Curative and eradicant efficacy

Workshop Late Blight 2010 Arras
Johan Desnouck
• Is a product from AGRIPHAR S.A.
• Containing 50 g/l CYMOXANIL en 400 g/l PROPAMOCARB
  – **PROPAMOCARB (400 g/l)**
    • 2.5 l PROXANIL = 2.70 l TATTOO C / 1,60 l INFINITO
    • 2.0 l PROXANIL = 2.16 l TATTOO C / 1,28 l INFINITO
  – **CYMOXANIL (50 g/l)**
    • 2.5 l PROXANIL = 2.66 KG CURZATE M
    • 2.0 l PROXANIL = 2.22 KG CURZATE M

• Formulated as a suspension concentrate (SC)
• Dose rate: 2-2.5 l (depending country)
Definition curative activity, ....

Curative activity - the fungicide is active against *P. infestans* during the immediate post infection period but before symptoms become visible, i.e. during the latent period.

...antisporulant activity (eradicant)

Antisporulant activity - *P. infestans* lesions are affected by the fungicide by decreasing sporangiophore formation and/or decreasing the viability of the sporangia formed.

Ninth Workshop of a European Network for Development of an Integrated Control Strategy of Potato Late Blight
Tallinn, Estonia, 19-23 Oct 2005
Report of the fungicide sub-group:
Discussion of potato early and late blight fungicides, their properties & characteristics
Latent Period

Infection

3 to 5 days

First sporangiophores

Curative effect

1 to 3 days

Developed late blight
PPO Lelystad: Curative Effect 2008 Pot Trial

- 21.05.2008: Planting
- 18.06.2008: Inoculation (15-20 cm)
- Treatment at
  - I+12h, I+18h, I+36h, I+48h
- 4 repetitions

<table>
<thead>
<tr>
<th>Object</th>
<th>treatment</th>
<th>Dose/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Untreated</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Proxanil</td>
<td>1.5</td>
</tr>
<tr>
<td>3</td>
<td>Proxanil</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Proxanil</td>
<td>2.5</td>
</tr>
<tr>
<td>5</td>
<td>Cymoxanil (45%)</td>
<td>0.24</td>
</tr>
<tr>
<td>6</td>
<td>Benthiovalicarb+Mancozeb</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Mandipropamid</td>
<td>0.6</td>
</tr>
<tr>
<td>8</td>
<td>Fluopicolide+Propamocarb</td>
<td>1.6</td>
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% Infected foliage

23.06.2008

Significantly the best!
I = Artificial infection

Treatments:
I+12h: Curative spraying
I+24h: Curative spraying
I+36h: Curative spraying
I+48h: Curative spraying

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Visual effect
Curative Effect 2008
Field Trial

- Target: to see the effect of two applications Proxanil and Proxanil combinations in extreme conditions (heavy infection pressure) in the beginning of the season (fast growing plants)
- Artificial infection over the objects: June 5
- First application: June 7 (no visual symptoms)
- Second application: June 11 (first visual symptoms)
- Shirlan 0.4 l for the following treatments

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Location: Mennesis Fr
Cyazofamid always with adjuvant 0.15 l/ha
Untreated

Cyazofamid + Cymoxanil

Proxanil

Cyazofamid + Proxanil

Fluopicolide + Propamocarb
• First treatments with Shirlan at low doses (0.3).
• Inoculation infection rows.
• Treatments: 3 treatments with a shorter interval at moment of high pressure from infection rows.
• Further treatments with Shirlan.
• Infection pressure in Lelystad 2009
Phytophthora trial PPO Lelystad
% leaf infection

- 0.17 Curzate partner
- 0.2 Ranman + 0.17 Curzate partner
- 0.2 Ranman + 0.6 Revus
- 0.2 Ranman + 2 Valbon
- 1.6 Infinito
- 2 Proxanil
- 2 Proxanil + 0.2 Ranman

Cyazofamid always with adjuvant 0.15 l/ha
Antisporulating effect

Latent Period: 3 to 5 days

Lesion Area: First sporangiophores developed late blight 1 to 3 days

Infection: 3 to 5 days

Developed late blight: 1 to 3 days
Curative – eradicant: a big difference
Curative – eradicant: a big difference

% leaf infection

Eradicant (5days)

2.0 Mefenoxam+Mancozeb
2.0 PROXANIL
2.2 Mancozeb+Cymoxanil
2 Propamocarb+Fenamidone
Untreated
Curative – eradicant: a big difference

- Untreated
- Fluopicolide+Propamocarb 1,6
- Proxanil 2,5

Trial – PPO 2008
Conclusions

Curative activity:

• In comparison with cymoxanil alone (a compound known to have good curativity), the curative activity of the formulation cymoxanil + propamocarb is stronger, even though the limited curativity of propamocarb. This shows a synergy of the formulation propamocarb and cymoxanil. Proxanil has the best curative activity in the presented trials.

Eradicant activity:

• None of the tested products has satisfying eradicant activity. Proxanil shows the best stop effect but it is not strong enough to stop the visual blight spots immediately. It demonstrates the importance of a good preventive product in the schedule to stop visual late blight.
### Proposal EU rating

<table>
<thead>
<tr>
<th></th>
<th>Effectiveness</th>
<th>Mode of action</th>
<th>Rain</th>
<th>Mobility in the plant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td>Leaf blight</td>
<td>New growth</td>
<td>Stem blight</td>
<td>Tuber blight</td>
</tr>
<tr>
<td><strong>Propamocarb HCL</strong></td>
<td>-</td>
<td>?</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><strong>+ cymoxanil</strong></td>
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- **Preventive leaf blight**: no information in the EU trials = -
- **New growth**: no specific data = ?
- **Stem blight**: looking to the active ingredients propamocarb and cymoxanil = ++
- **Tuber blight**: comparable as other propamocarb containing products = ++
- **Protectant**: ++
- **Curative**: the curativity is at least as good as the systemically products and clearly better than cymoxanil/mancozeb = ++(+)
- **Anti sporulant**: there is a good anti sporulating (eradicant) effect = ++(+)
- **Rainfastness**: as it is a systemic and translaminair product, the rain fastness = +++