Steinernema carpocapsae (entomopathogenic nematodes)

For control of the Red Palm Weevil (*Rhynchophorus ferrugineus*) and Palm Borer (*Paysandisia archon*)

### General information

Today, red palm weevils and palm borers are considered to be the main pests causing major damage to palm trees. In the larval stage, both pests can effectively be controlled by repeated treatments with the entomopathogenic nematode *Steinernema carpocapsae*.

### Red Palm Weevil (*R. ferrugineus*)

**Application recommendation**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Water volume</th>
<th>Dose</th>
<th>Application interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date palm <em>Phoenix dactylifera</em> 5 – 15 litres/palm approx. (reduce the volume for plant nurseries)</td>
<td>2 million nematodes/litre</td>
<td>every 4 to 6 weeks (intensify treatments when pest activity is high)</td>
<td></td>
</tr>
<tr>
<td>Canary land date palm <em>Phoenix canariensis</em> 15 – 25 litres/palm approx.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application period** (for Mediterranean zone)

<table>
<thead>
<tr>
<th>Month</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**To be noted**

- If temperatures are above 35°C inside palm stem use other treatments.
- If palms already show severe damage symptoms use other treatments from June - August, and combine with nematodes for the rest of the application period.
- If adult palm weevils can be found, use CK-lures (a mixture of pheromones and feed attractant, available from Andermatt Biocontrol) to capture them.

### Palm Borer (*P. archon*)

**Application recommendation**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Water volume</th>
<th>Dose</th>
<th>Application interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date palm <em>Phoenix dactylifera</em> 5 – 15 litres/palm approx.</td>
<td>3 million nematodes/litre</td>
<td>every 3 weeks (preventive)</td>
<td></td>
</tr>
<tr>
<td>Canary land date palm <em>Phoenix canariensis</em> 15 – 25 litres/palm approx.</td>
<td>6 million nematodes/litre (curative)</td>
<td>every 2 weeks (curative)</td>
<td></td>
</tr>
</tbody>
</table>

**Application period** (for Mediterranean zone)

<table>
<thead>
<tr>
<th>Month</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Spray mixture and application method**

1. Nematode applications can be made by watering can, irrigation system, motorised sprayer (lance), etc.
2. Clean tank well, especially after insecticide application.
3. Dissolve nematode packages into a bucket of tap water and stir well.
4. Partly fill the tank with cool clean water.
5. Start agitator and add content of the bucket into the spray tank.
6. Dilute the mixture to the required quantity of water in the tank.
7. **For *R. ferrugineus* / *P. archon***: spray nematode solution slowly into the crown of the palm to the base of the leaves.
8. **For *P. archon***: also treat the top few metres of the palm stem.
9. Keep agitator running during application to prevent nematodes sinking to the bottom of the spray tank.
10. The stock should be applied immediately after preparation.
11. Adjust water volume according to palm size.
Steinernema carpocapsae (entomopathogenic nematodes)

For control of the Red Palm Weevil (*Rhynchophorus ferrugineus*) and Palm Borer (*Paysandisia archon*)

- **Important**
  - **Humidity:** Rain, drizzle, mist or dew after/during the treatment favours a good efficacy.
  - Nematodes are susceptible to direct sunlight. Therefore apply in the evening or late afternoon, if possible.
  - To prevent nematode damage or clogging, remove all filters and sieves.
  - The aperture of the nozzle should have a diameter of at least 0.5 mm. Flat spray or hollow cone nozzles are ideal.
  - Spray with pressure of 2 - 5 bar. If necessary, increase pressure up to a maximum of 15 - 20 bar.
  - Treat at temperatures between 14°C and 35°C (internal temperature of the palm).

- **Contact**
  For advice on the use of nematodes please contact:
  
  Andermatt Biocontrol AG  
  Stahlermatten 6  
  CH-6146 Grossdietwil  
  Tel ++41 (0)62 917 51 25  
  Fax ++41 (0)62 917 50 06  
  sales@biocontrol.ch, www.biocontrol.ch

- **Storage**
  - Use nematodes as soon as possible after receipt.
  - See package for expiry date
  - Storage temperature after receipt: 2 - 6 °C in the dark
  - Do not freeze the product
  - Do not store mixed suspension

- **Precaution**
  Keep away from children. Wash face and hands after handling.

- **Limitation of liability**
  The instructions for use are a general guideline. Numerous factors, such as application technique, population density, incorrect storage and failure to observe the required waiting period after a chemical control, can influence the efficiency of the product. Andermatt Biocontrol AG cannot be held responsible for any risks. Please follow the instructions carefully or ask for help. Liability is disclaimed for insufficient quality or possible damage arising from circumstances outside of our jurisdiction.