

CONSIDERATIONS WHEN CONVERTING FROM SURFACE TO MECHANICAL MOVE IRRIGATION

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Summary:

Decisions to make when considering converting from surface irrigation to another form of irrigation can be overwhelming. What type of irrigation to switch to? What changes will need to be made to my management? How do I make this as easy as possible? This paper will focus on suggested steps and irrigation equipment considerations to make the transition easier, more efficient and cost effective when a farmer decides to change to mechanical move irrigation.

Introduction:

The profitability of converting from surface irrigation to a center pivot has been discussed many times in the central plains states (i.e. research by Lamm, 2000) with the focus on differing pumping capacities on crop yield and revenue. In most of these cases the items considered include the cost of the pumping system and the irrigation system, changes to production costs and potential on yield. To a lesser extent some discussion has been on the potential labor savings. The studies date back for many years and include but not limited to Dhuyvetter 1996, Williams, et.al. 1996 and Lamm, et.al. 1997. These studies focused on the impact of sprinkler irrigation capacity on corn yield potential and economics. Some manufacturers offer information for the conversion to mechanical move irrigation, Lindsay, 2003 and Valmont 2003.

In recent years with the help of the EQIP program, the economics have changed and incited farmers to consider conversion to other forms of irrigation to reduce on farm water use. Another driver for conversion is water limitations either through availability or regulation. This is becoming more and more of a consideration throughout the central plains states. Grain prices also have a significant impact on considerations of whether or not to convert. Corn futures are now closing over \$5.00 per bushel as compared to corn prices in past studies of \$2.50 per bushel.

For a grower today considering conversion to mechanical move irrigation, the following questions need to be taken into consideration: What steps can be taken to ensure the best long term solution? How might a grower proceed? What should be part of the considerations for making a major irrigation change in the grower's operation?

Discussion:

To begin the process, one should consider the following steps before talking with an irrigation supplier. This prepares the grower and helps focus on the items of particular importance to their operation. Also the irrigation dealer and/or consultants should help encourage the grower to follow through a decision making process to reach the optimum decisions regarding conversion. The crop consultant can be of assistance at several points during the decision making process to provide data and/or recommendations about the production plan.

- 1) Start with a review of current management and cropping plans
 - a. Does conversion fit into the long term plan for the operation?
 - i. Cropping/rotation plans
 - ii. Expansion
 - b. Consider what are the primary reasons for switching?
 - i. Labor availability
 - ii. Water availability
 - iii. Overall profitability

- 2) Perform a field resource inventory – the crop consultant may have good input at this stage
 - a. Available water supply
 - b. Available power supply
 - c. Soil types
 - d. Field size and shape
 - e. Field ‘problems’ – is there an area that has never yielded the way the grower would like? Do challenges such as buildings or power lines exist that would hinder a conversion to mechanical move irrigation?
 - f. Changes needed to existing farm equipment if conversion is completed

- 3) Consider irrigation equipment options that may be a best fit. At this stage do not rule out any options.
 - a. Center pivot
 - b. Towable center pivot
 - c. Center pivot with corner arm
 - d. Linear

- 4) Select a partner to help with the conversion process
 - a. Interview potential irrigation equipment suppliers
 - i. Explain what is being considered and your needs
 - ii. Show the information that has been collected
 - b. Look for a partner who:
 - i. Is open to listening to you
 - ii. Understands your needs and your field

- iii. Understands the value of converting to your operation
 - iv. Has product options for consideration
 - v. Does not immediately jump to make a quotation
 - vi. Has finance options and understand cost share programs
 - c. Consider more than just the sales person of the dealership
 - i. Service and parts support
 - ii. Experience with the options presented
 - iii. Talk with your neighbors about their experiences with the dealer
 - d. Request a proposal to use as part of the comparison – look for:
 - i. Does the proposal offer options?
 - ii. Is financing and cost share information presented?
 - iii. Is operating cost addressed?
 - iv. Is the proposal addressing the overall farms needs?
- 5) Once the partner is selected review goals – is it to:
 - a. Maximize the area covered in the field?
 - b. Maximize returns from the field?
 - c. Maximize returns for the farm?
 - d. Minimize investment?
 - e. Minimize labor ?
 - f. Minimize operational expense ?
- 6) Review the management plans and agricultural practices anticipated for the new mechanized irrigation system
 - a. Crops
 - b. Application of crop production products
 - c. Tillage practices
- 7) Review the options presented by the irrigation dealer
 - a. Type of irrigation equipment
 - i. Area covered
 - ii. Options on the equipment
 - iii. Ease of use
 - b. Initial investment
 - i. Financing plans
 - ii. Cost share programs
 - c. Operating costs
 - d. Life expectancy of the equipment
 - e. Labor requirements
 - f. Ability to automate
- 8) Take the time to consider the long term impacts of the decision
 - a. Well manufactured, designed and applied mechanical move irrigation equipment should last for at least twenty years

- b. Conversion to mechanical move equipment should make life easier and not harder
- c. Realize it may take two years to begin to reach the goals

At this point one should be ready to make a decision on how they want to proceed. But before proceeding, consideration should be given to the specific type of irrigation equipment. Many times one automatically assumes the best solution for their situation is a center pivot – and it may well be. But a grower should consider other options and also look for an irrigation equipment supplier who is open to considering options.

Whether the primary goal is maximizing the area irrigated, minimizing operating costs or maximizing profits, several options are available for consideration:

- Towable center pivot
 - Advantages
 - Maximizes the area covered by using one center pivot over multiple fields
 - Can always add a fixed pivot in the future
 - Disadvantages
 - Labor – will require time to go to the field, prepare the center pivot for towing, actual towing and switching back from tow to operating
 - Pumping rate – flowrate needs to be more than what is required for the areas irrigated to allow for downtime and towing

- Center pivot with corner arm
 - Advantages
 - Maximize the area covered – corner arm can be folded in and out to dodge obstructions
 - Uniform watering over the entire field
 - Disadvantages
 - Initial investment
 - In some situations may have more wheel track issues

- Linear
 - Advantages
 - Will maximize the area covered in a square or rectangular field
 - Wheel tracks may fit cropping plan better
 - Disadvantages
 - Initial investment
 - If a hose drag, may require labor to switch the hose
 - If a ditchfeed, ditch maintenance is required

- Options to consider for all mechanical move irrigation equipment

- Flootation options (not available for towable machines) – to minimize the wheel tracks and avoid getting stuck
- Sprinkler package – to maximize productivity from the crop and the soil
- Pipeline materials – different options available depending on the crop production products used
- Automation capabilities
 - Control panel for off-peak operation
 - Automatic changes to manage water applied for different sectors of the field
 - Remote monitoring and/or control options
- High speed operation to allow for minimal water applications for germination and application of crop production products.

Conclusions:

Decisions to make when considering converting from surface irrigation to another form of irrigation can be overwhelming. What type of irrigation to switch to? What changes will need to be made to my management? How do I make this as easy as possible? This discussion has focused on eight steps to consider to help make the decision making process simpler. It is critical for the grower to have a goal in mind as to why to convert and then follow through to see that this goal is met. Options need to be considered to determine the best equipment solution for the situation. Lastly, numerous options exist to maximize the coverage with mechanical move irrigation depending on the grower's specific situation.

References:

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