University of California

Nitrogen Management Training

for Certified Crop Advisers

MODULE 6

Nitrogen Management Tools and Resources

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UC Cooperative Extension | University of California Agriculture and Natural Resources

Nitrogen Management Resources

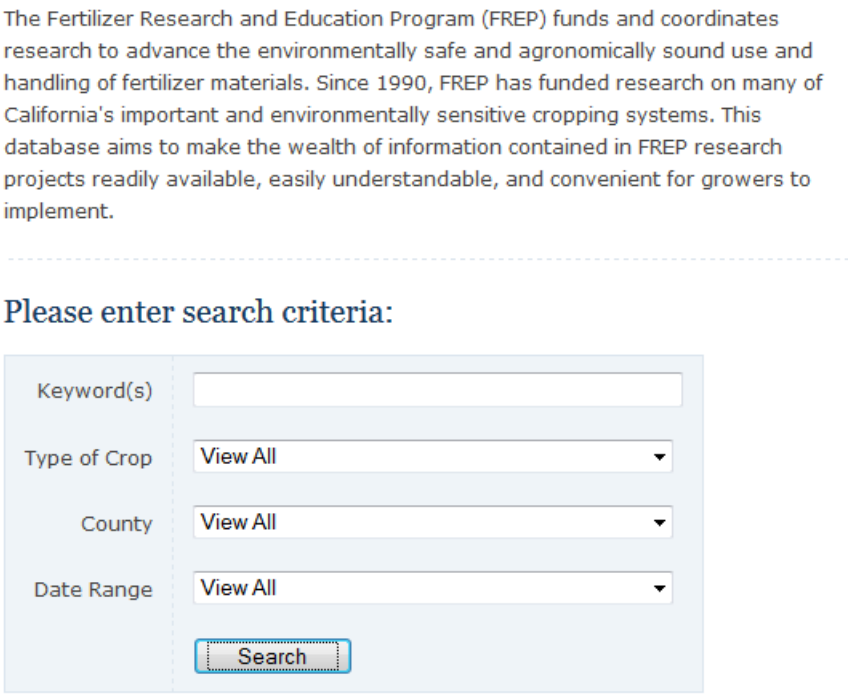
Nutrient Management of Specific Crops

FREP Database

http://www.cdfa.ca.gov/is/frep/

Go here for:

- Up-to-date California crop research
- Database searchable by crop, county and research date

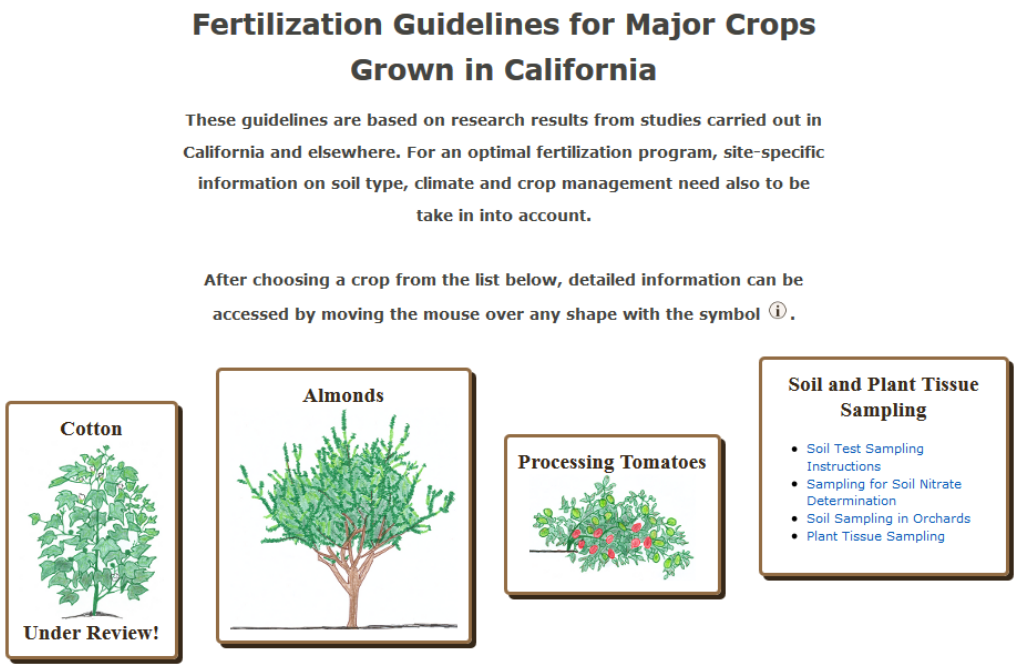


Fertilization Guidelines for Major CA Crops

http://apps.cdfa.ca.gov/frep/docs/guidelines.html

Go here for:

