

are weak with humus content and estimated water holding capacity. Traditional forest site survey methods are not sufficient for accurate quantification of timber

yield. Estimations can be refined with a more precise measurement of gravel content, direct measurement of water holding capacity (pF-value) as well as by the

detailed evaluation of climatic data.

Based on the results, it is prudent to attempt the conversion of black locust stands to mixed deciduous stands.



Figure 5. Magyargencs 31B forestdetail (forest management unit)



Figure 6. Magyargencs 5D forestdetail (forest management unit)

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**THE FECUNDITY OF THE POPLAR LEAF BEETLE (*CHRYSOMELA POPULI* L. 1758)
OVERWINTERING GENERATION UNDER LABORATORY CONDITIONS
(ПЛОДОВИТОСТЬ ПЕРЕЗИМОВАВШЕГО ПОКОЛЕНИЯ ТОПОЛЕВОГО ЛИСТОЕДА
(*CHRYSOMELA POPULI* L.) В ЛАБОРАТОРНЫХ УСЛОВИЯХ)**

*Тополевый листоед (*Chrysomela populi* L. 1758) – один из наиболее опасных вредителей в тополевых питомниках и в различных видах плантаций тополей по всей Европе. В работе была исследована плодовитость перезимовавшего поколения в лабораторных условиях. Перезимовавшие имаго были собраны в марте 2014 г. перед наступлением сезона спаривания. Парочки содержались при температуре 20 °C и фотопериоде 16:8 и выкармливались листьями гибридного тополя *Populus x euramericana* cv. *Rapponia*. В процессе исследования подсчитывалось количество яиц от каждой самки и их вес до и после яйцекладки. Представлены данные о количестве яиц и размере каждой яйцекладки, времени между яйцекладками и плодовитости имаго.*

Abstract - The poplar leaf beetle (*Chrysomela populi* L. 1758) is one of the most important defoliator pest in the poplar nurseries and in the different type of poplar plantations all over Europe. In our trial the fecundity of the overwintering generation was investigated under laboratory conditions. The hibernated adults were collected in March 2014 before beginning of the breeding season. The pairs were kept in 20 °C under 16:8 photoperiod and they were fed with *Populus x euramericana* cv. Pannonia.

During the investigation we observed and counted the number of eggs by each female and measured the weight of them before and after the oviposition. The results represent the egg number and the size of each egg masses, the elapsed time among the ovipositions and the reproduction ability of the imagoes.

Keywords – *Chrysomela populi*, herbivore, overwintering generation, reproduction ability, oviposition, egg mass.

Introduction

The poplar leaf beetle (*Chrysomela populi* L. 1758) (Fig. 1) is one of the most important

defoliator pest in the short rotation coppice forests all over in Europe. It belongs to the family of *Chrysomelidae* with over 30 thousand species. Many of the Chrysomelids are responsible widespread for serious agricultural and forest damages. These pests are every time phytophagous species, the larvae and the imagoes both are feeding by the leaves of their host plant (Lopatin & Nesterova, 2005). In Middle Europe about 50 *Chrysomela* species causes losses by their feeding on the shoots of trees belonging to the family of *Salicaceae* (Urban, 1997).

Ch. populi causes serious problems in the nurseries as well as in the young forestations and plantations, too. Poplars and willows are the most common trees in short rotation coppice (SRC) in Hungary. The use of these fast growing species for bioenergy has attracted the attention, mainly in the European countries in the last decades. In these cases the most important duty of the forestry management is to ensure and also to optimize the mean annual growth.

The intensive plantations usually are monoclonal and due to that they are vulnerable by insects therefore successful forest mana-

gement cannot carry out in these fields without plant protection. That is why it is so important to get to know more about this pest's copulation and fecundity.

Material and methods

In our trial the fecundity of the overwintering generation was investigated under laboratory conditions. Laboratory studies were carried out from the end of March 2014. The samples were collected before the beginning of the breeding season. We made pairs from the samples randomly and the imagoes were placed in plastic cages. The chrysomelids were fed on shoots of *Populus x euramericana* cv. Pannonia. Petioles of the leaves were put in a holed Eppendorf tube covered by parafilm. The pairs were kept under 20 °C, 16:8 photoperiod. Through the daily monitoring, the date of the copulation and the number of eggs were recorded by 10 pairs.

Results

The results represent the egg number of each egg masses and the elapsed time among the ovipositions (Fig. 2.).

