THE EFFICACY OF SOME PESTICIDE COMPLEXES IN CONTROLLING APRICOT TREE CULTURE SPECIFIC PATHOGEN AGENTS IN S.C. TERRA VIVA S.R.L. BALS DURING 2007-2009

EFICACITATEA UNOR COMPLEXE DE PESTICIDE ÎN COMBATEREA AGENȚILOR PATOGENI SPECIFICI CULTURII DE CAIS DIN S.C. TERRA VIVA S.R.L. BALŞ ÎN PERIOADA 2007-2009

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Abstract. *Long time experience in controlling pathogen agents and animal pests in fruit growing sector led to a multitude of studies that tried to elucidate different aspects imposed by the fruit growing cultures pedoclimatic conditions, as well as, the biological efficacy of different plant protection products during their use in time. In this context, on the knowledge of the pesticide range used in controlling pests in apricot tree cultures, we have aimed to observe, in specific production conditions, the biological efficacy of the main active substances used in controlling apricot tree specific pests.*

Key words: apricot tree, pathogen, attack, pesticide, efficacy

Rezumat. *Experienţa îndelungată în combaterea agenţilor patogeni şi a dăunătorilor animali în sectorul pomicol a indus efectuarea unei multitudini de studii prin care s-a încercat să se elucideze diferite aspecte impuse de condiţiile pedoclimatice ale plantaţiilor pomicole, dar şi de eficacitatea biologică a diverselor produse de protecţie a plantelor în decursul folosirii lor în timp. În acest context, pe baza cunoaşterii gamei de pesticide utilizate în combaterea agenţilor de dăunare din cultura de cais, ne-am propus să urmarim, în condiţii specifice de producţie, eficacitatea biologică a principalelor substanţe active folosite în combaterea organismelor dăunatoare specifice acestei specii pomicole.*

Cuvinte cheie: cais, pathogen, atac, pesticide, eficacitate

INTRODUCTION

A difficult problem of contemporary fruit growing, with a tendency to increase in the near future, is represented by the sensibility of cultured species to pathogen agents and animal specific pests (Murg Silvia, Ilie Cornelia, Ştirbu Patricia, 2006). Preventing the damage caused by pest agents specific to apricot tree culture implies using expensive treatments representing, therefore, a significant part of the production costs (Tomşa M., Tomşa Elena, 2003). Nevertheless, protecting apricot tree cultures against diseases and animal pests with Romanian current pesticides is a necessity, no other method being able to guaranty both the quantitative and qualitative safety production (Oroian I., Porca Monica, Oltean I., Şerba I., 2003).

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MATERIAL AND METHOD

The research was conducted on Portici apricot variety, newly introduced in culture in SC Terra Viva SRL Bals. In order to establish the health status of the crop we have considered the following pests: *Plumpox virus*, *Podosphera tridactyla*, *Monilina laxa*, *Stigmina carpophilla*, *Quadraspidiotus perniciosus*, *Hyphantria cunea*, teranychid mites.

Depending on the medium values of the attack degree (A D%), these were classified into: Low attack degree – A D%=1-10%; Medium attack degree– A D=10-20%;High attack degree – A D=20-30%;Very high attack degree – A D>30% (Simeria Gh., Pîrşan P., Damianov Snejana, 2007). In controlling pests, in specific production conditions, we used two treatment schemes (variants). Variant 1: an annual treatment scheme that used fungicides with mainly surface action, excepting safety treatments (table 1). Variant 2: an annual treatment scheme that used fungicides with mainly systemic action (table 2). Each variant consisted in a number of 5 apricot trees, experiences being set up in randomized blocks. Data collection was made on five trees establish in each variant for every repetition. During the research period were conducted in the orchard macroscopic controls and in laboratory microscopic controls before and after treatments. For comparison of experimental results has been taken as a control variant the average of the variants. This choice was based on the fact that apricots can't be grown without phytosanitary protection, setting a variant without treatment was impossible and in addition, other variants would be come out significant, affecting results.

RESULTS AND DISCUSSIONS

Apricot is another stone fruits species, grown in SC Terra Viva SRL Bals. Like all fruit species, apricot is attacked by a number of pest agents, for which we carried out controls on the 756 existing trees in the orchard.

If the case of *Monilinia laxa* attack was found that 300 of the 756 control trees had not presented any attack symptom representing a rate of 39.6%. A percentage of 60.4% from the trees presented a weak attack, and no tree has not presented a medium or powerful attack. The attack of the *Stigmina carpophilla* fungus has been signalized at all controlled trees, from which 694 trees presented weak attacks, and 62 trees were recorded with medium attack. Regarding the pest attack, analyzed trees had presented week attacks produced by: *Quadraspidiotus perniciosus*, *Hyphantria cunea* and tetranychids mites. Of the 756 controlled trees, 33 trees, representing a rate of 4.4% presented symptoms of tetranychids mites attack, 24 representing a rate of 3.2% presented symptoms of *Quadraspidiotus perniciosus* attack, while 15 trees, representing a rate of only 2.0% presented symptoms of *Hyphantria cunea* attack.