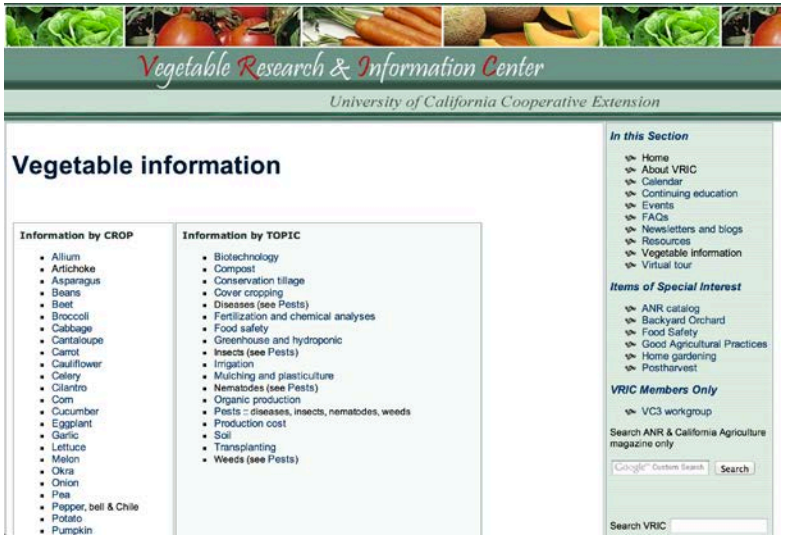
- Application rates & times
- Fertilizer placement
- Fertilizer type
- Deficiencies
- Tissue Analysis



Vegetable Research and Information Center

Go here for:

- Information about nutrient management, irrigation, and fertilization in CA vegetables **organized by crop** http://vric.ucdavis.edu/main/veg_info.htm
- Calendar of educational events and new research projects http://vric.ucdavis.edu/index.htm



CropManage

https://ucanr.edu/cropmanage/login/

Go here for:

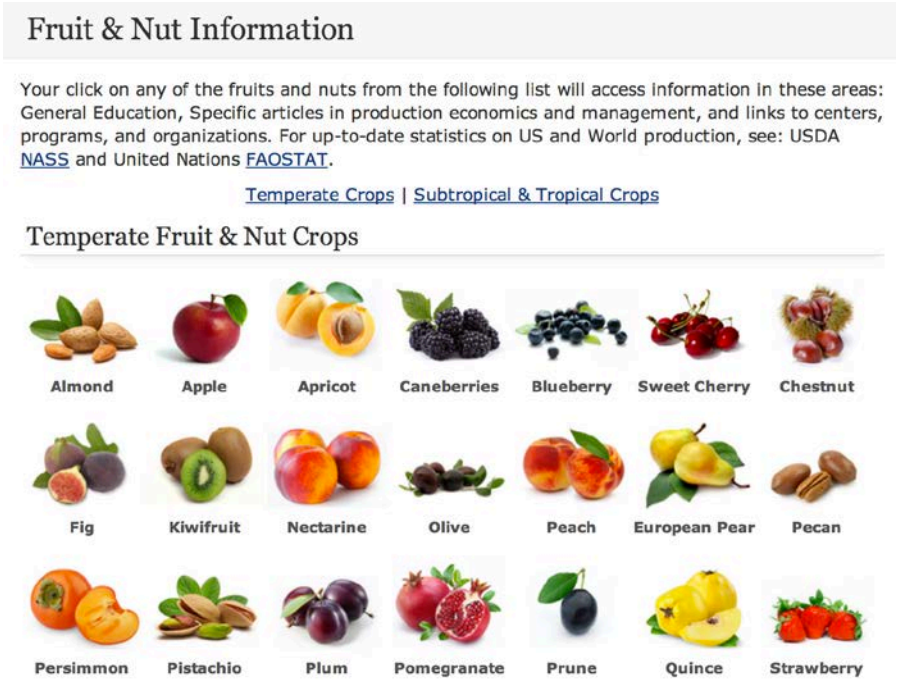
- Irrigation and N management of coastal vegetables and berries
- Sharing data between users of a single farm operation

Fruit and Nut Research and Information

http://fruitsandnuts.ucdavis.edu/

Go here for:

- Information on biology, fertilization and management of fruit and nut crops
- Links to literature searchable by crop

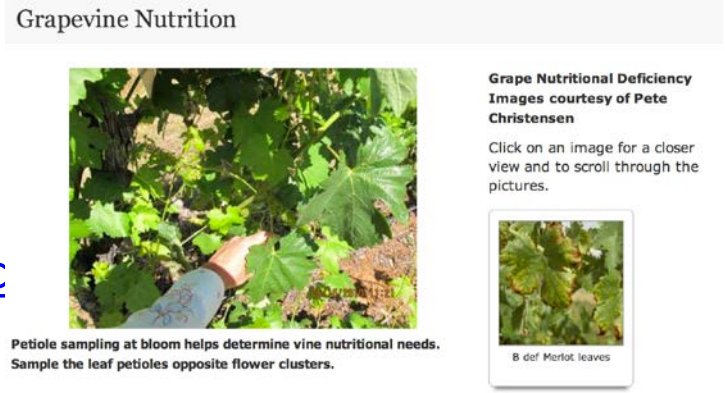


Orchards and Grapevines

Go here for:

