

RESEARCHES REGARDING THE EFFICIENCY OF SOME INSECTICIDE USED IN THE POTATO APHID CONTROL

CERCETĂRI PRIVIND EFICACITATEA UNOR INSECTICIDE FOLOSITE ÎN COMBATAREA AFIDELOR CARTOFULUI

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Abstract: The researches, carried out during 2005-2006 in potato field at Didactic Station (STN) Timișoara revealed the fact that the most efficient products in aphids control were: Mospilan 20 SP and Regent 200 SC. Were tested two insecticides for treatment of tubercles and four insecticides for treatment during the vegetation.

Rezumat: Cercetările efectuate în anii 2005 - 2006 la Stațiunea Didactică (STN), Timișoara în cultura de cartof au scos în evidență faptul că cele mai eficiente insecticide în combaterea afidelor au fost Mospilan 20 SP și Regent 200 SC. Au fost testate două produse pentru tratarea tuberculilor și patru produse pentru tratamente în timpul vegetației.

Key words: control, insecticides efficiency, aphids, potato,
Cuvinte cheie: combatere, insecticide, eficacitate, afide, cartof,

INTRODUCTION

Chemical control is intended to reduce the aphid populations from potato crops and prevent transition of the virotic diseases.

Researches done on national and international level show the tendency to test some of the pesticide which can be included in the integral control of potato pests systems.

In Romania researches regarding the control of aphids were made by Donescu (1998), Cojocar (1970), (1987), Perju (2004), Plămădeală (1987).

Because of higher and higher demands regarding the quality of potatoes it is imperative today to know the principal aphid vectors, their biology and ecology.

The main objective must not be only to control the aphids but finding the most efficient means to prevent their spread in order to stop viral diseases transitions by aphids.

MATERIAL AND METHODS

The researches, carried out in potato field at Didactic Station (STN) Timișoara in 2005-2006.

The disposals of experimental parcels were made in 5 variant with 3 repetitions.

Were tested in order to determine the efficiency, two insecticides for treatment of tubercles: PRESTIGE 290FS in dose of 1,0 kg/t, and MOSPILAN 70WP in dose of 0,2 kg/t. For treatment during the vegetation there were tested four insecticides THIONEX 35EC in dose of 3.0 l(kg)/ha, VALLIANT 25EC in dose of 0.08 l(kg)/ha, MOSPILAN 20 SP in dose of 0,06 l(kg)/ha, REGENT 200 SC in dose of 0.09 l(kg)/ha.

The efficiency was checked at different intervals of time (1, 3, 5, 7 and 10 days) .

Wingless aphids were observed for evaluating the efficacy of insecticides using the 100 leaf method collected alternatively from bottom, middle and apex of the plant.

For the interpretation of the results regarding the efficiency coefficient were used the Henderson-Tilton formula.

RESULTS AND DISCUSSIONS

In 2005, the best results were obtained in case of Prestige 290 FS applied on tubercles before planting. The culture was protected approximately two months, reducing the aphid populations. Also good results were obtained in case of Mospilan 70 WP applied on tubercles before planting. The culture was protected approximately 50 days, reducing the aphid population (table 1).

Table 1

The efficiency of insecticide in aphids control thought treatment at tubercle 2005

Active substance	Commercial name	Doze	No. of wingless aphids / 100 leafs after: (no. of days from sprout)					
			10	20	30	40	50	60
Treatment on tubercles		Kg/t						
Imidacloprid 140 g/l + pencicuron 150 g/l	PRESTIGE 290FS	1,0	0	0	0	0	1	3
Acetamiprid 70 %	MOSPILAN 70WP	0,2	0	0	0	0	3	4
Untreated Witness	-	-	0	3	7	26	35	54

After one day from the treatment in vegetation, in 2006, the most numerous exemplars were collected from the third variant, treated with Valliant 25 EC. The lowest number of individuals was collected from the fourth variant treated with Mospilan 20SP.

After three days from the treatment, the most exemplars collected from the treated variant were: 10 individuals on variant treated with Valliant 25 EC and 8 individuals on the variant treated with Thionex 25 EC. The lower number of individuals was collected from the fourth variant treated with Mospilan 20SP.

After five days from the treatment, the most numerous exemplars were collected from the variant treated with Thionex 25 EC and Valliant 25 EC. On variant treated with Mospilan 20 SP were not collected any individuals.

