RATIONALIZATION OF THE APPLICATION OF TREATMENTS TO COMBAT PLUMS BLACK SAWFLY (*HOPLOCAMPA MINUTA*)

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Abstract: *The researches were done in a plum orchard along Bistra Valley, in the Caransebes fruit culture area, where is cultivated Anna Späth plum tree variety by observing the biology and ecology of the pest, based on the climatic conditions, during a period of three years. Starting with the green button phenophase 30 branches of three plum trees were isolated with muffs in order to determine the period before egg deposition, the beginning and density of the ponta. Starting with the flowering of mirobolan (Prunus cerassifera) there were done observations of growth daily, in the boxes. Chemical treatments against adults are done during the pre-oviposite period until the flowers are opened. It is recommended to use organophosphoric products based on chlorbaryphos, dimethoate, pyridophention, methyl or carbamate demeteone based on carbaryl, pirimicarb and cartap (Minoiu and Lefter 1987). It is recommended to perform deep autumn and spring shoots, which destroy most of the cocoons that hibernate durning the winter in the soil, collecting and destroying the infected fruit before the larvae exit. Also the use of healthy planting material and the use of resistant varieties are particularly effective methods in preventing the attack. For chemical control, only one phytosanitary treatment is sufficient when 10 to 15% of the flowers begin to shake their petals.There are going to be used in this treatment homologated products belonging to several chemical groups: organophosphorus (Carbetox 50 CE - 0.175%, Diazinon 60 EC - 0.15%, Diazol 60 EC 0.15%, Diazol 50 EW - 0.2% , Sinattox Plus 0.075%), carbamates (Victenon 50 WP - 0.05%), synthetic pyrethroids (Fastac 10 EC 0.015%, Meothrin 20 CE - 0.02%, Polytrin 200 EC 0.015% - 0.02%).Effective commercial products are: Sumicombi 30 CE - 0.02%, Nudrin 90 PS 0.05%, Imidan 50 VP - 0.05%, Reldan 50 CE - 0.1%, Fastac 10 CE - 0.04%. Phenologically, when the pest appeared in the Anna Späth plum tree variety was in the white button phenophase and during flowering when 30% of the flowers were in blossom. Hoplocampa minuta Crist., in the orchards along the Bistra Valley, in the Caransebes fruit culture area, normally appear in the IInd and IIIrd decade of April, only in 2010 it happened to appear in the Ist decadev of April, when therse is registered a medium temperature sum of 47,2°C. The beginning of egg deposition takes place during the second half of April – beginning of May, when there is registered a medium effective temperature sum of 88,6°C, while 10-25% of the flower petals fall down.The beginning of flowering for the Anna Späth plum tree variety normally takes place in the IInd and IIIrd decades of April and the beginning of petal fall period took place in the second half of April – beginning of May. For Apple blossom weevil the moment when must intervene with combating treatment is the period of additional feeding before the start laying.*

Key words: *pest, Hoplocampa minuta, bioecology, plum tree*

INTRODUCTION

The research was carried out in a plum tree plantation of the Stanley variety, with bioecological observations based on meteorological factors for a period of 2 years. Starting with the green button phenophase, 50 branches were isolated on a number of 3 trees to determine the pre-oviposite period, the beginning and the density of the pike. Since the beginning of the plum blossom, daily observations have been made on the biological material growth boxes.

The biological reserve of this species is conditioned by the climatic factors in which the propagation period takes place and by the fighting actions conducted in the area. The temperature of the air in the pre-oviposite and ovipositary period has an important role in the species development. Favorable multiplication conditions are recorded in the spring in which, during the aforementioned periods, the average air temperature is between 11 and 15 ° C. Average daily temperatures above 15 ° C. Average daily temperatures above 15 ° C are particularly favorable for multiplication.

To determine the relationship between the frequency of the attack and the damage, 20-30 trees of the same age and the same level of flowering are chosen during the blooming period.

Half of the trees are treated with an insecticide product that is recommended for combating the black sawfly. The frequency of attack is determined on untreated trees.

MATERIALS AND METHOD

In the conducted research it was used the sum of the effective temperatures for each biological stage, the 10-day temperatures around the date of occurrence of the stages and the correlation between the phenology of the trees and the periods of occurrence of the most important stages were used.

The treatments were applied in the following phenophases:

Variant I: When 10 - 15% of flowers began to shake their petals;

Variant II: When 30 - 50% of flowers have shaken their petals;

Variant III: When over 50% of the flowers have shaken their petals.