Links to information on grapevine nutrition, with attention to Boron, Phosphorous, and Zinc.

http://cecentralsierra.ucanr.edu/Agriculture/Viticulture/Grapevine_nutrition/



Go here for:

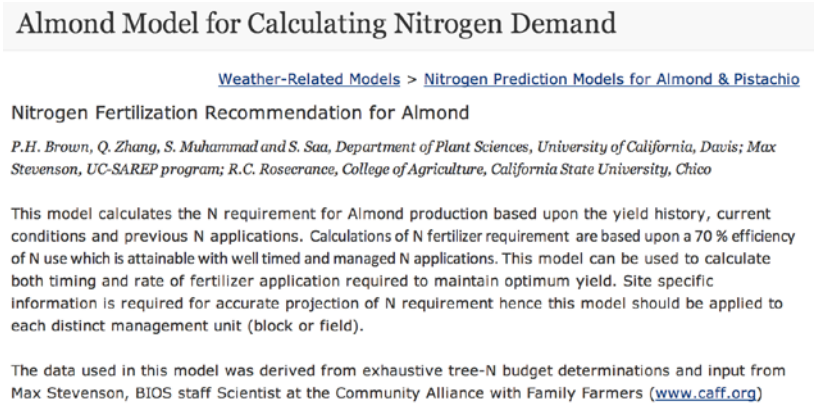
Links to recent and ongoing UC viticulture research and educational events

http://iv.ucdavis.edu/

Almond Resources

Go here for:

A model the calculates site-specific Almond N requirement and timing for optimum yield.
http://fruitsandnuts.ucdavis.edu/almondmodels/



Almond Model for Calculating Nitrogen Demand

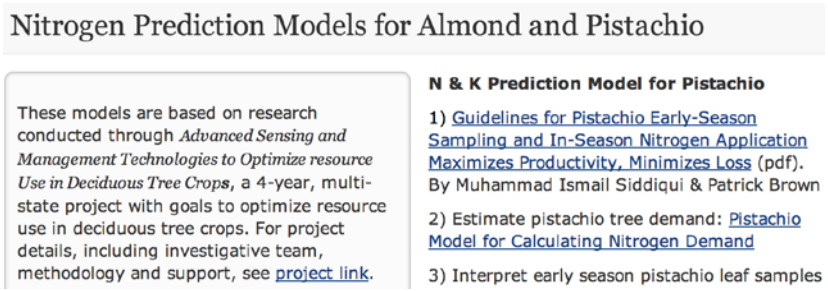
Weather-Related Models > Nitrogen Prediction Models for Almond & Pistachio

Nitrogen Fertilization Recommendation for Almond

P.H. Brown, Q. Zhang, S. Muhammad and S. Saa, Department of Plant Sciences, University of California, Davis; Max Stevenson, UC-SAREP program; R.C. Rosecrance, College of Agriculture, California State University, Chico

This model calculates the N requirement for Almond production based upon the yield history, current conditions and previous N applications. Calculations of N fertilizer requirement are based upon a 70 % efficiency of N use which is attainable with well timed and managed N applications. This model can be used to calculate both timing and rate of fertilizer application required to maintain optimum yield. Site specific information is required for accurate projection of N requirement hence this model should be applied to each distinct management unit (block or field).

The data used in this model was derived from exhaustive tree-N budget determinations and input from Max Stevenson, BIOS staff Scientist at the Community Alliance with Family Farmers (www.caff.org)



Nitrogen Prediction Models for Almond and Pistachio

These models are based on research conducted through *Advanced Sensing and Management Technologies to Optimize resource Use in Deciduous Tree Crops*, a 4-year, multi-state project with goals to optimize resource use in deciduous tree crops. For project details, including investigative team, methodology and support, see project link.

N & K Prediction Model for Pistachio

1) Guidelines for Pistachio Early-Season Sampling and In-Season Nitrogen Application Maximizes Productivity, Minimizes Loss (pdf). By Muhammad Ismail Siddiqui & Patrick Brown

2) Estimate pistachio tree demand: Pistachio Model for Calculating Nitrogen Demand

3) Interpret early season pistachio leaf samples

Go here for:

Instructions for leaf sampling and predicting N and K status
http://fruitsandnuts.ucdavis.edu/Weather_Services/Nitrogen_Prediction_Models_for_Almond_and_Pistachio/

