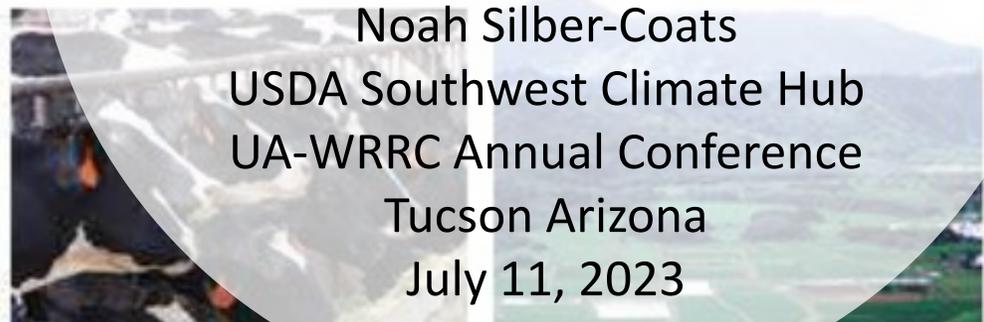




# The Water Adaptation Techniques Atlas (WATA)



Noah Silber-Coats  
USDA Southwest Climate Hub  
UA-WRRC Annual Conference  
Tucson Arizona  
July 11, 2023



**United States Department of Agriculture  
Climate Hubs**



**Mission:** Develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers that enable **climate-informed decision-making**.

**Vision:** Robust and healthy agricultural production and natural resources under increasing climate variability and climate change.

*Three approaches to promote climate awareness and resilient, productive working lands...*



Science and data syntheses



Tool/technology co-development and support



Outreach, convening, and training

# Water Adaptation Techniques Atlas

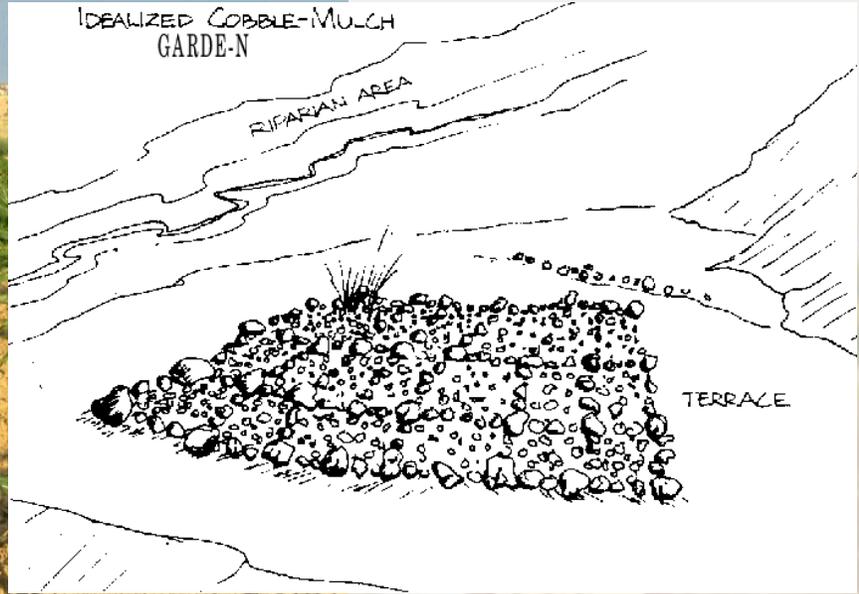
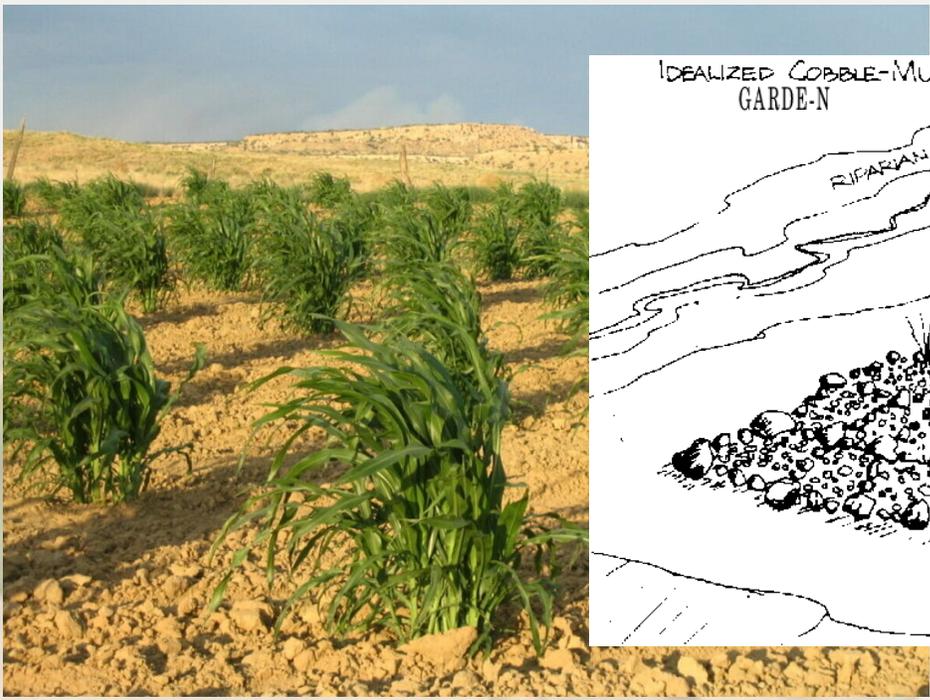
The Water Adaptation Techniques Atlas (WATA) compiles information about responses to water scarcity in the southwestern U.S., presented in the form of case studies. Each case is pinned to a geographic location where the action takes place. To get started, click on a case in the map or use the filter or search tools, above. Please submit suggestions and comments about this tool [here](#).

