



USDA-CSREES 2007 National Water Quality Conference

[Rainfed Cropping Systems to Improve Drought Tolerance for the High Plains](#)

Droughts are frequent in the High Plains. Nebraska records show 21 drought periods of 5 or more years in length in the years from 1220 to 1952. Today Nebraska is facing a drought and a depleting aquifer that is forcing farmers to find more water efficient ways to produce crops. Some land that is now irrigated may have to return to rainfed or limited irrigation. Also, a large number of cropland acres in the High Plains will always be rainfed. The winter wheat fallow system was developed to compensate for the low precipitation in the high plains. Fallowing with tillage that buried most crop residues was replaced with tillage which left residues on the soil surface. Residue on the soil surface helps protect the soil from wind and water erosion. This stubble mulch let more rain and snow soak into the soil to increase the soil water thus increasing efficiency. The crop residue also reduced soil temperatures to reduce evaporation of water from the soil. The fallow period, which is from 13 to 15 months in the winter wheat fallow rotation, is only able to save 20-30% of the precipitation received during this time. Research to shorten the fallow period and increase water use efficiency both during the fallow period and in crop period led to developments such as conservation tillage, ecofallow, no-till, controlled traffic and skip-row. Most of the successful rotations for rainfed cropping systems in the High Plains begin with producing a good winter wheat crop. Systems for rainfed land which include a winter wheat, skip-row corn, skip-row corn fallow rotation will be discussed in this paper along with systems to increase water use efficiency for irrigated land.

Author: Robert N. Klein

University Affiliation: University of Nebraska

Co-Author(s): Jeffrey A. Golus, Roger W. Elmore, Stephen C. Mason, M. F. Vigil, A. J. Schegel, Alex Pavlista, Charles Shapiro, David Baltensperger, Drew Lyon, Stevan Knezevic, and Mark Benards