After seven days from the treatment, the most exemplars were collected from the second variant (Thionex) (13 individuals) followed by the third variant (9 individuals).

After 10 day of treatments, the greatest number was find on variant two, treated with Thionex 25 EC (15 individuals), followed by the third variant treated with Valliant 25 EC (8 individuals). The variant treated with Mospilan 20 SP had the lowest number of collected individuals (table 2).

THONEX 35 EC, applied in a doze of 3 l/ha presented the highest efficiency coefficient was over 76 % at 24 hours from treatment. Efficiency declined at 74 % after 3 days, at 61% after 5 days, at 60% after 7 days and only 58 % after 10 days.

MOSPILAN 20 SP applied in a doze of 0,06 kg/ha registered a percent of efficiency of 90 % after one day, 96% after 3 days, 100 % after 5 days, efficiency remained high in next intervals approximate 96 % after 7 days and 97% after 10 days.

VALLIANT 25 EC applied in a doze of 0,08 l/ha registered a reduced percent of mortality, after 24 hours 53 %, the percent increased in the next intervals at 67 % after 3 days, 71% after 5 days, 72% after 7 days and at 77% after 10 days.

REGENT 200 SC applied in a doze of 0,09 l/ha presented a good efficiency of 86% even from the first day of treatment and increased in the next intervals at 93% after 3 days, reaching the highest percent after 5 days of 96 %, and maintaining a high level of 90%.

Table 2

The number of individuals on potato leaves from after treatment

Date of harvest	V1 (untreated witness)	V2 (treated. with Thionex 25EC)	V3 (treated. with Valliant 25EC)	V4 (treated. with Mospilan 20 SP)	V5 (treated. With Regent 200SC)
7.07.2006(before the treatment)	28	29	27	30	27
8.07.2006 (after 1 day from the treat.)	29	7	14	3	4
10.07.2006 (after 3 days from the treat.)	30	8	10	1	2
12.07.2006 (after 5 days from the treat.)	30	12	9	0	1
14.07.2006 (after 7 days from the treat.)	32	13	9	1	2
17.07.2006 (after 10 days from the treat.)	35	15	8	1	2

Analyzing the results we can observe that all products offer a good efficiency in control of aphid populations.

The most efficient insecticides were: Mospilan 20 SP, it had an efficiency coefficient of over 96%, followed of Regent 200 SC with efficiency over 93%.

Valliant 25 EC had an efficiency of over 68%, and the lowest efficiency was achieved with Thionex 35 EC of just 66% (table 3).

Table 3

The efficiency of insecticide in aphids control through treatments in vegetation, 2005

Active substance	Commercial name	Doze l(kg)/ha Conc%	Aphid Effect (% mortality)					Average
			1 day	3 days	5 days	7 days	10 days	
Endosulfan	THONEX 35EC	3.0	76,69	74,25	61,37	60,77	58,62	66,34
Cipermetrin 25 %	VALLIANT 25EC	0.08	53,38	67,81	71,03	72,84	77,93	68,59
Acetamiprid 20 %	MOSPILAN 20 SP	0.06	90,01	96,78	100	96,98	97,74	96,30
Fipronil	REGENT 200 SC	0.09	86,68	93,53	96,78	93,96	94,48	93,08

In 2006 the best results were obtained in case of Prestige 290FS applied on tubercles before planting. The culture has been protected for two month, reducing the aphid population. Best results were obtained in case of Mospilan 70 WP applied on tubercles before planting. The culture has been protected approximately for two month, reducing the aphid population (table 4).

The efficiency of insecticide in aphids control thought treatment at tubercle 2005

Table 4

Active substance	Commercial name	Doze	No. of wingless aphids / 100 leafs after: (no. of days from sprout)					
			10	20	30	40	50	60
Treatment on tubercles		Kg/t						
Imidacloprid 140 g/l + pencicuron 150 g/l	PRESTIGE 290FS	1,0	0	0	0	0	0	1
Acetamidiprid 70 %	MOSPILAN 70WP	0,2	0	0	0	0	1	2
Untreated Witness	-	-	0	1	4	18	30	49

After one day from the treatment in 2006, the most exemplars were collected from the third variant. The lowest number of individuals was collected from the fourth variant treated with Mospilan 20SP .

