Alberta Irrigation Management Model (AIMM)

Alberta
AGRICULTURE, FOOD
AND RURAL DEVELOPMENT
IRRIGATION BRANCH

The Alberta Irrigation Management Model (AIMM) is a software package to help producers in their irrigation scheduling decisions. The model requires as input: field size; type, capacity and operation schedule of irrigation system; crop being grown; planting date; meteorological inputs; soils information; root zone of crop; management allowed depletion and daily irrigation amounts. Outputs can be displayed in graphical or tabular format and both can be either printed or saved to disk.

The model uses the ASCE standardized evapotranspiration equation for calculating reference evapotranspiration.

The necessary meteorological data for determining evapotranspiration can either be obtained from the nearest meteorological station or a user may enter his/her own meteorological text file.

Available water holding capacity is based on the bucket concept with the root zone divided into two storage compartments. During an irrigation or rainfall event, the upper half of the root zone fills before input water moves into the lower half of the root zone. Once the entire root zone profile is filled to field capacity, the excess input moisture is considered deep percolation.

Soil hydrologic properties (field capacity, wilting point, available water holding capacity) are based on soil texture. Site-specific values for soil hydrologic properties can be used when available. Root zone soil textural layers can be incremented at as fine of a resolution as data is available.

Field runoff can occur during rainfall events when the rainfall intensity exceeds the steady state infiltration rate of the soil. Steady state infiltration rate is determined from pedotransfer functions using near surface soil texture. No field runoff is generated from irrigation events. The assumption being that the irrigation system is designed to apply water at or below the steady state infiltration rate of the soil.

Minimum system requirements: Windows 95, 486DX, 16Mb of RAM and 5Mb of hard disk space. More enhanced systems would increase the operational speed.

Outputs:

1. Key Output From AIMM:

1) Graphical and tabular reports of daily "year to date" soil moisture conditions, evapotranspiration (crop water use), climate data, irrigation application amounts, surface run-off and deep percolation for any number of fields or sites within fields.
2) Predictive assessment on crop water requirements and irrigation timing for designated near-future time periods.

2. Optional Output From AIMM:

1) Record keeping for crop production information such as fertilizer and chemical use, seeding rate, crop yields, pumps and pumping record information, irrigation application and rainfall.