As the effects of climate change coupled with economic and population growth put increasing strain on water resources in the Southwest, what can be done to adapt? WATA is a resource that helps provide answers to that question. Adaptation to aridity has always been a necessity in the Southwest and the current patterns of growth and development in the region would not have been possible without monumental adaptation. As changing conditions challenge the assumptions upon which the dams and canals of the past century were constructed, new efforts are taking shape at multiple scales to cope with water scarcity. WATA seeks to document these efforts,

## Criteria for cases:

- Concrete management intervention
- Evidence of impact on the hydrological cycle
- Within the region – currently AZ, NM, UT, NV, CA – collaborators here and elsewhere welcome!

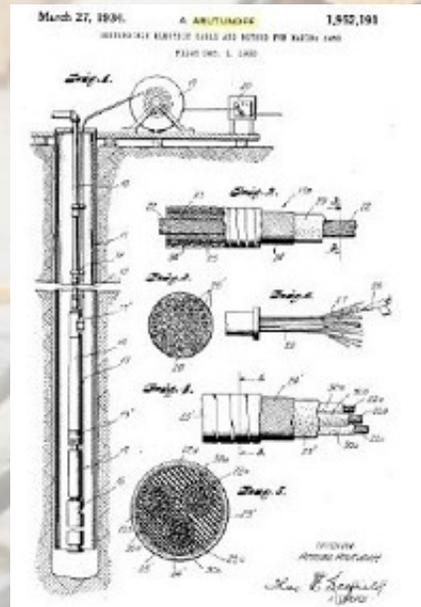




*History of the West is a story of constant adaptation to water scarcity – with a very different relationship to nature in the settler colonial era...*

*“Solutions” also... frame problems  
...create winners and losers  
...can be maladaptive  
...are context-specific*

