

INFESTATION OF HAZEL NUTS BY HAZELNUT WEEVIL (*CURCULIO NUCUM* L., COLEOPTERA, CURCULIONIDAE) IN POLAND

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Accepted: September 17, 2005

Abstract: In four years' experiment the infestation of hazel nuts by hazelnut weevil was investigated. Significant differences in resistance of different hazelnut cultivars were found. Olbrzymi z Halle cultivar exhibited a moderate resistance to the pest and was classified to the III class, while other cultivars showed a moderate susceptibility to the pest and were classified to class IV.

Key words: hazelnut cultivars, *Curculio nucum*, hazelnut resistance

INTRODUCTION

In Poland there is an increasing interest in cultivation of hazel, so it is necessary to develop efficient methods of hazel protection against the most common pests.

Hazelnut weevil *Curculio nucum* L. is the main pest of hazel shrubs causing the highest losses in nut yield (Gantner and Jaśkiewicz 2002a, 2002b). The adults are feeding on leaves and subsequently on hazelnut fruitlets, but larvae feed on the endosperm tissue and later on the growing cotyledons of nuts (Piskornik 1989).

Observations made in southern Poland showed that hazel cultivars manifest differentiated susceptibility to the pest (Piskornik 1989, 1992, 1994).

The aim of this work was to find out the differences in infestation of different hazel cultivars by larvae of *C. nucum* L.

MATERIAL AND METHODS

Observations were carried out in the years 2000–2003 on hazel plantation in Mydlniki near Kraków on five cultivars: Kataloński, Warszawski Czerwony, Webba Cenny, Długi Wczesny and Olbrzymi z Halle. Each cultivar was represented by 5 shrubs, cultivars were randomly distributed on the plantation. No insecticide treatments were applied.

Four samples of 100 nuts were collected from the yield of every cultivar and the percentage of nuts damaged by larvae was determined.

To establish the level of resistance of hazel cultivars to *C. nucum* six resistance classes were distinguished based on Piskornik et al. (1989) scale:

- class I – resistant cultivars (0 to 2% of damaged nuts)
- class II – fairly resistant cultivars (2.1 to 5% of damaged nuts)
- class III – moderately resistant cultivars (5.1 to 10% of damaged nuts)
- class IV – fairly susceptible cultivars (10.1 to 20% of damaged nuts)
- class V – susceptible cultivars (20.1 to 50% of damaged nuts)
- class VI – very susceptible cultivars (over 50% of damaged nuts)

Obtained results were statistically analysed. Duncan's test showed the significance of differences between examined features.

RESULTS AND DISCUSSION

The degree of hazelnut injury by the pest larvae varied considerably in vegetative seasons of the years 2000 to 2003. Table 1 shows the results of 4 years' study on the infestation of nuts by hazelnut weevil larvae. The highest percentage of infested nuts was noted in the year 2002 (21.4%) while the smallest in the year 2000 (7.0%).

Significant differences in resistance of different hazelnut cultivars were found. Olbrzymi z Halle cultivar exhibited a moderate resistance to the pest (III class, mean from four years), however in two years of study it showed a lower degree of yield damage (II class). A similar information is given by other authors. According to Piskornik (1989, 1992) Olbrzymi z Halle cultivar remained untouched by larvae and was classified to I class.

Other cultivars showed a moderate susceptibility to the pest and were classified to class IV. In this class the greatest mean percentage of damaged nuts was found on Kataloński cultivar; in previous research it was found that this cultivar was the least suitable for aphids (Wojciechowicz-Żytko 2003).

The greatest differences in damage level were noted on cultivar Długi Wczesny. In 2000 this cultivar was classified to class II while in 2002 to class V. Piskornik (1989, 1992) working on resistance of hazel cultivars found out that Warszawski Czerwony and Webba Cenny showed a moderate resistance (III class), while Kataloński was classified into IV class (fairly susceptible).

Table 1. Infestation of different hazel cultivars by *Curculio nucum* L.

Cultivar	Year									
	2000		2001		2002		2003		Mean	
	%	class	%	class	%	class	%	class	%	class
Kataloński	7.5	III	25.0	V	20.0	IV	15.0	IV	16.9a*	IV
Warszawski Czerwony	10.0	III	12.5	IV	27.5	V	12.5	IV	15.6a	IV
Olbrzymi z Halle	5.0	II	9.8	III	9.3	III	5.0	II	7.3b	III
Webba Cenny	7.5	III	17.5	IV	25.0	V	7.5	III	14.4a	IV
Długi Wczesny	5.0	II	15.0	IV	25.0	V	5.5	III	12.6a	IV
Mean	7.0		16.0		21.4		9.1			

*Means followed by the same letter are not significantly different at $\alpha=0.05$

The results indicate that one cultivar - Olbrzymi z Halle - is less suitable for hazelnut weevil than other tested hazel cultivars.

Mechanisms of plant resistance to pests are very complicated complex of host plant/pest interaction based not only on physical and chemical factors but also on biochemical defence and should be taken under consideration in further investigations.

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POLISH SUMMARY

PORAŻENIE RÓŻNYCH ODMIAN LESZCZYNY (*CORYLUS L.*) PRZEZ SŁONKOWCA ORZECHOWCA (*CURCULIO NUCUM L. – COLEOPTERA, CURCULIONIDAE*) W POLSCE

Celem czteroletnich badań było ustalenie różnic w porażeniu orzechów pięciu odmian leszczyny przez larwy słonkowca orzechowca (*Curculio nucum L.*). Stwierdzono występowanie różnic statystycznych w odporności odmian na tego szkodnika. Najbardziej odporną okazała się odmiana Olbrzymi z Halle, która została zakwalifikowana do III klasy odporności, natomiast pozostałe odmiany były bardziej podatne.