

Thirsty crops and hungry people: Symposium to examine realities of water security

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You may have guzzled a half-liter bottle of water at lunchtime, but your food and clothes drank a lot more. The same half-liter that quenched your thirst also produces only about one square-inch of bread or one square-inch of cotton cloth.

Agriculture is in fact one of the world's most insatiable consumers of [water](#). And yet it's facing growing competition for water from cities, industry, and recreation at a time when demand for food is rising, and water is expected to become increasingly scarce. Take irrigation, for example, says Fred Vocasek, senior lab agronomist with the nation's largest crop consulting firm, Servi-Tech, Inc., in Dodge City, KS.

"Irrigation withdrawals in the United States have stabilized since about 1980, but [food consumption](#) trends are following the upward population trend," he says. "In other words, we have an increasingly hungry world with stable, or limited, freshwater supplies for food production. So, how do we keep pace with the widening gap?"

That's the central question behind the symposium, "Green Dreams, Blue Waves, and Shades of Gray: The Reality of Water," being held Sunday, Feb. 17 at the American Association for the Advancement of Science (AAAS) meeting in Boston, MA.

The principal answers, say the symposium speakers, lie in three areas: Protecting our limited stores of freshwater in lakes, streams, and the ground (blue water); optimizing the use of water in crop production

(green water); and reusing "waste" water (gray water) that has already served some purpose, such as food processing or energy production.

But those answers also raise a host of additional questions, says Vocasek, who co-organized the session with John Sadler of the USDA-Agricultural Research Service. Who gets the water from an aquifer when farmers want it for irrigation, a gas company wants to pump it for fracking, or a city hopes to water a new golf course? How do we convince producers to adopt water-conserving technologies and practices when it's not in their economic interest to do so? Why can't farmers simply irrigate less?

The last question is especially complex because of the issue of "virtual" water—the hidden water in food that went into growing it, Vocasek says. If the United States, for instance, decides to conserve water in the Ogallala Aquifer by growing less corn and importing grain from China instead, it's still consuming the virtual water that grew the Chinese corn. And because Chinese farmers use water much less efficiently than U.S. producers, by "trying to save water here, we may actually be wasting water on a global scale," he says.

To portray the full extent of this complicated issue, "The Reality of Water" will begin with three talks on the three types of water—blue, green, and gray—and how they can be best used to ensure both adequate food and abundant water supplies for future generations. After those speakers "paint the picture," Vocasek says, "the next three panelists will put the frame around that picture. Because there are limitations due to economics, there are limitations due to legal and ownership issues. And there are limitations due to day-to-day operations."

For example, restricting water use in certain situations or regions can be a useful approach. But government agencies often can't require landowners to cut consumption, because water rights—the right to divert

water for specific purposes—are property rights in the United States. Reusing [gray water](#) to irrigate crops can also be tricky, because wastewater often carries salts or other contaminants that can damage the soil over time.

Yet another constraint is the large size of the average farm today, which often makes it unattractive for farmers to implement practices, such as cover crops and multi-year crop rotations, that help store water in the soil but take extra time and labor. "You can have a lot of plans," Vocasek says, "but there are practicalities that we deal with, as well."

This is why the symposium includes not only the perspectives of researchers and professors, but also crop consultants and professional agronomists who are "toe-to-toe" with the farmer, Vocasek adds.

"The theory, the research, the data are important, but you've got to have someone to help put it all together, because it can't be done from a university or federal office," he says. "It's got to be done right there on the tractor seat."

Provided by American Society of Agronomy

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