



Irrigation Scheduling Tools

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Irrigation Fact Sheet #3

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Knowing when to turn on the irrigation system is the main concept of irrigation scheduling. All irrigators use some system for scheduling irrigation. Checkbook irrigation scheduling and soil moisture monitoring are two common types of gathering information to improve irrigation scheduling decisions.

Checkbook method of irrigation scheduling follows the concept that the soil in your field is like a bank checking account. Rain fall and irrigation applications are deposits into the checking account. Daily water removal from evaporation and transpiration (evapotranspiration or E.T.) from the field and crop would be considered withdrawals from the account. The soil as a bank has a draw back in that there is a maximum amount of water that can be held in the account. Water added to the soil beyond the soil's water holding capacity is lost to the aquifer below.

Four different checkbook irrigation scheduling tools are available through MSU Extension that will adapt to irrigation in the Michiana area.

Irrigation Scheduling Checkbook Method – University of Minnesota is an Extension bulletin that explains basic concepts of irrigation scheduling and incorporates them into a paper system that provides support and recordkeeping. This method will provide accurate results in all of Michigan and Indiana. Crop specific E.T. values are taken from a table incorporating daily high temperature and stage of plant growth for weeks after emergence. The bulletin is available through the University of Minnesota or from the web link listed below select "Irrigation" on the left hand side: <http://www.msue.msu.edu/stjoseph>

Michiana Irrigation Scheduler is a simple computerized irrigation scheduling **checkbook model** from the Agronomy Department of Purdue University. This method will provide accurate results throughout Michigan and Indiana. Crop specific E.T. values are estimated from the daily high and low temperatures provided by the producer. **Michiana Irrigation Scheduler** is available from: www.agry.purdue.edu/irrigation/IrrDown.htm

Irrigation Scheduler V 4.0 is a product of the Enviro Weather Program at MSU. This web based tool pulls data from a network of 58 strategically located Michigan weather stations (Michigan Automated Weather Network, MAWN). This method will provide results for all of Michigan and the upper tier counties in Indiana. Crop specific E.T. values are calculated from one or more local weather stations representing your field location. Irrigation Scheduler V 4.0 has the greatest potential for accuracy using the most specific data. Irrigation Scheduler V 4.0 is available from: <http://www.agweather.geo.msu.edu/mawn/>

MSU Excel Version of Scheduler was developed as a spreadsheet alternative to the web based Irrigation Scheduler V 4.0. It allows greater flexibility and adaptability to the computer savvy irrigator. This method will provide results for all of Michigan and the upper tier counties in Indiana. Reference crop E.T. can be taken from each of the MAWN weather stations where the program will use crop specific coefficient to adjust for your crop stage of growth. The MSU Excel version of scheduler is available from: <http://www.agweather.geo.msu.edu/mawn/irrigation/>

All of the above mentioned irrigation scheduling tools, plus other irrigation management information is available from: <http://www.msue.msu.edu/stjoseph> click the "irrigation" button on the left hand side.

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Soil Moisture Monitoring

Soil moisture monitoring can be a viable method of scheduling irrigation when coupled with appropriate record keeping and actual estimates of percent moisture available. Soil moisture holding capacity and crop removal rates (E.T.) still need to be known to allow calculation of maximum amount that may be applied and how many days till the next needed irrigation.

Soil moisture monitoring methods range from the simple feel test by a trained and calibrated person to equipment costing \$5,000 or more for the analyses reflection of emitted electron. All systems will require calibration against a volumetric sample for each soil type to achieve accuracy and meaningful data.

Soil moisture monitoring has the added disadvantage of being accurate to only the specific test location. Variability in soil type, soil moisture holding capacity, crop removal at specific location, irrigation application, compaction and alteration to test site for equipment and procedure all reduce the value of soil moisture monitoring as an irrigation scheduling method.

Information on soil moisture monitoring systems and their comparison is available from SOWACS a resource center for soil moisture measurement equipment at: <http://www.sowacs.com/>

Best management of water resource and increased profit and yield often come from the use of a combination of these tools and methods. Each of these tools and methods has the potential for increasing yields while minimize water and fuel use but errors specific situation of the field and year can also allow these methods to be misleading. Scouting fields for moisture stress along with visual inspection of the running irrigation machine is essential.