MEMORANDUM

TO: Water Resources Commission

FROM: Paul R. Cleary, Director

SUBJECT: Agenda Item L, May 21, 2004
Water Resources Commission Work Session

Principles and Application of Irrigation Optimization

I. Issue Statement

Marshall English, Professor, Bioengineering Department, Oregon State University, will provide an overview of a federally-funded pilot project to provide advisory service to Oregon farmers interested in applying the principles of irrigation optimization. Professor English will describe this new approach to irrigation management that focuses on maximizing net economic returns rather than the traditional approach which seeks to maximize crop yield. *This is an informational report only; no Commission action is required.*

II. Background

Conventional irrigation practices are designed to avoid crop stress in order to maximize yields. Professor English predicts that, during the next few decades, the expansion of irrigated lands for increased food production, accelerating economic competition for water, and increasing environmental concerns, will lead to a shift from traditional irrigation management approaches to a new approach that maximizes net economic returns rather than yields. Research indicates that profit-maximizing strategies may increase net farm incomes by 5 or 10 percent above the profits realized by conventional irrigation, and sometimes much more when water supplies are limited. Additionally, this approach may substantially reduce environmental costs of irrigation.

This alternative approach, which might be referred to simply as "optimization," is recognized by economists and a growing number of irrigation professionals as the most rational basis for irrigation management. Many individual farmers, seeing the potential advantages of this approach, have attempted to develop optimum irrigation strategies on their own; but they have had little guidance from the scientific, economic or engineering communities. In fact, at present, there appear to be no educational or outreach programs providing advice on irrigation optimization for working farms anywhere in the world.

The presentation will outline the principles of irrigation optimization and the application of these principles for profit maximization. It will then address the need for advisory services to assist farmers with this fundamentally different approach. The objective of maximizing net economic returns implies an altogether different approach to irrigation management. While maximizing yields implies full irrigation, maximizing net returns implies deficit irrigation, the deliberate under-irrigation of a crop. The challenges associated with this approach and the limited efforts to apply the principles of optimization under real-world conditions will be discussed. A federally-funded pilot project to initiate a formal structured advisory service for Oregon farmers interested in adopting this approach will also be described.

III. Recommendation

This is an informational report. No Commission action is required.

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