impact
of the College of Agriculture and Life Sciences

*Competitive Agricultural Systems in Global Economy*

# Soil Water Depletion Levels for Irrigation Wheat and Barley

## Issue

The generally accepted soil water depletion level for irrigating wheat and barley is when 50 pecent of the plant available water in the root zone is depleted. This critical depletion level has not been verified in Arizona. The optimum soil water depletion level should be derived from grain yield, water cost, and associated production costs on a local level.

## What has been done?

University of Arizona researchers have studied the relationship between soil water depletion and wheat and barley yield for two years at Maricopa Agricultural Center and for one year for wheat at a commercial farm near Stanfield, AZ. This research has been reported in several publications and newsletters.

## Impact

The highest grain yields were obtained at 35 percent depletion of plant available water in the soil. However, this increased grain yield of about 800 lbs / acre is produced with the cost of an additional two irrigations compared to irrigating at 50 percent depletion and of an additional 35 lbs N / acre required in wheat to maintain equivalent grain protein levels. Assuming current grain prices and water costs, irrigating at 35 percent depletion is economically advantageous only where water costs are low, such as along the Colorado River. In the counties along the Colorado River (ie., Yuma, La Paz, and Mohave) irrigating at 35 percent rather than 50 percent depletion would generate about an additional $2 million in income.

***Funding***
Arizona Grain Research and Promotion Council

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