David Burton
Civic Communications Specialist
2400 S. Scenic Ave.
Springfield, MO 65807
417-881-8909
FAX 417-881-8058
burtond@missouri.edu

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Drip Irrigation Efficient, but Requires Careful Planning

MARSHFIELD, Mo. — Drip irrigation is an efficient way to water vegetable and fruit crops. It can increase crop yields 50 to100 percent. At the same time, it can reduce water use by 30 to 50 percent compared to other irrigation systems according to Bob Schultheis, natural resource engineering specialist, University of Missouri Extension.

"Careful planning and knowing available resources is critical to getting a good system that meets your needs," said Schultheis. "You have to consider things like how much water the soil will hold and how much water the crops need."

Schultheis says it is also important to ask if your water source is adequate, reliable and of high quality and whether or not you have time to work with the system.

NUMBER DETAIL

Soils in southern Missouri typically store 1.5 to 2.5 inches of water per foot of soil depth. However, because crop water use in summer can exceed 0.25 inch per day, a 2-foot deep soil only contains a 9 to 15-day water supply.

According to Schultheis, typical water intake rate of these soils is 0.2 to 0.7 inch per hour, so heavy rains may run off and not soak in enough to be available for the crops.

Crops under drip irrigation typically require a water supply capacity of 2 to 5 GPM (gallons per minute) per acre, compared to 4 to 7 GPM per acre for sprinklers.

"A house well can sometimes be used to irrigate up to two or three acres of vegetables or fruits, in addition to supplying the household needs. However, a larger pressure tank may be needed to avoid burning out the pump from excess cycling," said Schultheis.

Drip systems operate at lower pressures (6-20 psi) than sprinklers (25-45 psi), thus requiring smaller pipes, pumps and energy demands. Other advantages of drip irrigation include less evaporation, less runoff, and fewer weeds, plus the ability to apply fertilizers through the system, continue fieldwork while irrigating, and automate for around-the-clock watering.

PROPER SYSTEM SET-UP

A good filter with a 150- to 200-mesh screen is critical to prevent clogging of the water emitters, which dispense water at 0.5 to 2 gallons per hour.

"A well is preferred over a stream or pond for a water source because filtering is less costly and not as prone to run dry in hot weather," said Schultheis.

Proper system design involves getting accurate dimensions and elevations of the field, distances to water and power sources, crops to be grown, row and plant spacing, and hours of operation.

The water supply should be tested for pH, hardness and minerals to get the best results from chemigation through the system.

The University of Missouri Soil Testing and Plant Diagnostic Services lab in Columbia can test water for irrigation suitability (see http://soilplantlab.missouri.edu/soil/water.aspx).

For the protection of groundwater supplies, check valves should be installed to prevent back-siphoning fertilizers or pesticides into the water supply.

"There is a bit of a learning curve to running a drip system profitably and efficiently. Most producers find that it takes one to three years of in-season experience to learn their system and the irrigation management strategies it offers," said Schultheis.

MORE INFORMATION

For more information about drip irrigation, as well as a list of equipment suppliers, go online to http://extension.missouri.edu/webster/irrigation.aspx. Presentations on this topic can be found online at http://extension.missouri.edu/webster/pres-2014-02-19.aspx.

For more information on this topic or other engineering concerns, you can reach me at the Webster County Extension Center in Marshfield by phone at 417-859-2044, by email at schultheisr@missouri.edu, or go to our website at extension.missouri.edu/webster.

Source: Bob Schultheis, (417) 859-2044

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