

# OBSERVATIONS REGARDING THE EFFICACY OF THE SEEDOPRID 600 FS PRODUCT TO COMBAT *DIABROTICA VIRGIFERA VIRGIFERA* LE CONTE SPECIES FROM MAIZE CROPS

## OBSERVAȚII CU PRIVIRE LA EFICACITATEA PRODUSULUI SEEDOPRID 600 FS ÎN COMBATAREA SPECIEI *DIABROTICA VIRGIFERA VIRGIFERA* LE CONTE DIN CULTURILE DE PORUMB

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**Abstract.** *Experiments have been organized at INCDA Fundulea, at the Agriculture Development Research Stations Livada, Lovrin and Oradea. The efficacy of the Seedoprid 600 FS product was analysed in comparison with the Cruiser 350 FS product, for the seed treatment at a dose of 10 l/t and 18 l/t. The assesment of the efficacy was made in comparaisn with the version control, without seed treatment. This was very good at those two products, the average being 7,37 at Seedoprid 600 FS product and 7,17% at Cruiser 350 FS product. At the untreated control, the frecquency of the attack was about 23,36%, and there are significantly loss of production. There weren't recorded any phytotoxicity phenomena that affects the crops.*

**Key words:** maize, seed treatment, efficacy

**Rezumat.** *Experiențele au fost organizate în cadrul INCDA Fundulea, la Stațiunile de Cercetare și Dezvoltare Agricolă Livada, Lovrin și Oradea. Eficacitatea produsului Seedoprid 600 FS a fost analizată comparativ cu produsul Cruiser 350 FS, pentru tratament la sămânță în doze de 10 l/t, respectiv 18 l/t. Aprecierea eficacității s-a făcut și comparativ cu varianta martor, fără tratament la sămânță. Aceasta a fost foarte bună, la cele două produse, media fiind de 7,37 la produsul Seedoprid 600 FS și de 7,17 % la produsul Cruiser 350 FS. La martorul netratat, frecvența atacului a fost de 23,36 %, existând pierderi importante de producție. Nu s-au înregistrat fenomene de fitotoxicitate care să afecteze culturile.*

**Cuvinte cheie:** porumb; tratament la sămânță; eficacitate

### INTRODUCTION

At those approximately 25 species of pests economically important from Romania, it is to add, from the year 1996, *Diabrotica virgifera virgifera* Le Conte species – the western corn rootworm (Roșca, 2004).

In USA, the pest is considered as one of the most important 4 pests of maize crops. The losses caused in USA by genus are between 60 and 85 million USD/year. The cost of pesticides applied for combating larva or adults to which is added the crop losses due to the attack of the pest, is around 1000 million USD.

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The species is signaled in Romania from 1996 and on the territory of Romania in Nădlac, county Arad. So far, it has not produced obvious damages, but there are all chances that in the coming years, the pest to become one of the main factors of drastic decrease in maize yields, limited even on maize crop (Grozea, 2003).

The pest was detected in county Timiș, in 1997, when Bărbulescu (2000) there were started the adults flight tracking activities. First bent plants, features produced by the larva attack were in 1999, near Jimbolia, in Grabași, county Timiș (Rosca, 2004).

Gradually, the western corn rootworm advanced to south, center and north of the country. Thus, in 1997, this was present in the counties Arad, Timiș, Caraș-Severin and Mehedinți. In 1998, was signaled the presence of pest in others counties, such as: Bihor, Hunedoara, in Dolj in 1999, and in 2000 in Satu Mare, Sălaj, Alba, Gorj and Olt. The number of catches in yellow traps, Multigarb, Cucurbitacin and with sexual pheromone, from an average of 181 individuals in 1997 to 654,3 in 2000.

## **MATERIAL AND METHOD**

The experiments have been organized at INCDA Fundulea, at the Agriculture Development Research Stations Livada, Lovrin and Oradea. The efficacy of the the Seedoprid 600 FS product was analysed in comparasion with the Cruiser 350 FS product, for the seed treatment at a dose of 10 l/t and 18 l/t. The active substance of the Seedoprid 600 FS product is imidacloprid 600g/l, conditioning form FS, the producing company is Makhtesim Agan.

The tests were performed in 2011, when there were made a total number of 3 tests in those 3 stations. SCDA Livada, SCDA Lovrin and SCDA Oradea on a hybrid of maize, Fundulea 376. To carry out the tests, it has been organized an experiment in randomized blocks, the size of experimental parcel was about 100 m<sup>2</sup>, it was made with 2-3 days before maize seeding, which was made between April 24th – May 13rd.

The observations have been taken throughout the vegetation period, being examined the plants with symptoms of “Gooseneck” and by determining the mark on the IOWA scale (an undamaged plant – 6 plants strongly attacked). In terms of product application equipment on seeds, it was used a porzolator with a capacity of 5 kg, and the seeding has been done manually.

The climatic conditions favored the evolutions of the pest, the experiments being placed in conditions of monoculture maize, with moderate infestations, expressed by an average percent in those 3 stations of 23,36 % plants with symptoms “Gooseneck”, Oradea (28,80%), Lovrin (13,35%) and Livada (27,93) and through mark 4,33 on IOWA scale, 4,88 (Oradea), 3,35 (Lovrin) and 4,76 (Livada).

