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Изворен научен труд

EFFICACY OF SOME INSECTICIDES IN THE CONTROL OF TOBACCO APHID (MYZUS NICOTIANAE BLACKMAN)

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INTRODUCTION

Tobacco plants are attacked predominantly by two aphid species: peach aphid (Myzis persicae Sulz.) and tobacco aphid (MyZus nicotianae Blackman), which are the main tobacco pests. The aphids colonize the lower side of the top leafs and subsequently spread to the flowers and small capsules. In cases of mass infestation, conditioned by favourable weather conditions (temperature, humidity) and food, tobacco aphids breed intensively and build colonies very fast, covering densely the entire leaf surface. Attacked plants slow their development, blossom prematurely and give lower quality production.

Adult aphids and their larvae harm the plants, sucking juices from the leaves, flowers and young capsules. As a consequence of these damages, they exude honeydew, which covers the leaves, and when it dries the leaves glue together and blacken (3). The big danger, which the tobacco aphid represents, is conveyed not only in the direct damages that it causes, but also in the fact that it transmits viral diseases agents: Cucumber mosaic virus (CMS) and Potato virus Y (PVY). M. nicotianae Blackman transmits these two viruses in larger extend in comparison to M. persicae Sulz. (8).

The control of aphids is carried out predominantly with chemical agents and is very difficult due to aphids' biological and ecological-adaptive features: multigenerationality, ability for anolocyclic development, resistant forms, etc. The pest control is most effective when the treatment is performed in the beginning of tobacco's vegetation (the middle of June), which coincides with the mass migration of winged adults, and when the disease is still weak and the infested plants in the field are no more than 5-10% (2).

Multiple treatments and long chemical control lead to the appearance of the more aggressive forms of MyZus nicotianae Blackman, which requires the dosage of chemicals to be increased and new more toxic chemical substances to be found.

Some investigators (9) indicate data for resistance development, which according to Blackman (1) the development of resistance to organic phosphorus insecticides is related to the appearance of a mutation, responsible for the pink form of M. nicotianae. Harlow C. and Lampert E. (6) found out that the red form of M. nicotianae is resistant to organic phosphorus insecticides. In order not to allow the appearance of resistant forms, it is necessary aphicides on the basis of different active substances to be used during the vegetation period (5).

In connection with the abovementioned, the aim of the conducted trials was to investigate the efficacy of some insecticides, applied singly or in combination, against the tobacco aphid (Mysus nicotianae Blackman).

MATERIAL AND METHODS

In 2006, experiments in laboratory environment were carried out at the Tobacco and Tobacco Products Institute - Plovdiv, Bulgaria, aimed to establish the biological efficacy of some insecticides and insecticide combinations for control of the tobacco aphid:

Tested insecticides:

The trade names of the insecticides used in the trials:

Actara 25 VG (triamethoxam), Confidor 70 VG (imidacloprid) and Regent 800 VG (fipronil) - applied singly. Talsar 10 EK (bifentrin) was used in combination with the specified insecticides and in the mixture the dosage of both insecticides was lowered by 30%. All insecticide solutions were prepared immediately before the treatment.

Treatment object - Myzus nicotianae Blackman

The tobacco aphids (red form) were collected from naturally infested tobacco plants - variety Plovdiv 7, in a trial field of the Tobacco and Tobacco Products Institute - Plovdiv. At the time when the trials were carried out, the tobacco plants were in a phenophase butonisation, and the aphids - in a phase apterous partenogenetic females adult and larvae.

Laboratory biological examination for assessing efficacy of the insecticides in time:

To assess the efficacy of insecticides we used the leaf dip test (4). For each leaf, 50 apterous adult females were counted and carefully carried over the tobacco leaves. Each variant encompassed two leaves. The prepared leaves were dipped for about 5-10 seconds in petri dishes with d-15cm, containing prepared solutions of the tested insecticides with the specified concentration. The control leaves were dipped into tap water. After that, the leaves were dried from excess insecticide solutions on filter paper. In order to prevent desiccation of the leaves, they were placed on a piece of moist blotting paper and the base of each leaf was wrapped with cotton, soaked in water. Each treatment was replicated four times and each variant included a total of 400 apterous adult female aphids. The mortality rate was established 24h and 48h after the treatment, and aphids' vitality was monitored with binocular eyepiece. The insecticide efficacy for each variant was calculated with the formula of Henderson and Tilton (7).

RESULTS

From the results in Table 1, it can be seen that the best initial effect is achieved with insecticide combinations: Confidor 70 VG + Talsar 10 EK and Actara 25 VG + Talsar 10 EK. The number of living aphids for *Variant 4* is 22, and the efficacy is 94%. For *Variant 2* the living aphids are 26, and the efficacy is 93%.