The Fastac 10 EC - 0.015% pesticide was used for control treatment.

Observations were made when the fruit had a diameter of 0.15 cm and the beginning of the fall of plums (barely shaped).

Estimation of population, attack and mode of harm

The insect is monophagous, its larvae attack only plum fruits. Population estimates are made during plum blossom and of the attack 15 to 20 days after the petals have been shaken, when the fruit has the size of an olive.

Indicative guidelines for population estimation and Hoplocampa minute attack are shown in the table1:

Table1

Guidelines for population estimation and *Hoplocampa minuta* attack

SURFACE (ha)	STATIONS NO.	TREE NO./STATION	ANALIZED ORGANS	NO, OF ORGANS ANALIZED/TREE	DETERMINATION
1-10	5	2	FLOWERS FRUITS	20 20	Density of eggs / 100 flowers F% of the attacked fruit
11-50	7	2	FLOWERS FRUITS	20 20	Density of eggs / 100 flowers F% of the attacked fruit
51-100	10	2	FLOWERS FRUITS	20 20	Density of eggs / 100 flowers F% of the attacked fruit

RESULTS AND DISCUSSIONS

The generalization of chemical pest control until 1989 led to a substantial reduction of the attack in the Caransebes orchards area. The failure to apply the plum-prune treatments in recent years has made that in the plum orchards from Caransebes fruit basin the damage caused by the Plums Black Sawfly reaching alarming

proportions, their size varying from one year to another and from one area to another, in raport with the biological reserve and the thermo hydrodynamic conditions during the period of the sawflys multiplication.

In the observations made in the years 2016-2017, the frequency of the attack in the Caransebeş fruit basin, Glimboca was 98.3% in 2016 compared to 2015, when the attack frequency was 87.7% and in 2017 the frequency of the attack was 70.1%. The level of attack is appreciated in the raport with the fruit production.

Treatments were performed mechanically with MST-900, using the Fastac 10 CE insecticide at a concentration of 0.015% in the three treatments treated, and the observations to determine the efficacy of the treatments were performed 7 days after the fall of the petals, after binding, when the fruits had dimensions of up to 0.3 - 0.5 cm. Observing in each variant 300 fruits on 3 trees.

Following treatments, the following efficacies were achieved:

Table2

Effectiveness of treatments applied in combating the plums black sawfly (*Hoplocampa minuta* Crist.) in the Stanley variety in 2016

VARIANT	PESTICIDE	PHENOPHASE	TREATMENT APPLICATION DATE	EFFICACITY		ATTACK FREQUENCY
				OBSERVED NO. OF FRUITS	NO. OF ATTACKED FRUITS	
1.	Fastac 10 CE - 0,015%	10-15% of flowers at the beginning of shaking	12.04	300	14	4,66
2.	Fastac 10 CE - 0,015%	30 - 50% of flowers with scaled petals	16.04	300	39	13,00
3.	Fastac 10 CE - 0,015%	over 50% of flowers with scaled petals	19.04	300	187	62,33
4.	MARTOR	-	-	300	202	67,33

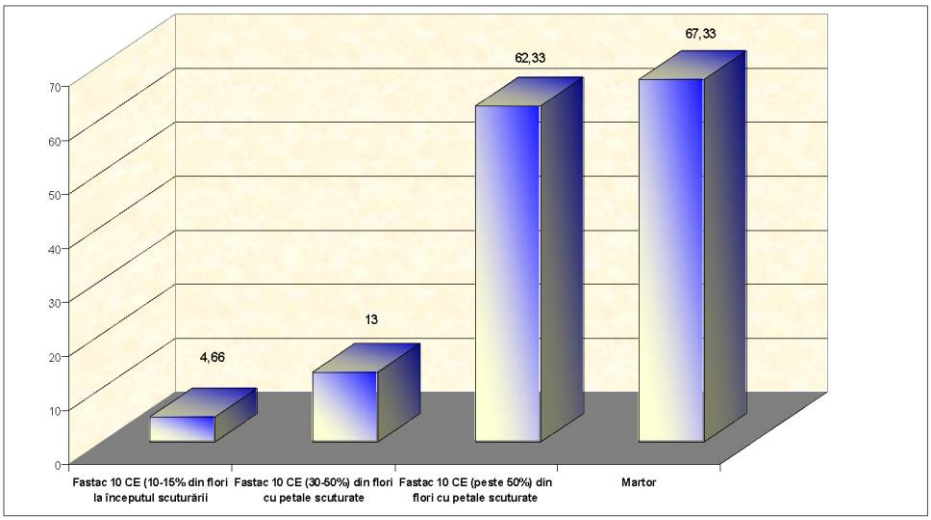

Fig.1 Graphic representation of the attack frequency of the *Hoplocampa minuta* species

