Late blight control strategies in the Mediterranean area with Infinito and Consento

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EuroBlight Cyprus 13 May 2013
Late blight control strategies in the Mediterranean area with Infinito and Consento

Outline of the presentation

Key features of Infinitio & Consento

- Mode of action and use recommendations
- Regulatory profile

Performance, disease control and yield
- Middle East countries
- North African countries

Summary & conclusion
Infinitio mode of action and interaction with the lifecycle of *Phytophthora infestans*

- **Infinito** is a co-formulation of 2 active ingredients
  - Fluopicolide (Acylpicolides) 62,5 g/l
  - propamocarb HCl 625 g/l
- **Infinito** is a Suspension Concentrate (SC), easy to handle liquid formulation
- **Infinito** has a novel mode of action: redistribution of spectrin-like proteins into the cytoplasm

![Infinitio Activity Diagram](image)

- **Preventive activity**
- **Anti-sporulant**
- **Curative activity**
Complementary fungicidal activity of the two active ingredients in **Infinito**

**Fluopicolide**
- New mode of action
- Contact + translaminar
- Active on all steps of Oomycete life cycle
  - strong and quick effect on zoospores
  - Anti-sporulant
- Excellent protectant activity + curative potential
- Long lasting performance

**Propamocarb-HCl**
- Well known fungicide with no resistance after more than 20 years of use
- Systemic (xylem distribution)
- Curative
- Active on mycelium growth, spore production and spore germination

➤ Excellent complementarity and pro-active resistance management
Favourable regulatory profile

- Low acute toxicity
- Not carcinogenic/mutagenic
- No developmental or reproductive toxicity
- Non-toxic to birds, bees and non target organisms (Typhlodromus, Aphidius (parasitic wasps), earthworms)
- Not toxic to aquatic organisms
- Extremely low or No residues in potatoes
- Short PHI, meets required quality for storage / processing

➢ Infinito - a modern tool for use in integrated crop management (ICM)
CONSENTO is a combination of two active ingredients:

- Fenomen® 75 g / l
- Propamocarb-HCl 375 g / l

The combination of Fenomen + propamocarb provides:

- excellent preventive and curative efficacy
- good protection of the new growing leaves and stems which develop after application
- good rain fastness.
- Good control of Alternaria solani
Favourable regulatory profile

- Low acute toxicity
- Not carcinogenic /mutagenic
- No developmental and reproductive toxicity
- Fenomen® is practically not toxic to birds and bees.
- Not toxic to aquatic organisms in GAP conditions
- No risk for beneficial insects
- Extremely low residue level when applied according to GAP
- Short Pre Harvest Interval (see recommendations)

- Consento - a modern tool for use in integrated crop management (ICM)
Performance against late & early blight in MEA countries
(Egypt, Israel & Turkey)
Consento control of *Alternaria solani* (cultivar Mundial)

Consento at 1.5 & 2 L/ha provided excellent control of *Alternaria solani*
Infinito control of *Phytophthora infestans* (cultivar Niata)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>AUDPC</th>
<th>% Efficacy</th>
<th>Yield t/ha</th>
<th>Added yield vs. Control relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infinito 1.5l/ha</td>
<td>20.25 b</td>
<td>91.3 ab</td>
<td>62.2 a</td>
<td>159</td>
</tr>
<tr>
<td>Infinito 2l/ha</td>
<td>12.63 b</td>
<td>94.5 ab</td>
<td>65.2 a</td>
<td>166</td>
</tr>
<tr>
<td>Standard</td>
<td>11.75 b</td>
<td>95.4 a</td>
<td>60.4 a</td>
<td>154</td>
</tr>
<tr>
<td>Control</td>
<td>246.63 a</td>
<td>N/R</td>
<td>39.2 b</td>
<td>100</td>
</tr>
</tbody>
</table>

* Statistical analysis according to Tukey-Cramer at significance level of 0.05. The efficacy data were transformed via arcsinus prior to the analysis.

- Infinito is effective against active late blight infection = standard
- Infinito at dose rates of 1.5 and 2 l/ha resulted in better yield > standard in average of 61% more yield compared to 54% achieved by standards.
Does Infinito need a tank mix partner?
Cultivar: Shipody

Conclusions:
- Infinito solo at 1.5 L/ha > Standard and = similar to all other tankmix combinations
- Infinito does not need to be tank mixed with other partners to achieve effective control of Phytophthora infestans on potato

Vitane WG 45% Cymoxanil
Athlete WG 50% Dimethomorph
Folio Gold SC Mefenoxam 37.5 g/l + Chlorothalonil 500 g/l
Curazate 60% Cymoxanil
Infinito control of late blight in different potato varieties

In all trials, INFINITO was tested at 1.5 l/ha curatively e.g. at the beginning of infection 2–5% or later on at first disease establishment e.g. 8–17% disease severity on different potato varieties at several locations.