*WATA collects them all!*





Search bar with magnifying glass icon

CLEAR ALL

Category ⓘ

Crop Choice and Rotation ⓘ

Alternative Crops ⓘ

Crop Shift ⓘ

Fallowing ⓘ

Heritage Crops for Arid Lands ⓘ

Inter-Cropping ⓘ

Plant/Harvest Timing ⓘ

Food Sovereignty/Security

Indigenous/Ancstral Techniques ⓘ

Irrigation Technology and Timing ⓘ

Deficit Irrigation ⓘ

Drip Irrigation ⓘ

Dryland Farming ⓘ

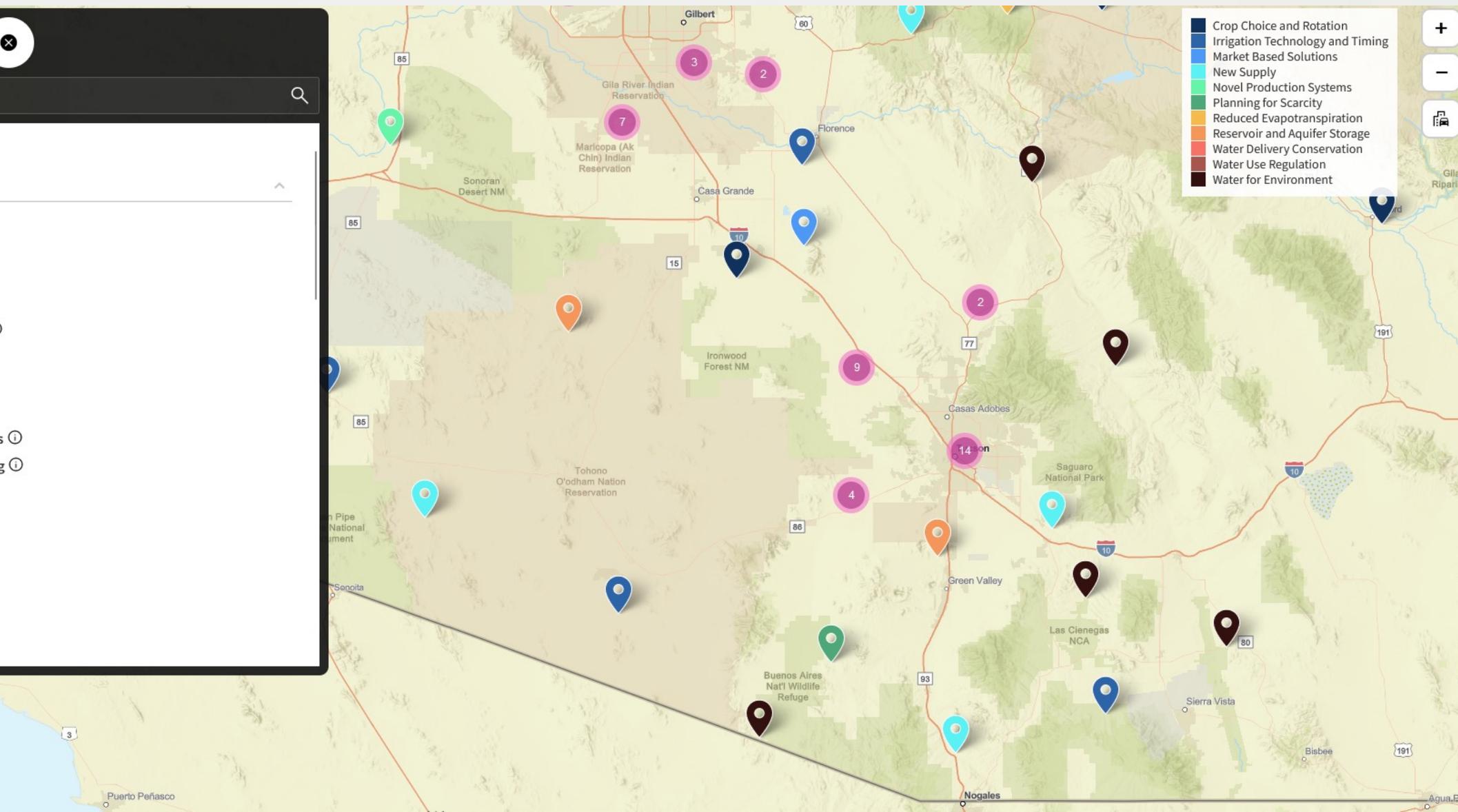
Irrigation Timing ⓘ

Sprinkler Irrigation

Market Based Solutions ⓘ

Water Market or Bank

- Crop Choice and Rotation
- Irrigation Technology and Timing
- Market Based Solutions
- New Supply
- Novel Production Systems
- Planning for Scarcity
- Reduced Evapotranspiration
- Reservoir and Aquifer Storage
- Water Delivery Conservation
- Water Use Regulation
- Water for Environment



# Water Conservation for Irrigated Agriculture





## Cases

60 matches

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**'Seco' Barley - A 'One-Irrigation', Drought-Tolerant Variety**  
Barley developed to produce a crop with minimal irrigation that outperforms commercial varieties under drought conditions.

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**'Solar' and 'Solum' - High-yielding One-Irrigation Barley Varieties**  
Barley varieties developed for minimal irrigation, developing deep roots to produce grain under dry conditions.

