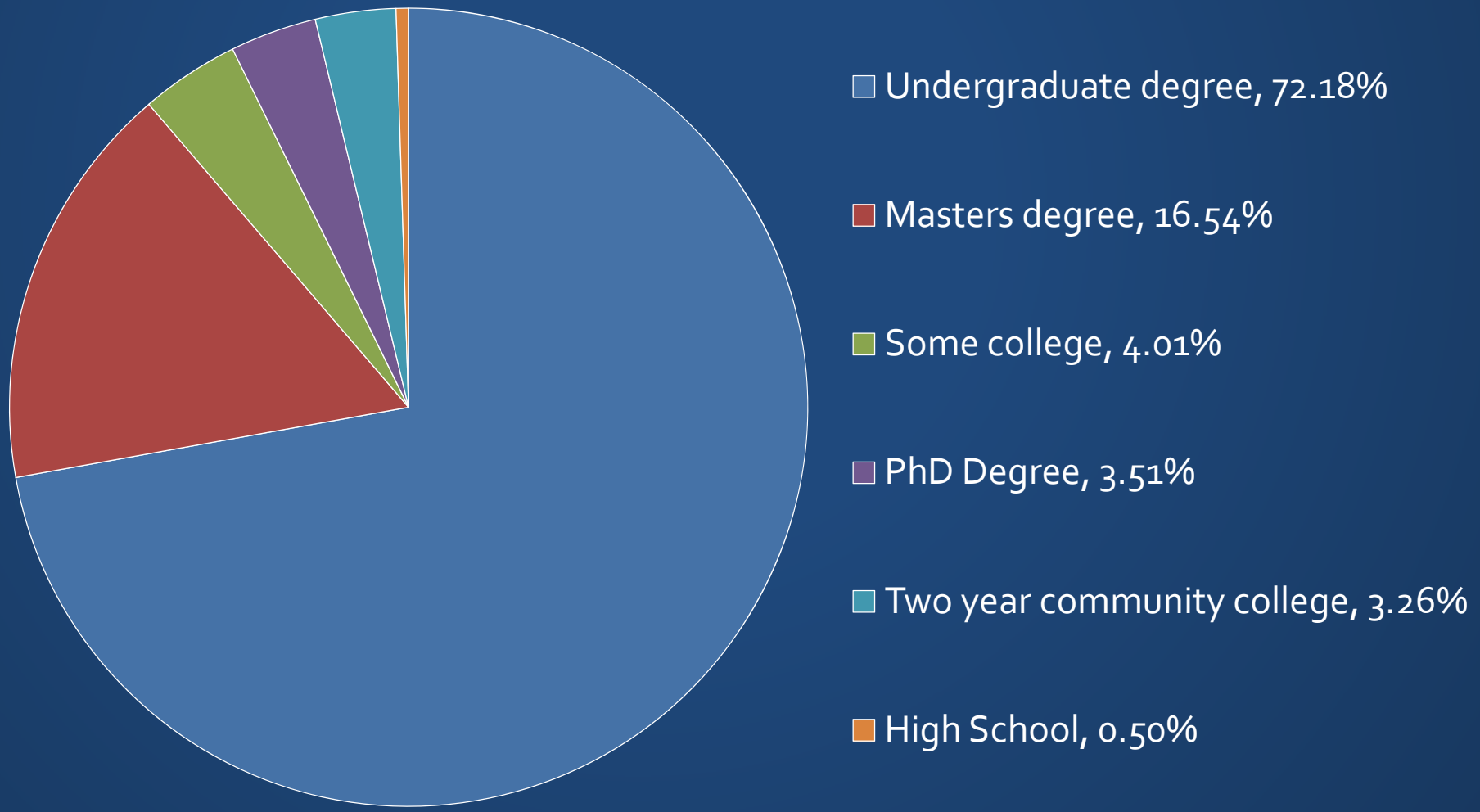
N Management Training Program for CCAs

Are you now better able to address nitrogen mitigation regulatory requirements?



N Management Training Program for CCAs

What is the highest level of education you have completed?



