Management of powdery mildew of pea (Pisum sativum L.) caused by Erysiphe polygoni

M.R. DABBAS* AND H.G. PRAKASH
Vegetable Research Station, C.S.A. University of Agriculture and Technology, Kalyanpur, KANPUR (U.P.) INDIA

ABSTRACT
Powdery mildew of pea (Pisum sativum L.) due to (Erysiphe polygoni D.C.) cause much damage to the crop. An experiment was conducted in 2008-09, 2009-10 and 2010-11 to know the effective fungicidal practice for management of this disease. Three foliar sprays at 10 days interval from initiation of the disease of Baylilton (0.25%) gave average minimum (5.65%) disease intensity and maximum grain yield 3.080kg/plot (3.2m x 3.0 m). In term of cost-benefit ratio treatment (T5), three foliar sprays of Baylilton (0.25%) at 10 days interval from initiation of the disease gave (1:2.03).

INTRODUCTION
Table pea (Pisum sativum L.) is an important vegetable crop for providing Protein to vegetarian population of India. It is grown as winter vegetable in plains of North India and as summer vegetable in hills. Severe losses to the table pea are caused by different pathogens such as Erysiphe polygoni, Uromyces vicifaecae, Mycosphaerella pinodes, Ascocytto pitarum, Sclerotinia sclerotiorum, Pernospora pisi, Uromyces fabae and Septoria pisi. Among them Powdery mildew caused by (Erysiphe polygoni D.C.) is a serious disease which is responsible for reduction in pod numbers to about 21-30 per cent and reduction in pod weight about 26-47 per cent, when the crop is infected about 100 per cent (Munjal et al., 1963). The pathogen of this disease is an obligate parasite. The conidia produced as a result of primary infection on alternate host are wind-blown, brought on to healthy leaves and other parts, hence foliar application of fungicidal chemicals strategy was taken up to control.

MATERIALS AND METHODS
The trial was conducted in three years viz., 2008-09, 2009-10 and 2010-11 with nine treatments along-with control in the experimental field of Vegetable Research Farm, Kalyanpur of Chandra Shekhar Azad University of Agric. and Tech., Kanpur with individual plot size (3.2m x 3.0m). Treatments were: three foliar sprays of Tridemorph (Calixin), three foliar sprays of Flusilazole (Cursar), three foliar sprays of Tebuconazole (Folicure), three foliar sprays of Sodium bisulphate, three foliar sprays of Baylilton, three foliar sprays of Difenoconazole (Score), three foliar sprays of Wettatable sulphar, three foliar sprays of Neem oil and three foliar sprays of Carbendazim were used. Highly susceptible variety of table pea, Azad P-1 were used in all three years, 2008-09, 2009-10 and 2010-11. Disease intensity were recorded after 10 days of every spray and average were calculated separately in every year. Yield data of grain were also weighted after harvesting of the crop and average were calculated separately in every year.

RESULTS AND DISCUSSION
Perusal of three years data depicted in Table 1 revealed that treatment, three foliar sprays of Baylilton (0.25%) at 10 days interval from initiation of the disease was found significantly (P< 0.05) superior in respect of mean, disease intensity (5.65%), yield (3.050 kg/plot) and (1:2.03) benefit-cost ratio followed by three foliar sprays of Tridemorph (Calixin) @ (0.1%) at 10 days interval from initiation of the disease refelacted (6.59%) disease intensity, (2.950 kg/plot) grain yield and (1:2.03) cost-benefit ratio. Best third treatment was three foliar sprays of flusilazole (0.1%) at 10 days interval,
started from initiation of the disease which gave (7.24%)
disease intensity, (2.730kg/plot) grain yield and (1:1.78) benefit-
cost ratio. Least effective treatment were three foliar sprays of
wettable sulphar (0.3%) and three foliar sprays of Neem oil
(0.25%) recorded non significant difference in each treatment
but these were superior over the control in all three types of
data. The application of carbendazim (0.1%) solution three
times at 10 days interval from initiation of the disease gave
(12.55%) disease intensity (2.080kg/plot) grain yie ld and
(1:1.96) benefit-cost ratio. All nine treatments of different
groups and Wettable sulphar were significantly superior over
the control. The study indicated that three foliar sprays of
Bayliton (0.25%) at 10 days interval from initiation of the
disease found more effective in reducing the disease intensity,
increasing the grain yield at maximum cost benefit ratio. Similar
results were also reported by Banyal and Rana (2003);