Considering our results one pair from the wintering generation is able to reproduce 2-5 times (in average 3,6 times) under their lifespan. An average egg mass consisted of 59 eggs under examined conditions. Comparing this results with data from other literatures we can say that this value match to them. According to Tillesse et al. (2007) one egg mass consists of 15-65 egg and they are settled usually in groups. In our research the eggs numbers were alternating the scale 1-64 by one clutch.

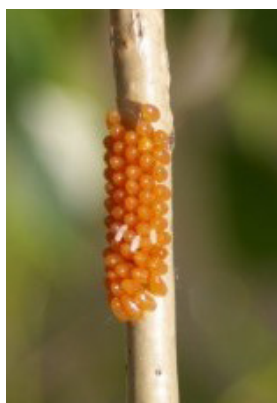


Figure 1. Feeding imagoes from the overwintering generation (left) and fresh egg mass (right)

Sometimes we observed extreme high egg numbers, but in these cases the females laid not in a single egg mass, she composed 2-4 separated groups. Urban et al. (2006) described that under laboratory conditions the clutches are divided into 2 or more part, that is why the number of eggs in clutches is lower than in nature. By them the size of the egg masses varied from 1 to 68.

Conclusions

Correlate with the climate change many of the species are reacting for the changing environmental conditions, also they are increasing their resistance through their reproductive strategy. That is why it is important to know, that a certain pest how behaves under different conditions.

In this paper we published our results only about one tempera-

ture but in our trial we are going to carry on further investigation under other temperatures (25 and 30 °C) to get to know more about the fecundity of this serious forest pest. With the help of the results we try to serve useful help for the forest management to optimize the plant protection in these vulnerable monocultural poplar forest.

Acknowledgments

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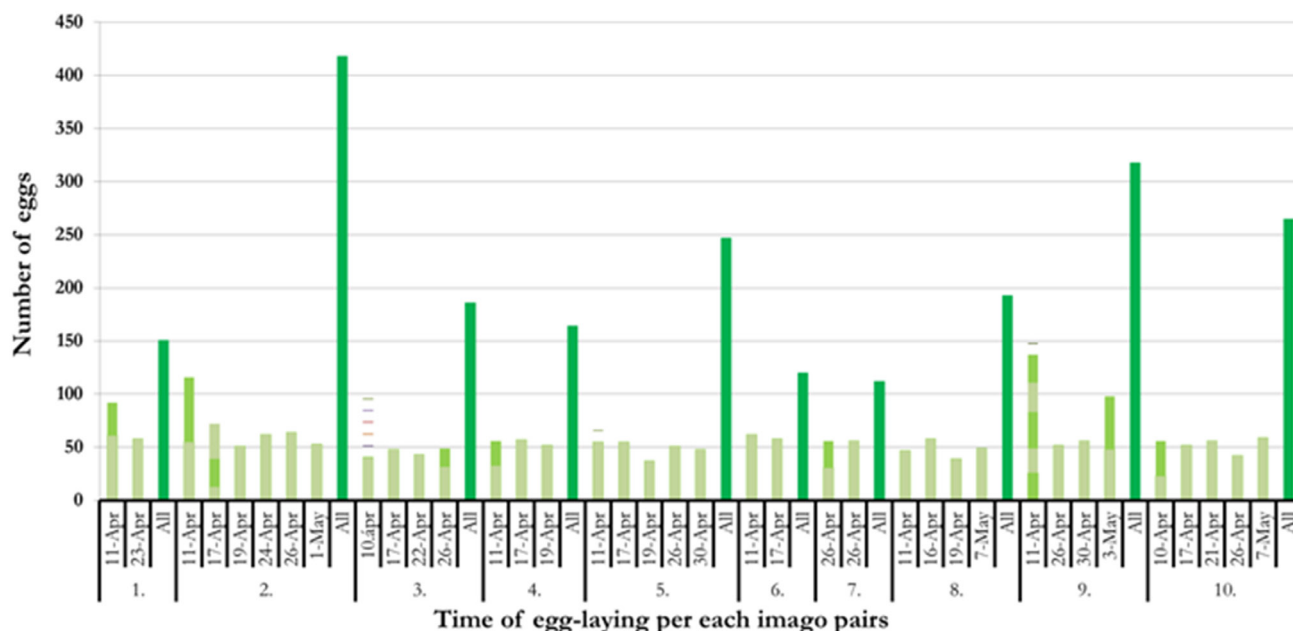


Figure 2. The reproduction rate of the overwintering generation under 20 °C

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