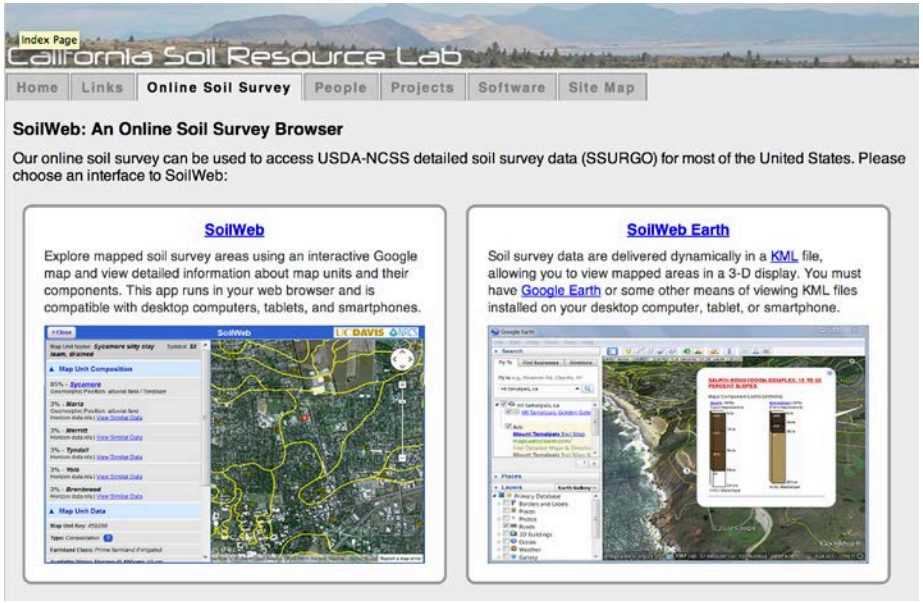
Field Soil Properties

SoilWeb

http://casoilresource.lawr.ucdavis.edu/soilweb/

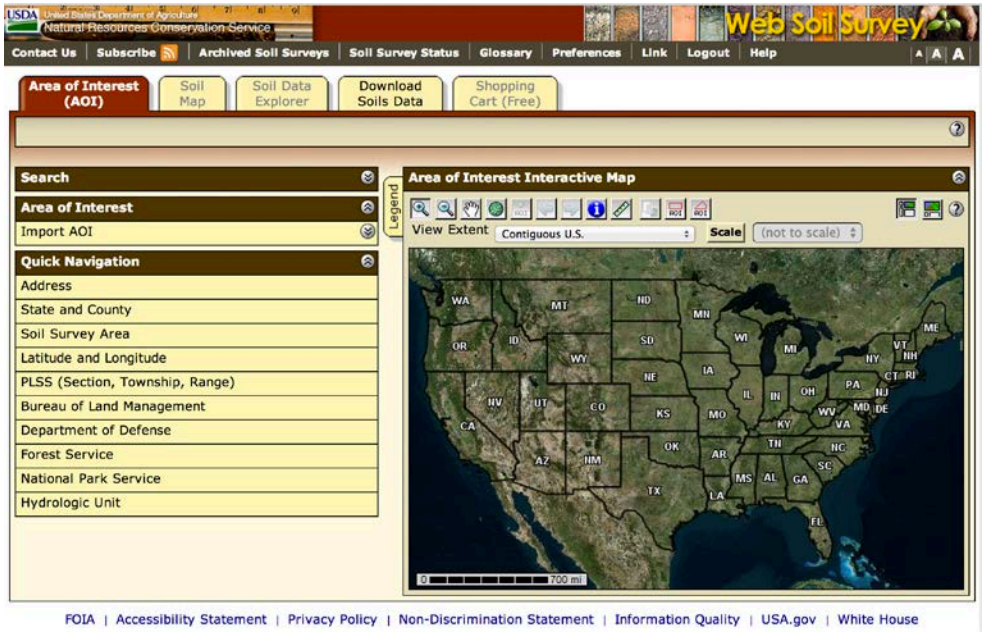
Go here for:

- Soil survey areas and mapped soil properties
- Interactive GPS features



NRCS Web Soil Survey

http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm



Go here for:

- Global and local soil maps
- Guide to soil maps by topic area

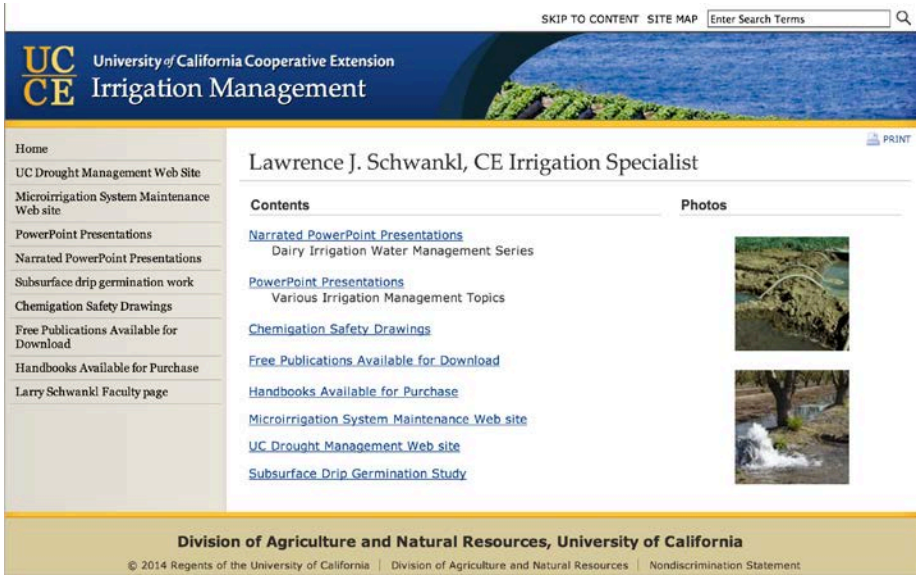
Irrigation Management

UC Cooperative Extension Irrigation Management

http://ucanr.edu/sites/irrmgm/

Go here for:

- Introduction to irrigation management

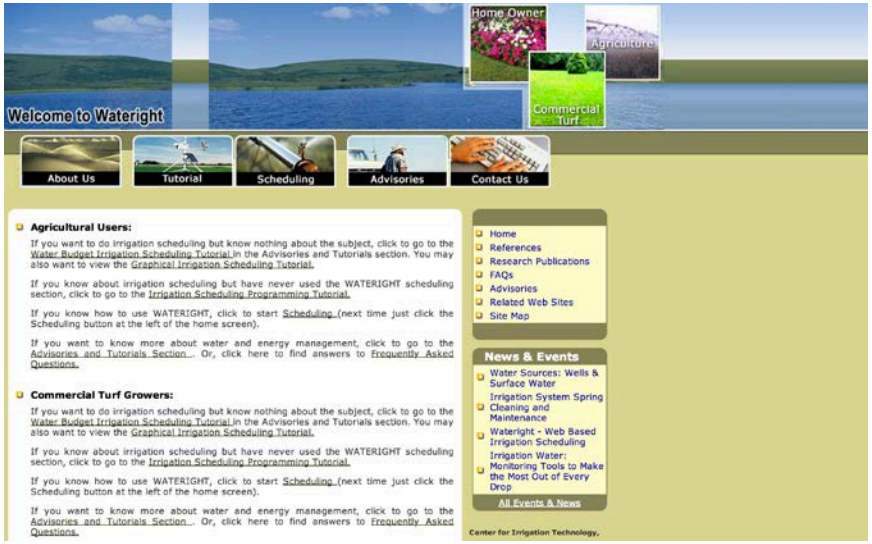


WATERIGHT

http://www.wateright.org/

Go here for:

- How to get started with irrigation scheduling
- Irrigation scheduling planning tools
- Water and energy management



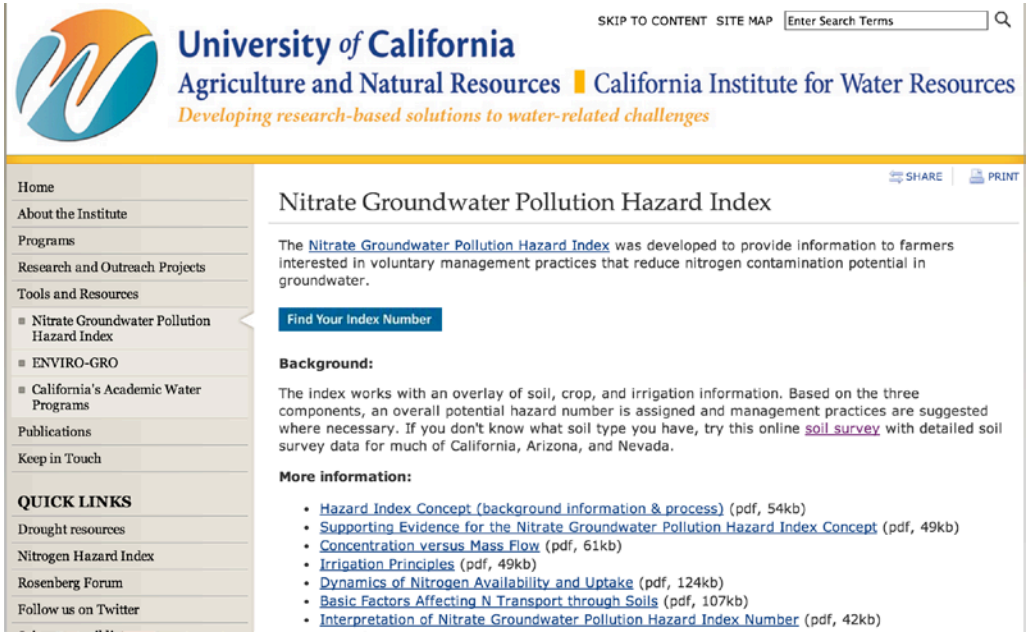
Risk of Nitrate Leaching

Nitrate Groundwater Pollution Hazard Index

http://ciwr.ucanr.edu/Tools/Nitrogen_Hazard_Index/

Go here for:

- Estimate of a field's nitrate pollution risk
- N management suggestions



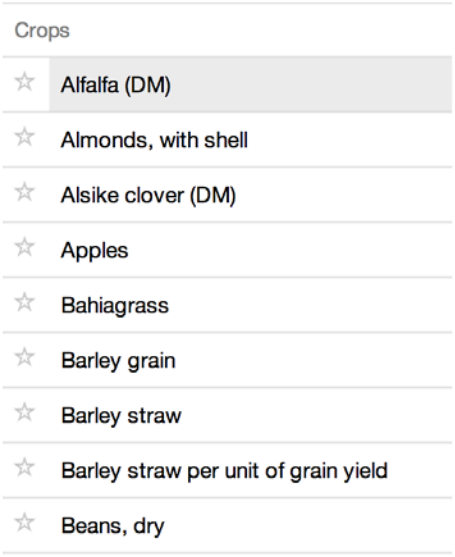
N Removed with Harvested Crops

IPNI Crop Nutrient Removal Calculator

https://www.ipni.net/app/calculator/home

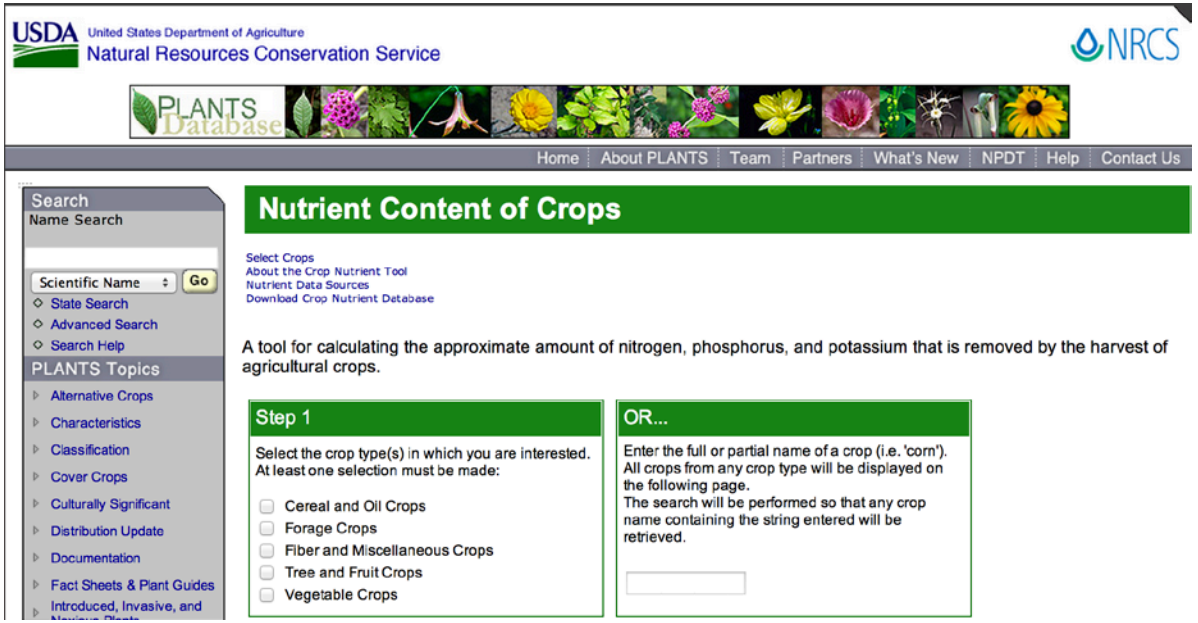
Go here for:

- N, P, K harvest removal estimates of field crops
- Multilingual crop nutrient calculator



NRCS Crop Nutrient Tool

http://plants.usda.gov/npk/main



Go here for:

- Elemental N, P, K harvest removal estimates of field crops
- Explanation of how removal calculations are made

