PHYTECH FOR ALMONDS

FROM PLANTING TO HARVEST

Young Orchards

Mature Orchards

YOUNG

Avoiding water stress is critical to reaching full production quickly[1].

VEGETATIVE

Water stress is not desirable in the earlier, vegetative, stage of the season.

REPRODUCTIVE

Regulated stress can be sustained and even help prevent issues such as hull rot disease or shaker damage, while too much stress can result in yield reduction[2,3].

POST-HARVEST

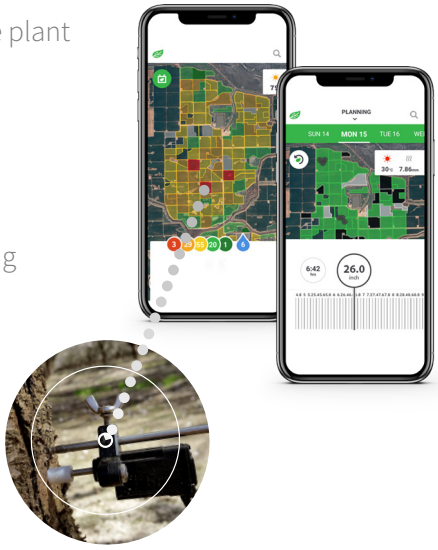
Post-Harvest stress can result in up to 73% yield reduction in the subsequent year's yield[2] .

Phytech provides the optimal tool to control water stress in every stage of the almond tree's life.

THE PHYTECH SOLUTION

Phytech provides an innovative plant based irrigation planning tool.

Phytech identifies yield reducing stress and immediately alerts growers on mobile and web platforms.



Sensors on selected trees continuously measure changes in trunk diameter, that are translated into plant stress indications.

Supporting parameters included in the system: irrigation monitoring, soil moisture monitoring, climate data and satellite image analysis.

Direct plant sensing for determination of water stress is the most accurate way to make irrigation decisions. Phytech's propriety technology, a combination of plant sensors and plant stress algorithms, is the best plant-based system available to growers today.

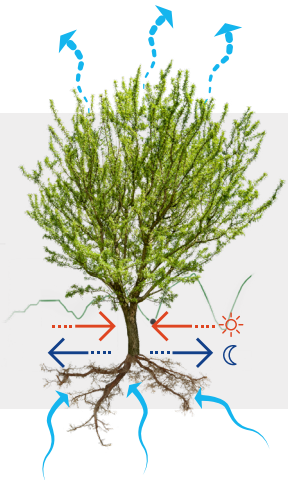
1. UN special report "crop yield response to water": http://www.fao.org/docrep/016/i2800e/i2800e.pdf
2. Almond board of California publication: http://ucmanagedrought.ucdavis.edu/Agriculture/Crop_Irrigation_Strategies/Almonds/
3. David Doll, UC Davis extension in Merced county, CA: http://www.growingproduce.com/fruits/impacts-of-drought-on-almond-production/

THE FUTURE OF IRRIGATION PLANNING

Phytech has developed an innovative irrigation planning tool to answer the question of **when and how much to irrigate**. The tool learns the irrigation and stress patterns of each individual plot and as result predicts plant stress. Almond growers can now be certain of the minimal amount of irrigation required to avoid stress and optimize their water use.

HOW DOES IT WORK?

A trunk of an almond tree shrinks during the day as a response to lowering water levels. The more it is stressed, the more it contracts, before replenishing again at night. Phytech's algorithms utilize this shrink-swell mechanism as a tool to quantify water stress.



TRIAL RESULTS

For more than 3 years, Phytech has partnered with UC Davis Cooperative Extensions in a series of irrigation trials held in 3 locations in the Central Valley of California. The studies confirm the ability to accurately detect yield reducing stress on a daily resolution, and establish the connection between the number of seasonal stress days registered by Phytech, and a decrease in yield.

Stress to yield

Harvest results from a 2016 kern county trial showing the relationship between number of stress days and crop yield

"IT'S LIKE AN AUTOMATIC PRESSURE BOMB.."

Stem water potential measurements (SWP), manually taken with a pressure bomb, are proven to assist in irrigation of almonds[4]. However, acquiring the measurement is time and staff consuming. Phytech provides the **plant status** stress indicator, which is highly correlated with SWP.

Plant status is taken automatically every day.

Plant status results go directly to the grower's mobile phone or computer.

Phytech automatically transforms MDS reading into stress alerts and irrigation recommendations.

The plant status indicator takes into account both the daily water stress level and the plant growth, resulting in a more accurate algorithm.

ROI (RETURN ON INVESTMENT)

Phytech enables to optimize irrigation and prevent stress. For example, stress prevention of as little as four (4) stress days during the season leads to about 6% seasonal yield gain.

Typical field parameters

40 ACRE/PLOT x **2,200** BUSHEL/ACRE **2.4** LB/$ x

Possible yield gain for prevention of 3 stress days

6% YIELD OPTIMIZATION = **$12,672** $/PLOT

Possible revenue gain

$316/AC

Phytech's service model cost is a fraction of the grower's savings

4. University of California (UC davis) publication: http://anrcatalog.ucanr.edu/pdf/8503.pdf