

# Water Savings Through Conservation Tillage

Gary L. Hawkins, Ph.D., Biological and Agricultural Engineering, Ag Pollution Prevention – Row Crops  
Dana Sullivan, USDA-ARS, Soil Scientist  
Clint Truman, USDA-ARS, Soil Scientist

Through a partnership with the University of Georgia – College of Agriculture and Environmental Sciences, USDA-Agricultural Research Service, USDA-Natural Resource Conservation Service, Soil and Water Conservation Society and Resource Conservation and Development Councils to name a few, research and education programs on water savings through use of conservation tillage continues.

Cotton, corn and peanut production in Georgia covers 2.3 million acres and is a \$867 million business annually. On 30% of those acres, conservation tillage is the preferred method of operation. Conservation tillage is a systems approach that provides benefits such as reduced fuel usage, improved soil quality, and reduced erosion. But perhaps one of the most important aspects, *water savings*, is often overlooked. Considering that 49%, 55% and 75% of cotton, corn and peanuts receive irrigation, conservation tillage can save a significant amount of water and energy statewide. Conservation tillage systems, through the use of cover crops and reduced tillage, increases water infiltration by as much as 30 to 45% compared to conventional tillage systems for loamy sand and sandy loam soils. This means less water is running off fields and into waterways, which may carry agrochemicals.

Increased infiltration in any soil type is beneficial to the farmer because it reduces the amount of water that needs to be applied via irrigation. In dryland systems, increased infiltration may have an even greater impact on expected yields. Increasing infiltration is particularly important in the Coastal Plain, where sandy, drought-prone soils are common.

Statewide, as conservation tillage increases, the potential for water savings is estimated to increase as follows:

- 30% adoption (current rate) ---- 3 – 12% water savings
- 40% adoption ---- 5 – 18% water savings
- 100% adoption (full adoption) ---- 12 – 46% water savings

*Results are a function of management – para-tillage, strip-tillage with residue removed, strip-tillage with residue remaining or no-till. Savings are calculated based on estimated water use in 100% conventional tillage adoption.*

At current rates of conservation tillage adoption (30% adoption) and based on published data, water savings on **COTTON** acres amounts to **4.4 billion gallons annually** (*numbers for corn and peanuts would be 0.3 and 1.0 billion gallons*). The values for cotton were calculated using the following assumptions (2004 data):

- 1,300,00 acres of planted cotton in Georgia (Georgia Agricultural Statistics, 2004)
- 30% adoption rate of conservation tillage in Georgia (Conservation Technology Information Center)
- 41.5% of the cotton is irrigated (Kerry Harrison, 2005)
- 1 irrigation application saved per growing season (1 inch per application) (Truman and Rowland, 2005)
- 27,154 gallons per acre-inch of water

This information along with calculated values for 40% and 100% conservation tillage adoption can be seen in Figure 1. The values for 40% adoption represent a small increase in the number of acres as compared to current adoption rates. The 100% adoption rate was calculated to provide a benchmark number for comparison purposes.

Another way to look at the amount of water saved by agricultural producers using the current adoption rate for conservation tillage is by putting it in terms of water used (based on average daily consumption (USGS, 2000)) for various cities:

Atlanta	3 months – 1 year
Macon	1 – 3 years
Savannah	1.5 – 6 years

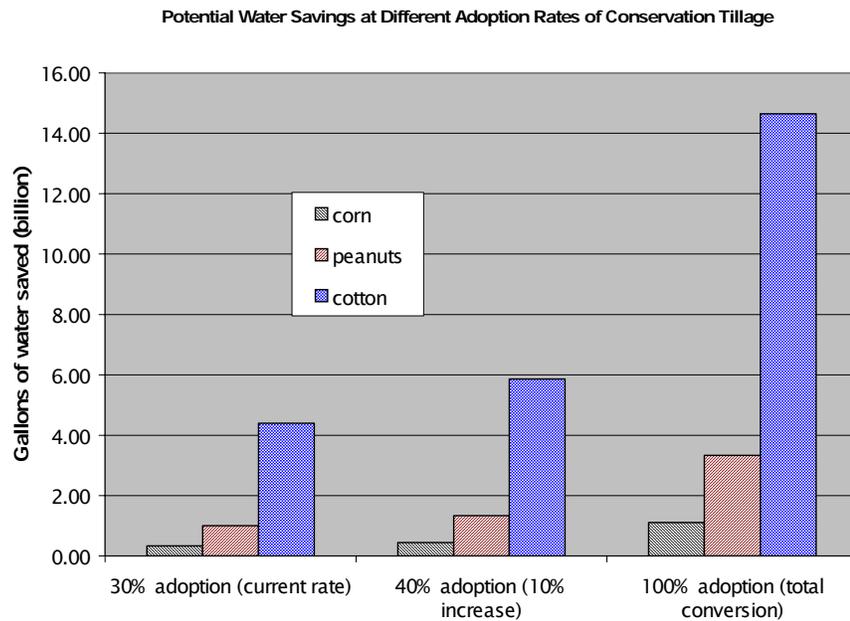


Figure 1. Graph to be used for comparing different adoption rates of conservation tillage and the potential water savings associated with each.

This information is presented to highlight current and potential water savings through the use of conservation tillage systems. Additionally, the information is presented to inform you that there is a strong partnership between Local, State and Federal agencies addressing the issue of water savings in the agricultural community.

If you have further questions on issues such as cover crops, tillage, how-to's or other aspects of Conservation Tillage or Water Savings please contact Dr. Gary L. Hawkins, UGA Biological and Agricultural Engineering – Tifton, 229-386-3914, Dr. Dana Sullivan, USDA-ARS, Tifton, 229-386-3665, Dr. Clint Truman, USDA-ARS Tifton, 229 386-7174, your local UGA Extension Agent (1-800-ASK-UGA1) or NRCS Agent.

**References:**

- Georgia Agricultural Statistics. 2005. Georgia Agricultural Facts, 2004 Edition.
- Harrison, K. 2005. A memo addressed to County Extension Agents concerning 2004 Irrigation Survey.
- Truman, C.C. and D.L. Rowland. 2005. Conservation Tillage to manage water and supplemental irrigation in Georgia. Proceedings of the 2005 Georgia Water Resources Conference, held April 25-27, 2005, at the University of Georgia. Kathryn J. Hatcher, editor, Institute Ecology. The University of Georgia, Athens, GA.