Accessibility: *FREP Research Database*

- **Objective:** To make FREP research data and findings readily available to growers and crop advisors.
- Cooperative FREP-UC Davis Project
- Developed web-based searchable database - CDFA-IT
- Synthesized key information from technical reports

The FREP Database: Search Options

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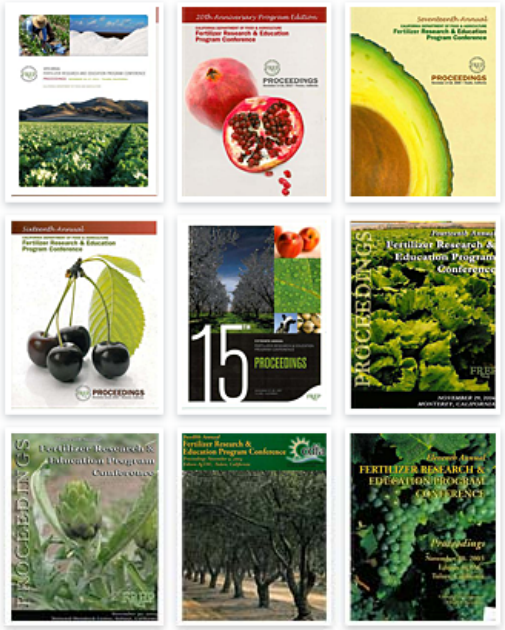
FREP DATABASE

The Fertilizer Research and Education Program (FREP) funds and coordinates research to advance the environmentally safe and agronomically sound use and handling of fertilizer materials. Since 1990, FREP has funded research on many of California's important and environmentally sensitive cropping systems. This database aims to make the wealth of information contained in FREP research projects readily available, easily understandable, and convenient for growers to implement.



Please enter search criteria:

Keyword(s)

Type of Crop: View All

County: View All

Date Range: View All

Search

The FREP Database: Search Options

The FREP Database: Search Options

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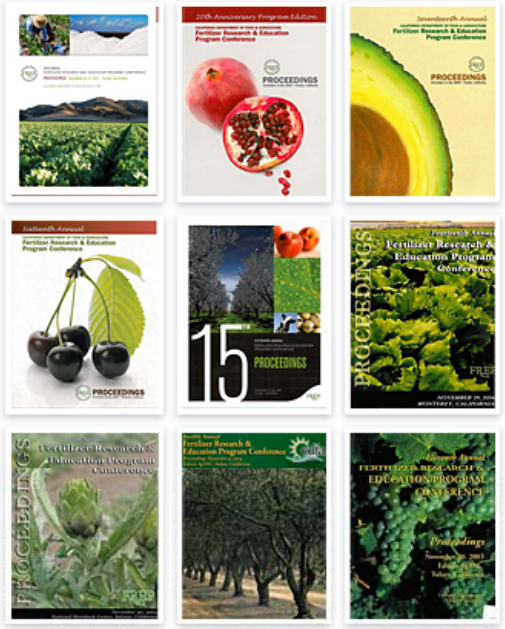


Please enter search criteria:

Keyword(s)	Nitrate
Type of Crop	View All
County	View All
Date Range	View All

Search

The FREP Database: Search Results

FREP DATABASE

Search results:

Study Title	ect County	Crop Type
Demonstration of Pre-Sidedress Soil Nitrate Testing as an N Management Tool	Monterey	Lettuce
Demonstration Program for Reducing Nitrate Leaching through Improvements to Irrigation Efficiency and Fertilizer/Cover Crop Management	Monterey	Lettuce
Determination of Best Nitrogen Management Practices for Broccoli Production in the San Joaquin Valley	Fresno	Broccoli
Development and Demonstration of Nitrogen Best Management Practices (BMP's) for Sweet Corn in the Low Desert	Riverside	Sweet Corn
Development and Promotion of Nitrogen Quick Tests for Determining Nitrogen Fertilizer Needs of Vegetables and Survey of Soil Residual Nitrate-Nitrogen Levels	San Benito, Monterey	Cabbage, Onion, Lettuce
Development of a Model System for Testing Foliar Fertilizers, Adjuvants and Growth Stimulants	Site independent	Arabidopsis used as model plant
Development of a Nitrogen Fertilizer Recommendation Model to Improve N-Use Efficiency and Alleviate Nitrate Pollution to	Yolo, Colusa	Almond

The FREP Database: Report Summaries

STUDY RECORD

Demonstration of Pre-Sidedress Soil Nitrate Testing as an N Management Tool

Hartz, T.K., Department of Vegetable Crops, University of California, Davis

Project Highlights

- Sidedressing to lettuce can be delayed as long as residual soil NO_3-N in the top foot of soil exceeds 20 ppm.
- Maximum yields can be achieved in fields with lower soil NO_3-N levels by sidedressing only enough to raise soil NO_3-N concentration to 20 ppm.

