

Cultivating corn in clumps increases water efficiency, yield



Cornfields in the Texas High Plains may look a little different in the future if research findings by a group of scientists are adopted by farmers.

This group is discovering that planting corn in clumps instead of the traditional rows increases water use efficiency and corn yield.

Researchers are Dr. B.A. Stewart and graduate student Mohankumar Kapanigowda of West Texas A&M University in Canyon, and Drs. Terry Howell, Louis Baumhardt, and Paul Colaizzi of the Conservation and Production Research Laboratory (CPRL) in Bushland, which is a unit of U.S. Department of Agriculture's Agricultural Research Service.



Researchers have discovered that corn grown in clumps (left) rather than in traditional rows (right) increases water use efficiency and corn yield.

Saving agricultural water in the Texas High Plains is a high priority, as the main source for its water is the Ogallala Aquifer. The portion of the aquifer that extends from Texas up to western Kansas is declining at a relatively rapid rate with depletion of 1- to 3-feet per year with very little recharge.

The group has previously determined that planting grain sorghum in clumps produces significantly more grain because less water is used to produce vegetative growth during the early growing season. This leaves more soil water available for the reproductive and grain filling periods.

Now, they are studying corn.

Stewart, director of West Texas A&M's Dryland Agriculture Institute, said that under very limited water conditions, plant populations of corn must be low.

"At low populations, tillers, or plant side shoots, often form at the beginning of corn's growing season," Stewart said. "When harsh summer conditions arrive, these tillers are often aborted but the moisture and nutrients they used are lost. We have found in our research, as yet unpublished, that clump planting reduces the number of tillers. This

reduction means more moisture and nutrients are available late in the season to serve the main ear."

In one study conducted during 2007 at the Bushland research lab, Kapanigowda planted corn in clumps spaced 40 inches apart and in traditional rows spaced equidistant. He used two irrigation methods: low-energy precision applicator (LEPA) and low-elevation spray applicator (LESA). The three irrigation rates he used were dryland, 2 inches, and 4 inches.

The results showed that clump planting in groups of three reduced the tillers, which conserved more soil water until it was needed for producing grain.

"With clump planting, there was an 11 percent increase in grain yield compared to equidistant plants under dryland conditions," Stewart said, "but no benefit with 2 and 4 inches of irrigation."

This research is part of the federally funded Ogallala Aquifer project, a joint project of U.S. Department of Agriculture's Agricultural Research Service, Texas AgriLife Research, Texas AgriLife Extension Service, West Texas A&M, Texas Tech University, and Kansas State University. 💧