The data listed in table 3 shows that in the apricot orchard of SC Terra Viva SRL Bals during 2007 to 2009 the majority of harmful agents have registered weak attacks, and for pathogens *Plum pox virus* and *Podosphaera tridactyla*, the attack was not reported. During the period under study has been followed the biological action of a complex of pesticides (table 2 and 3) used in controlling the "key" disease reported. For *Monilinia laxa* were made observations regarding the degree of attack on fruits and shoots.

Regarding the attack degree on fruits the results presented in table 4 were obtained from the analysis in the field of 250 fruits/variant. Interpreting the collected data showed that the apricot Portici variety from SC Terra Viva Portici SRL Bals, the degree of attack on fruits has recorded low values especially in the use of fungicides with predominantly systemic action. Low value of the attack degree at the variant 1 where there were used it mainly products with surface action is explained by the fact that at critical moments to apricot at the attack of the fungus *Monilinia laxa* were used systemic products.

Table 1

Variant I – treatment scheme with products used for controlling harmful agents in the apricot orchard

Nr.	Phenologic phase	Agent	Commercial name of product	Active substance	Dose kg, l / ha conc.%	Observations
1	White button	*Monilinia laxa Stigmina carpophilla*	Funguran OH 50 WP	Metallic copper 50%	0,065	Treatment performed at phenological stage (March - decade 3)
2	15-20% of flowers has fallen petals	*Monilinia laxa Stigmina carpophilla Anarsia lineatella Grapholita molesta* Aphids	Sumilex 50 PU Calypso480SC	procimidon tiacloprid 480 g/l	0,1 0,02	The most important treatment for combating moniliosys Treatment performed at phenophase (April - decade 1)
3	Complete fallen of petals	*Monilinia laxa Stigmina carpophilla* Defoliation insects, aphids, moths, mites	Merpan 80 WDG Decis 2,5 CE	captadin 80% deltametrin 25 g/l	0,25	Treatment runs phenological, complexed (April - decade 2 and 3)
4	Fruits as a peanuts size	*Monilinia laxa Stigmina carpophilla* Aphids, Defoliation insects	Dithane M 45 Reldan 40 EC	mancozeb 80% clorpirifos metil	0,2 0,15	Treatment runs phenological, complexed (May – decade 1 and 2)
5	Fruits with diameter of 1,5 -2 cm	*Monilinia laxa Stigmina carpophilla Anarsia lineatella Grapholita molesta,* aphids, mites	Bravo 500 SC Decis 2,5 CE	clorotalonil deltametrin 25 g/l	0,15 0,01	Treatment phenological runs, complexed with the treatment to control Anarsia lineatella - first treatment generation I (June - decade 2)
6	Normal fruits before ripening	*Monilinia laxa,Stigmina carpophilla* San Jose scale, Aphids, Defoliation insects	Teldor 500 SC Talstar 10 EC	fenhexamid bifentrin	0,08 0,2	Treatment phenological runs, complexed with the treatment to control Anarsia lineatella - second treatment generation I (July - decade 3)
7	After harvest	*Monilinia laxa,Stigmina carpophilla*, *Anarsia lineatella, Grapholita molesta*, Aphids, mites,San Jose scale	Funguran OH 50 WP Decis 25 WG	Metallic copper 50% deltametrin 25 g/l	0,065 0,003	Treatment phenological runs, complexed with the treatment to control Anarsia lineatella - first treatment generation II (August - decade 1)
8	75% of leaves fallen	*Monilinia laxa Stigmina carpophilla*	Bordelaise solution	Metallic copper as $CuSO_4$ neutralized	0,5	The treatment is performed during vegetative rest period

Table 2

Variant II – treatment scheme with products used for controlling harmful agents in the apricot orchard

