THE SUPRASPREADERS EFFECT SILWET L-77 IN INSECTICIDES SOLUTION ON POTATO CROP

EFECTUL SUPERSPREADERSULUI SILWET L-77 ÎN SOLUȚII DE INSECTICIDE APLICATE LA CULTURA CARTOFULUI

I. OLTEAN, I. OROIAN, TEODORA PĂRĂU, ILONKA BODIŞ

U.S.A.M.V. Cluj-Napoca, Romania

Abstract: *In the conditions of the actual situation of agosystems from Romania's agriculture without chemical fighting, based on the integrated fighting, of weeds, diseases and pests it cannot be conceived the development of crop production. Besides the preventing methods for fighting, it is recommendated the application of chemical methods of fighting with the most secures and efficient products, which corresponds the actual level of finicality for the potatoes for consumption and seeds.*

Rezumat: *În condițiile situației actuale a agroecosistemelor din agricultura României fără combaterea chimică, pe fondul combaterii integrate, a buruienilor, bolilor şi dăunătorilor nu se poate concepe dezvoltarea producției de cartofi. Pe lângă măsurile preventive de combatere, se recomandă aplicarea unor metode chimice de combatere cu cele mai sigure şi mai eficiente produse, care să corespundă nivelului actual al pretențiilor pentru cartofii de consum şi de sămânță.*

Key words: *potato, Colorado beetle, insecticides*
Cuvinte cheie: *cartof, gândacul din Colorado, insecticide*

INTRODUCTION

The potato, being a plant with alimentary and fodder usage or for industrialisation has a very big importance.Because of the nutrient characteristics, ecological plasticity and production capacity, the importance of potato crop is in continous growing.

For protecting the crops of parasite and concurent species they are used different measures thru which are followed the reduction of intial biological reserve and also the multiplication and infection rate or reduce them both. The principal protection methods of potato actions first of all over the growing of parasite and concurent population species.Of course, their effect is specatcoulos. For example, an intensive attacked culture by the Colorado beetle, *Leptinotarsa decemlineata*, it is saved by a traetment with insecticides with shock action, the effect being obvious even after the aplication of the traetment.

In the conditions of the actual situation of agosystems from Romania's agriculture without chemical fighting , based on the integrated fighting, of weeds, diseases and pests it cannot be conceived the development of crop production. Besides the preventing methods for fighting, it is recommendated the application of chemical methods of fighting with the most secures and efficient products, which corresponds the actual level of finicality for the potatoes for consumption and seeds.

The Colorado beetle, *Leptinotarsa decemlineata*, it is the most prevalent and in the same time the most damaging pest for potato an tomatos. The attack of grubs on the palnts may have as a result the complete destruction of foliation, followed by a drastic allowance which it will be obtained , followed by the total disparagement of crop.

The warning for the chemical treatment after the biological chriteria it is made at the appereance of damaging degrees, at a PED of 5 adults per 10 plants and when are formed florist greenhoms at 20 grubs per plant or when 5 to 8 % from shrubberys are attacked.

For evoiding the resistance phenomenon apearence it is neccesary the rational utilisation of a various pesticides assortment. The growing of the doses for the Colorado beetle fighting it is not indicated because they do not assure a grown death; it selects the ressistant individuals distrois the utile enthomofauna, polutes the biocenosys. The bigest wheight in fighting the Colorado beetle consists in the fact that the appearence of the beetle from the soil it is more echelonated in time. The appereance of beetle in the spring takes about 3-4 decades, thing that happens inthe summer generation

Considering that for the fighting with this pest ,were used for a very long time the synthesis piretroids, sometimes it is semnalated the resistance phenomenon. For this it is neccesary the insecticides alternance used in the fighting process. On the phytopharmaceuticals product market every pesticides producing company, launches year by year, a wide range of products which needs to be checked in the specified conditions for every area of potato crop.

MATERIALS AND METHOD

In year 2007 in the city Campenesti were placed experiences for fighting the Colorado beetle. The experimental field was organised in a parcel of one hectar. The surface of every variant is of 10 ares. The untreated control variant was a surface of 100 mp, which immediatly after the efectuation of the observations for establishing the biological efficiency ofthe tested products, was also treated, because of the existence of the risk like on that area the crop to be fully compromised, it being at the same time a danger for the neighbour areas.

The chemical treatments were made at the appereance of the first generation grubs, with the help of SOLO pomps, using aproximatly 400 liters of solution per ha, for a good cover of the entire plant foliar apparatus.

