



Responding to Limited Water Supplies and Drought

Kelly Covello, Almond Board of California



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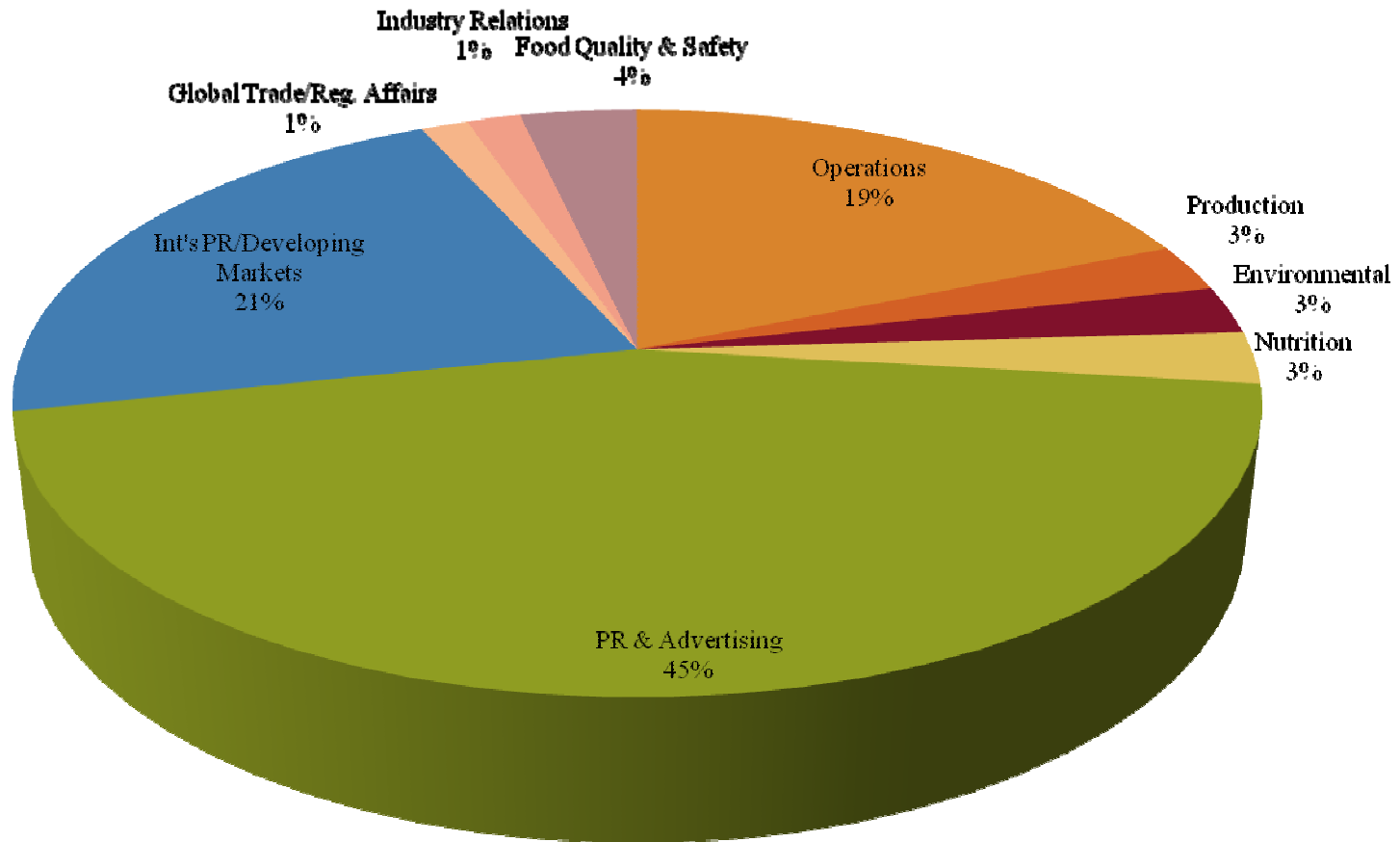
Almond Board of California

The Almond Board of California was established in 1950. The Board administers a grower-enacted Federal Marketing Order under USDA supervision. The Board's mission is to create a rewarding environment for the production, processing and marketing of California almonds, the world's healthiest specialty crop. The Federal Marketing Order for California almonds is used to support research, promotion and technical services and to increase the consumption of California almonds around the world.

