



ENVIRONMENTAL STEWARDSHIP

Water Conservation and Quality

Water conservation and water quality are major issues in the U.S. Population growth, changes in precipitation patterns and increasing demand for industrial, residential and agricultural use are placing additional stress on limited water supplies. Runoff from agricultural lands carries soil and chemicals from pesticides and fertilizers into bodies of water, threatening the ability of aquatic organisms to survive and posing serious human health risks. Land-grant university researchers across the U.S. are exploring innovative ways to conserve water and protect water quality.

SUCCESSFUL EXAMPLES INCLUDE:

- A new modeling tool helps users understand the many interacting variables, costs and outcomes associated with different types and levels of water use in the Middle Rio Grande valley of southern **New Mexico**, west **Texas**, and northern Chihuahua. Requiring no specialized skills to use, the tool could help promote sustainable water use decisions by farmers, cities, homeowners, and others in the region.
- The University of **Georgia**'s mobile irrigation lab performed free irrigation audits for farmers, testing their systems and showing them how to correct inefficiencies to conserve water and save money. The farms audited cover nearly 3,000 acres and could potentially save almost 21 million gallons of water.
- In **Texas**, Prairie View A&M University hosted workshops for research scientists and students on soil moisture sensors installation, calibration, and use. If used correctly, sensors can tell growers when to irrigate their crops and exactly how much water the crops need, helping them avoid wasting water.
- Combined with estimations of daily precipitation and temperature, new measurements of the exact water requirements of turfgrass in **Texas** will help conserve water while still maintaining ideal plant growth.
- A **multistate** team of researchers identified drought-tolerant herbs and demonstrated that water with high sodium can be used to grow zinnias, pansies and poinsettias in greenhouses. Using low-quality or reclaimed water sources and growing plants with lower water requirements has helped growers use less freshwater.
- Education about the importance of water conservation in **Alabama** led to increased rain barrel installation and use. Over 200,000 gallons of rainwater were collected in 2017 and used in local gardening and landscaping.

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- Purposefully flooding agricultural lands in winter, when surplus surface water is often available, could help replenish groundwater supplies before an irrigation season; however, some crops do not grow well with excess water. **California** scientists are testing the suitability of alfalfa fields, almonds and pistachios for winter groundwater recharge and determining appropriate amount, timing and duration of flooding.
- **Oregon** scientists identified cover crops, pollinator crops, water storage systems and soils that favor dry farming, which relies solely on water stored in soils instead of irrigation. Advances in dry farming will help farmers contend with water scarcity and conserve freshwater for other uses.
- To sustain the Ogallala aquifer and the farmland that relies on it, **New Mexico** researchers are identifying crop varieties that use less water and grow well in the region. Stability in production is worth billions of dollars, as it protects rural communities and industries depending on agriculture.
- Research in **Missouri** has shown that well-managed forage systems protect water quality by filtering soil from runoff water before it reaches lakes, rivers and streams.
- **Iowa** State University researchers found that strategic placement of prairie plants in crop fields significantly reduces soil, phosphorous and nitrogen runoff, which are major pollutants of lakes, rivers and streams.
- Harmful algal blooms cost millions of dollars by limiting activities that can take place in waterways, reducing tourism, and contaminating drinking water. To combat this issue, **Ohio** researchers are finding ways to keep excess phosphorous out of waterways and reduce the likelihood of algal blooms.
- Researchers in **Illinois** are evaluating the use of woodchips and fly ash pellets as an effective treatment technology of wastewater contaminated with high phosphorous concentration, which poses a direct health hazard to both humans and animals.

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