They were tested 7 products for the fighting of Colorado beetle, awoing the required doses from the producer. Then, every product was tested mixed with supraspreader SILWET L-77. This is a product from the organosilicones group, which improves the absorbtion at the stomates level by reducing the active tension of the aqueos solution. Sequel to the introduction of this product in the used solution, this interacts easier with the plant organs that need to be protect.

The tested insecticides were the folowing:

-BULLDOCK 25 EC
-CALYPSO 400
-CONFIDOR 200 SL
-KARATE ZEON
-MOSPILAN 20 SP.
-NURELLE D 50/500
-VICTENON 50

RESULTS AND DISCUSSION

The testing results made for establishing the biological efficiency at some insecticides in 2007, applied alone or mixed with SILWET L-77 are presented in table 1.

In year 2007 at the untreated control the bigger number of grubs on plant were recorded at the first observation made on 5th of june, 560 grubs found on 5 plants, meaning 112 grups on plant. At this numeric density the attacked plants have the foliar apparatus completly distroied, the grubs using the nip of the sprouts as well. At these densities all the used products cut down the level of population. In this year three products gave extrodinary results.

In all those 14 variants in which chemical treatments were applied, the medium number of grubs on 5 analised plants declined badly, being variants in which were semnalated

no attacks. The efficiancy ot the applied treatment was between 86,9 % and 100 %.

At Bulldock 25 EC in dose of 0,3 L/ha, after treatment the biological efficiency was of 87,5 %. Applying this product mixed with SILWET L-77 were still noticed 6,24 grubs per plant, so an efficiency of 94,40 %. At this variant the efficiancy of the product rised up with 6,9%. Although it is from the synthesis piretroids, being a new formula, the shock effect it is peculiar also the remanence of the product it is remarkable.

Calypso 480 SC in dose of 80 ml/ha, applied alone , had an efficiency of 94,90 % , being one of the best efficiancies. At the application of this product mixed with SILWET L-77 was noticed an efficiency of 100 %. At this variant the product efficiency grown with 5,1 %.

Confidor 200 SL, used in a dose of 0,16 l/ha, had the greatest efficiency from all the products used alone, of 96,40 %.The medium number of grubs in this variant was of 4,92 grubs per plant.At the application of this product mixed with SILWET L-77 was noticed an efficiency of 100 %.At this variant the efficiency ofthe product rised up with 3,6 %.

Nurelle D 50/500, used in a dose of 0,5 l/ha, has almost the same results as Nomolt , but hi sone has a lower price.The mixe between a piretroid from synthesis and an organophosphoric gives the product special qualities , having a shock effect and a very good remainence. In this variant were noticed 11,56 grubs per plant. At this product application mixed with SILWET L-77 were still noticed 3,78 grubs per plant , so an efficiency of 96,60 %.At this variant the product efficiency grown with 6,90 %.

Table 1

The efficiency of insecticides in fighting of the Colorado beetle (Câmpeneşti 2007)

Var	Product	Dose l,kg/ha,	Observation date		
			5.06		Growing of efficiency at SILWET
			Grubs/ 5 pl.	E %	
1	Bulldock 25 EC	0,30	**69,7**	**87,5**	
2	Bulldock 25 EC + Silwet L-77	0,30 + 0,10	**31,2**	**94,4**	**+ 6,9**
3	Calypso 480 SP	0,08	**28,6**	**94,9**	
4	Calypso 480 SP+ Silwet L-77	0,08+ 0,10	**0**	**100**	**+ 5,1**
5	Confidor 200 SL	0,16	**20,1**	**96,4**	
6	Confidor 200 SL+ Silwet L-77	0,16+ 0,10	**0**	**100**	**+ 3,6**
7	Nurelle D 50/500	0,50	**57,8**	**89,7**	
8	Nurelle D 50/500+ Silwet L-77	0,50+ 0,10	**18,9**	**96,6**	**+ 6,9**
9	Mospilan 20 SP	0,06	**47,7**	**91,5**	
10	Mospilan 20 SP+ Silwet L-77	0,06+ 0,10	**13,1**	**97,7**	**+ 6,2**
11	Victenon 50 WP	0,50	**61,6**	**89,0**	
12	Victenon 50 WP+ Silwet L-77	0,50+ 0,10	**10,2**	**98,2**	**+ 9,2**
13	Karate ZEON	0,20	**73,5**	**86,9**	
14	Karate ZEON+ Silwet L-77	0,20+ 0,10	**18,3**	**96,7**	**+ 9,8**
15	Untreated control	-	**560**	-	

The product Mospilan 20 SP , used alone , had an efficiency of 91,50 %.By using it together with SILWET L-77, his efficiency rised with 6,2 %, reaching a point of 97,70 %.

