WHAT IS ADEQUATE MOISTURE FOR POTATOES

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Potatoes are not heavy water users compared to our longer season crops, such as alfalfa and pastures. Potatoes require about 19 to 21 inches of water in Eastern Washington and will not very over two or three inches from year to year. The amount of water plants use very with the season and is primarily as result of climatic conditions such as temperature, sunlight, humidity and wind. The most important part of getting good quality potatoes is the manner in which these 19 to 21 inches are provided.

Frequency of Irrigation

The frequency of irrigation, or more correctly, the moisture level maintained, is the critical part of irrigating potatoes. Farmers experience and research point to a higher quality potato when high moisture levels are maintained. In maintaining high moisture levels, a considerable amount of water is wasted, which erroneously implies potatoes are a high water use crop.

A soil moisture measuring techniques and water application methods have been improved, recommendations have been made to decrease the amount of water withdrawn between irrigations. Until more detailed research information is obtained locally, a recommendation is to withdraw not more than 35 per cent of the usable water in the upper two feet of soil. Thus, 1.4 inches of water could be removed from a soil with a usable water holding capacity of 2 inches per foot of depth (4 inches X 35 per cent = 1.40). On sandier soils this may be one inch or less.

A recent experiment in Texas closely follows results obtained by other research workers in Idaho, New York, Utah, and Colorado. Five moisture levels were maintained.

M_1 Low moisture level, alternate row irrigation
M_2 Low moisture level, every-row irrigation
M_3 High moisture level, alternate-row irrigation
M_4 High moisture level, every-row irrigation
M_5 High moisture level, every-row irrigation, crest of bed "blackened"

The following table shows results of this particular experiment.

Treatment	Water Applied (Inches)	Yield US No. 1 cwt/acre
M_1	14.47	108
M_2	15.05	115

M_3	19.50	168
M_4	21.70	177
M_5	23.34	208

Detailed soil sampling showed very little moisture extracted from the area below the 18-inch depth.

Influence of Temperature on Quality

Potatoes are generally considered a cool weather crop and considerable research work has been done, which indicates better yield and especially quality of potatoes when soil temperatures are low. Frequent irrigations or maintaining high moisture levels encourages cooler soil temperatures.

Scheduling Irrigations

There is nothing wrong in following a set pattern of irrigating by the so-called calendar method if just the amount of water which has been used by the crop since the previous irrigation is applied. Since plant demands change from week to week, the amount of water applied should also vary. This can be applied handily by sprinklers, but is a little more difficult with surface methods.

Considerable work has been done in the Columbia Basin Area and more will be done in the future throughout the state in obtaining water holding capacities of various soils. Additional research work is planned at the Othello Unit to determine optimum moisture levels for potatoes.

Information is being made available in many parts of the state on a daily basis for scheduling irrigations by the evaporation pan method.

This method of scheduling has been discussed at previous conferences and a detailed description does not fit into this topic of discussion. A bulletin describing this method combined with the scheduling board will be available in March or April from your Extension Service.

Individuals within the United States Weather Bureau are very interested in developing a procedure for predicting a three to four day evaporation period. This will pinpoint more closely the specific water needs of potatoes.