

EFFECT OF DATE OF INOCULATION OF POTATOES  
WITH LEAF ROLL VIRUS ON SYMPTOM EXPRESSION  
AND NET NECROSIS

Guy W. Bishop

Associate Entomologist, University of Idaho

Young potato plants are more susceptible to leaf roll virus infection than older plants, and a higher rate of infection will result when aphid vectors are transmitting the virus from young source plants. Conditions for leaf roll virus transmission, therefore, are potentially most favorable during the early part of the growing season. In experiments at Aberdeen, Idaho, about 95% infection resulted when series of plants less than 1 week old were inoculated by using infective green peach aphids, Mysuz persicae. Less than 5% infection was obtained when duplicate series of plants were inoculated at the end of the growing season.

Green peach aphid vector numbers are lowest during the early part of the growing season and increase in numbers as temperatures become warmer. Aphid numbers generally are highest in the last part of the growing season.

Decreasing plant susceptibility to leaf roll virus infection is counteracted by increasing vector numbers and serious virus spread may occur, therefore, at any period during the growing season.

Effect of Time of Inoculation on Symptom Expression.

In experiments at Aberdeen, Idaho, over a period of years, in which series of potato plants were experimentally infected with leaf roll virus at various times, early season infections produced plant symptoms indistinguishable from symptoms of seed borne leaf roll virus. Infections that occurred late in the season always resulted in symptomless plants. Generally no symptoms were detectable in plants infected 6 weeks or longer after emergence.

When initial infection of multiple-stemmed hills occurred through a single stem, nearly all tubers from plants infected early in the season contained the virus, but the virus was present in less than 50% of the tubers from late season infected plants. Much of the variation resulted from failure of the virus to move from the initially infected stem to other stems of the plant. But many instances were recorded where infected and uninfected tubers were produced by a single stem.

Effect of Time of Inoculation on Net Necrosis.

Work by Davidson and Sanford in Canada has shown that time of infection is important in determining the degree to which resulting tubers were subject to net necrosis. A low incidence of net necrosis

was observed when plants were infected soon after emergence or when they were near maturity. Plants infected during mid-season showed the highest susceptibility to net necrosis:

<u>Date Virus Became Systemic</u>	<u>% Net Necrosis</u>
June 15	0
June 25	3
July 5	16
July 15	14
July 25	28
Aug. 5	34
August 15	53
August 25	55
September 5	31
September 15	0

These data indicate that if the virus reaches the stolens before the tubers are formed the subsequent tubers will have little or no net necrosis. Apparently the highest incidence of net necrosis results when the virus enters the plant after the tubers are formed and are still enlarging rapidly.

Experiments at Aberdeen, Idaho, also on Russet Burbank, substantiate these findings. Early season inoculations resulted in about 7% net necrosis, middle season inoculations 17%, and late season inoculations 3%.

Folsom, working with the Green Mountain variety, found that plants graft inoculated on July 5, produced tubers that developed only 8% net necrosis. Net necrosis in tubers from plants graft inoculated on August 9, and September 2, was 82% and 53% respectively.

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