INSECTICIDES FOR THE CONTROL WITH COTTON LEAF APHID (APHIS GOSSYPII GLOVER) OF THE COTTON

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ABSTRACT

During the period 2014-2015, a field experiment has been carried out at the Field crops institute – Chirpan. The field was naturally infected with cotton leaf aphid including 4 replications of 10 m^2 for each variant. The insecticides showing good biologic effect against the cotton leaf aphid are the following: Danadim progress 400 EC in a dose 0.05%, Dursban 4 E in a dose 100 ml/da, Pirinecs 48 EC in a dose 100 ml/da, Lannat 25 VG in a dose 100 g/da, Deccis 100 EC in a dose 12.5 ml/da, Mospilan 20 SP in a dose 0.0125% and Cohinor 200 SL in a dose 0.05%.

Key words: Cotton leaf aphid, Insecticides, Cotton

INTRODUCTION

In different regions of the world with cotton production, there were observed 1326 insects, mites and nematodes as species in cotton agrocenoses.

In Bulgaria damages to cotton are caused only by: wire and pseudo-wire worms, grasshoppers, crickets, cotton aphid, tobacco thrips, common spider mite, cotton moth and malvaceous moth. In the highest density and a base pest for cotton is the cotton leaf aphid (Aphis gossypii Glov.) (Radev, 1967; Radev, Stefanov, 1976; Rashev, 2012).

Damages on cotton caused by the cotton leaf aphid depend on its appearance during the phenological development of the crop. The pest is found on cotton plants in phenophases of germination, budding, flowering and ripening. It appears on the cotton with its emergence (10-15 May) – in the phase cotyledons (Rashev, 2012).

The critical period in the development of the crop culture is from the phase of germination to the formation of 2^{nd} -3^{rd} real cotton leaf. As a pest, against him are held 2-3 chemical treatments annually. (Stefanov, Dimitrov, 1986)

The repeated use of insecticides and multigenerational species, often cause the reduction of their efficiency. Permanent application of insecticides against aphids, and mainly on cotton and, on some greenhouse crops, it has helped to build populations resistant to these drugs (Zilbermints et. al., 1979; Zil'bermints and Zhuravleva, 1990; Grafton-Cardwell, 1991; Hollingsworth et al., 1997; Kerns et al., 1998; Denholm et al., 1999; Godfrey and Fuson, 2001).

The aim of this study was to revise the efficacy of insecticides against the cotton leaf aphid, in view of the successful leading the fight against it and prevent the development of resistance.

MATERIAL AND METHODS

In the period 2014-2015 at the Field Crops Institute - Chirpan conducted a field experiment on naturally infected the cotton area with cotton aphid in 4 repetitions of 10 m^2 for each variant. Forth the treatment are used the following insecticides: Danadim progress 400 EC (dimethoate 400 g/l), Dursban 4 E (chlorpirifosetil 480 g/l), Pirinecs 48 EC (chlorpirifosetil 480 g/l), Lannat 25 WG (methomyl 250 g/kg), Mospilan 20 SP (acetamiprid 200 g/kg), Deccis 100 EC (deltamethrin 100 g/l) and Cohinor 200 SL (imidacloprid 200 g/l). The control was sprayed with water. The initial density of aphids was read before spraying. For this purpose, same individual leaves infected aphid are marked with cards, for all variants and controls. Their number is recorded on the card, which is

attached with a thread to the marked leaf. After spraying on the 1st, 3rd, 7th and 14th day, the surviving aphids are also counted in the variants and control and the data is recorded on the card. The efficacy of the insecticides for each variant are calculated by the formula of Henderson-Tilton.

RESULTS AND DISCUSSION

On Table. 1 are introduced the results of the efficacy of the tested insecticides against the cotton aphid during 2014. Phosphoroganic insecticides Danadim progress 400 EC (dimethoate) at a dose of 0.05%, Dursban 4 E (chlorpirifosetil) and Pirinecs 48 EC (chlorpirifosetil) at a dose of 100 ml/da, pyrethroid Deccis 100 EC (deltamethrin) at a dose of 12.5 ml/da and the neonicotinoids Mospilan 20 SP (acetamiprid) in dose at a dose of 0.0125% showed rapid initial effect and on the 1st day after treatment showed 100% efficacy. It was found a good length (within the fourteenth day after treatment) for the insecticides preparations Mospilan 20 SP and Cohinor 200 SL.

