RESEARCHES CONCERNING THE APPLE BLOSSOM WEEVIL TREATMENTS WARNING IN THE WEST OF ROMANIA CONDITIONS

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Abstract: *The apple blossom weevil (Anthonomus pomorum L.) is one of the most important pests from the Romanian apple orchards and his control constitute a major preoccupation of the plants protection specialists. For an efficient control realisation the prognosis and warning activities are essential. The treatment warning is based on the biological, ecological, and phenologycal criterions. All three criterions must be known for each geographic zone. In the West part of Romania in the plain part especially, the investigations concerning treatments warning criterions are rare or absent. In the West part of Romania conditions the pest's development peculiarities for his efficient control are not well-known. In this context the paper have the aim to present the obtained results concerning the biological, ecological and phenologycal criterions for the treatments warning. For this zone the researches about apple blossom weevil (Anthonomus pomorum L.) are disparate or absent. The researches were carried out in four years in the apple orchard from Şag-Timişeni (Timiş-District). The biological criterion was realised on the hibernate adults collected periodically, in March-April months. The ecological criterion was established by aid of effective temperatures sum and the phenologycal criterion by the aid of the apple buds development. For the West Plain of Romania the researches are new. For the treatments warning establishment on the biological criterion resulted that hibernated adult apparition was recorded from 30.03 to 24.04.2005 and from 10.04 to 27.04 in 2007. After the ecological criterion the treatments warning were effected from 26,8ºC effective temperatures sum in 2008 to 72,3ºC in 2006. Concerning the buds evolution the treatments warning realised at 10-15% development. The results are placed between the limits of another obtained data in Europe. The knowledge of the treatments warning is essential in the establishment of the pest's optimum control moment. The work is first from the West Romania and represents an important aid from the Anthonomus pomorum L. control in the investigated zone.*

Key words: *apple, apple blossom weevil, treatments, warning*

INTRODUCTION

Apple-blossom weevil Anthonomus pomorum is a major pest of orchards in our country. Particularities of development to achieve pest forecasting and warning treatments are not well known and detailed in terms of Western Romania.

Against this background, the work aims to present the results of criteria: biological, ecological and phenological, in order to develop predictions for an effective pest control.

Researches on pest were made by: BONNEMAISON (1946), DICKER (1946), BALACHOWSKY (1963), ALFORD (1992).

In our country, various aspects of biology, ecology and pest control have been performed by MANOLACHE and all (1957), ISAAC (1965), ŞUTA (1976), RAFAILĂ (1978), BAICU and SĂVESCU (1986), IORGA (1990), LEFTER, MINOIU (1990), PĂLĂGEŞIU (2002), PERJU (2002), TEODORESCU and all (2003), UNGUREANU (2006).

Further researches conducted by COSOVEANU (2009), the elaborate work brings new contributions to the achievement of integrated pest fighting on the Western Plains.

MATERIALS AND METHODS

The research was conducted in a plantation of apple trees in the village of Sag (Timişeni) during the period 2005-2008.

In order to develop treatment alerts, 3 criterions were used, biological criterion based on observations regarding the hibernate adult emergence regularly collected in the months March - April.

Ecological criterion has been established with the aid of the effective temperatures, and phenological criterion was carried out according to Ionathan variety depending of apple blossoms development.

RESULTS AND DISCUSSION

The settlement of treatments application timing was performed according to the maximum occurrence of pests (Table 1).

Table 1.

Settlement of treatments application timing according to warnings (2005-2008)

Year	Appearance date	Warning date From	To	No. days from occurrence to alert
2005	18.03	30.03	06.04	12 zile
2006	21.03	31.03	07.04	10 zile
2007	06.03	17.03	21.04	11 zile
2008	22.03	31.03	07.04	9 zile

Analyzing the presented data it results that the number of days elapsed from the warning varied between 9 days in 2008 and 12 days in 2005.

Maximum emergence (Table 2) was recorded earliest in 2005 (30.03.-11.04) and no later than 2007 (10.04-27.04), number of days within the maximum to warning being a zero.

Table 2.

Warning setting based on maximum occurrence of the pest in the years 2005-2008 in Şag plantation

Year	Maximum appearance	Warning date	No. days from maximum to warning
2005	30.03-11.04	30.03	0
2006	04.04-16.04	31.03	0
2007	10.04-27.04	17.03	0
2008	02.04-18.04	31.03	0

Given the sexual maturation period (Table 3) it resulted that depending on the beginning of maturation period, warning was made after 8-12 days, and from the end of maturation passed between 0-2 days.

Table 3

Setting warnings according to the period of sexual maturation

Year	Sexual maturation period Begining	End	Warning date	No. days from Begining sex. mat.warn	No. days from End sex. mat.warn
2005	18.03	28.03	30.03	12	2
2006	21.03	29.03	31.03	10	2
2007	06.03	15.03	17.03	8	0
2008	22.03	07.04	31.03	8	0

Using ecological criteria requires its association with the phenological and biological criteria.

Depending on ecologycal criterion treatments warning was carried out by the effective temperature sum of 26.8 degrees C in 2008 to 72.3 degrees C in 2006 (Figure 1).

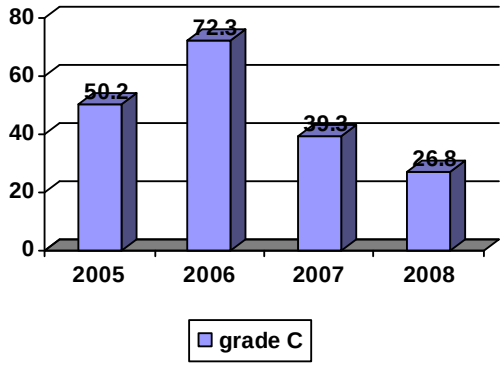

Figure 1. The sum of effective temperature based on weather data records to treatments warnings elaboration

Depending on the phenological criterion during the 4 years of research, the emergence of hibernating adults took place at a difference of 1-3 days before or after bud phenophase. (Table 4).

Table 4.

Correlation between the Apple-blossom weevil occurrence and apple phenology

Year	Weevil appearance	Buds swelling	Withering	Warning
2005	18.03	20.03	24.03	30.03
2006	21.03	18.03	25.03	31.03
2007	06.03	08.03	14.03	17.03
2008	22.03	21.03	27.03	31.03

Regarding the establishment of warnings depending on bud phenophase, it has been found that between them exists a closed connection, the warning being made at a rate of 10-15% of buds.

The obtained results fall within the set and other researchers from abroad and from Romania, constituting new contributions in the treatment warning area, of optimal timing of treatments application in conditions of the Western Romania.

CONCLUSIONS

In order to determine the date of treatments warnings made on biological criteria, the number of days of occurrence varied between 9 days in 2008 and 12 days in 2005.

Maximum pest emergence was recorded earlier in 2005 (30.03-11.04) and no later than 2007 (10.04-27.04), the number of days from a maximum being zero.

According to early sexual maturation, warnings was made after 8-12 days, and after the end of sexual maturation, warning was made after 0-2 days.

From ecological criteria point of view, a sum of effective temperatures was elaborated which varied between 72.3 degrees C in 2006 and 26.8 degrees C in 2008.

Depending on the phenological criterion, the hibernating adults appearance took place at difference of 1-3 days before or after the the buds swelling phenophase to all varieties examined. Depending on withering phenophase warning was made at a rate of 10-15% withering.

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