IRRIGATION WITH SOLID SET SPRINKLERS

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In the 1965 Washington State Potato Conference Proceedings, there are two articles dealing with irrigation principles and optimum moisture levels for best yields and quality. These discussions dealt with the science of irrigation -- the "When to Irrigate" and the "How Much to Apply." This paper deals with the art of applying water --the "how."

Potatoes are not a high water using crop. From 19-22 acre inches of water is the plant requirement for central Washington potatoes. Potato quality is dependent upon a high moisture level. Therefore, potatoes should be irrigated frequently with light applications of water. Information is available on how much water is being used daily during the summer months in the form of evaporation reports.

A solid set sprinkler system is one method used to provide light, frequent irrigations and there is considerable interest among growers in this method. A solid set consists of enough laterals and sprinkler heads whereby no lines are moved once the system has been installed. Solid sets have been used in the Bakersfield and Hemet, California areas for about ten years. The Washington State University Extension Service, Moses Lake Soil Conservation District, and the Columbia Basin Sprinkler Association had a demonstration utilizing a solid set on Percy Driggs farm near Moses Lake in 1959. In 1957 a solid set sprinkler system was demonstrated on the Charles Fisher farm in Block 42 near Moses Lake.

SUMMARY OF COMMENTS BY PANEL MEMBERS WHO ARE PRESENTLY USING SOLID SET SYSTEMS

Panel Members

John Ford, Sun Glo Producers, Winchester

Jack Young, Skone & Connors, Warden

Maurice Koester, Star Route, Mesa

Panel members who have switched to this design have done so because (1) low water-holding capacities of sandy or shallow soils which make it practically impossible to apply light applications with surface irrigation, and (2) labor requirements are high when frequent changes are made on both sprinkler and surface irrigation.

Some of the disadvantages of their particular systems are: (1) Costs are high (one reports $467 per acre). (2) With a low gallonage

sprinkler heads and automatic valves, trash in the water is a problem. (3) Non-uniform water distribution. Proper design is even more important than with movable systems and is especially important on items such as proper combinations of lateral and sprinkler spacings and pressures.

Types of systems used by panel members are:

(1) John Ford. Food Machinery and Chemical Companies Sequa-Matic Automatic valves and controls with 1-1/2" aluminum lateral lines spaced 80' apart. One-fourth inch sprinkler heads located 60' apart. Pressure, 85-90 psi. applying about 17.5 gallons per minute for .35 acre inches of water per hour. The system is capable of recycling every five minutes, but is recycled to irrigate only when a two to four-hour irrigation would refill the root zone (this would mean a withdrawl from .7 to 1.4 inches between irrigations).

(2) Jack Young. A combination of regular aluminum pipe, gravity pressure (no pump) and manual control, 3" aluminum laterals spaced 50' apart, 9/64" sprinkler heads, located 30' apart. Pressures range from 35-50 psi., averaging about 3.5 gallons per minute and which applies approximately .22 inches per hour. (Twelve-hour sets would apply approximately 2.64 inches.) Irrigation frequencies range from five to eight days.

(3) Maurice Koester. A combination of aluminum pipe consisting of 800' lengths of 3" laterals spaced 40' apart. Manual operated. 5/64" sprinkler heads located 40' apart. Pressure about 50 psi. provided 1.23 gallons per minute per head applying 1.8" gross in a 24 hour set. Normal irrigations on three-day intervals.

SUMMARY

Growers are using different types of solid sets for a variety of reasons. Some are using them for labor saving, others for applying light, frequent irrigations. We hope this discussion has provided some ideas, some answers and a summary of the trends which will provide light, frequent irrigation.