7-19-2006

Groundwater Irrigation Management Under Variable Risk Preferences

Jeffrey M. Peterson
Kansas State University

Abstracts of presentations given on Wednesday, 19 July 2006, in session 24 of the UCOWR Conference.

GROUNDWATER IRRIGATION MANAGEMENT UNDER VARIABLE RISK PREFERENCES

Jeffrey M. Peterson, Assistant Professor, Department of Agricultural Economics, 216 Waters Hall, Kansas State University, Manhattan, KS 66506, 785-532-4487, 785-532-6925, jpeters@agecon.ksu.edu
Sreedhar Upendram, Graduate Research Assistant, Department of Agricultural Economics, 342 Waters Hall, Kansas State University, Manhattan, KS 66506, 785-532-6709, 785-532-6925, sreedhar@agecon.ksu.edu

Groundwater is a scarce resource with competing demands – drinking, irrigation, industrial and recreational uses. Irrigation is by far the largest demands of groundwater among the competing uses. The groundwater supplies are declining at an alarming rate in Western Kansas because more water is pumped out than the water recharge rate. Crops undergo water-stress due to water deficiency which might affect yields. Optimal irrigation scheduling is a viable solution to maintain soil moisture level above permanent wilting point, avoid unnecessary irrigation events and conserve water for alternative uses. This paper is aimed at evaluating the downside risk of crop returns using irrigation scheduling under variable well capacities, soil moisture and risk preference levels. For the purpose of analysis, alternative crop irrigation schedules would be devised for varying well capacities and soil moisture levels using KanSched model developed by K-State Research and Extension. The irrigation schedules would be used to compute yields and net returns using the Kansas Water Budget model developed by Loyd Stone et al. The net returns would be examined under varying risk preference levels to reduce the downside risk of crop returns under conditions of water stress. The results from this analysis would be helpful in maintaining the optimum soil moisture levels to maximize yields and net returns to the farmers. Farmers would be afforded a valuable tool to address the issues of timing the irrigation events, optimal amount of irrigation, and maximize the use of groundwater resources available under varying risk preferences.

Contact: Jeffrey Peterson, Assistant Professor, Kansas State University, jpeters@agecon.ksu.edu, Department of Agricultural Economics, 216 Waters Hall, Kansas State University, Manhattan, KS 66506, 785-532-4487, 785-532-6925