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Buying a Center Pivot

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A center-pivot sprinkler system is a medium cost, low labor irrigation method. A few of these systems have been high cost, high labor irrigation methods. Consideration of a few details in the purchase of the system can help prevent the high cost and/or high labor.

The center-pivot system is a piece of machinery which may be subject to breakdowns or stoppages. Therefore, it is important to purchase such equipment from a reliable dealer who stocks parts and is readily available to provide service when and if it is needed. This should be a major consideration in purchasing a system because a system which is out of service when a crop needs water can result in substantial yield reduction.

Many different types of systems are available today. *Table 1* is provided to help choose a center-pivot. Consideration must be given to soil texture and slope of the field to be irrigated with the center-pivot. The field may have an obstruction such as a farmstead. Also several crops may be grown under the same system.

Conditions may require special precautions for certain features of a system. Also, conditions may cause certain features of a system to be preferred. Sometimes a preferred feature under certain conditions may not be selected by an individual buyer because of its higher price.

Special problems are occurring with some center-pivot systems when fields are not properly prepared for installation. Surface drainage should be provided in all fields where center-pivots are installed. If water is allowed to collect in undrained low areas, crop yield reduction or loss can occur. Most center-pivots are not capable of traveling through water collection areas.

Special management practices are required on sandy soils to prevent blowouts if native grass cover is destroyed.

Frequently, management blunders are made in developing a project too rapidly. Center-pivot irrigation is usually not an easy moneymaking project. As with other types of irrigation, successful operation requires a high level of management. If plans are to have a total of five systems, why not start with one or two? Some farmers would be better off financially today if they had followed this procedure.

Table 1. Center-pivot options

	Soil Texture						Slope			
	Gravel	*Coarse sand*	*Fine sand*	*Sandy loam*	*Silt loam*	*Clay loam*	*Flat to rolling*	*Steep hilly*	*Several crops*	*Obstructions*
Propulsion 1/ 2/ 3/										
Electric									P	P
Water spinner										
Water cylinder								S		
Oil motor									P	P
Oil cylinder								S	P	
Air cylinder								S	P	
Drive Train 1/ 2/										
Trojan bar								S		
Gear box										P
Chain drive										P
Wheels 4/										
Rubber tire					P	P				
Steel wheel										
Large diameter and width					P	P				
Tower & pipe support 4/										
Continuous pipe - cable support										
Flexible joint - truss support								P		
Tower spacing										
90-100'					P	P		P		
120-130'					P	P		P		
170' +										
Water application 4/ 5/										
Constant spacing			P	P	P	P				
Variable spacing			P	P	P	P				
Spray nozzles	P									
System Capacity (130 acres) 6/										
500-700 gpm					P	P				
600-800 gpm		P	P	P						
800-1000 gpm	P									
System speed 7/										
36 hour revolution or less	P	P								

S - Field conditions may require special precautions for features of a center-pivot; e.g. a water cylinder propulsion feature may require brakes on steep, hilly terrain.

P - Field conditions may cause a feature to be preferred, e.g. electric motor propulsion may be preferred over an oil cylinder in a field with obstructions, such as a farmstead, to provide a quick reverse.

A blank space indicates the feature requires no special precautions and the feature is not preferred over another feature.

1/ Several crops under one pivot may require running the system without watering.

2/ Obstructions such as a farmstead make a quick reverse desirable.

3/ Oil or air cylinder trojan bar drives on steep ground may require brakes.

4/ High silt content soils appear to cause the most problems for traction, flotation and water intake.

5/ At this time spray nozzles are only recommended on gravels or coarse sands unless high speeds are used.

6/ A low capacity is preferred on soils with low intake rates; however, the soil profile should be near field capacity before the peak water use period starts.

7/ A system which will apply one-half inch or less is preferred on soils with low waterholding capacities for early in the growing season when the root zone is small. A system speed of 36 hours or less per revolution is also preferred for injecting chemicals through the system.

File Under: IRRIGATION ENGINEERING
A-1, Irrigation Systems and Development

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