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Mosaic disease of cucumbers: a new resistant variety

Cover Page Footnote
The author is indebted to—Dr. J. D. Wilson, Professor of Plant Pathology, Ohio Agricultural Experiment Station, Ohio, U.S.A., for seed supplies; Mr. M. Thornett, Biometrician, Plant Research Division, for statistical analyses; the Horticultural Division and Vegetable Research Station Manager, for assistance in conducting experiments and; Mr. M. Stevens, market gardener, Balcatta, for providing facilities to conduct the gardener's trial.
Mosaic Disease of Cucumbers
A NEW RESISTANT VARIETY

By H. L. HARVEY, B.Sc. (Agric.), Senior Plant Pathologist.

Tests with the cucumber variety Ohio MR 200 which was introduced from the U.S.A. (1), have shown it to be almost unaffected by the cucumber mosaic virus. It is a good type and satisfactory yielder and promises to be the answer to the cucumber mosaic problem in Western Australia.

Mosaic is one of the serious hazards to commercial cucumber growing, especially in the early plantings in the Balcatta market gardens. All locally-grown varieties are very susceptible to the disease and in surveys commenced in 1951, infections up to 35 per cent. occurred (2). In the spring crops of 1959 in Balcatta, the disease was even more prevalent, infections in some cases exceeding 60 per cent. in the field soon after transplanting from the seedling cold frames. Stunting was often so severe that crops were regarded as a total loss and ploughed under.

The disease, which is caused by a virus, is transmitted by aphids which occurred in plague form in the spring of 1959. Transmission may also occur by plant contact and by handling, but there is no evidence of transmission through cucumber seeds or soil in Western Australia.

SYMPTOMS
Infected cucumber vines are very conspicuous in the field when compared with healthy vines. They are stunted due to rosetting or shortening of the stem. The leaves are small and their very pale colour contrasts with the dark green foliage of normal plants. Infected leaves show an obvious yellow and green mottle or mosaic pattern (Fig. 1) and if diseased plants produce fruit they may be undersized and malformed with mottling of the skin and the formation of dark green blisters (Fig 2). The disease may kill plants prematurely.

HOSTS
The cucumber mosaic virus has a very wide host range, including members of the melon family, tomatoes, N.Z. lupins, silver beet (Chard) and numerous ornamental species. The disease is of greatest economic importance in Western Australia in cucumber crops.

TESTS WITH OHIO MR 200
Preliminary field tests in 1958 indicated that Ohio MR 200 was a desirable type of cucumber with a high resistance to mosaic, and this was substantiated in 1959 in a yield experiment under severe mosaic conditions at the Vegetable Research Station at Herdsman Lake and in a gardener's trial at Balcatta.
YIELD EXPERIMENTS AT HERDSMAN LAKE—SPRING, 1959

Seedlings of the cucumber varieties Ohio MR 200, Marketer, Davis Perfect and Palmetto were planted out 7/9/59 in a randomised block design of six replications with four hills per plot. Sap inoculations with the cucumber mosaic virus were made on 28/9/59 and 14/10/59 and later the hills were thinned to single plants. The inocu-
Fig. 3.—Davis Perfect cucumber plants (left) stunted by mosaic during early growth and Ohio MR 200 plants (right) growing normally at the Herdsman’s Lake Research Station. All plants were inoculated with the mosaic virus had been retained from naturally infected cucumber plants grown at Herdsman Lake the previous season.

Mosaic symptoms were very slight or absent in Ohio plants but very conspicuous in other varieties which soon became badly stunted (Fig. 3). Picking was commenced on 14/10/59 and concluded 30/12/59 and total yields and percentages of first quality fruit are presented in Table 1.

It is apparent from these figures that in total yields of fruit and in quality, Ohio was far superior to other varieties.

GARDENERS’ TRIAL AT BALCATTASPRING, 1959

Two rows (60 plants) of Ohio MR 200 were grown in the middle of a commercial planting of Davis Perfect in the early spring of 1959. Following a heavy aphid infestation three weeks after transplanting, mosaic spread in the Davis Perfect plants finally infecting and badly stunting 60 per cent. or more of them. In Ohio, by contrast, a few plants showed only mild mottling without stunting (Fig. 4) and produced high quality fruit. Owing to the rapid deterioration of the main crop of Davis Perfect the gardener abandoned the whole area and no comparative yield figures were available. From the first two or three picks and from assessments of mosaic incidence, however, it was apparent that Ohio would have outlived and out-yielded Davis Perfect, had the area not been abandoned.

Table 1

<table>
<thead>
<tr>
<th>Variety</th>
<th>Total Yield</th>
<th>First Quality Cucumbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio MR 200</td>
<td>93.66</td>
<td>85</td>
</tr>
<tr>
<td>Davis Perfect</td>
<td>11.70</td>
<td>12</td>
</tr>
<tr>
<td>Marketer</td>
<td>7.64</td>
<td>37</td>
</tr>
<tr>
<td>Palmetto</td>
<td>2.63</td>
<td>0</td>
</tr>
</tbody>
</table>

Difference for significance at 0.1% level: 20.89

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CONTROL

Hitherto, the control of mosaic in cucumbers has been directed at the reduction of aphid populations through the medium of weed control, garden sanitation and the use of insecticides and also by roguing diseased plants.

As adequate supplies of seed become available, the adoption of Ohio MR 200 for early spring plantings is recommended in mosaic-liable districts such as Balcatta and parts of Osborne Park. At present only small trial lots of seed can be made available from limited supplies and market gardeners requiring seed for trial should address requests to the Department of Agriculture, South Perth.

ACKNOWLEDGMENTS

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the Horticultural Division and Vegetable Research Station Manager, for assistance in conducting experiments and;

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REFERENCES


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