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Statewide Agronomy Needs Assessment Survey in Arizona

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Summary

A needs assessment survey (NAS) is a vital tool for developing effective research-based extension and academic programs (Mukherjee & Turner, 2025; Caravella, 2006). The Agronomy Program at the University of Arizona conducted a statewide agronomy NAS to identify specific research and extension needs to optimize resource use for crop production across Arizona. The primary objectives of this NAS were to identify growers' challenges in Arizona crop production practices, such as weed management, variety selection, crop rotation, and pest management, and to understand agronomic research and extension services beneficial to Arizona's agricultural growers. The survey was developed in 2025 on the Qualtrics platform and distributed to agronomy stakeholders throughout the state via direct and indirect channels, including newsletters. Participation was voluntary, and responses were gathered over a three-month period. The responses came from individuals actively involved in agricultural production in Arizona. The survey successfully captured responses from a diverse range of agricultural producers across multiple counties and various farm sizes about their agronomic production systems. The survey documented the geographic distribution of growers as well as production characteristics such as farming methods, crop types, and cropping systems followed by the growers. The data revealed that 71 growers responded to the survey, with strong representation from Maricopa, Pinal, Yuma, Cochise, and Pima counties. For questions with multiple categorical responses, proportions were calculated as a percentage of respondents, consistent with standard NAS methodology. The survey suggested that farmers in Arizona practice a range of agricultural methods, including conventional, organic, and integrated livestock

production systems, and grow a variety of crops, including grains, cotton, forage, and specialty crops. The top three challenges in crop production are: 1) Water scarcity, 2) Pest management, and 3) Weather Variability (especially heat stress). Consequently, agronomic research trials, including soil and irrigation amendment, integrated pest management, variety selection, and precision agriculture, could be beneficial to optimizing region-specific production. Finally, the growers are using both digital and traditional platforms to stay up to date on agronomic research, but most prefer to read newsletters or attend field days. This information will be used to guide future agronomy research, outreach, and extension programs designed for Arizona agricultural systems.

Survey Description

Understanding stakeholder distribution is essential for designing targeted educational programs and applied research initiatives in agronomy. This survey gathered insights on challenges and agronomic research needs in agronomic production practices from growers across Arizona. The survey included questions about, location (County), farm size (acreage), operational scale, and regional classification. A total of 71 growers, with significant participation from Maricopa, Pinal, Yuma, and Pima counties, responded to the survey (Figure 1). The survey respondents were categorized in three farm size categories based on their scale of operation: small-scale operations (<100 acres), medium-sized farms (100 –1000 acres), and large-scale commercial farms (>1000 acres). This illustrates the structural diversity within the state's agronomic production systems. Arizona growers operate

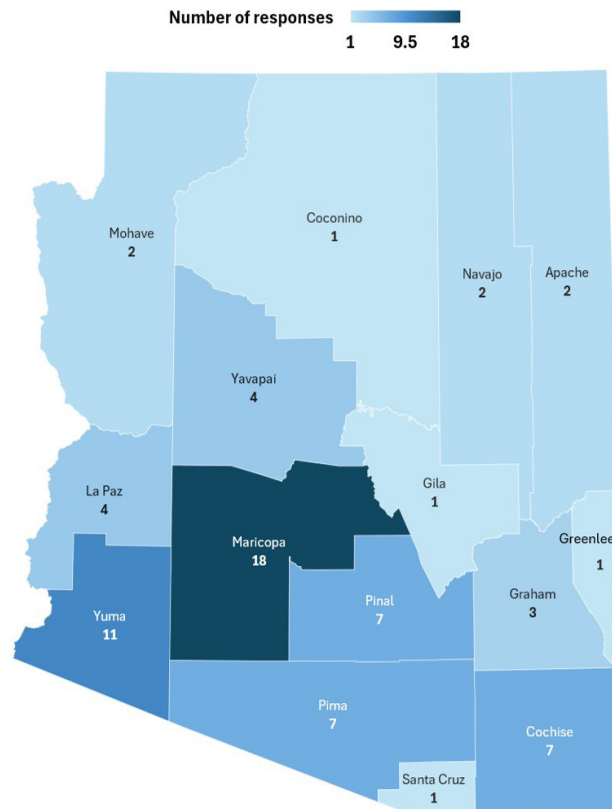


Figure 1: Geographical distribution of survey respondents across 15 counties of Arizona.