Victenon 50 WP used in a dose of 0,5 kg/ha, although used for a long time in fighting agains the Colorado beetle still maintains a good action. I tis noticed the fact that the grub's death occurs after 24 h form the treatment application.Used alone , had an efficiency of 89 % , and mixed with SILWET L-77, rised the efficiency with 9,2 % , reching a level of 98,20 %.

The Karate product , used in a dose of 0,2 l/ha, at higher density of population, gives good results.After the treatment, the effiiency was of 86,90 %, with a number of 14,70 grubs per plant.Mixed with SILWET, rised the efficiency with 9,8 %, reaching a point of 96,70 %.

CONCLUSIONS

1. The Colorado beetle, *Leptinotarsa decemlineata*, remains the most important pest for the potato crop.

2. In the favorable years of growing and development of this pest , the population reaches alarming values ,by 112 grubs per plant , situations in which the culture might be compromised.

3. The chemical traetments are binding for fighting this pest , the products being chosen function the dimension ofthe population and the financial possibilities of the farmer.

4. The best results in fighting the Colorado beetle were obtained witht he following products : : Calypso 480 SC – 80 ml / ha; Confidor 200 SC – 160 ml/ha.

5. The synthesis piretroids are presenting a good shock effect, the results presented are good immediatly after the treatment, yet if the population is renewing after aproximatly 10 -14 days a new treatment is neccesary.

6. By using superspreader SILWET L-77, in a quantity of 0,1 l/ha, it realise a growing of the biological efficiency of all the used insecticides for fifgting the Colorado beetle.

7. The superspreader SILWET L-77 , at the insecticides : Calypso 480 SC – 80 ml/ha and Confidor 200 SC – 160 ml/ha ,rised the efficiency up to 100 %.

8. The biological efficiency of the used insecticides for the species fighting *Leptinotarsa decemlineata,* can be rised up to 9,8 % by using those mixed with SILWET L-77.

BIBLIOGRAPHY

1. ALEXANDRESCU SANDA şi colaboratorii, 1993, Amestecuri sinergice cu eficacitate în combaterea gândacului din Colorado, Protecţia Plantelor, nr.11-12, pg.70-71.
2. BAICU T., 1978, Aprecierea valorii agricole a unui pesticid, Analele ICPP, vol.XIV, pg. 185-198
3. BAICU T., 1982, Combaterea integrată a bolilor şi dăunătorilor şi limitarea poluării cu pesticide, Editura Ceres, Bucureşti.
4. BRUDEA V.,2002, Noi insecticide eficace în combaterea gândacului din Colorado în nordul Moldovei, Sănătatea Plantelor, nr.45, pg. 14.
5. MORAR G., V. FLORIAN, I. OLTEAN, 1998, Protecţia culturilor agricole pe înţelesul tuturor - Protecţia cartofului împotriva buruienilor, bolilor şI dăunătorilor, 11 p., Tipo Poliam Cluj-Napoca.
6. MORAR G., CAMELIA SÂRB, I. OLTEAN, 2006, Efectul extractelor hidroalcoolice din plante asupra gândacului din Colorado (*Leptinotarsa decemlioneata* Say.), Eco Life – Eco Zonne, Târg internaţional specializat de ecologie şi protecţia mediului, Environment&Progress – 7/2006, Editura Fundaţia pentru Studii Europene, Cluj-Napoca, pag. 75-78.
7. OLTEAN I., T. PERJU, ASEA TIMUŞ, 2001, Insecte fitofage dăunătoare ale plantelor cultivate, Editura Poliam, Cluj-Napoca, p 147-149.
8. OLTEAN I., 2002, Cercetări privind combaterea chimică a gândacului din Colorado, *Leptinotarsa decemlineata* Say, Rev. Protecţia Plantelor, XII / 46, p.. 63-72.
9. OROIAN I., I.OLTEAN, 2002, Program orientativ pentru combaterea manei şi a gândacului din Colorado, Rev. Prot. Plant., XII / 45, p. 31-32)
10. OLTEAN I., MARIA MONICA PORCA, 2003, Researches related to the chemical fight of the Colorado bug, *Leptinotarsa decemlineata* Say., Journal Central European Agriculture, Croaţia, ISSN: 1332-9049, vol 4(2003), number 3., pag..257-264.