Lack of Economic Benefits Applied Through Center-Pivot Irrigation Systems for Control of *Alternaria solani* on Potato

G. D. EASTON, Plant Pathologist, and M. E. NAGLE, Agricultural Technologist III, Department of Plant Pathology, Irrigated Agriculture Research and Extension Center, Washington State University, Prosser 99350

**ABSTRACT**


In south central Washington, near the Oregon border, fungicides applied through center-pivot irrigation systems were evaluated for 3 yr for control of *Alternaria solani* on potato. Four applications of fentin hydroxide applied through a center-pivot irrigation system did not control *A. solani* or increase tuber yield. Four to six applications of chlorothalonil applied through a center-pivot system in August, before the onset of early blight, significantly reduced lesion numbers in all years of testing but did not increase yield.

**RESULTS**

Control plots during all three seasons averaged less than one lesion per leaf until early August (Table 1). Moderate to severe early blight developed at the end of August and lesion numbers increased rapidly to as many as 72.5 per leaf in 1977.

In 1973, fentin hydroxide was injected in the irrigation water four times at 38,680, 36,661, 36,895, and 35,614 (average 36,952) liters of solution per hectare. In 1976, chlorothalonil was injected four times at 55,136, 54,809, 54,314, and 59,222 (average 55,870) liters of solution per hectare, and in 1977, six times at 49,115, 42,103, 47,713, 61,747, 49,115, and 36,483 (average 47,713) liters of solution per hectare.

Plots sprayed with fentin hydroxide showed no control in 1973 (Table 1). Chlorothalonil-treated plots had significantly reduced lesion numbers in 1976 and 1977. By September, visual differences between chlorothalonil-treated and control plots were noted in the infrared photos in 1976 but not in 1977. Neither fentin hydroxide nor chlorothalonil applications significantly increased yields. Potato plants in these fields died prematurely by mid-September.

**DISCUSSION**

On the basis of appearance of the first lesions, the first fungicide application for early blight control should be in late July or early August in Washington (Table 1). Chlorothalonil was injected four times at 55,136, 54,809, 54,314, and 59,222 (average 55,870) liters of solution per hectare, and in 1977, six times at 49,115, 42,103, 47,713, 61,747, 49,115, and 36,483 (average 47,713) liters of solution per hectare.

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not agree with those of Douglas and Groskopp (3), who were able to control early blight and increase yields in eastern and southeastern Idaho with ground-applied fungicides on sprinkler-irrigated potatoes.

Field-grown Russet Burbank potatoes are killed early by known (5,8,10,17) and unknown factors in Washington, even in fields that have had only one previous crop of potatoes. By August, early blight is especially severe on foliage of these physiologically aged, early-dying plants (2). However, even though chlorothalonil sprayed on potato reduced lesions of early blight, it was not expected to and did not control early dying and therefore did not increase yields. Early blight probably would not have been an economic problem in the absence of the other diseases, because in our area, it does not usually express itself on foliage in fields that do not have early dying.

We conclude from this and a previous study (5) that fungicides applied either by aircraft or through center-pivot irrigation for control of early blight do not provide economic benefits under growing conditions in Washington.

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**LITERATURE CITED**