across a wide range of production systems, including conventional, organic, and integrated livestock systems, covering grain, fiber, forage, and specialty crops. The survey data revealed strong representation among growers from Maricopa, Pinal, Yuma, Cochise, and Pima counties (Figure 1). The geographic and operational diversity identified in this survey underscores the importance of tailoring agronomy research and extension programs to specific regional production systems. By incorporating stakeholder distribution data into their planning, agronomy programs can enhance effectiveness and impact.

Identification of Agronomic Priority Areas

This survey provided an excellent opportunity to identify key agronomy priority areas for the sustainable production of crops in Arizona. These areas are vital components of modern production systems and should be emphasized in research, education, and Extension programs. The following section summarizes responses to survey questions designed to identify agronomic priority areas and needs.

1. What crops do you currently grow throughout the year?

Survey responses indicate that producers cultivate a diverse range of crops year-round, reflecting Arizona's multi-season agricultural production systems. Major crops include, but are not limited to, grains, fiber crops, forage crops, and specialty crops (Figure 2).

2. What farming methods do you follow?

The survey indicated that Arizona growers employ a diverse array of farming methods, including conventional, organic, integrated livestock production, and small-scale urban farming systems. Among these methods, conventional cropping was the most commonly practiced, as shown in Figure 3.

3. What cropping systems do you follow?

The choice of cropping systems varies based on factors such as region, water availability, and market demand. The survey found that Arizona growers cultivate single and double crops, and some even engage in multiple cropping, particularly in rotation with specialty crops in Yuma, AZ. More than 50% of respondents reported

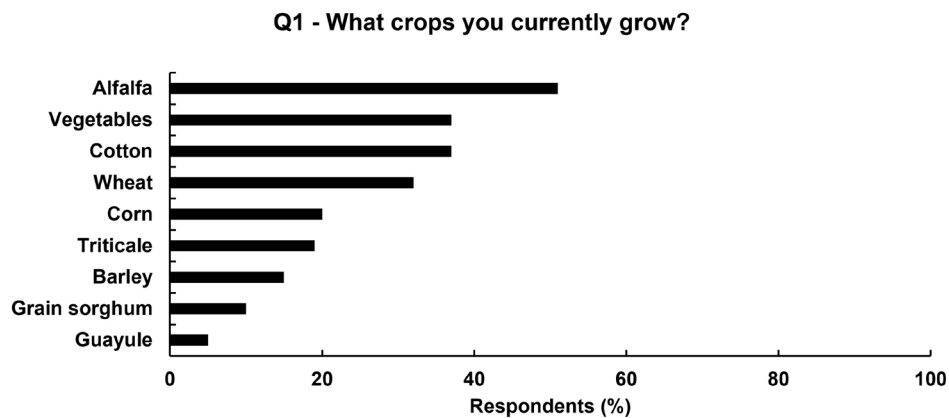


Figure 2. Percentage of respondents by crop type.

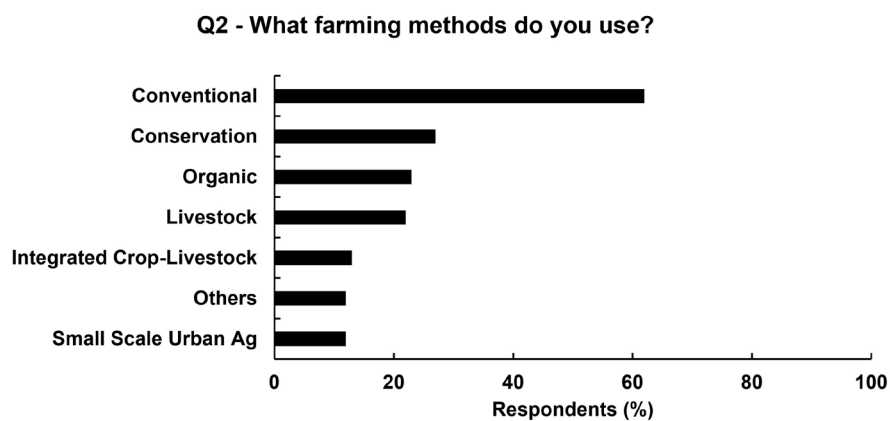


Figure 3. Percentage of respondents by farming methods.