Forty-eight hours after the treatment the efficacy for both variants reaches 99% with a minimal number of 2 living aphids.

From the insecticides that were applied singly, the highest efficacy - 90% for 24 hours after the treatment was achieved with Confidor 70 VG, followed by Actara 25 VG - with 78% efficacy. At the 48th hour the efficacy of *Variant 3* reaches 99%, and the efficacy of *Variant 1* - 98%, the number of the living aphids is 5 and 7 respectively.

From the data in the table it is also seen that the addition of Talsar 10 EK from the group of synthetic piretroids to Confidor 70 VG and Actara 25 VG accelerates the initial effect and increases the efficacy with 4% and 15% respectively, in comparison with the single application of these insecticides.

The data, obtained for Regent 800 VG applied singly, show that the efficacy of this insecticide is not good enough. A large part of the treated aphids remain alive 24 hours after the treatment. At the 48th hour the efficacy reaches 68%. For *Variant 6* - Regent 800 VG + Talsar 10 EK, the efficacy both at the 24th hour (91%) and the 48th hour (98%) is very close to the best variants, and the number of living aphids is 33 and 6 respectively.

Table 1. Efficacy of some insecticides and insecticide combinations for control of the tobacco aphid

Таб.1 Ефикасност на некои инсектициди и комбинации на инсектициди во сузбивањето на лисната вошка

Variants Dosage Варијанта доза	Condition of the population - Услови на популацијата				
	Number of living individuals Бр. на живи единки	Hours after the treatment - Часови на третирање			
		After 24 hours		After 48 hours	
		Living individuals живи единки	Efficacy, % Ефикас-ност	Living individuals живи единки	Efficacy, % Ефикас-ност
1. Actara 25 VG - 20g/dka	400	85	78	7	98
2. Actara 25 VG - 15g/dka + Talsar 10 EK - 20ml/dka	400	26	93	2	99
3. Confidor 70 VG - 15g/dka	400	39	90	5	99
4. Confidor 70 VG - 10g/dka + Talsar 10 EK - 20ml/dka	400	22	94	2	99
5. Regent 800 VG - 3.5g/dka	400	230	40	120	68
6. Regent 800 VG - 2.5g/dka + Talsar 10 EK - 20ml/dka	400	33	91	6	98
7. Control - no treatment Контрола нетретирана	400	380	-	378	-

CONCLUSIONS

As a result from the conducted trials, the following conclusions can be made:

At the 24th hour after the treatment against tobacco aphid, the following insecticide combinations have the best biological efficacy: Confidor 70 VG and Talsar 10 EK; Actara 25 VG and Talsar 10 EK; Regent 800 VG and Talsar 10 EK.

The addition of the synthetic piretroid Talsar 10 EK to insecticides Confidor 70 VG, Actara 25 VG and Regent 800 VG results in a fast initial effect and increases the efficacy of the combinations in comparison to the single use of the above-mentioned insecticides.

Among the singly used insecticides, Confidor 70 VG shows the best biological effect for control of the tobacco aphid, followed by Actara 25 VG. Both insecticides reach maximal effect at the 48th hour after the treatment.

The applied insecticides and insecticide mixtures are able to restrict the density and the harmful effect of the tobacco aphid.

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ЕФИКАСНОСТ НА НЕКОИ ИНСЕКТИЦИДИ ВО СУЗБИВАЊЕТО НА ЛИСНАТА ВОШКА (MYZUS NICOTIANAE BLACKMAN)

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РЕЗИМЕ

Во 2006 година се изведувани експерименти во лабораториска средина, во Институтот за тутун и тутунски производи (ИТТП) - Пловдив, Бугарија, за проучување на биолошката ефикасност на некои инсектициди и инсектицидни комбинации во сузбивањето на лисната вошка (Myzus nicotianae Blackman). Експериментите се поставени во 6 варијанти и контрола во четири повторувања, на тутунски растенија од опитното поле на ИТТП-Пловдив, природно заразени со лисна вошка (црвена форма). За проценка на ефикасноста на инсектицидите во одреден временски период, користен е методот на потопување на листот. Утврдено е дека следниве комбинации на инсектициди покадуваат добра биолошка ефикасност против лисната вошка: Confidor 70 VG во доза од 10g/дка и Talsar 10 EK во доза од 20 ml/дка; Actara 25VG во доза од 10 g/дка и Talsar 10 EK во доза од 20 ml/дка; Regent 800 VG во доза од 2.5 g/дка и Talsar 10 EK во доза од 20 ml/дка. Од единечните инсектициди, Confidor 70 VG во доза од 15 g/дка и Actara 25 VG во доза од 20 g/дка покадаа добар биолошки ефект против лисната вошка на тутунот.

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