

AGRICULTURAL EXPERIMENT STATION
Oregon State College
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POTATO LEAF ROLL

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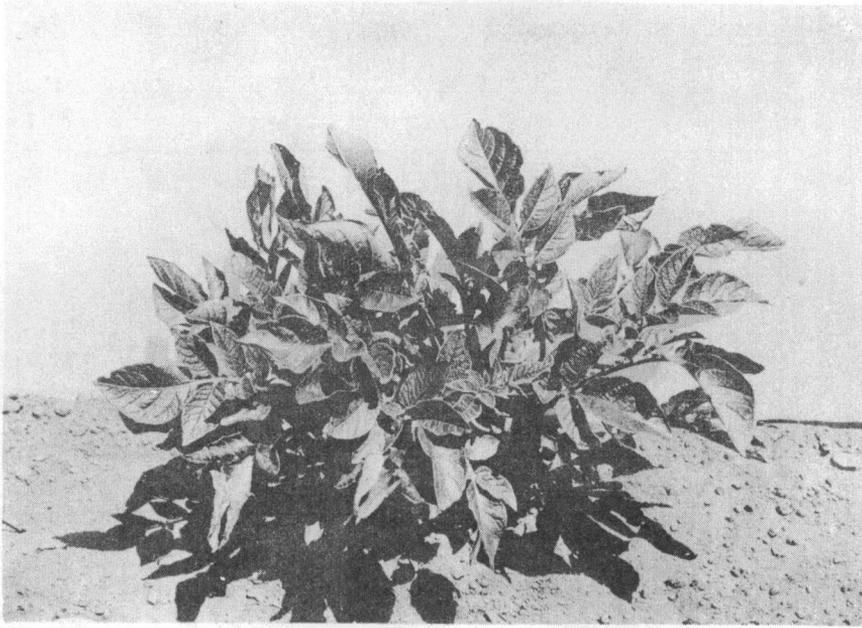
Leaf roll, a dangerous virus disease of potatoes which threatens to become serious, seems to be on the increase in parts of Oregon. This threat is very properly causing major concern among potato growers.

SYMPTOMS OF THE DISEASE

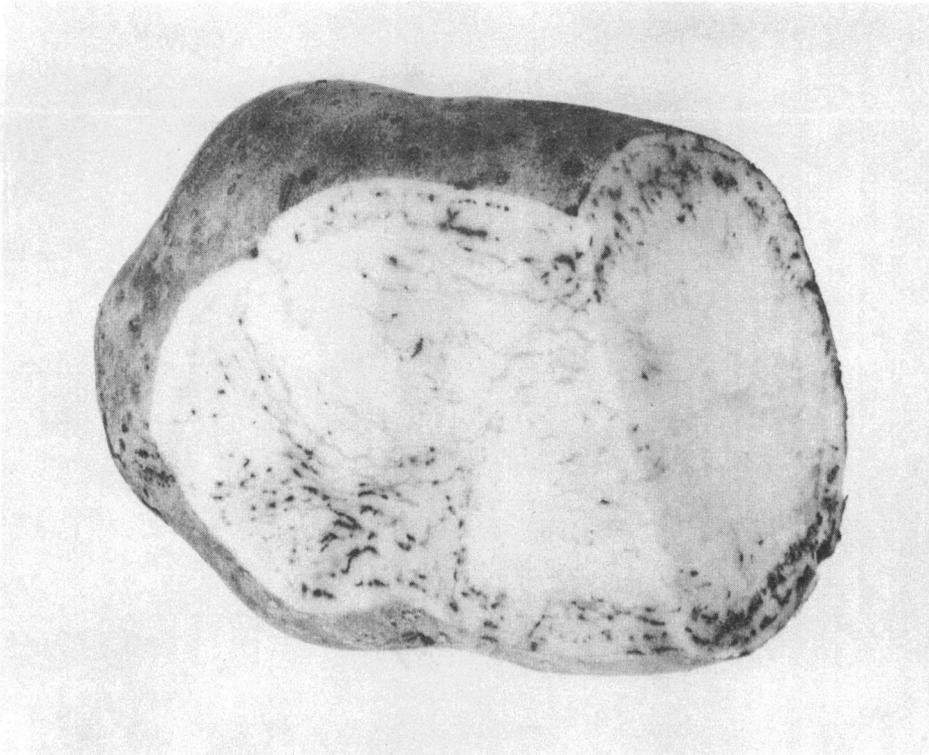
In Leaves. Leaf roll is characterized by an upward rolling of the leaflets which become thickened, stiff and leathery. This gives the plant a stiff, erect appearance. Leaves of affected plants show a distinct rolling from the midrib to the edges rather than the V-shaped fold from the midrib as is the case with Rhizoctonia. Leaflets in the upper part of the plants point upward and show the lower side, particularly in newly infected plants. The leaves eventually assume a yellowish color and the whole plant becomes dwarfed.