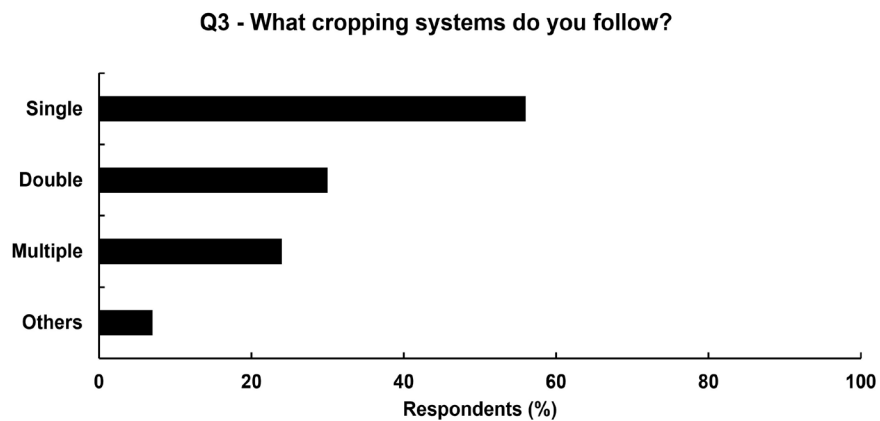


Figure 4. Percentage of respondents by type of cropping system.

Q4 - How satisfied are you with the current farming operation?

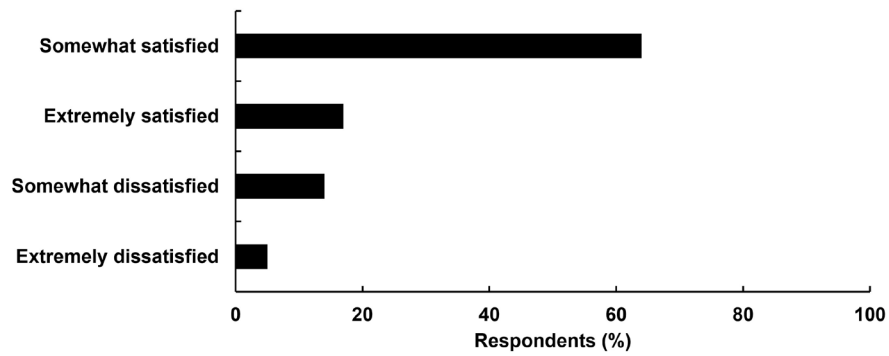


Figure 5. Percentage of respondents satisfied with current farming operation.

Q5 - What are the biggest challenges you face in your farming operations?

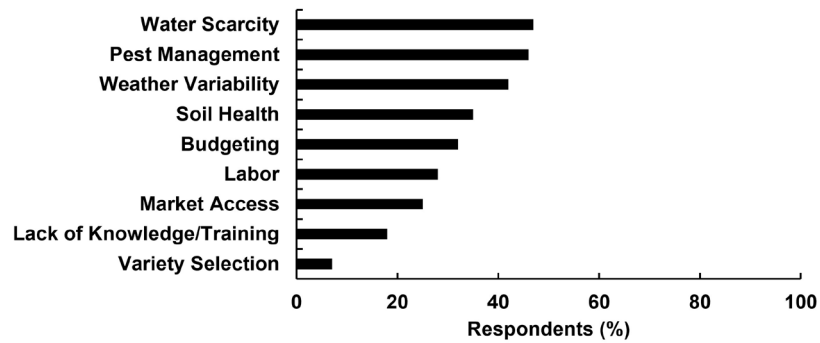


Figure 6. Percentage of respondents facing challenges specific to farming operations.

Q6 - What agronomic research trials could be beneficial for your farming operations?