Manure Management

Manure Management for CCAs

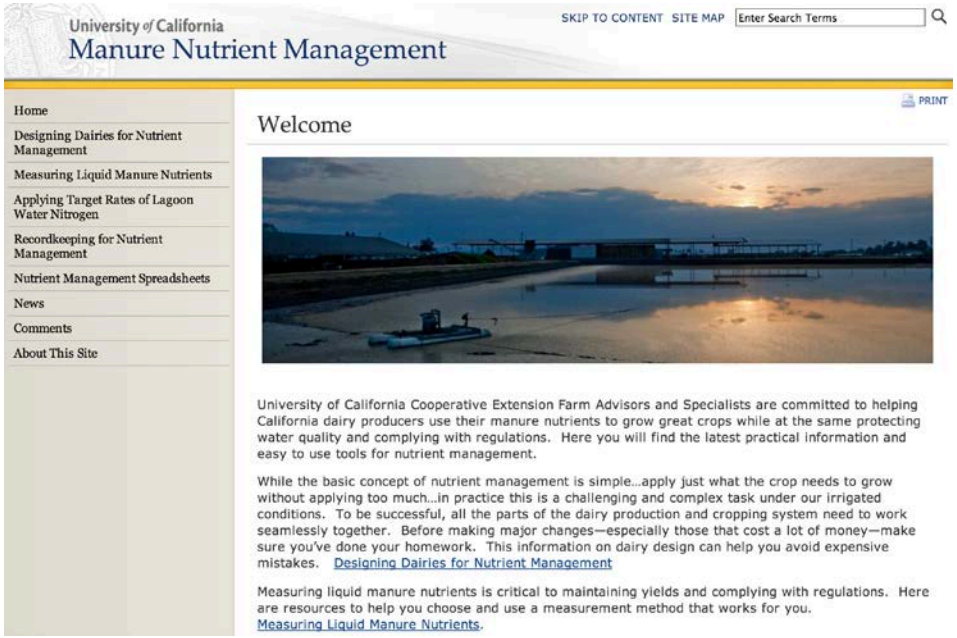
http://manuremanagement.ucdavis.edu/

Go here for:

- Technical information on dairy manure nutrient management
- Goals for CCAs serving CA dairy farmers

Manure Nutrient Management

http://manure.ucdavis.edu/



Go here for:

- Help quantifying nutrients in manure sources
- Nutrient recordkeeping
- Application targeting calculator and design ideas

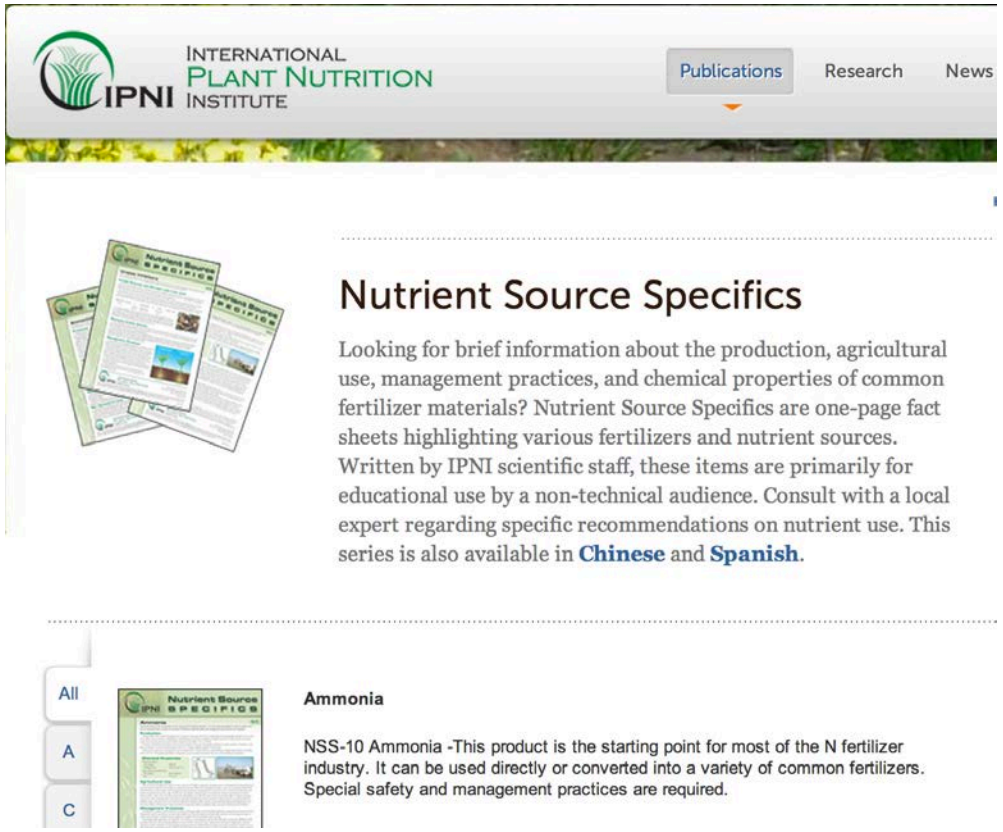
Fertilizer Sources and Transformations

Nutrient Source Specifics

http://www.ipni.net/specifics-en

Go here for:

- Background about properties and use of fertilizers
- Chinese and Spanish language series



Nitrogen Notes

http://www.ipni.net/nitrogennotes

Nitrogen Notes

A basic understanding of the reactions of nitrogen in soils provides a solid foundation for making wise nutrient stewardship decisions. This series of fact sheets, written by IPNI staff, covers the major nitrogen fertilizer transformations that occur in crop production.

