YIELDS FROM CURRENT SEASON INFECTED POTATO LEAF-ROLL VIRUS RESISTANT AND SUSCEPTIBLE POTATO VARIETIES

Robert T. McMillan, Jr.
University of Florida, IFAS
Sub-Tropical Experiment Station
Homestead

Abstract
Comparisons, under greenhouse conditions, were made of the effect of potato leaf-roll virus (PLRV) on four resistant and susceptible potato varieties: B 2795-5, Russet Burbank, White Rose, and Kennebec. Yields from all varieties inoculated with PLRV were reduced. Differences in yield performance between healthy and current season affected plants decreased with resistance.

Introduction
Potato virus diseases annually continue to cause significant losses at all levels of the industry. The most prominent loss due to the potato leaf-roll virus (PLRV) is the excessive reduc-

Table 1. Sources of potato varieties and their established level of resistance to PLRV used in yield experiment.

<table>
<thead>
<tr>
<th>Variety or Line Number</th>
<th>Source</th>
<th>Procuring Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Rose</td>
<td>Washington State University Horticulture Department</td>
<td>1965</td>
</tr>
<tr>
<td>Kennebec</td>
<td>Washington State University Horticulture Department</td>
<td>1965-66</td>
</tr>
<tr>
<td>Russet Burbank</td>
<td>Washington State University Horticulture Department</td>
<td>1965-66</td>
</tr>
<tr>
<td>B 2795-5 b/</td>
<td>USDA ARS Crops Research Division, Aberdeen, Idaho</td>
<td>1965</td>
</tr>
</tbody>
</table>

a/ The varieties are listed in order of decreasing levels of resistance based on field trials carried out by Seth Barton Locke, "Leafroll Field Resistance in Potatoes", The American Potato Journal, 42, 1965 (4), at three locations in Washington over a period of 11 years.

b/ This line has not been tested in field trials in Washington; thus, its relative resistance is not known.
tion in yield of the commercially acceptable vari-
egies, (2, 3, 5, 6, 7, 8, 9, and 10). Reductions from PLRV varied from 10% in the most resist-
ant varieties to 50% or higher for the most sus-
ceptible varieties. The experiment reported here was conducted to determine the effect of PLRV on yield of a new candidate B 2795-5 for breed-
ing material in the Pacific Northwest.

MATERIALS AND METHODS

All tubers of varieties listed in Table 1 previously indexed for PLRV were potted March 1967, in metal flats containing a 2:1 mixture of silica sand and peat moss. Prior to transplanting, the plants were each infested with ten viruliferous and nonviruliferous Myzus persicae Sulz. and the group was confined by a small leaf cage (1). After inoculation access, each plant was dipped in a malathion solution and transplanted into 12-inch crocks containing a 2:1:1 mixture of Snake River Soil, peat moss, and vermiculite.

The plants were 2 cm high when inoculated and plants infested with nonviruliferous aphids served as a control. Colonies of aphids were maintained on sugar beet plants in aphid-tight cages. The virus source plants were chronic leaf-roll-infected Russet Burbank plants inocu-
lated the previous year, caged to prevent stray aphids from transmitting other viruses to them.

Plants were grown in a greenhouse without supplemental light. Average temperatures in greenhouse were 25°C. The greenhouse was fumigated occasionally with nicotine.

The experimental greenhouse planting ar-
rangements was a randomized block design with six plants of each variety replicated four times. All inoculated plants showed typical "current" season3 symptoms, i.e., rolling of leaflets of up-

Table 2. Effect of potato leaf-roll on yield of several potato varieties.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield in Grams c/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healthy</td>
</tr>
<tr>
<td>White Rose</td>
<td>262.1 c</td>
</tr>
<tr>
<td>Kennebec</td>
<td>218.3 b</td>
</tr>
<tr>
<td>Russet Burbank</td>
<td>204.5 a</td>
</tr>
<tr>
<td>B 2795-5 b/</td>
<td>263.9 c</td>
</tr>
</tbody>
</table>

a/ The varieties are listed in order of decreasing levels of resistance.

b/ This line has not been tested in field trials in Washington; thus, its relative resistance is not known.

c/ Numbers followed by the same letter are not significantly different at the 5% level according to Duncan's Multiple Range Test.
per leaves and leaf stems showing purple color at 7 to 9 weeks after inoculation.

The tubers were harvested and weighed soon after the vines died.

RESULTS

The yields of healthy, resistant, and susceptible varieties were statistically different (Table 2). The highly susceptible varieties Russet Burbank and Kennebec had lower yields than the more resistant White Rose and B 2795-5.

Reduction in yields of virus inoculated, resistant, and susceptible varieties were statistically significant. The most resistant variety, White Rose, had a yield reduction one and half times higher than the most susceptible, Russet Burbank. Table 2 shows that White Rose had a lower reduction in yield than either of the more susceptible varieties, Russet Burbank and Kennebec.

The variety B 2795-5, whose place in the resistance scheme of varieties tested in Washington is not known but is reported (U.S., Dept. of Agr. Report, 1960) to have high resistance to PLRV, also had a low reduction in yield.

DISCUSSION

As indicated here and in papers by other workers, a yield reduction is characteristic of PLRV-infected potato plants. However, the degree of reduction in yield is correlated directly with resistance.

The yield of B 2795-5 suggests that it possesses disease resistance comparable to that of White Rose.

LITERATURE CITED


DISEASES OF WATERCRESS IN FLORIDA

J. O. STRANDBERG
University of Florida
Central Florida Experiment Station, Sanford

C. A. TUCKER, II
Agricultural Extension Service, Seminole County

Abstract

A recent survey of diseases affecting watercress (Nasturtium officinale R. Br.) in Florida showed that several fungal and one viral disease are causing losses to commercial watercress producers. Leafspot caused by Cercospora nasturtii Passerini, leaf and stem blights caused by Sclerotinia sclerotiorum (Lib.) DBy, and Chonaphora cucurbitarum (Berk & Rav.) Thaxt. and a stunting and discoloration of plants caused by Spongospora subterranea (Wallr.) Lagerh. f. sp. nasturtii and Plasmodiophora brassicae Wor. are presently causing severe losses to growers. A virus of the cucumber mosaic group and a blight caused by Pellicularia rolfsii West were observed to inflict only minor damage but both represent a potential hazard to commercial watercress production. Control of these diseases is complicated by a lack of effective fungicides registered for use on watercress.