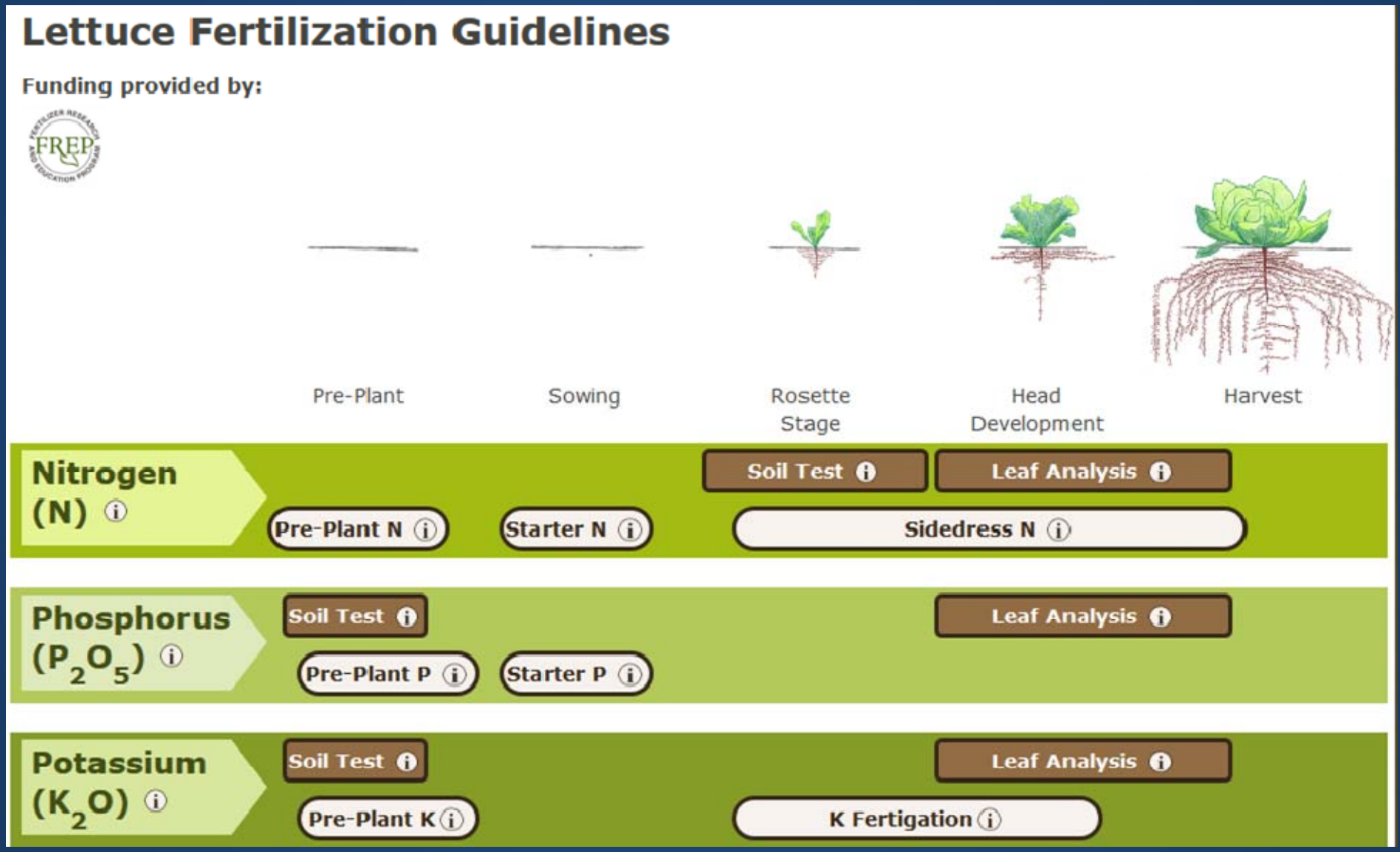
Crop
Lettuce

County
Monterey

Years of Study

Fertilization Guidelines: Start Page

Fertilization Guidelines: Some Screenshots



Fertilization Guidelines: Some Screenshots

Lettuce Fertilization Guidelines

Funding provided by:

Nitrogen (N) ⓘ
Soil Test ⓘ | Leaf Analysis ⓘ
Pre-Plant N ⓘ | Starter N ⓘ | Sidedress N ⓘ

Phosphorus (P_2O_5) ⓘ
Soil Test ⓘ
Pre-Plant P ⓘ | Starter P ⓘ

Potassium (K_2O) ⓘ
Soil Test ⓘ
Pre-Plant K ⓘ

Acknowledgments ⓘ

Additional Information:

1. Lettuce Production in California (Historic Background, Production Statistics)
2. UC Nutrient Management for Vegetable, Fruit and Nut Crops

Sidedress N

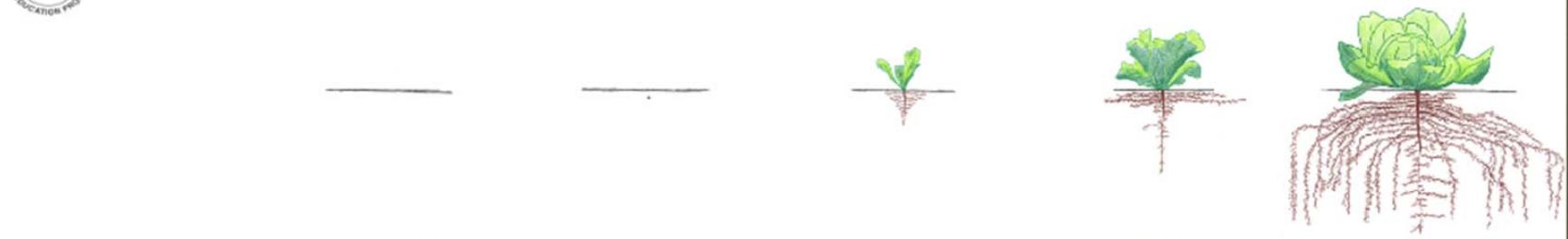
Between heading and harvest, the N demand of lettuce is high, reaching 3-4 lbs N/acre per day [N13, N32, N33]. During this period, which is generally the last month before harvest, 70-80% of the total N is taken up [N21, N30, N33, N41]. A sufficient N supply between heading and harvest is crucial for obtaining a high yield.

- Application Rate ⓘ
- Site Specific Fertilization Management ⓘ
- Mode of Application ⓘ
- Fertilizer Type ⓘ
- Time of Application ⓘ

Fertilization Guidelines:
Some Screenshots

Lettuce Fertilization Guidelines

Funding provided by:



Nitrogen (N) — Soil Test | Leaf Analysis | Pre-Plant N | Starter N

Phosphorus (P_2O_5) — Soil Test | Pre-Plant P | Starter P

Potassium (K_2O) — Soil Test | Pre-Plant K

Acknowledgments

Additional Information:

Links:

Soil Nitrate Test

Samples are taken from the top foot of the soil profile, which is the major rooting zone [N20, N21]. Zones of recently banded fertilizer applications should be avoided so that the N availability is not over-estimated [N11]. For more information on sampling procedure see Sampling for Soil Nitrate Determination).

Young lettuce plants require little N, as approximately 70% of the total N is taken up between heading and harvest [N21, N30, N33, N41]. Therefore, taking a soil sample after thinning, prior to the first in-season N application, and a second 2-3 weeks later provides sufficient information to schedule N applications throughout the season [N13].

Soil Nitrate Quick Test

Interpretation of Test Results

Fertilization Guidelines: Summary

- The guidelines …
  - … are a summary of research results
  - … include general information for crops grown in California
  - … provide a basis for in-depth discussions with local farm advisors or fertilization experts about site-specific adjustments
  - … can easily be expanded and updated
  - … include a list of references

Conclusions

- Data from 145 completed projects has been entered into database
- The database is accessible online:
  - www.cdfa.ca.gov/is/frep/
- Fertilization guidelines for major crops are added on a flow basis
- The guidelines are accessible online:
  - http://apps.cdfa.ca.gov/frep/docs/guidelines.html

Focused Research: "Pump and Fertilize"

- Two research projects are underway with funding of over $700,000
- Three years field level research in Tulare Lake Basin and Salinas Valley
- Both projects done by UC research teams

THANK YOU