How to Buy an Irrigation System for a Sod Farm

Based on Information from

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Sod growers planning to purchase and install an irrigation system for their sod farm should ask about two important facets of the system: performance and cost of the equipment. But, to select the right equipment at the right price, the purchaser must first determine just what he wants the system to do. To establish these specifications, he should consider these points:

1. Area to be covered
2. Hours available for watering
3. Amount of water to be applied
4. Type of system
5. Use of system to aid seed germination
6. Use of system for applying fertilizers and herbicides
7. Maximum wind under which system must operate
8. Maximum precipitation rate
9. Uniformity of precipitation
10. Service life of system components

Area To Be Covered

The first step is to determine the area to be covered by the irrigation system and to specify this on an accurate plot plan. Areas that cannot be watered, as well as watered areas, should be shown since both will play an important part in selecting the type of heads best suited to the job.

Watering Hours

For large areas, the cost of an irrigation system is affected to a considerable extent by the time available to apply a specified amount of water. For example, watering 100 acres at the rate of 1½" per week requires 4,085,000 gals. of water per week, or 572,640 gals. per day. If watering must be accomplished in a six-hour period, the flow required will be 95,440 gals. per hour, or 1,590 gals. per minute. This means that the mains and pump will have to be big enough to deliver this volume of water. If, on the other hand, 12 instead of 6 hours can be allowed for watering, the flow required is cut in half to 795 gals. per minute. This could make a difference of as much as $14,000 to $18,000 in material costs alone.

Amount Of Water

A sod farm irrigation system should be designed to take care of peak-moisture-use periods. Weather conditions determine how much water has to be applied. Temperature, air movement, and humidity determine the amount of water extracted from the soil, and consequently the amount that should be applied to maintain satisfactory growing conditions. Periods of peak use may require the application of 1" of water every three or four days.

Type Of System

Should the sod farmer purchase a portable system or a solid-set system? The quick-coupler system with impact sprinklers costs less initially but more to operate than the fully automatic system with pop-up rotor sprinklers. However, the operating cost of the solid-set system is sufficiently lower to quickly compensate for the higher first cost.

Sod growers should select a system that shows the highest dollar return for the frequency of irrigation and the cost of labor for their area. If a portable system is being considered, the cost of moving the system for an expected irrigation frequency should not be greater than the annual cost of a solid-set system. Varying factors are involved for each sod farm, but generally where frequent, light irrigations are required, a solid-set system is most economical.

The choice between buried or surface irrigation systems also involves a compromise between labor costs and pipe interference with sod harvesting. A buried system will interfere with harvesting operations, whereas the surface system can be removed. Also, the surface system always has the possibility of being used in other locations. Each grower has problems that are individual, and his irrigation system must be designed to answer his particular needs.

Use Of System For Seed Germination

One of the most important considerations in selecting irrigation equipment is its use on germinating seed, for the sod crop will never be any better than the initial stand. A solid-set system, which does not require pipe to be rotated from field to field, is most desirable from this standpoint, since irrigation may be required several times a day during germination, depending on weather and soil conditions. Once the soil surface is wet, it must be kept damp to prevent crusting of the soil and dehydration of sprouted seeds. Also, to prevent compaction of the soil surface, water drops should be kept small. This requires a fairly high pressure for a given nozzle size.

Keep in mind that it is necessary to have a higher pump capacity for germination than is required for normal irrigation of sod.

Use For Fertilizer And Herbicide Application

For maximum efficiency, a sod farm sprinkler system should be used to apply chemicals, fertilizers, and herbicides or pesticides. This requires the incorporation of some type of injector into the system. When he selects the injector, the sod grower

Table 1. Effect of Wind Velocity on Sprinkler Spacing

Wind	Maximum Triangular Spacing
0 to 3 miles per hour	60% of the diameter
3 to 5 miles per hour	50% of the diameter
5 to 7 miles per hour	40% of the diameter
8 to 10 miles per hour	30% of the diameter

should keep in mind the amount of chemical to be injected; this should be in proportion to the flow rate of water through the system. Only in this way can he be sure of avoiding the danger of applying excessive amounts of chemicals. Chemicals should go only where the water goes. Thus, the need for uniform application of water is apparent. The sprinkler system should also apply water at a rate that precludes runoff and insures an adequate amount of water at each irrigation.