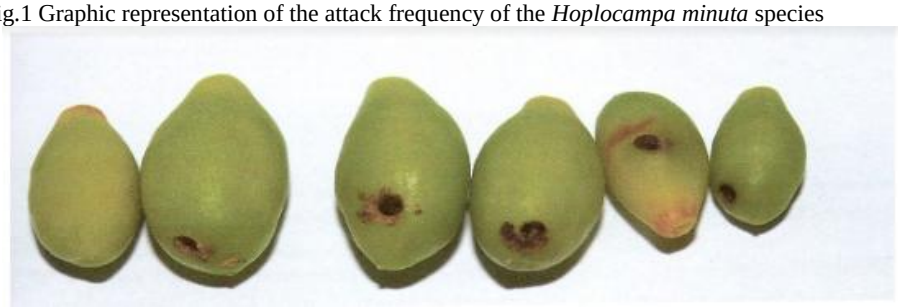

Fig. 2 Black Plum Sawfly damage mode

Fig. 3 *Hoplocampa minuta*-larva

The data presented in the table shows that the best efficacy in controlling the Stanley variety was obtained in variant I when the treatment was applied in the phenophase 10-15% of the flowers at the beginning of the petals shaking. Good results were obtained in variant II when the treatment was applied when 30-50% of the flowers shaken their petals.

The delay in applying treatment under the conditions of variant 3 when spraying took place over 50% of the shattered petals increased the frequency of the attack, reaching 62.33%, close to the value obtained in the untreated control variant (67.3%).

For the Anna Späth plum, the efficacy of the treatments is shown in the table3:

Table3

Effectiveness of treatments applied in combating the plums black sawfly (*Hoplocampa minuta* Crist.) In the Anna Späth variety in 2017

VARIETY	PESTICIDE	CONC.%	PHENOPHASE	TREATMENT APPLICATION DATE	EFFICACITY		ATTACK F%
					OBSERVED NO. OF FRUITS	NO. OF ATTACKED FRUITS	
1	Fastac 10 CE (cipermetrin 100 g /l)	0,015	10 to 15% of the flowers at the beginning of the petals shake	18.04	300	12	4,0
2	Fastac 10 CE (cipermetrin)	0,015	30 - 50% of flowers with scaled petals	22.04	300	31	10,03
3	Fastac 10 CE (cipermetrin	0,01	over 50 - 75% of flowers with scaled petals	25.04	300	149	49,7
4	UNTREATED TREE	-	-	-	300	177	59,1

The Anna Späth variety, which blooms for 7 to 10 days the Stanley variety, as shown by the data presented in the table, the best efficacy in combating plums black sawflies was also performed in variant 1 when the treatment was applied when 10-15% of the flowers began to shake their petals and even in the second variant with an attack frequency of 10.3%.

Applying treatments to control this plum-damaging pest is not economically justified if done at the end of the fall of petals (over 50-75% with shaved petals), causing additional pollution in plum plantations.

CONCLUSIONS

The plums black sawfly (Hoplocampa minuta Crist.) In the conditions of the Lugoj Herindeşti fruit basin usually appears in the first and second decades of April at an average effective temperature of 46.6 ° C, in the white button phenophases - blooming 30%.

The beginning of the attack takes place in the second half of April, rarely at the beginning of May, at an average average temperature of 87.70 ° C, when the trees usually had 30-50% petals shaken.

The larvae occur at the end of April and in the first half of May at an average effective temperature of 151.6 ° C when the fruit was formed.The beginning of the blooming of the Stanley plum variety, this year took

place in the first decade of April, and the beginning of the petal shake occurred in most of the years in the second decade of this month.

The Anna Späth variety has vegetation 7 to 10 days longer. Pest control is done when 10 - 15% of the flowers begin to shake their petals.

The rationalization of treatments to combat this pest is only through the knowledge of the Heclocampa minuta Crist bioecology. and their application in accordance with the phenological phase, respectively 10 - 15% of the flowers are at the beginning of the petals shaking.

Applying treatments when over 50% of the flowers have shaken their petals is unjustified in terms of economic efficiency, causing environmental pollution in plum plantations.

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