- A voluntary 10 member Board of Directors (5 almond growers and 5 almond processors)
- Numerous board-appointed committees representing industry interests, strategy, and investment
- A non-profit organization that enables almond growers and processors to combine financial resources

Almond Board of California Budget

FY 2008/2009 Budget



Total Budget = 41,855,115
\$.03/lb assessment

California Almond Industry Overview

California Almonds are responsible for 80 percent of the world's almonds and virtually 100 percent of the domestic supply.

Almonds are California's No. 1 agricultural export and the top U.S. horticultural export.

In the 2008-09 crop year, growers have produced 1.6 billion pounds of almonds on 660,000 acres throughout the central valley

Bearing acreage will expand this crop year (09/10) from 660,000 to approximately 700,000 acres



Current Water Allocations Impacting Almonds

Central Valley Project

- North of the Delta 5%
- South of the Delta 0%
- There are local variations

Currently 20% for the State Water Project

- All acreage in south

Final water allocations announced in May



Almond acreage impacted by water shortage

Ongoing drought conditions, new environmental restrictions on water supply from the Sacramento-San Joaquin River Delta, and increasing demand across the state mean that California Almond farmers face a severe loss of their most important crop input: water

It is estimated that fully one-third of California's planted almond orchards, or approximately 250,000 acres, under both the California State Water Project and Central Valley Project, are impacted.

- 200,000 acres southwest of the Sacramento-San Joaquin River Delta – CVP and SWP
- 50,000 acres northwest of the Delta - CVP



Effects of water stress on almonds

Generally, nut size is reduced during the first season of significant water stress.

Water deficits can affect almond orchards not only in the year in which stress occurs, but also in the following seasons

A crucial stage is bud differentiation in the fall (late August-early September). Significant stress at this time will reduce nut load the next season.

In the longer term, because significant water stress also reduces vegetative growth and potentially decreases productivity per unit canopy volume, nut load can be reduced for a number of subsequent years

Recent research indicates some stages of almond fruit growth are more tolerant to water stress than others. Understanding these stages permits growers to reduce water during these periods while minimizing damage to trees and to current and subsequent crops. This is known as “Regulated Deficit Irrigation “ (RDI). This is a moderate water stress strategy.

Almond Board of California response

The Almond Board of California is helping growers face these challenges and continues to invest, through UC research, on water-efficient farming and technologies, including new deficit irrigation techniques that reduce water usage with minimal impact to orchard production (RDI).

For the past 25 years, the ABC has funded 66 irrigation projects, totaling over \$1 million dollars, leading to dramatically increased efficiency in water use through advances in irrigation scheduling and management, micro-irrigation, and other techniques.

- The ABC is currently funding projects for the 2008/09 project year to look at drought management techniques more closely and actual almond water requirements for survival.
- The ABC is extending information via, seminars, its newsletters and has established a “drought management portal” on its website as a one-stop resource for information (www.almonndboard.com)



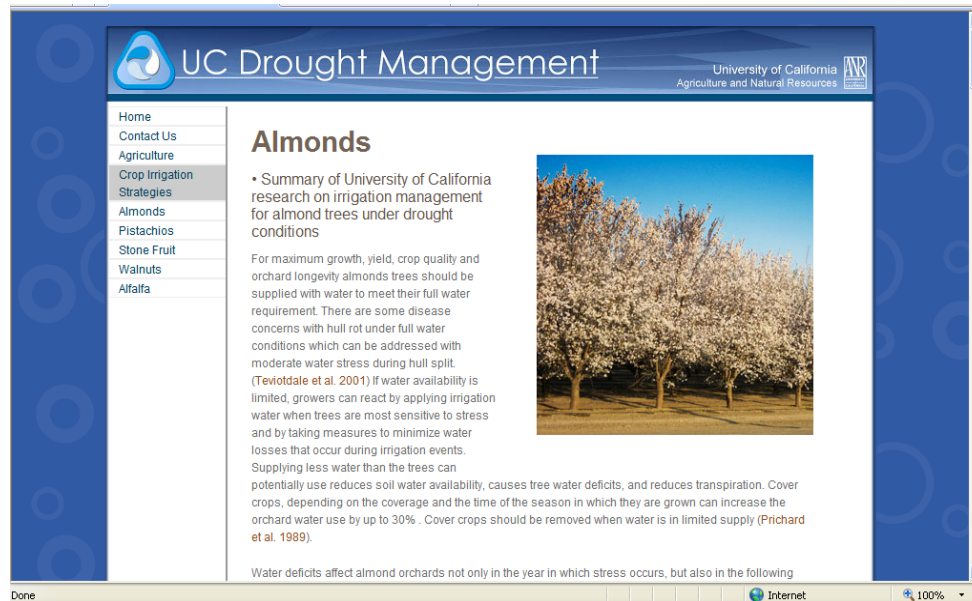
UC Response

UC has held meetings in recent months to help growers deal with drought

UC has developed a Drought Management Website

(<http://ucmanagedrought.ucdavis.edu/>)