Wind Conditions

It takes very little wind to affect the performance of large sprinkler systems, but many do not realize how great this effect is. Since there is only a slight difference in the effect of wind on various pop-up sprinkler heads, Table 1. can be used as a guide to head spacing required for several different wind velocities.

The effect is greater than it seems at first glance, because the number of heads required increases in inverse proportion to the square of the spacing. Therefore, four times as many heads are required to operate successfully in an 8- to 10-mile-per-hour wind as are required in a zero to 3-mile-per-hour wind.

Whenever possible, most growers prefer to schedule watering times for periods of the day or night when wind velocity is low, rather than to pay the much greater cost involved in installing a system that will provide good water coverage in the wind. However, the prospective buyer must thoroughly understand the effect of local wind conditions before he sets out to purchase an irrigation system.

Precipitation rate is the average rate, in inches per hour, at which sprinklers deliver water. A low rate is considered to be under .30″ per hour; a medium rate is around .45″ per hour; and a high rate is anything over .50″ per hour.

Good soil conditions on flat ground can successfully use a high rate of application. Heavy soil, soil compaction, sloping areas, or any other condition that results in a low infiltration rate, indicate the need for a lower rate of water application. Sometimes it is difficult to tell in advance how high a precipitation rate can be used successfully on all parts of the sod area, so it is usually best to specify the lower rates of precipitation, which will give the least trouble with runoff in problem areas.

Uniformity of Precipitation

This is a measure of the efficiency of the system, and there is considerable difference between a good and a poor system in this respect. Sod farm irrigation requires a uniform application of water since most grass varieties are shallow-rooted. For this same reason, frequent irrigation is needed during periods of high moisture use. Thus, sprinklers selected should be from a quality manufacturer and should be designed for scientific uniformity of water application.

Service Life

There is also a considerable difference in the life expectancy of the various components used in sprinkler systems, even under ideal conditions. Adverse conditions can cause further shortening of life expectancy. For example, water hammer, or associated high pressure, can cause premature failure of pipe and fittings. Abrasive or corrosive water can shorten the life of rotor heads, especially where the mechanism is exposed to the water stream. On rotor heads, the total effect of these variables can result in an operating life from as low as 50 hours to as high as 5,000 hours.

It thus becomes very important for the prospective buyer of irrigation equipment to specify durability of system components. It should be possible to obtain five-year usage of heads, controls, and valves, and 15-year usage of pipes and fittings.

The sod grower planning a new irrigation system should know and specify just what it is he expects of the system. Then, if he wishes, he can leave to responsible experts the job of designing the system that will meet his specifications. In this way, the grower can be more sure of getting a system that will meet his own needs and problems.

Fall Turf Care Important

Bluegrass should be mowed, fed, and watered as long as it continues to grow, Colorado State University extension horticulturist, C. M. Drage, says. He explains that fall conditions are favorable for the growth of cool-season grasses, which should be fertilized at this time, even though results will not be as obvious as in spring fertilization.

The grass responds by increasing its root system and storing extra plant food for new top growth in the spring. Fall fertilization also stimulates tillering, which takes place when new plants rise from rhizomes near the mother plant and contributes to a dense stand of grass. Nitrogen, generally the most important element in turf fertilizer, should be provided at 1 to 2 lbs. per 1,000 sq. ft., Drage recommends. For conditions of average fertility, lawns will require 3 to 4 lbs. of available nitrogen per 1,000 sq. ft. each year. This can be applied half in spring and half in fall; but if grass is fertilized only once a year, fall is probably the best time.

Recommending against overfertilization as unnecessary and impractical, Drage adds that lawns should be mowed in fall at the regular height of 1½ to 2½ in. Grass will need less water in the fall, but soil should not be allowed to dry out.