Cover spraying for septoria leaf spot of celery

S C. Chambers
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Cover Page Footnote
The author is indebted to Mr. W. Stevens, Balcatta on whose property the trial was conducted. Grateful acknowledgment is also made to Mr. W. Pickering for his assistance with the field work and to Mr. M. Thornett for statistical analysis of results.

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Excellent control of Septoria leaf spot on winter grown celery has been obtained with the fungicide Dyrene® when applied at 10-11 day intervals during the season.

LEAF SPOT, caused by the fungus Septoria apii Chester is the most serious disease of celery in Western Australia and is responsible for heavy losses in many winter grown crops.

Although the disease can be controlled by spraying regularly with Bordeaux 4 : 4 : 40 (Chambers, 1958), this fungicide is not entirely satisfactory owing to the unsightly blue deposit it leaves on the foliage.

More recent work has shown that the foliage discoloration can be reduced considerably by using ziram (1\textfrac{1}{2} lb. per 100 gal.) in place of Bordeaux mixture for the last two cover sprays before harvest (Chambers, 1961). Nevertheless, some growers still report unsightly Bordeaux deposits, which must be removed before marketing the celery.

To try and eliminate this problem, it was decided to examine alternative fungicides which might replace the Bordeaux mixture in the recommended schedule.

Two possible materials, maneb and Dyrene (R) have been reported to give good control of Septoria leaf spot in the United States of America by Darby (1958, 1960) and Wilson (1958).

A field experiment was therefore initiated to compare these fungicides with the standard treatment under local conditions.

EXPERIMENTAL

The trial was carried out in a market garden at Balcatta, using portion of a celery crop transplanted from seed beds early in April, 1963.

The experimental design was a simple randomisation of four treatments in each of 10 replications and the component plots contained a single row of 15 plants.

The materials tested as cover sprays were:

- Bordeaux 4 : 4 : 40 replaced by ziram (1\textfrac{1}{2} lb. per 100 gal.) for the last two applications before harvest; Dithane M22 (R) (2 lb. per 100 gal.); Dithane M45 (R) (2 lb. per 100 gal.) and Dyrene (R) (2 lb. per 100 gal.).

- Calcium caseinate (1 lb. per 100 gal.) was used as a spreader for the Bordeaux mixture and B.A.S.F. Rapid Wetting Agent (1 to 2 fl. oz. per 100 gal.) was added to each of the other fungicides. Cover sprays
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were applied at 10 to 11 day intervals, starting April 17 until August 9.

The incidence of Septoria leaf spot was assessed on August 5. Randomised samples of 100 leaves from each plot were examined and a numerical value was allotted to the condition of each leaf in accordance with Table 1.

**TABLE 1**

CLASSIFICATION OF LEAF SPOT SYMPTOMS ON INDIVIDUAL LEAVES

<table>
<thead>
<tr>
<th>Class</th>
<th>Symptoms on Leaf</th>
<th>Numerical Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No visible symptoms</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Less than 4 lesions per leaflet</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>More than 4 lesions per leaflet</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Partial or complete collapse of leaflets</td>
<td>3</td>
</tr>
</tbody>
</table>

An analysis of the incidence of Septoria leaf spot in relation to treatment is shown in Table 2.

**TABLE 2**

EFFECT OF VARIOUS COVER SPRAYS ON INCIDENCE OF SEPTORIA APIII

<table>
<thead>
<tr>
<th>Fungicide</th>
<th>Evaluation of Disease Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Leaf Value</td>
</tr>
<tr>
<td>Dyrene</td>
<td>0.99</td>
</tr>
<tr>
<td>Bordeaux followed by Ziram</td>
<td>1.06</td>
</tr>
<tr>
<td>Dithane M22</td>
<td>1.21</td>
</tr>
<tr>
<td>Dithane M45</td>
<td>1.54</td>
</tr>
<tr>
<td>Difference for significance P = 0.05</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
</tr>
</tbody>
</table>

* Using transformation 10x.3.

**DISCUSSION**

From the results in Table 2, it is evident that Dyrene is equally as effective as the recommended Bordeaux schedule in controlling Septoria leaf spot of celery. Furthermore, as Dyrene does not discolor the foliage, it is to be preferred to the Bordeaux schedule (Fig. 1).
However, if adequate control of the disease is to be maintained in winter-grown celery it is essential to spray regularly and thoroughly throughout the season. The importance of satisfactory routine spraying was amply demonstrated by the serious Septoria damage which occurred where Bordeaux was applied infrequently to the bulk crop adjoining the experimental plots (Fig. 2).

The other two fungicides under test, Dithane M22 and Dithane M45, were not as satisfactory as the Bordeaux schedule in controlling the disease (Table 2), although neither caused any foliage discoloration.

**RECOMMENDATION**

Septoria leaf spot can be effectively controlled in winter grown celery by spraying with Dyrene (R) at the rate of 2 lb. per 100 gallons. The first application should be made within 14 days of transplanting and subsequent sprays should be applied at intervals of 10 to 11 days.

**ACKNOWLEDGMENTS**

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**REFERENCES**


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