Nr.	Phenologic phase	Agent	Commercial name of product	Active substance	Dose kg, 1/ha conc.%	Observations
1	White button	*Monilinia laxa Stigmina carpophilla*	Sumilex	procimidon	0,1	Treatment performed at phenological stage (March - decade 3)
2	15-20% of flowers has fallen petals	*Monilinia laxa Stigmina carpophilla Anarsia lineatella Grapholita molesta* Aphids	Teldor 500 SC Calypso 480 SC	fenhexamid tiacloprid 480 g/1	0,08 0,02	The most important treatment for combating moniliosys Treatment performed at phenophase (April - decade 1)
3	Complete fallen of petals	*Monilinia laxa Stigmina carpophilla* Defoliation insects, aphids,	Topsin 70 PU Talstar 10 EC	tiofanat metil bifentrin	0,07 0,2	Treatment runs phenological, complexed (April - decade 2 and 3)
4	Fruits as a peanuts size	*Monilinia laxa Stigmina carpophilla* Aphids, Defoliation insects	Dithane M 45 Sinoratox 35 CE	mancozeb 80% dimetoat	0,2 0,1	Treatment runs phenological, complexed (May – decade 1 and 2)
5	Fruits with diameter of 1,5 -2 cm	*Monilinia laxa Stigmina carpophilla Anarsia lineatella Grapholita molesta,* aphids, mites	Teldor 500 SC Decis 2,5 CE	fenhexamid deltametrin 25 g/1	0,08 0,01	Treatment phenological runs, complexed with the treatment to control *Anarsia lineatella* - first treatment generation I (June - decade 2)
6	Normal fruits before ripening	*Monilinia laxa,Stigmina carpophilla,* San Jose scale, Aphids, Defoliation insects	Rovral 50 WP Calypso 480 SC	iprodione tiacloprid 480 g/1	0,1 0,02	Treatment phenological runs, complexed with the treatment to control *Anarsia lineatella* - second treatment generation I (July - decade 3)
7	After harvest	*Monilinia laxa, Stigmina carpophilla*, *Anarsia lineatella, Grapholita molesta*, Aphids, mites, San Jose scale	Dithane M 45 Fastac 10 EC	mancozeb, alfa - cipermetrin	0,2 0,015	Treatment phenological runs, complexed with the treatment to control *Anarsia lineatella* - first treatment generation II (August - decade 1)
8	75% of leaves fallen	*Monilinia laxa Stigmina carpophilla*	Champion 50 WP	Metallic copper as $CuSO_4$ neutralized	0,3	The treatment is performed during vegetative rest period

Table 3

Phytosanitary status of appricot crop from SC Terra Viva SRL Balş during 2007 – 2009

Harmful agent	Nr. trees	Nr. Controlled trees	Nr. Trees without attack	%	Nr. Trees with attack	%	Nr. Trees with low attack	%	Nr. Trees with medium attack	%	Nr. Trees with high attack	%	Nr. Trees with very high attack	%
Plum pox virus	756	756	756	100	0	0	0	0	0	0	0	0	0	0
Podosphaera tridactyla	756	756	756	100	0	0	0	0	0	0	0	0	0	0
Monilinia laxa	756	756	300	39,6	456	60,4	456	60,4	0	0	0	0	0	0
Stigmina carpophilla	756	756	0	0	756	100	694	91,8	62	8,2	0	0	0	0
Quadraspidiotus perniciosus	756	756	732	96,8	24	3,2	24	3,2	0	0	0	0	0	0
Hyphantria cunea	756	756	741	98,0	15	2,0	15	2,0	0	0	0	0	0	0
Tetranychids mites	756	756	723	95,6	33	4,4	33	4,4	0	0	0	0	0	0

Table 4

***Monilinia laxa* — attack degree on fruits during 2007 – 2009**

Variant	Attack degree %	%	Differences	Signification
V1	2,2	146,6	0,7	-
V_2	0,9	60	-0,6	-
Variants average	1,5	100	-	-

DL 5% = 0,9
DL 1% = 1,4
DL 0,1% = 2,6

It has taken this choice, because in the studied years pathogen infection pressure was high, so use a product contact could lead to impairment of production.

Regarding the attack frequency on shoots, as seen in table 5, it fluctuated between 2.2% at V_2 variant respectively 3.4%, at V_1 variant. Low values of the attack degree following the application of the two treatment scheme guarantee that the mycelium fungus has not infiltrated the skeleton branches, being known the severity of the disease at apricot in case of a strong attack. For pathogen *Stigmina carpophilla* observations were made on the attack degree on the leaves. From the analysis results shown in table 6 is observed that the attack degree of the pathogen showed similar values in the two variants, the difference from the variants average taken as a witness is statistically ensured.

Table 5

***Monilinia laxa* – attack frequency on shoots during 2007 – 2009**

Variant	Attack frequency %	%	Diferences	Signification
V_1	3,4	121,4	0,6	-
V_2	2,2	78,6	-0,6	-
Variant average	2,8	100	-	–

DL 5% = 1,2 DL 1% = 2,5 DL 0,1% = 2,9

Table 6

***Stigmina carpophilla* – the attack degree on the leaves during 2007 – 2009**

Variant	Attack degree %	%	Diferences	Signification
V_1	2,8	116,6	0,4	-
V_2	2,0	83,3	0,4	-
Average variant	2,4	100	-	–

DL 5% = 1,5 DL 1% = 2,3 DL 0,1% = 2,8

CONCLUSIONS

1. In the apricot orchard the pathogen whose attack is met with greater frequency and intensity is *Monilinia laxa*. At this pathogen attack on fruits showed higher values than attack on shoots, regardless of the variant.

2. In the apricot crop, regardless of treatment scheme has been recorded a weak attack of the *Stigmina carpophilla* fungus, another pathogen that can cause crop losses of apricot orchards unprotected in terms of phytosanitary.

3. Based on the results, one can say that for the culture of apricot can be used successfully one of the tested variants, but noting that at the critical moments for apricots, should be used a systemic product to achieve safety.

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