Use of Soil Moisture Information in **Agricultural Decision-Making: Perspectives from Irrigators** Luke Muller¹, Alissa Meek², Paul Weckler³, Martha Sibley⁴ and Tyson E. Ochsner¹ (1) Plant and Soil Sciences, Oklahoma State University (2) Environmental Science, Oklahoma State University (3) Biosystems and Agricultural Engineering, Oklahoma State University (4) Sociology, Oklahoma State University





What are irrigators biggest concerns about water management and adopting technology to help in decision making?

Interviewed producers in southwest Oklahoma about adoption of soil moisture sensors on their land and other water conservation concerns.

Objectives-

- Collect qualitative data on how farmers make water management decisions.
- Determine how valuable readily available data from moisture sensors are for producers.
- Use gathered information for further direction of extension, research, and resources.



How do we take these concerns and turn them into applicable solutions?

Management decisions are being made based off **past experiences** of the farmers and how much money it **cost** to implement a new system. Most expressed how **valuable** it would be in having the data that the sensors provide. It ultimately was not feasible in their **budget** to make the cost of the probe work in with the rest of the production inputs.

Many suggested that a closer **monitoring of the groundwater and aquifers** should be considered to help area farmers in water application decisions.



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	Concern			Water				
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		enutereque			Limited		o Many C	
					Other Irrigation	Improv		
	Making Decisions					1111212121		
- Contraction Contraction	Personal Experience	Money	Time	Exter				
		Labor			User Friendly			

Figure 1. Color coded topics from all the interviews of most the important issues produces saw in water management and technology.

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PRESENTER:

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BACKGROUND:

Responding to global water availability challenges requires improved water management in irrigated agriculture, and one promising approach is through improved use of technologies such as wireless soil moisture sensors. However, the use of soil moisture information is complicated by factors such as uncertainty or errors in the measurements, spatial variability in the field, the need to know soil water retention properties, and the level of understanding required to properly translate soil moisture values into an indicator of crop water status and irrigation requirement. Oklahoma has 601,492 acres of irrigated cropland that is managed each year in the face economic and environmental pressures. Providing resources for efficiency is crucial for farming longevity.

METHODS

- 1. Conducted interviews with producers in Harmon and Tillman counties in southwest Oklahoma
- 2. Included farmers with and without soil moisture probes installed on their operations.
- 3. The interview guide included questions on technology, conservation, and practices.
- 4. Transcribed interviews.
- 5. Identified nodes, or common themes across the interviews.
- 6. Used NVivo to formulate word cloud and hierarchy chart.



Water management can be improved if accessible, reliable data is available to producers.

"Knowing the accuracy is a concern, and how it translates to the different soil types throughout the field."



"I can see where if we can figure out where our soil profile is with moisture content how we would not have to water as much or we could time it better to start, time it better to finish. It goes back to conserving our water pool. "

"Having enough of it (water). It seems like we're being forced to maintain or do more with less'

RESULTS

Concern		Water			
Water	Efficiency	Training		Resource	Waste
		Soil	Plant		
	Temperature			Limited	Too Many C
				Technology Other Irrigation Impro	Trust
Making Decisions					
Personal Experience	Money	Time	Exter		
	Labor			User Friendly	

- The efficacy of water management technology is the top concern for adopting it into operations for producers.
- Personal experience and money is the driving force for making decisions, not data.
- Water management and conservation is handled on an individual level, with a lack of cooperation when it comes to regional attention monitoring of aquifers or other water resources



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