Table 1. Efficacy of insecticides against cotton leaf aphid in 2014

Variants Dose	Number of the live aphids	Days after spraying, efficacy							
		1st day		3rd day		7th day		14th day	
		Number of live	E %	Number of live	E %	Number of live	E %	Number of live	E %
Dimethoate Danadim progress 400 EK - 0.05%	350	0	100	3	99.0	6	97.5	12	90.4
Chlorpirifosetil Dursban 4 E - 100 ml/da	362	0	100	0	100	5	98.0	15	87.2
Chlorpirifosetil Pirinecs 48EK - 100 ml/da	351	0	100	2	99.4	6	97.8	16	86.0
Deltamethrin Deccis 100 EK - 12.5 ml/da	367	0	100	1	99.7	5	97.5	13	89.0
Acetamiprid Mospilan 20 SP – 0.0125%	352	0	100	0	100	3	98.8	7	94.0
Methomyl Lannat 25 WG - 100 g/da	360	1	99.7	3	99.1	7	97.1	14	88.0
Imidacloprid Cohinor SL - 0.05%	354	1	99.7	3	99.0	6	97.5	9	92.2
Control	352	348		314		236		114	

About the pyrethroid Deccis 100 EC the efficiency is maintained until the seventh day after the treatment as it was also about organophosphorus insecticides Danadim progress 400 EC, Dursban 4 E and Pirinecs 48 EC and carbamate insecticide Lannat 25 VG - respectively 97.5%, 98.0%, 97.8%, 97.5 % and 97.1%.

The results obtained in 2015 (Table. 2) are unidirectional with those of 2014 regarding the efficacy of insecticides Danadim progress 400 EC, Dursban 4 E, Pirinecs 48 EC, Deccis 100 EC, Mospilan 20 SP, Lannat 25 VG and Cohinor 200 SL.

Table 2. Efficacy of insecticides against cotton leaf aphid in 2015

Variants Dose	Number of the live aphids	Days after spraying, efficacy							
		1st day		3rd day		7th day		14th day	
		Number of live	E %	Number of live	E %	Number of live	E %	Number of live	E %
Dimethoate Danadim progress 400 EK - 0.05%	326	0	100	3	99.0	6	97.4	15	86.4
Chlorpirifosetil Dursban 4 E - 100 ml/da	310	0	100	1	99.7	6	97.3	16	84.7
Chlorpirifosetil Pirinecs 48EK - 100 ml/da	316	0	100	3	98.9	8	96.4	18	83.2
Deltamethrin Deccis 100 EK - 12.5 ml/da	314	0	100	2	99.3	7	96.8	17	84.0
Acetamiprid Mospilan 20 SP – 0.0125%	328	0	100	1	99.6	4	98.3	8	93.0
Methomyl Lannat 25 WG - 100 g/da	326	2	94.4	3	99.0	7	97.0	18	83.6
Imidacloprid Cohinor SL - 0.05%	317	1	99.7	2	98.9	5	97.8	8	92.6
Control	338	332		289		236		114	

CONCLUSIONS

For successful leading the fight against cotton leaf aphid *(Aphis gossypii Glov.)* the insecticides that can be uses are: Danadim progress 400 EC (dimethoate) at a dose of 0.05%, Dursban 4 E (chlorpirifosetil 480 g/l) at a dose of 100 ml/da, Pirinecs 48 EC (chlorpirifosetil 480 g/l) at a dose of 100 ml/da, Deccis 100 EC (deltamethrin 100 g/l) at a dose of 12.5 ml/da, Mospilan 20 SP (acetamiprid 200 g/kg) at a dose of 0.0125%, Lannat 25 VG (methomyl 250 g/kg) at a dose of 100 g/da and Cohinor 200 SL (imidacloprid 200 g/l) at a dose of 0.05%.

The best duration was observed (within the fourteenth day after the treatment) about the neonicotinoid insecticides Mospilan 20 SP and Cohinoor 200 SL. The insecticides Danadim progress 400 EC, Dursban 4 E, Pirinecs 48 EC, Deccis 100 EC and Lannat 25 VG retain their efficacy until the 7th day after the treatment.

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