- Extensive compilation of drought-related water management and irrigation strategies



Almond grower response to reduced water allocations

Growers intend to produce on a significant amount of acreage and are/will:

- Following annual crop acreage and diverting water to almonds
- Using carry-over water allotments from last year
- Using well water -- cost of pumping, water quality (e.g., salts and boron) can be issues
- Depositing and withdrawing “banked” water, different scenarios
 - Currently pumping water from wells which meet a specified quality standards and “banking” it into the canals / water projects for use later
 - Withdrawing water from ground water recharge basins
 - Obtaining water from CA Emergency Drought Water Bank
- Transferring water
 - Trying to buy
 - Transferring from areas where they have rights
- Removing older less productive orchards
- Implementing drought management scenarios as researched and recommended



Team work needed to manage limited water

Handlers, growers, irrigation experts and farm advisors are working together to identify strategies to cope with less; as reviewed in recent UC water meetings

- Growers on a limited budget should stretch water use over as much of the season as possible and in proportion to almond evapo-transpiration (ET°);
- Growers on a limited water budget should opt for fuller irrigations at critical stages rather than smaller doses of more frequent irrigation to minimize loss through surface evaporation;
- Growers should save enough water for post-harvest applications during bud differentiation from late-August to early-September to preserve next season crop production;
- While the goal is to retain leaves on trees until fall, growers should not be afraid of partial pre-harvest defoliation.

Joe O'Brien with Valley Tech Agricultural Laboratory Services checking soil moisture



Short term implications of water shortage on almond supply

California Almond bloom has just occurred and it is too early to determine the crop set for the 2009/10 crop year.

- The NASS subjective forecast will not be available until May 2009
- However, the preliminary industry estimates of bearing acreage for the coming crop year are approximately 700,000 acres

It is difficult to project the actual impact of the drought on total production and revenue

- There are approximately 6,000 almond growers across the state of California, all of whom are facing different challenges related to availability of water

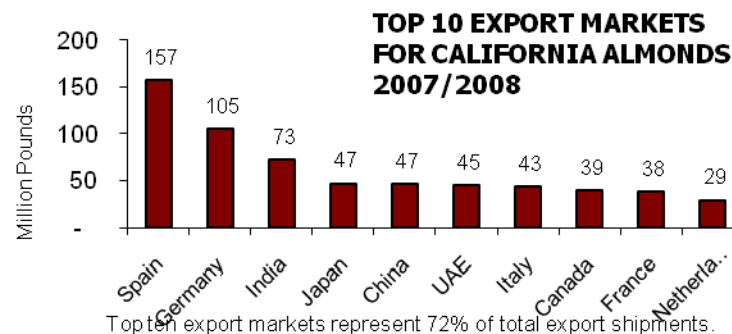


Short term implications of water shortage on almond exports

Approximately 70% of the California Almond production is destined for export markets.

Many factors impact export revenue year to year, including but not limited to, currency fluctuations, market access barriers, competition, market demand, economic climate and others.

It is not possible to project export revenue, nor is it possible to isolate the impact of California's drought on revenue.



Long term Impacts on building global demand

The California Almond growers take great pride in our ability to supply 80% of the world's demand for almonds.

The almond industry has invested tens of millions of dollars to grow demand and develop markets around the world;

- Those markets want to consume more almonds and we need to meet the demand

Customers and consumers want products and raw materials that are plentiful, with a sure supply for the future;

- A lack of a sure supply will force manufacturers to prefer other raw material ingredients

Through our commitment to global marketing, we are making great strides in distinguishing the premium quality of California Almonds in the minds of customers and consumers. As a result, we do not anticipate a significant change in global market share as a result of the current drought, but there may be implications longer term.



Long term solutions are needed

Decades of inaction to solve the state's growing needs for water will impact all of California's residents, growers and businesses.

While California's water demand has grown over the past 30 years, no major water project has been constructed to improve the state's water management and conveyance system.

The water supply and conveyance in California require long term solutions; we can't keep living from rain storm to rain storm; all stakeholders on the state and federal level need to agree on the long term solution which is the most beneficial for California, and then work very hard to implement it

