

LEAF ROLL CONTROL

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Potato leaf roll is a virus disease that is spread by aphids. Tubers from infected plants carry the virus from one season to the next and the primary source of leaf roll is plants from infected seed. This includes volunteer plants developing from tubers left in the ground at harvest. Plants developing from infected tubers show chronic leaf roll symptoms -- severe rolling of the leaves, chlorosis, and stunting of the plant. These chronically infected plants serve as reservoirs of the virus for current season spread by aphids.

Plants infected during the growing season show current season leaf roll symptoms -- an upward rolling of the upper leaves followed by a purplish coloration. Brown flecks or streaks form in the vascular tissue at the stem end of the tubers. In addition to reduction in yield, the flecking in the tubers (net necrosis) may cause a loss of the entire crop due to "grade out" inspectors. Varieties such as Russet Burbank are very susceptible to net necrosis. Net necrosis may develop before harvest but usually develops or intensifies during storage.

Control of leaf roll must involve three main considerations:

- (1) Susceptibility of the potato variety grown;
- (2) Sources of the virus;
- (3) Spread by aphids.

Susceptibility of the variety

The ideal way to control any plant disease is to have varieties available that are immune or resistant to the disease. Unfortunately, this is easier said than done, because of the difficulty of combining both disease resistance and the desired horticultural qualities into one variety. In spite of this difficulty, plant breeders may develop potato varieties that are resistant to leaf roll and we hope that these are available before many years go by.

Sources of the virus

The two main sources of leaf roll virus in potato fields are infected plants arising from infected seed potatoes or from small tubers left in the ground after harvest. Use of seed potatoes that are certified to be free or relatively free of leaf roll greatly reduces the amount of seed borne virus. Infected volunteer potato plants probably constitute the major source of leaf roll and these should be eliminated by either rotating fields out of potatoes for one year so that volunteers can be destroyed or by treating the potato crop with maleic hydrazide to prevent sprouting of tubers the following season.

Potatoes in back yard gardens may also be an important source of

leaf roll but regulating this source is probably impossible or at least difficult without legislation.

Spread by aphids

Spread from one plant to another within a season is entirely by aphids so that insect control is one of the chief means of reducing current season spread of leaf roll. Controlling current season leaf roll controls the development of net necrosis --- the greatest cause of economic loss.

Leaf roll control can be briefly stated as follows:

1. Eliminate the sources of the virus -- Use certified seed, control volunteer potato plants, and destroy all cull piles.
2. Reduce current season spread by controlling aphids throughout the season.
3. Grow leaf roll resistant varieties when they become available.