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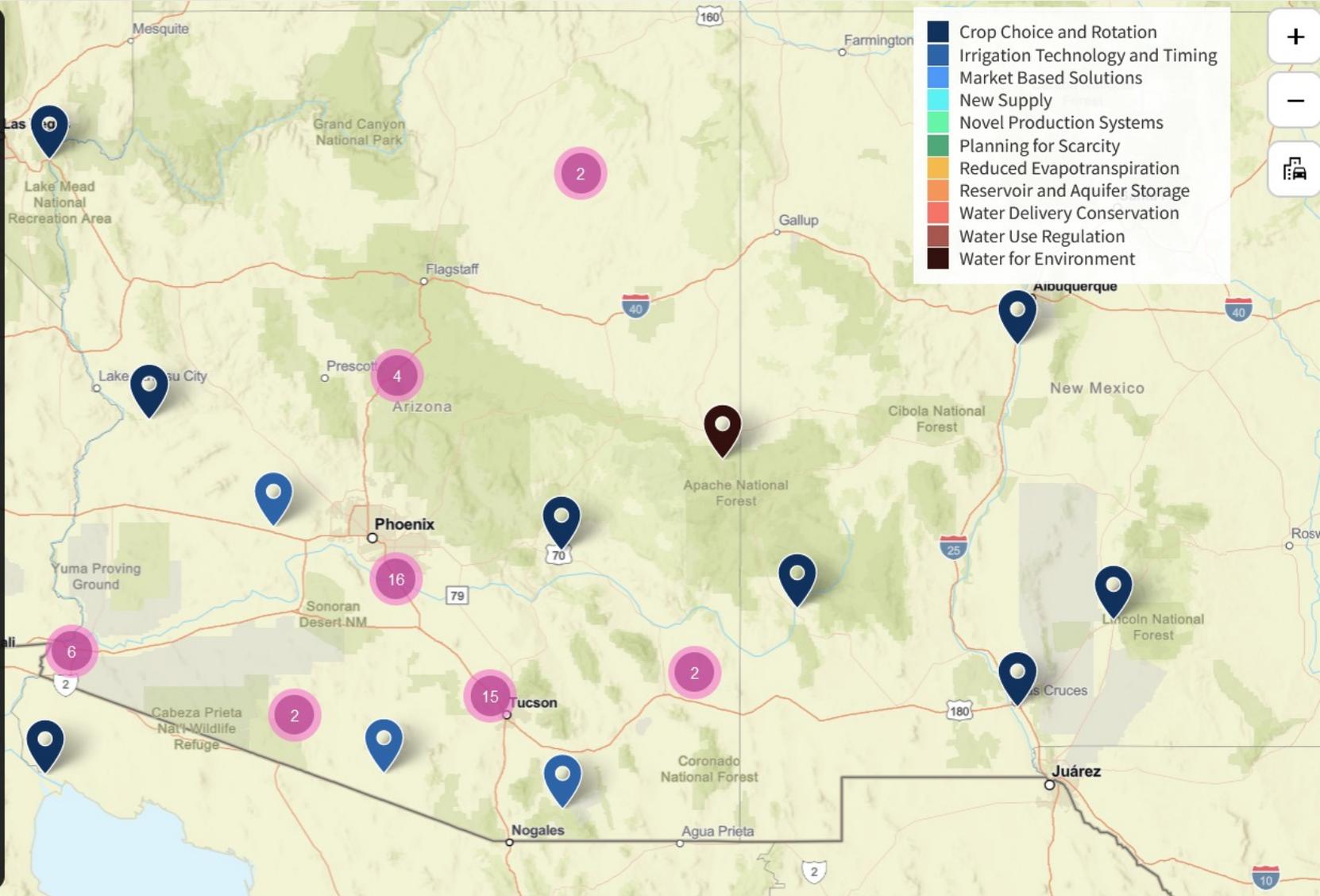
**Agave Field Trials in Arizona**  
A plant with a long history in the Southwest could be an alternative crop for the future.

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**Alexander Pancho Memorial Farm**  
Farm using traditional dryland techniques

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**Barley-Mesquite Agroforestry with Water Harvesting Catchments**  
Inter-cropping of trees and winter grain with compacted rainwater harvesting strips produces two successful crops without irrigation in



# Water Conservation for Irrigated Agriculture

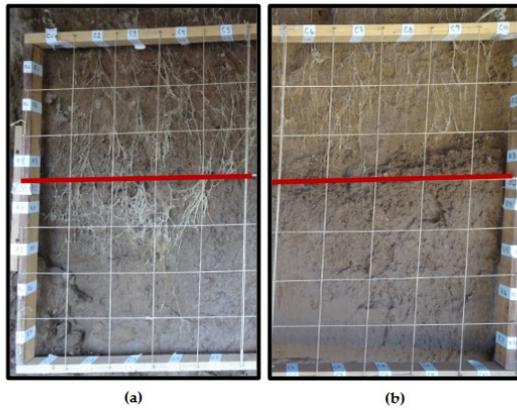


Figure 5. Root profile at physiological maturity (PM) from 50–10 cm under low irrigation treatment in 2018, red line indicates start of caliche layer at 70 cm: (a) “Solar” variety at PM with roots growing through caliche; (b) “Cochise” variety at PM showing root growth stops at the caliche layer.



Figure 5. An experimental planting of Buffalo Gourd. Courtesy of William P. Bemis.



*Clockwise from top left: One-Irrigation barley, buffalo gourd, N-Drip, Soil moisture sensor-based irrigation scheduling, deficit irrigation, liquid nano-clay*