- INFINITO could stop the disease very quickly at 3 DAA and showed 85–100% efficacy at 7 DAA and continued up to 14 DAA.
- The new leaves were healthy
- Farmers reported INFINITO to show up > 20 days long lasting efficacy compared to standards.
### Overall Farmers' feedback:

<table>
<thead>
<tr>
<th>Farm name /location</th>
<th>Area treated ha</th>
<th>Pre-spray infection (% disease severity)</th>
<th>Sprayer/ spray volume ha</th>
<th>Farmer feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coppenhagen / Nubarya</td>
<td>0.8 ha</td>
<td>17%</td>
<td>boom sprayer 240 l / ha</td>
<td>“Excellent as disease has been stopped quickly &amp; for long time”</td>
</tr>
<tr>
<td>Coppenhagen / Nubarya</td>
<td>2 ha</td>
<td>2%</td>
<td>boom sprayer 200 l / ha</td>
<td>“Happy, disease disappeared…”</td>
</tr>
<tr>
<td>Ramadan Khoryes Menofya</td>
<td>0.5 ha</td>
<td>13%</td>
<td>knapsack sprayer 250 l / ha</td>
<td>“New leaves are clean”</td>
</tr>
<tr>
<td>International potato center Behera</td>
<td>0.2 ha</td>
<td>8%</td>
<td>knapsack/ sprayer 240 l / ha</td>
<td>Very effective as disease was stopped long time. We need new a.i. because of Metalaxyl resistance</td>
</tr>
<tr>
<td>Salma - Nubarya</td>
<td>Commercial Fields (large area)</td>
<td>5 – 10%</td>
<td>boom sprayer 200 l / ha</td>
<td>Excellent: stopped the disease + long lasting efficacy &gt;20 days compared with standard</td>
</tr>
</tbody>
</table>
Field treated with Infinito (1.6 l / ha - Menofya)
Treated potato plants

Untreated potato plants
Consento control of *Phytophthora infestans* in tomato (Turkey)

Consento showed excellent efficacy against tomato late blight = Standard.

* Untreated = % infection

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Bayer CropScience
Performance in North African countries (Tunis, Morocco)
VOLARE control of *Phytophthora infestans* (Tunis – Jendouba)

Foliar blight (%) 10 days after 4th application

- Réf 3: 6.0%
- Réf 4: 5.0%
- Réf 1: 4.0%
- Réf 2: 3.0%
- VOLARE: 1.0%

Volare (Infinito) excellent control of *Phytophthora* compared to standards
Disease conditions in the trial, 18 days after the 2nd application of Volare

VOLARE treated plot: no visible symptom of late blight on leaves

Reference treatment: New late blight spots are visible on leaves
UNTREATED: aggressive disease development within 4 days

% disease incidence

Day 0 | Day 0+4

3,5  | 28,8

Successful curative control with Volare (Infinito) at 1.5 Ltr. / ha

4 DAT > Ridomil Gold

Volare (150 ml/hl)  | Mefenoxam + Mancozeb (250 g/ml)

95,62  | 71,35

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**Bayer spray programs with & without Volare against late blight disease, Morocco**

### Summary BCS I program:
The inclusion of 2X Volare provided the best efficacy

<table>
<thead>
<tr>
<th>Programme</th>
<th>BCS I</th>
<th>BCS II</th>
<th>BCS III</th>
<th>Untreated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Application</td>
<td>Antracol 250 g/hl</td>
<td>Mancozeb 200 g/hl</td>
<td>Mancozeb 200 g/hl</td>
<td>Untreated</td>
</tr>
<tr>
<td>2nd application</td>
<td>Volare 150 ml/hl</td>
<td>Mefenoxam + Mancozeb 250 g/hl</td>
<td>Cymoxanil + Famoxadone 400 g/ha</td>
<td>Untreated</td>
</tr>
<tr>
<td>3rd application</td>
<td>Volare 150 ml/hl</td>
<td>Mefenoxam + Mancozeb 250 g/hl</td>
<td>Cymoxanil + Famoxadone 400 g/ha</td>
<td>Untreated</td>
</tr>
</tbody>
</table>
Both Infinito and Consento are combinations based upon two different active ingredients with excellent complementary performance enabling pro-active resistance management.

Consento provides both control of *Alternaria* and *Phytophthora*.

Infinito and Consento provided reliable and consistent control across the region at various disease levels.

Both products showed excellent efficacy, increased the potato yield when applied either protective or curative.

In the Middle East and North Africa Consento and Infinito have become important parts of potato spray programs to control early and late blight diseases.
Thank you for your kind attention