BACULOVIRUSESIN NOCTUIDS COMBATTINGINORGANIC FORMING

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Abstract

In the of this study biological efficiency of the baculoviral preparation Virin-HS-P in combating *Helicover paarmigeraon* tomatoes was estimated. Virin-HS-P preparation testing for *Helicover paarmigera* of II generation development control on tomatoes was carried out at a rate of 0,15kg/ha. The biological efficacy constituted 85,2% in comparison with chemical etalon Actarawith a biologically efficacy of 92,6% under the same conditions.

Key words: ecology, baculoviruses, viral preparation, *Helicoverpaarmigera*, biologically efficacy.

In viral preparation production a special place is related with strain quality of the baculoviruses, which under the natural ecosystems ensures an efficient decrease of population density of harmful insects.

Preparation Virin-HS-P when applied on vegetables a great attention should be paid to strain quality of baculoviruses. Frevious investigation have shown, that under field conditions the preparation allows an essential diminuation of the *Helicoverpaarmigera* density on the tomato plantations. Testing of two species of *Helicoverpaarmigera* and *Mamestrabrassicae* have demonstrated the fact that virus *M.brassicae* in combating *H.armigera* possesses an increased biological activity. It is because of its specificity which it attacks only a just species of harmful insects.

Entomopathogenic viruses, especially those from the Family Baculoviridae, exclusively on invertebrates, particular by on insects, can be utilized successfully for obtaining viral preparations which provoke epizooties thus having contributed to regulations of such population density of such in insects (Theilmann D.A., Beissard, 2005 et al.)

In particular viral preparations which awing to their horizontal and vertical transmission persist in biocenoses and this control for years the density of the harmful pests.

Integrated plant protection represents a complex of flexible measures, to call to ensure an optimal protection of plant for a long period of time and which corresponds to diverse demands of social development. It is elaborated on the immense knowledges about agroecosystem as a functional unity of the biosphere, an is used not for combatting of a concrets species of the harmful organisms, but for a complex of organisms which damage a concrete culture, taking into account the continuous changes in the ecosystem. With the purpose of reduction the devastations caused by harmful organisms is considered utilization of natural factors of agrocenoses, which are capable to limit at a high extent the density and damage caused by them. Wide application of knowledges about the immunity and resisitence of plants to diseases and pests, biological and abiotic factors which act on harmful organisms, introduction and aclimatization of beneficial organisms allow at a high degree to reduce harmful population density so that the damage from them becomes insignificantly (Popuşoi I., Volosciuc L., 2004).

However, conception concerning baculoviruses specificity remain so for unclear. It was demonstrated that VPN are not characterized by a strict specificity and baculoviruses can infect and insects which belong to different species. Elaboration of technologies for production and application of baculoviral insecticides is indispensable associated which investigations of their morphological and biological peculiarities. Diverse microscopic methods which allow both preliminary, and final identification of pathogen agent were applied in this sens (Volosciuc L., 2009).

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MATERIAL AND METHOD

The following species of phytophage insects were used: *Helicoverpaarmigera*. Determination of the sick larvae was accomplished by respective simptoms, then with the help of a photonic microscope. For this purpose microscopy with phase contrast and other with interference were used. Infectation of larvae was carried out with viral suspensions at a dose of 10^2 – 10^7 SPVC per individual. Observations where accomplished beginning with the third day after infectation. Efficiency on the viral preparation was determined by the formula:

$$E = 100 - \frac{B}{A} \times 100, \text{ where}$$

E - biological efficiency of numerical density reduction of pest comparatively with the witness (%);
A - numerical density of the pest larvase in the variant – witness on the day of the experiment carried out;
B - numerical density of the pest larvae in experimental variant on the day of the experiment carried out.

Mortality evidence of H.armigera larvae wa done untill the 10 th day.
Determination of the VPN concentration was accomplished with the help of the Goryaev chamber by the formula (methodical indications 2002):

$$T = \frac{\Sigma \text{polyhed in 100 smallsquare4 x} 10^6}{100} \times K, \text{ or } T=10^5 a \times b$$

T - viruses titre;
K - viral suspensiondilution.

