Western Coordinating Committee Petition

NUMBER: WCC-XXX

TITLE: Climatic Data Applications in Irrigation Scheduling and Water Conservation

DURATION: October 1, 2000 - September 30, 2005

DESCRIPTION AND JUSTIFICATION:

Climate data collected by federal, state, and local governments is typically distributed by the state climatologist and the federal government. An existing western coordinating committee (WCC-102) coordinates the collection and dissemination of this weather and climate data in the western U.S. and one of the objectives is to promote application of weather- and climate-based products in agricultural and natural resource management. However, most of the emphasis in the past has been in the area of Integrated Pest Management.

Irrigation scheduling models that use climate data have been developed by a group of individuals that are usually separate from the state climatology group. It is essential these groups coordinate so that the format of the climate data needed by the irrigation scheduling models are compatible with the format of the data available from state climatologists. Typically, irrigation scheduling models using climate data do not readily input data from outside the state where the model was developed. Models may not accept climate data from other states unless the state climatologist provides a conversion program, which is not one of the objectives or expertise of the state climatologist. Consequently, to conserve manpower resources, it is essential that there be coordination among the developers of irrigation scheduling models to make them easily adopted in all states.

Irrigators tend not to use climate based irrigation scheduling models, possibly because of a lack of user friendliness of the models, lack of trust in the basic assumptions behind the models, and a lack of economic reward perceived by the irrigators if they were to take the time and effort to learn how to use the models. Coordination of extension efforts on the use of the irrigation scheduling models could result in the development of more user friendly models and a better diffusion method of the technology to increase farmers use of irrigation scheduling models.

Coordination of on farm demonstrations that verify that the use of irrigation scheduling model can increase irrigation efficiency and yields by proper timing and application of irrigation water could result in increased use of these models and increased water conservation. This is especially important in the conversion to improved irrigation systems, which have the potential to increase yields and irrigation efficiency, but only if farmers know how to manage the system through some form of irrigation scheduling. Currently, climate based irrigation scheduling models are the most effective way to schedule irrigations.

Climate based irrigation scheduling models do not all use the same reference evapotranspiration equation nor do they all use the same growing degree cutoff temperatures when developing crop coefficients to reduce reference evapotranspiration to actual evapotranspiration. Consequently, it is difficult to use crop coefficients developed for one irrigation scheduling model in another irrigation scheduling model. Methods need to be adopted to allow conversion of crop coefficients developed for one model for use in another.

OBJECTIVES:

1. Coordinate the development of delivery methods for the dissemination of climate based irrigation scheduling.
2. Coordinate the identification of existing climate-based irrigation scheduling methods or tools.
3. Coordinate the acceptance of a standardized reference evapotranspiration equation.
4. Coordinate the identification and documentation of crop coefficients used in irrigation scheduling and the method by which coefficients are moved forward in time (accumulated heat units, % crop cover, time, etc.).

EXPECTED OUTCOMES: (Note: states and agencies with responsibilities in a particular task are shown in parentheses below, following each expected outcome).

From Objective 1:

1. Develop a listing of effective methods to disseminate climate-based irrigation scheduling. (all states)
2. Evaluate effectiveness of delivery methods (develop baseline). (all states)
3. Develop an Internet site for the coordinating committee and report findings on the Internet and through other sources. (all states)
4. Evaluate the use of Internet video programs that record the steps to use a computer model as a tutorial to increase the use of computer based irrigation scheduling models. (NM)
5. Coordinate the development of a standard climate format that will be used by all irrigation scheduling models and generated by all state and federal climate programs. (NM, AZ)

From Objective 2:

1. Develop an inventory of irrigation scheduling models through a survey of all states and coordinate with the states to post the irrigation scheduling models on the Internet site. (all states)
2. Coordinate with the Irrigation Association Water Management committee to inventory irrigation scheduling models available from private industry. (all states)
3. Develop a list of the different methods of scheduling irrigation using climate data based on the inventory and evaluate results of using the different methods. (all states)
4. Report the results of the inventory and evaluation on the committee's web site. (all states)

