What counts is the water that actually enters plant roots

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To help farmers make the best use of limited irrigation water in the arid West, U.S. Department of Agriculture (USDA) researchers are helping farmers determine how much water major crops actually need.

Tom Trout, research leader of the Agricultural Research Service (ARS) Water Management Research Unit (WMRU) in Fort Collins, Colo., and his colleagues are measuring crop water-use efficiency not by the traditional measure of crop yield per drop of irrigation water applied, but instead yield per drop of water actually taken in by the crop.

ARS is USDA's chief intramural scientific research agency, and the research supports USDA's commitment to agricultural sustainability.

Trout is in the fourth year of a study to determine how much water the four crops common to the High Plains region-corn, wheat, sunflower, and pinto beans-actually use.

Regenesis Management Group, LLC, in Denver, Colo., has signed a Cooperative Research and Development Agreement with ARS to create monitoring instruments and software for a web-based application being designed by the company, known as SWIIM™, or Sustainable Water and Innovative Irrigation Management™. Contributions to SWIIM™ are also provided through a research and development agreement with Colorado State University at Fort Collins.

Trout and his colleagues designed the study to find out if limited

irrigation is best for farmers for each of these crops and to help with irrigation timing, amounts, and other options. The four crops are being grown with six levels of irrigation, from full irrigation down to only 40 percent of full. In the first three years of the study, each acre of land produced about 10 bushels of corn for each inch depth of water consumed, or one pound of corn for each 60 gallons of water.

These results will help farmers in this region decide whether to put all their irrigation water into producing corn, or to reduce either their irrigation levels or the amount of land they plant, and sell or lease water rights on the rest.

These results are preliminary and may vary with different timing of water applications or newly developed varieties.

The scientists plan to extend the results over a wide range of conditions throughout the central high plains.

More information:
www.ars.usda.gov/is/AR/archive/aug11/water0811.htm

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