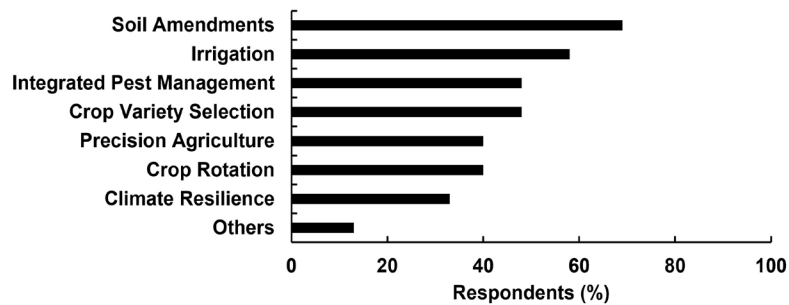


Figure 7. Percentage of respondents by agronomic research trials beneficial to farm operations.

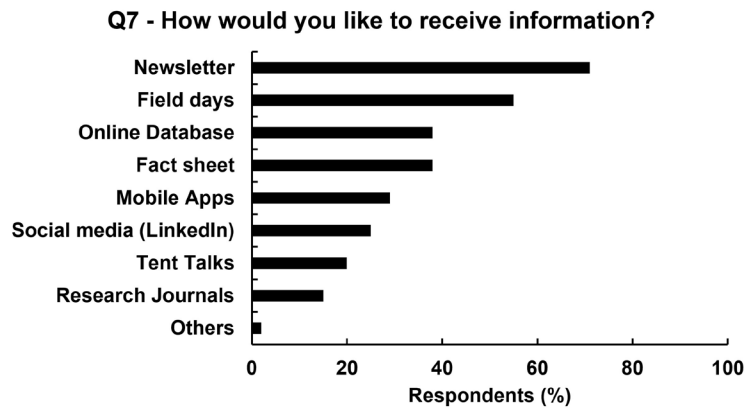


Figure 8. Percentage of respondents by information method.

growing single crops each year, as illustrated in Figure 4. The results suggest that producers are adapting their cropping systems to enhance efficiency and sustainability while maintaining productivity.

4. How satisfied are you with your current farming operation?

About 70% of respondents reported being moderately satisfied with their current farming operations. However, satisfaction levels vary with the scale of operations, profitability, and environmental challenges. Understanding producer satisfaction is crucial for identifying areas where Extension support and technical assistance might be necessary (Figure 5).

5. What are the biggest challenges you face in your farming operations?

The survey has identified several key challenges impacting crop production in Arizona. The three top challenges included water scarcity, pest management, and weather variability (such as heat stress events) (Figure 6). These challenges highlight regional or farm-specific production and underscore the need for research-driven agronomic solutions.

6. What research trials could be beneficial for your farming operations?

More than 30% of respondents indicated that field-based research trials focusing on variety selection and management practices such as soil amendments, irrigation methods, integrated pest management, precision agriculture, and climate resilience would be highly beneficial (Figure 7). The respondents showed a particularly strong interest (over 50%) in trials related to soil

amendments and irrigation. Integrated pest management and crop variety selection were considered the next most beneficial areas. Other research information on seed prices and availability, as well as grazing methods, was also highlighted as beneficial. Access to reliable, research-based recommendations can significantly improve operational efficiency and crop productivity.

7. How would you like to receive information?

Survey results indicate that producers use multiple communication channels, including newsletters, field demonstrations, online databases, factsheets, social media platforms, and research journals (Figure 8). More than 50% of respondents suggested reading the newsletter or attending field days to stay up to date with agronomic research. By combining traditional extension outreach with online platforms, information accessibility and engagement can be improved.

Conclusion

The results of the Statewide Agronomy Needs Assessment Survey provide essential baseline data on the geographic and operational characteristics of agricultural producers in Arizona. Arizona growers engage in a variety of farming practices, including conventional, organic, and integrated livestock production systems, and cultivate crops such as grains, cotton, forage, and specialty crops. Water scarcity has been the most significant challenge to agricultural crop production. Research on irrigation practices, soil amendments, crop varietal performance, pest management, and climate resilience would be highly beneficial for growers in optimizing production practices. Moreover, the findings indicate that a range of Extension and educational tools should be used to ensure the timely

dissemination of applied research findings to target growers. These tools include newsletters, field days, tent talks, social media platforms, and research journals.

Acknowledgments

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