## **RESULTS AND DISCUSSIONS**

An essential role in establishing the strategy to combat the western corn rootworm has the forecast of pest occurrence, which is based on the number of adults, eggs and larva, taking into consideration both the density of the pest and climatic conditions, especially the cultivation system in the area.

It is emphasized in this sense, especially, the high capacity of extension of the pest, similar to the butterflies. Reported for the first time in Europe, in Yugoslavia at Surcin in July 1992, the pest is signaled in 1996, to more than 100

km distance, pointing in this respect that *Hyphantria cunea* species introduced in August 1940 at Budapest, came after 8 years at Subotica, at a distance of 100 km from the pointing of departure. The pest monitoring is made watching either adults or larva. For this are used different methods, yellow sticky baits, special traps, extractant plants and sexual pheromones (Rosca and Bărbulescu, 1993).

In this paper, are presented the results obtained in combating *Diabrotica virgifera virgifera* Le Conte species performed by treatment of seeds. In tables 1 and 2 are listed the results obtained from biological testing corn with the Seedoprid 600 FS product based on imidacloprid 600g/l.

Table 1 shows that the product Seedoprid 600 FS applied on a dose of 10 l/t, determined a significant reduction of larva attack of western corn rootworm on plants, expressed through the frequency of plants strongly attacked, in all those three experimental points, respectively Oradea (from 28,80 to 8,89%), Lovrin (from 13,35 to 4,06%) and Livada (from 27,93 to 9,17%). On average, this reduction of the attack, from 23,36% in untreated version to 7,37%, expressed as frequency of attacked plants, identified by characteristic symptom, „Gooseneck”, can be expressed by an efficiency of 68,46%, being similar to standard version Cruiser 350 FS (69,31%).

Table 1

**FS 600 Seedoprid efficacy in fighting *Diabrotica virgifera virgifera* Le Conte species from maize crops, expressed by the frequency of attacked plants**

Version	Dose	Frequency of attacked plants %			
		Oradea	Lovrin	Livada	Average
Seedoprid 600 FS	10 l/t	8,69	4,06	9,17	7,37
Cruiser 350 FS	18,0l/t	8,35	4,07	9,11	7,17
Untreated		28,80	13,35	27,93	23,36

Table 2 shows the efficacy analysis of Seedoprid FS 600, by recording the level of pest attack on the root, expressed by IOWA scale (in grades from 1 to 6), the maximum attack is 6. This parameter indicates a satisfactory level of potency, expressed by reducing the attack, from 4,88 to 1,87 (Oradea), from 3,35 to 1,77 (Lovrin) and 4,76 to 1,23 (Livada).

The average grade of 4,33 on the IOWA scale at the untreated version and 1,61, on the same scale, in the experimental field can be expressed by an efficiency of 63,05%, being similar to the standard Cruiser 350 FS (63,38%).

Table 2

**FS 600 Seedoprid efficacy in fighting *Diabrotica virgifera virgifera* Le Conte species from maize crops expressed by the degree of attack on the root**

Version	Dose	Degree of attack on IOWA scale 1-6			
		Oradea	Lovrin	Livada	Average
Seedoprid 600 FS	10 l/t	1,87	1,77	1,23	1,61
Cruiser 350 FS	18,0l/t	1,95	1,64	1,19	1,59
Untreated		4,88	3,35	4,76	4,33

From the data results a better potency in combating Seedoprid FS 600, *Diabrotica virgifera virgifera* Le Conte species (western corn rootworm), from corn crops, thus ensuring an adequate protection, respectively a degree of attack under 2,5 on IOWA scale, considered PED.

Summarizing the results presented in the two tables, concerned the value of 68,46%, which represents the average effective rate expressed through the frequency of strongly attacked plants, identified by characteristic symptom, „Gooseneck”, and the value of 63,05%, which is the average efficiency expressed by the attack on the root (highlighted on IOWA scale), results an overall average of 65,76% which is the effectiveness of maize seed treatment with the Seedoprid 600 FS product providing satisfactory protection on the maize crop, to the attack of *Diabrotica virgifera virgifera* Le Conte species (western corn rootworm), representing a protection solution in situations of growing corn in the first year of monoculture. This experimental results are also confirmed by the test results obtained in batch verification in production conditions. We also mention that there were't phytotoxicity phenomena to affect the crops.

## CONCLUSIONS

1. Pest *Diabrotica virgifera virgifera* Le Conte (western corn rootworm) reported in Romania in 1997 in Nădlac, county Arad is spreading quite rapidly, occupying in our country growing areas, although preventive measures are taken.

2. The experiences organized for pest control by seed treatment with FS 600 Seedoprid product have given good results compared with standard product version Cruiser 350 FS and with the untreated version.

3. Effectiveness of the seed treatment product when using Seedoprid FS 600 was good or very good, the average frequency of the attacked plants being 7,37 compared with the standard product version Cruiser 350 FS and the untreated control, of 23,36%.

4. Regarding the degree of the attack on roots (expressed by IOWA scale attack notes 1-6) had low values of 1,23 (Livada) to 1.83 (Oradea) compared with the standard product which had values of 1,19 (Livada), 1,95 (Oradea). The untreated control, took notes on the same scale, values of 3,35 in Lovrin, 4,76 in Livada stationary, 4,88 Oradea stationary.

## REFERENCES

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