In Tubers. The mature tubers sometimes show an extensive network of dark brown thread-like streaks running through the interior of the potato. This network is quite different from the discoloration in the vascular ring which is caused by other diseases and conditions. The brown color does not show until the tubers approach maturity and it continues to develop in storage. This symptom occurs particularly in plants infected during the current season and is termed net necrosis. In serious infestations it is almost impossible to make a good marketable grade of potatoes because of the waste caused by this discoloration. The yield from diseased plants is reduced. Yield reduction is very serious if the seed piece carried the disease. Few tubers from such plants ever reach marketable size. Seriously infected fields are not worth digging.

^{1/} In writing this circular, helpful suggestions were made by M. B. McKay, G. R. Hyslop, and T. P. Dykstra.



**Potato Plant Showing Symptoms of Leaf Roll.
(From Ore. Exp. Sta. Bul. 294)**



**Potato Tuber Showing Net-Necrosis Due to Leaf Roll Infection.
(From Maine Extension Service Bul. 246)**

DISTRIBUTION

This disease has been known in Oregon for many years. In 1932^{2/} it was stated that leaf roll occurred in eastern and central Oregon but was seldom found in western Oregon. It was suggested that perhaps this could be explained on the supposition that the disease was introduced with seed potatoes and that growers in the part of the State west of the Cascade Mountains had been more fortunate in obtaining disease-free seed. At present leaf roll occurs west of the Cascades but it still seems to be true that it is more prevalent in some areas east of the mountains.

SURVIVAL AND TRANSMISSION

The leaf roll virus is carried over from crop to crop in diseased tubers. It may overwinter in volunteer potatoes. It is scattered from diseased to healthy plants in the field during the growing season by certain insects, notably aphids. A large population of aphids may spread the disease from a small number of infected plants and cause serious crop and marketing losses.

CONTROL

(1) Use clean seed. Strict certification of seed potatoes should reduce the amount of seed-borne leaf roll to a minimum.

(2) Discard diseased tubers. When cutting seed, discard all seed tubers which show the characteristic net necrosis.

(3) Rogue diseased plants. During the growing season all plants showing leaf roll should be rogued as soon as they can be recognized. The earlier the roguing is done, the better, as there is less opportunity for aphids to spread the disease. When taking out diseased plants, be sure to remove the seed pieces also. They may sprout and produce another diseased plant.

(4) Maintain an isolated seed plot. Growers who produce their own seed potatoes should maintain an isolated plot for growing clean seed to use in the main commercial planting. The essential practices to observe in this special seed plot are:

- (a) Use the tuber unit system. Place all seed pieces cut from one tuber in a small container. Berry boxes, tin cans, or paper bags may be used. The berry boxes are preferable. Use a separate container for each tuber. Plant the pieces from one tuber one after the other in the row. Skip a hill,

^{2/} McKay, M. B. and T. P. Dykstra. Potato Virus Diseases. Ore. Agr. Exp. Sta. Bul. 294. 1932.

then plant the pieces from the next tuber, and so on. In this way, if a diseased tuber is in the seed lot, all pieces from this tuber will be planted in the same tuber unit in the row and thus all can be rogued earlier and more accurately.

- (b) Rogue carefully. When the potatoes are up and the symptoms are noticeable, rogue very carefully. Whenever any one of the pieces coming from a tuber shows disease, rogue out all hills coming from that tuber, because it is probable that all of these hills are diseased.
- (c) Index the foundation seed plot where practical. Some growers are indexing the tubers for the seed plot to good advantage. This involves the growing of one eye, preferably the stem-end piece, from each tuber well in advance of the field planting to determine whether the tuber is healthy. If this piece produces a healthy plant, it is assumed that all the other pieces of that tuber will produce healthy plants. All tubers detected as diseased are discarded and only the healthy ones are kept for planting in the tuber unit seed plots. Where facilities are available for doing the work effectively, this is undoubtedly the most nearly ideal method now known for controlling the potato virus diseases.