After 3 days from the treatment, the most exemplars were collected from the treated variants were: 11 individuals on variant treated with Valliant 25 EC and 9 individuals on variant treated with Thionex 25 EC.). The lowest number of individuals was collected from the fourth variant treated with Mospilan 20SP.

After 5 days from the treatment, the most exemplars were collected from the variant treated with Thionex 25 EC (13 individuals) and Valliant 25 EC (10 individuals).

After 7 days from the treatment, the most exemplars were collected from the second variant (14 individuals) followed by third variant (8 individuals).

After 10 days from the treatment, the most exemplars were collected from the witness variant

Between treated variants the greatest number was found on variant two, treated with Thionex 25 EC (15 individuals), followed by the third variant treated with Valliant 25 EC (7 individuals). The variant treated with Mospilan 20 SP have been the lowest number of collected individuals (table 5)

Table 5

The number of individuals from potato culture after treatment

Date of harvest	V1 (witness variant)	V2 (treated with Thionex 25E)	V3 (treated with Valliant 25EC)	V4 (treated with Mospilan 20 SP)	V5 (treated with Regent 200SC)
7.07.2006(before treaty)	27	28	27	29	26
8.07.2006 (after 1 day from treatment)	28	8	15	2	3
10.07.2006 (after 3 days from treat.)	31	9	11	1	2
12.07.2006 (after 5 days from treat.)	30	13	10	1	2
14.07.2006 (after 7 days from treat.)	32	14	8	1	1
17.07.2006 (after 10 days from treat.)	34	15	7	1	2

THONEX 35 EC, applied in a doze of 3 l/ha presented the highest efficiency after 24 hours from treatments of over 72,44 %. Efficiency declined at 72 % after 3 days, at 58% after 5 days, at 57% after 7 days and to only 63 % after 10 days.

MOSPILAN 20 SP applied in a doze of 0,06 kg/ha registered a percent of control of 93% after 1 day, 96% after 3 days, 96% after 5 days, efficiency slightly growing in next intervals at 97 % after 9 days, reaching again 96% after 10 days (table 6).

VALLIANT 25 EC applied in a doze of 0,08 l/ha registered a reduced percent of mortality, after 24 hours it was 48 %, increased in the next intervals at 65 % after 3 days, 67% after 5 days, 75% after 7 days and at 80% after 10 days.

REGENT 200 SC applied in a doze of 0,09 l/ha presented a good efficiency of 89% even from the first day of treatment and increased in the next intervals at 93% after 3 days, remained constant after 5 days at 93%, maintaining a high level of over 90%.

Analyzing the results we can observe that all the products offer a good efficiency in control of aphid populations.

Table 6

The efficiency of insecticide in aphids control thought treatment in vegetation, 2006

Active substance	Commercial name	Doze l(kg)/ha	Aphid Effect (% mortality)					Average
			1 day	3 days	5 days	7 days	10 days	
Endosulfan	THONEX 35EC	3.0	72,44	72	58,21	57,81	57,45	63,582
Cipermetrin 25 %	VALLIANT 25 EC	0.08	48,34	65,67	67,85	75,89	80,14	67,578
Acetamiprid 20 %	MOSPILAN 20 SP	0.06	93,11	96,88	96,78	96,98	97,16	96,182
Fipronil	REGENT 200 SC	0.09	89,66	93,77	93,57	96,98	94,32	93,66

The most efficient products were: Mospilan 20 SP who had an efficiency of over 96%, followed by Regent 200 SC with an efficiency over 93%

Valliant 25 EC had an efficiency of over 67%, and the lowest efficiency was achieved by Thionex 35 EC of just 63%

CONCLUSIONS

In two years, in foliar treatments the most efficient insecticide were: Mospilan 20 SP who had an efficiency of over 96%, followed by Regent 200 SC with an efficiency over 93% in both years.

In 2005 Valliant 25 EC had an efficiency of over 68%, and the lowest efficiency was achieved with Thionex 35 EC of just 66%.

In 2006 Valliant 25 EC had a efficiency of over 67%, and the lowest efficiency was achieved by Thionex 35 EC of just 63%.

The efficiency of insecticide in aphids control thought treatment at tubercle have also best results with use of Prestige 290FS.

The potato cultivation was protected approximately two months, reducing the aphid population.

Also good results were obtained in case of MOSPILAN 70 WP applied on tubercles before planting.

LITERATURE

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