Importance and Management of the Red Poplar Leaf Beetle (*Chrysomela populi* L.) in Short-Rotation Coppices (SRC): An Overview

Berlin, 2016-09-14
International Poplar Commission (IPC), 25th Session
Outline

Part I  The red poplar leaf beetle (*Chrysomela populi* L.)
Part II  Economic importance of *Chrysomela populi*
Part III  IPM with special emphasis on natural enemies
Part IV  Take home messages
(great) red poplar leaf beetle  
*(Chrysomela populi)*

- two generations per years
- larvae and adults feed on young leaves
- benefits from short rotation cycles (3-5 years)
- main pest species in poplar SRC, esp. on ‘Max’ varieties
Part I  The red poplar leaf beetle
Part III  IPM / Natural enemies
Part II  Economic importance
Part IV  Take home messages

Importance and management of *C. populi*
study area

- near Großschirma
- poplar and willow nursery with 5 poplar and 1 willow varieties
- Max 3 variety used for trial
- 30 stools per block, 120 for each variant, 240 in total
Results

\[ \Delta \text{Height} = -13\% \ (322/279 \text{ cm}) \]
\[ \Delta \text{Biomass} = -15\% \ (7.07/6.00 \text{ odt*ha}^{-1}) \]
\[ \Delta \text{Cuttings} = -21\% \ (22.23/17.47 \text{ cuttings per stool}) \]

Influence of feeding of *C. populi* on weekly height growth of Max 3 (n=120 stools per category in four blocks)
Integrated pest management strategy for *C. populi*

- **suppress population of *C. populi** below the economic injury level**

**Habitat manipulation to promote natural enemies**
- flowering plant strips
- alternative prey and hosts
- hibernating places

**Breeding and augmentation of natural enemies**
- relatively little research
- low value added of SRC

**Reduced use of broad-spectrum pesticides to conserve natural enemies**
- selective pesticides are not available at present

**Monitoring and forecasting of stage abundances → IMB Modell ASPIK (http://www.isip.de)**

**Use of more tree species and varieties in SRC**
- only seven eligible species at present
- only a small number of suitable varieties

**Part I** The red poplar leaf beetle

**Part III** IPM / Natural enemies

**Part II** Economic importance

**Part IV** Take home messages

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Importance and management of *C. populi*
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Part I
The red poplar leaf beetle

Part III
IPM / Natural enemies

Part II
Economic importance

Part IV
Take home messages

- hoverfly *Parasyrphus nigritarsis*
- true bug *Picromerus bidens*
- mite *Linobia coccinellea*
- chalcid wasp *Schizonotus sieboldi*
- pupa parasitised by tachinid fly *Cleonice callida*
- imago
- egg cluster
- L1, L2, L3
- pupa

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Importance and management of *C. populi*
**Schizonotus sieboldi**

- exoparasitic wasp
- development of larvae and pupation under the wing pads and the thoracic appendages of *C. populi*

Parasitation rate of *C. populi* pupae by *Schizonotus sieboldi* and *Cleonice callida*
### Longevity experiment with different diets

Tab: Sample size of the conducted laboratory experiment

<table>
<thead>
<tr>
<th>short code</th>
<th>diet</th>
<th>sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>NULL</td>
<td>without food source (control)</td>
<td>17 ♀ 14 ♂</td>
</tr>
<tr>
<td>W</td>
<td>water</td>
<td>17</td>
</tr>
<tr>
<td>PP</td>
<td>pupae</td>
<td>10</td>
</tr>
<tr>
<td>W/PP</td>
<td>pupae, water</td>
<td>11</td>
</tr>
<tr>
<td>W/PL</td>
<td>water, pollen (mix)</td>
<td>18</td>
</tr>
<tr>
<td>W/PP/PL</td>
<td>pupae, water, pollen (mix)</td>
<td>14</td>
</tr>
<tr>
<td>Z</td>
<td>nectar (fructose/glucose mix)</td>
<td>10</td>
</tr>
<tr>
<td>Z/W</td>
<td>water, nectar</td>
<td>14</td>
</tr>
<tr>
<td>Z/W/PL</td>
<td>water, pollen, nectar</td>
<td>17</td>
</tr>
</tbody>
</table>

- conducted in an environmental chamber at 25°C / 75% RH
longevity for males (light blue) and females (red) of *Schizonotus sieboldi* fed with different diets
Take home messages

- *Chrysomela populi* rank among the most important pests in SRC with poplar, especially with short rotation cycles.

- Natural enemies are known for all development stages of *C. populi*, some are highly specialized.

- Promotion of natural enemies through habitat manipulation, esp. flowering plants, is a key factor to suppress damage of *C. populi* below the economic injury level.
Thank you for listening!

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