INTRODUCTION:

Phytophthora infestans is one of the most serious and economically important pathogens in potato fields worldwide, including Estonia. Under favourable conditions it can destroy the whole potato haulm and cause a considerable yield loss. In Estonia, the average yield loss due to late blight can reach 20-25% and in untreated fields even more. Without control of potato late blight it is not possible to achieve high-quality crop yield.

R. infestans isolated from potato leaves were collected from a region of Southern Estonia during 2010 and 2011. In total, 128 isolates were assessed for mating type and 71 isolates were analyzed for resistance to metalaxyl.

MAIN AIM OF THE RESEARCH:

Survey the population structure of P. infestans in Estonia and characterise isolates by mating type and their resistance to metalaxyl.

MATERIALS AND METHODS:

In total, 128 isolates of Phytophthora infestans were collected from Estonia during 2010-2011. The isolates were sampled randomly from southern Estonia and the procedure was repeated two years.

Blighted leaves (one per plant) were collected in the period from the emergence of disease until the end of the growing season in both years.

Leaflets with single lesions, were collected from individual plants. Isolations were carried out as described in Runno-Paurson et al. (2009).

For mating type determination was used a method as described by Lehtinen et al. (2007).

The resistance to metalaxyl of 71 isolates was tested using a modification of the floating-leaflet method described by Hermansen et al. (2000).

Leaflets of susceptible cultivar Berber were obtained from five-week-old greenhouse-grown plants.

The metalaxyl concentrations were 0.0, 10.0 or 100.0 mg l−1 prepared from Analytical Master Standard, CGA 329351A.

Statistical analyses were performed with the programma Statistica 11 (StatSoft, Inc., Tulsa, Oklahoma).

CONCLUSION:

The proportion of metalaxyl-resistant isolates in the Estonian population in 2010-2011 were quite low.

Results showed that the use of metalaxyl-containing fungicides is still effective in Estonia.

In Estonia the ratio of P. infestans A1:A2 (which is close to 1:1) mating types is suitable for sexual reproduction.

During 2010-2011 13 fields had both mating types in the same potato fields.

RESULTS:

Among the 71 isolates, 9.5% were resistant, 8.5% intermediate and 88.7% sensitive to metalaxyl. In 2010 the percentage of resistant isolates was 9.5 % and in 2011 it was 0 %. In 2010 were 51 % of the isolates A1 and 49 % were A2 mating type. In 2011 were 48 % of the isolates A1, 49 % were A2 and 3 % were self-fertile A1A2 mating type.

There were thirteen fields that contained both A1 and A2 mating types.

A1 mating type individuals were detected in one of the fifteen fields, and A2 mating type individuals were also identified in one field.

Table 1. Metalaxyl resistance among isolates of Phytophthora infestans in Estonia 2010 and 2011

<table>
<thead>
<tr>
<th>Year</th>
<th>S (%)</th>
<th>I (%)</th>
<th>R (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>76.2</td>
<td>14.3</td>
<td>9.5</td>
</tr>
<tr>
<td>2011</td>
<td>94</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>88.7</td>
<td>8.5</td>
<td>2.8</td>
</tr>
</tbody>
</table>

S = metalaxyl-sensitive; I = intermediate metalaxyl-sensitive; R = metalaxyl-resistant

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