To determine VG concentrationthemethod of dropletcrushed. The concentration of the viral suspensionwasdeterminedbythe formula:

$$T = \frac{A \times 5{,}76 \times 10^6 \times K}{S \times 0{,}01}, \text{ where}$$

T - VG concentration in 1 ml of suspension;
$5{,}76 \times 10^6$ -surface of a lamella of 24 x 24 mm;
K - dilutiondegree;
S - surface of squarethe ocular lens;
0,01 - suspension volume;
A - granulesnumber in a square.

For the ocular 100 x the formula maybe:

$$T = 5{,}76 \times 10^6 \times a \times K.$$

RESULTS AND DISCUSSIONS

The experimental plot wassown on the17 of April 2013 with tomatoes of „*Rio Grand*" sort on an area of 1200 m^2, wherethe experimental parcel was dislocated in conformity with the methodology of field experimentsby Dospekhov (1985). The experimental scheme was ramdomized with five variants and four replicates.

Figure 2 **Pheromonetrapsdislocation for development monitoring of thesecond generation of *H.armigera*.**

Table 1

Biological efficacy of the viral preparation Virin-HS-p in the control of boll worm development on tomatoes "Rio Grand". The therd treatments on 16.08.2013

Nr. d/r	Preparation	Area, ha	Rate, kg/ha	Beforetreatment, larvae/ 100 plants	Aftertreatment,larvae/100 plants at day			Biological efficacy %
					5	7	9	
1.	Witness	0,012		48	54	57	59	
2.	St.Virin-HS-2	0,012	0,3	43	35	26	8	84,8
3.	St.Actara 25WG	0,012	0,06	44	12	5	4	92,6
4.	Virin-HS-P	0.012	0,1	46	32	27	11	80,5
5.	Virin-HS-P	0,012	0,15	44	30	24	8	85,2
	DEM							1,08

Table 1 having been analyzed, we canobserve, that biological efficacy of the preparation Virin-HS-P at arate of consume of 0.15 kg/ha is of 85,2 % in decreasing density of ballworm of II generation in comparison with chemical etalon Actara 25WG, whichhas a biological efficacy of 92,6%.

Table 2 having been analyzed, we may observe, that reduction of tomatoes attack in comparison with witness in the chemical variant Actara 25 WG at the 9 daywas 93,9%., but the degreeof attack in the biological variant with Virin-HS-P at a rate of consume 0,15kg/ha constituted 89,9%

Figure 3 **Tomatoes field treated with the Virin-HS-P**

Figure 4 **Bollworm attacks on the tomatoes plot of "Rio Grand" sort, the witnoss variant**

Table 2

Number of tomatoes attacked after treatment, sort "*Rio Grand*", the third treatment of 16.08.2013

Nr. d/r	Variant	Rate of consume, kg/ha	Number of attackedfruits	Tomatoesattackedbeforetreatments	Tomatoes attackedaftertreatment	Biological efficacy,%
					day 9	day 9, %
1.	Witness	-	100	42	55	-
2.	St.Virin-HS-2	0,3	100	37	6	87,6
3.	St.Actara 25WG	0.06	100	38	3	93,9
4.	Virin-HS-P	0.1	100	41	7	86,9
5.	Virin-HS-P	0.15	100	38	5	89,9
	DEM					1,01

CONCLUSIONS

On the basis of the results obtained we can deduce the following conclusions:

Climatic conditions of 2013 have influenced negatively development of the culture and the same time the fast development of the pest *Helicoverpaarmigera*.

The preparation Virin-HS-P does not negatively act on physiology development of the culture and on formation of tomato fruit.

Testing of the preparation Virin-HS-P at a rate of 0,15 kg/ha for control development of Boll worm, II generation, on tomatoes of "*Rio Grand*" sort has demonstrated a significant biological efficacy of 85,2% in comparison with that of chemical etalon Actara of 92,6%.

ACKNOWLEDGEMENTS

The author is deeply obliged to Dr. CiuhriiMircea, than director of the Insect-Pharm in Bucureşti, and to the whole staff of this institute for their extraordinarily kind and multilateral support.

Figure 5 **Attack of *Helicoverpaarmigera*larvae and the infectations with VPN of different ages on tomatoes of sort "*Rio Grand*" in variants with Virin-HS-P, with magnifying glass and photographed**

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