Go here for:

- Information on N fertilizer transformations
- Management suggestions to prevent leaching

Cover Crops

Cover Crop Guides

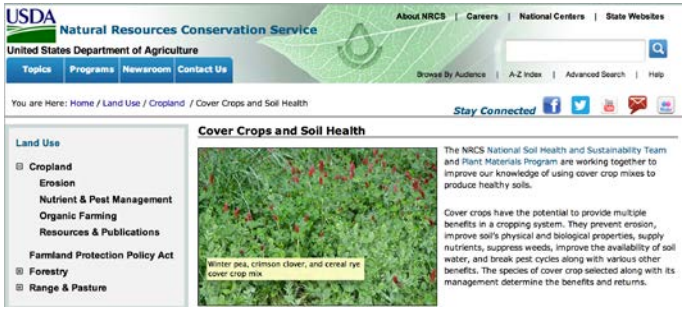
Go here for:

- Descriptions of 40 cover crops including management practices, climate and soil requirements, and uses

http://www.sarep.ucdavis.edu/database/covercrops

Go here for:

- Guidelines for when and how to use common cover crops



http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull national/landuse/crops/?cid=stelprdb1077238

Cover Crop Information

http://smallfarms.oregonstate.edu/node/54

Go here for:

- Calculator comparing nutrient values of cover crops, organic and synthetic fertilizers, and compost.

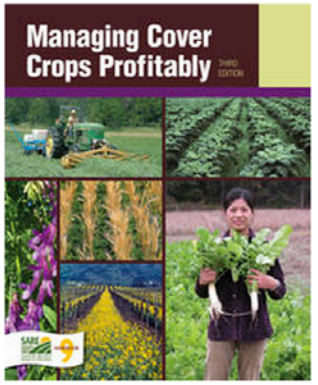
http://www.sare.org/Learning-Center/Books
Managing-Cover-Crops-Profitably-3rd-Edition

Go here for:

- A book explaining how to integrate cover cropping into a farming operation.

Managing Cover Crops Profitably, 3rd Edition

Managing Cover Crops Profitably explores how and why cover crops work, and provides all the information needed to build cover crops into any farming operation. Along with detailed management information on the most commonly used species—including grasses, grains, brassicas and mustards, and legumes—*Managing Cover Crops Profitably* offers chapters on the role of cover crops in broader topics such as crop rotations, pests and conservation tillage. It also has appendices on seed suppliers and regional experts.



Download Product

Additional Resources

California Agriculture

http://californiaagriculture.ucanr.org/

Research, reviews, and news in peer-reviewed journal format

UC Agriculture and Natural Resources Academic Directory

http://ucanr.edu/Find_People/Academic_Directory/

Contact information for UC experts. The directory can be filtered by commodity and appointment (e.g. Farm Advisors).

Agriculture and Natural Resources Catalog

http://anrcatalog.ucdavis.edu/default.aspx

Publications on agriculture, natural resources, and nutrition from UC ANR.

IPNI Publications

http://ppi-store.stores.yahoo.net/

Print information about fertilizers, with a special focus on the 4Rs

INTERNATIONAL PLANT NUTRITION INSTITUTE

IPNI INTERNATIONAL PLANT NUTRITION INSTITUTE

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- **Web Specials**
  Special packets of IPNI materials only available to web customers.

Preparing for the International CCA Exam
Order your copy of the study guide for the International Certified Crop Adviser (CCA) exam. This manual is a comprehensive preparation tool, updated each time the exam is revised.

Education Packet
A wonderful assortment of materials for young people.

Southeast Asia Program Store
Publications from the Institute's **Southeast Asia Program** are found here.

Manuals on ***rice***, ***oil palm***, and ***soil fertility*** are listed.

Soil Test Levels in North America, 2010
With the cooperation of numerous public and private soil testing laboratories, IPNI periodically summarizes data on soil test levels in North America (NA). The 2010 summary contains information about phosphorus (P), potassium (K), sulfur (S), magnesium (Mg), zinc (Zn), chloride (Cl-), and pH.

The Right Way to Grow Wheat ...4R Nutrient Stewardship

Books

Soil Fertility and Fertilizers, 8th ed. 2013
Havlin et al.

Western Fertilizer Handbook, 9th ed. 2002
Western Plant Health Association

Western Fertilizer Handbook: Horticulture, 3rd ed. 2012
Pier and Barlow

4R Plant Nutrition Manual, 1st ed. 2012
International Plant Nutrition Institute

University of California

Nitrogen Management Training

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Course materials available at:

ciwr.ucanr.edu/NitrogenManagement

Contributing partners:

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California Institute for Water Resources
University of California
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web: ciwr.ucanr.edu
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California Department of Food & Agriculture (CDFA)
web: www.cdfa.ca.gov
Twitter: @CDFAnews

California Association of Pest Control Advisers (CAPCA)
web: capca.com

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