From Objective 3:

1. Coordinate with American Society of Civil Engineers Evapotranspiration committee to centrally house standardized reference evapotranspiration equation. (all states)
2. Coordinate comparison of Et values computed by programs as implemented by states and private industry to the standardized equation and make findings available on the Internet and other sources. (all states)

From Objective 4:

1. Coordinate with American Society of Agronomy (ASA), American Society of Agricultural Engineers (ASAE), and American Society of Civil Engineers (ASCE) to develop an inventory of crop coefficients. (all states)
2. Develop a database on the committee's Internet site that allows for the retrieval of crop coefficients sorted by crops, equation formats, time basis, and relationships to different reference evapotranspiration equations. (all states)
3. Coordinate the evaluation of different cutoff temperatures for calculating growing degrees days as a heat unit time base. (NM, AZ)
4. Coordinate the development of relative maturity factors for different crops that can be used to scale crop coefficients from one variety to another variety having a different maturity class. (NM)

EDUCATIONAL PLAN:

Many of the participants serve on committees of ASAE, ASCE, Crop Consultants of America (CCA), and the Irrigation Association (IA). It is not possible for everyone to attend and keep abreast of all the activities being conducted by these organizations connected with irrigation scheduling. One of the major foci of WCC-XXX will be to have a session at each meeting that conveys to the group the activities in these other organizations and coordinates the activities among these groups. Another purpose of WCC-XXX is the on-going education of its participants regarding the activities on the web connected with irrigation scheduling.

Specifically, WCC-XXX will:

1. Have an in-depth education session at each annual meeting about different aspects of irrigation scheduling, educational material, and software.
2. Coordinate the development of effective documentation of irrigation scheduling information available through the web.
3. Coordinate the dissemination of information developed by committee members through newsletters, faxes, press releases, magazine articles, etc.
4. Coordinate the development of short course information on irrigation scheduling using climate data that can be used by IA, CCA, irrigation districts, and public schools.

PARTICIPANTS:

Appointment / State	Expertise Area	Research	%Extension	%Teaching
(Admin. Advisor J.J. Jacobs) University of WY				
Ted Sammis New Mexico State University (NM)	Irrigation Mgt	75		25
Edward C. Martin University of Arizona	Irrigation Mgt	25	75	
Harold R. Duke USDA-ARS-NPA AERC-CSU	Water Mgt	25	75	
Gerald W. Buchleiter USDA-ARS-NPA AERC-CSU	Water Mgt	50	50	
Dale F. Heermann USDA-ARS-NPA AERC-CSU	Irrigation Engineer	100		
Tom L. Spofford USDA-NRCS Portland, OR	Irrigation Engineer			
Peter Palmer US Bureau of Reclamation	AgriMet Program Coordinator			
Hall Werner South Dakota State University (SD)	Irrigation Engineer	20	60	20
Mahbub Alam Kansas State University	Extension Irrigation Engineer	100		
Tom Scherer North Dakota State University	Extension Irrigation Engineer	100		
Bart Nef Campbell Scientific Inc.				
Brian Correiar Adcon Telemetry, Inc				
Joe Henggeler University of Missouri	Extension Irrigation Engineer	100		
Terry Howell USDA-ARS-CPRL	Agriculture Engineer			
Steve Evett USDA-ARS-CPRL	Soil Scientist			

The participants of the WCC-XXX shown above, represents a wide variety of backgrounds and responsibilities. Included in this group are one state climatologist, and seven Cooperative Extension Service personnel. The committee is nearly evenly split between CSREES employees and those working for other federal agencies.

OPERATIONAL STRUCTURE:

One officer will be elected each year. A chairman, who develops the agenda and leads the annual meeting and a recording secretary who prepares the minutes and the annual report, and becomes the chair the following year.

SIGNATURES:

Administrative Advisor — Date: 5/17/00

Chair, Western Director's Association — Date: 8-15-00

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