

EFFECT OF STORAGE TEMPERATURES ON DEVELOPMENT OF LEAF ROLL VIRUS NET NECROSIS

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Net necrosis is the tuber symptom of leaf roll virus infection that occurs only in certain susceptible varieties of potatoes such as Russet Burbank (Netted Gem) and Green Mountain. Leaf roll virus is not a particularly serious disease in net necrosis resistant varieties, and their use, where practical, is the most effective means of avoiding losses.

In the Russet Burbank variety, leaf roll virus net necrosis may occur in tubers from either seed borne or current season infected plants. But, since plants produced from infected seed usually do not produce tubers of commercial size, the present discussion is concerned only with current season infections. Frequently only slight net necrosis will develop in storage even though extreme virus spread has occurred in the field. Conversely, a moderate field spread of leaf roll virus has resulted in serious losses. Variations of this kind may be partially caused by differences in time that infection occurred, as previously discussed. But soil temperatures prior to harvest and storage temperatures are equally important.

Much of the information on effect of temperatures on net necrosis has come from a study by Folsom (1946). Although he worked with the Green Mountain variety, the results are apparently generally applicable to other susceptible varieties.

When conditions are suitable, considerable net necrosis may be present at harvest time, and in most cases will continue to develop in storage. But crops that show little or no net necrosis at harvest time may be severely affected after a time in storage. Net necrosis usually increases in storage for 3 or 4 months but may increase in severity for up to six months.

Optimum temperatures for development of net necrosis (Green Mountain) are around 50°F. as indicated in the following table (Folsom 1946):

Storage Temperature (F.)	Maximum Net Necrosis
31°	1 %
33°	1.5%
36°	2.2%
51°	9.9%

When temperatures are either considerably above or below the optimum, net necrosis development is inhibited. A temperature of 70°F. has an effect similar to that of 33°.

When potatoes are subjected to high or low temperatures for periods of 10 days or longer, subsequent development of net necrosis is inhibited even when the potatoes are returned to storage at optimum temperatures. For example, samples held at 60 days at 31°F. then at 51°F. developed an average of about 4% net necrosis while duplicate samples held at 51°F. for 120 days developed 20% net necrosis.

Net necrosis development in storage may be reduced by either high or low soil temperatures prior to harvest; this probably explains many instances where net necrosis development is less than expected. Near optimum soil temperatures prior to harvest, when virus spread has occurred at the right time, results in a high incidence of net necrosis in the field.

Large tubers are more subject to net necrosis than small tubers. The difference may be caused by the virus reaching the tubers at a different time or it may be entirely due to the more frequent occurrence of the virus in larger tubers.

References

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