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The Use of Technology in Mechanized Irrigation

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Overview

The development of electronic technology has impacted all of us. It allows better communication, better access to information, and innumerable things that make our lives easier.

It is only natural that these new tools are being put to use to enhance the operation of irrigation equipment as well. As in other applications this manifests itself primarily in two ways. First, as a means to improve the ability to monitor and control equipment. Second, as way to improve the performance and efficiency of the equipment itself.

Monitoring and Control

Unlike most other farm equipment, irrigation systems typically operate unattended. Most farming operations have multiple irrigation installations and often times these are distributed over a large area. In the critical growing season timely management is very important. Interrupted operation at a time of high crop stress can be costly.

Monitoring used to require an individual visual checking each system. This required a lot of time and if a system failed just after being checked it would set idle until the next scheduled “drive by”, wasting valuable time.

Satellite and cell phone networks are now available to us for communication with systems regardless of their accessibility. Devices have been developed that are easily retrofitted to pivots in the field. In their simplest form they can be used for monitoring the system only. More sophisticated units add the ability to control at least the basic functions of the system.

Improved performance and efficiency

To improve the efficiency with which water is applied it is often desirable to "program" a pivot or linear move system to alter its operation either by time of day or location in the field. For instance half of a pivot might be planted to corn and the other half to soybeans, or the operator might want to irrigate only at night.

Early computerized control panels allowed these things to be accomplished but with a marked increase in the complexity of operation. Alpha numeric displays manipulate by a key pad could be very confusing resulting in limiting the utilization of the systems capability. Touch screen technology provides a much more intuitive and efficient operator interface. Visual representation of the system as programmed is one facet. Another is the ease of moving through several screens that provide direct feed back to the operator.

One of the main bits of information needed for effective management of an irrigation system and its functions is location. For center pivots, several devices have been used to mechanically measure the angular location of the pivot center. The accuracy and reliability of such devices is suspect because relatively small angle changes represent large displacement of the out end of a system. A GPS device located on or near the end of a system provides the accuracy needed.