



USDA-CSREES 2006 National Water Quality Conference

Irrigating with Limited Water Supplies

Irrigation management involves commitment of substantial time, capital, labor, equipment, and water. Lack of any of these resources can mean the difference between profit and loss. Drought throughout much of Montana and the Northern Plains and Mountains region has caused water supplies to become increasingly inadequate to satisfy crop needs during the entire irrigation season. Thus, this project seeks to provide irrigators with a user friendly, regionally applicable publication containing practical, low cost strategies to help achieve highest possible economic returns with limited water. Such strategies include fine tuning irrigation scheduling, capturing and storing precipitation, and growing crops well suited to limited irrigation. While the first two strategies are important in stretching water supplies, primary emphasis of this publication is placed on analyzing commonly irrigated determinate, indeterminate, and forage crops in terms of individual water use characteristics and effective management strategies to maximize their production.

Determinate crops, including wheat and sunflower, have fixed growth periods and are relatively insensitive to moisture stress during early vegetative stages and highly sensitive during seed formation. Indeterminate crops, such as potatoes and sugarbeets, have season-long, cumulative yield production and, therefore, can endure 4-5 day periods of moisture stress throughout the growing season. Because of their long growing season, determinate crops require more water than indeterminate crops. Perennial forage crops generally have deep, well-established root systems. Thus, they capitalize on early season moisture and generally withstand moisture stress better than determinate and indeterminate crops.

Considering these water use characteristics, irrigators are encouraged to substitute low water requirement crops for high requirement crops, choose crop varieties short in stature, and split fields between low and high water requirement crops or early and late season crops. While drought poses many challenges to irrigators, these strategies can help ease the burden of limited water supplies.

Author: Amber Kirkpatrick

Coauthor(s): Linzy Browning, Montana State University James W. Bauder, Montana State University Reagan Waskom, Colorado State University Matt Neibauer, Colorado State University Grant Cardon, Utah State University