<p>| Table 1 : Disease intensity, grain yield and economics of the crop |
|---------------------------------|----------------|-----------------|--|---------|---------|---------|</p>
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Treatments</th>
<th>Disease intensity (%)</th>
<th>Mean Yield (kg/plot)</th>
<th>Mean</th>
<th>C:B ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008-09</td>
<td>2009-10</td>
<td>2010-11</td>
<td>2008-09</td>
<td>2009-10</td>
</tr>
<tr>
<td>T₁</td>
<td>Tridemorph (Calixin) @ 0.1% three foliar sprays at 10 days interval from initiation of the disease</td>
<td>7.51 (15.89)</td>
<td>6.44 (14.71)</td>
<td>5.83 (13.97)</td>
<td>6.59</td>
</tr>
<tr>
<td>T₂</td>
<td>Flusilazole (Cursar) @ 0.1% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>7.98 (16.32)</td>
<td>7.19 (15.55)</td>
<td>6.54 (14.82)</td>
<td>7.24</td>
</tr>
<tr>
<td>T₃</td>
<td>Tebuconazole (Folicure) @ 0.1% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>8.35 (16.74)</td>
<td>8.14 (16.58)</td>
<td>7.65 (16.06)</td>
<td>8.05</td>
</tr>
<tr>
<td>T₄</td>
<td>Sodium bisulphate @ 0.25% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>14.99 (22.71)</td>
<td>12.24 (20.48)</td>
<td>11.48 (19.81)</td>
<td>12.90</td>
</tr>
<tr>
<td>T₅</td>
<td>Bayliton @ 0.25% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>7.49 (15.79)</td>
<td>5.09 (13.05)</td>
<td>4.37 (12.07)</td>
<td>5.65</td>
</tr>
<tr>
<td>T₆</td>
<td>Difeneconazole (Score) @ 0.05% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>10.48 (18.81)</td>
<td>9.95 (18.39)</td>
<td>9.77 (18.21)</td>
<td>10.07</td>
</tr>
<tr>
<td>T₇</td>
<td>Wettable sulphur @ 0.3% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>11.79 (20.18)</td>
<td>11.12 (19.54)</td>
<td>10.79 (19.12)</td>
<td>11.23</td>
</tr>
<tr>
<td>T₈</td>
<td>Neem oil @ 0.25% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>12.00 (20.00)</td>
<td>12.56 (19.48)</td>
<td>13.08 (19.18)</td>
<td>12.55</td>
</tr>
<tr>
<td>T₉</td>
<td>Carbendazim @ 0.1% three foliar sprays at 10 days interval from initiation of the disease.</td>
<td>37.99 (38.00)</td>
<td>22.50 (28.31)</td>
<td>21.78 (27.82)</td>
<td>21.74</td>
</tr>
<tr>
<td>:T₁₀</td>
<td>Control</td>
<td>37.99</td>
<td>37.99</td>
<td>37.99</td>
<td>27.42</td>
</tr>
<tr>
<td></td>
<td>Mean C:B ratio</td>
<td>2.73 (1.82)</td>
<td>1.80 (0.85)</td>
<td>0.58 (0.52)</td>
<td>12.26</td>
</tr>
</tbody>
</table>

Conclusion:
On the basis of above results it may be concluded that
three foliar sprays of Bayliton (Triadimefon) (0.25%) at 10
days interval from initiation of the disease may be
recommended for management of Powdery mildew of Pea.

REFERENCES
for the management of Pea powdery mildew. J. Mycol. Pl. Pathol.,
33(2) : 302-304.

and rust of pea by fungicide., Indian Phytopathol., 51(2) : 184-186.

Munjal, R.L., Chenulu, V.V. and Hora, I.S. (1963). Assessment of
losses due to powdery mildew (Erysiphe polygoni) on pea. Indian

against powdery mildew and rust of pea (Pisum sativum L.), Annals