THE PROTECTION OF THE RAPESEED CROP AGAINST THE ATTACK OF ATHALIA ROSAE IN THE S-E OF BOIANULUI PLAIN

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ABSTRACT

Athalia rosae, in the larval stage can compromise the crop in a very short time if no seed treatments have been performed. The prevention of the attack of this pest can be done by using the Lumiposa 625 FS insecticide seed treatment in a dose of 40 ml/500 thousand seeds, the only insecticide currently approved for rapeseed crop. From the tests carried out resulted that the product has an efficiency of 98.3%. If for various reasons the seed has not been treated with insecticide, in the vegetation when reporting larvae in the crop it can be intervened with one of the following products: Decis Mega 50EW, Proteus 110 OD, Mospilan 20SG or Fastac 10 EC whose effectiveness is basically the same ranging from 97.30% to 98.00% the only difference being the protection period which in the case of Proteus and Mospilan products is greater due to the systemicity of the product.

INTRODUCTION

In recent years, in Romania, the areas cultivated with rapeseed have been in a continuous expansion due to the fact that the obtained production is easily sold and the price of recovery ensures a consistent profit to the farmers. Due to the unfavorable climatic conditions during the sowing period, which have a decisive role in the success of the crop, the areas cultivated with this plant have decreased very much in the years 2018-2019. The only chance for rapeseed areas to grow in the future is for irrigation systems to become functional, so that there is no risk of autumn crop failure.

In the world economy, rape seed currently occupies a special place, the resulting production being used both in industry and in food (Bărbulescu et al., 2002; Bîlteanu, 2001; Buzdugan, 2006; Popov and Bărbulescu, 2007; Popov et al., 2007; Rîşnoveanu, 2010; Sin et al., 2005; Trotuş et al., 2008, 2009).

Harmful organisms can diminish the production with values between 35% to 60%, therefore great attention must be paid to respecting all technological links for the protection of rapeseed culture (Bărbulescu et al. 2001, Mustaţă, 2006; Popov, 2002; Popov, 2004 a, b; Popov et al., 2004, 2006; Raranciuc et al., 2007).

A very great practical interest has the knowledge of the harmful entomofauna, since the exact establishment of the moment when the attack takes place is very difficult due to the very small size of the insects and the attack mode hidden in the plant tissues, in the case of certain species (Trotter et al. , 2002, 2009; Trotuş, 2007).

Researches have highlighted a wide range of insects capable of causing damage since the emergence, such as crucifer flea beetle (Phyllotreta atra F.) and cabbage stem flea beetle (Psylloides chrysocephala L.) or throughout the vegetation period, of which we mention: Turnip sawfli (Athalia rosae L.), Pollen beetle (Meligetes aeneus F.), Mealy cabbage aphid (Brevicorynae brassicae L.), Rape stem weevil (Ceuthorrynchus napi Gyll.), Cabbage seed weevil

(Ceuthorrynchus assimilis), Red turnip beetle (Entomoscelis adonidis Pall.) etc. (Popov, 2004).

MATERIAL AND METHOD

The researches were carried out during the agricultural year 2018-2019, on the rapeseed culture established on the radius of Radomireşti commune, Olt county and consisted of soil surveys using the metric frame with the side of 0.5x0.5 m, during the period between the emergence and the formation of leaf rosette (6-8 leaves).

The experiment was placed on a Cernoziom cambic soil type, following the method of randomized blocks in four repetitions.

The prevention of the attack of Athalia rosae was achieved by the chemical treatment of the seed with the LUMIPOSA 625 FS insecticide in a dose of 40 ml/500 thousand seeds. After the emergence of the rapeseed crop and up to the leaf rosette phase, the following insecticides were used to protect the crop: DECIS MEGA 50 EW 0.150 l/ha, FASTAC 10 EC 0.2 l/ha, MOSPILAN 20 SG 0.15 kg/ha, PROTEUS 110 OD 0.35 l/ha.

The effectiveness of the insecticides used was determined using Abbott's formula:

$$E\% = 1 - = \frac{GA\% - Vt}{GA\% - Vm} * 100$$

- E%- effectiveness;
- GA%-Vt- the degree of attack in the case of the treated variant
- GA%-Vm- the degree of attack in the case of the control variant;

The frequency of the attack was calculated using the formula: $F\% = \frac{nx100}{N}$ where,

- n= number of attacked plants
- N= number of analysed plants
- The intensity of the attack was assessed using the 6-grade scoring scale.

Attacked area in percentage	Note of the intensity of the attack
1-3%	1
4-10%	2
11-25%	3
26-50%	4
51-75%	5
76-100%	6

The relative expression of the intensity of the attack is given by the relation: $I = \frac{\Sigma (ixf)}{n}$

- i= note or percentage of cover with attack
- f= number of cases with attack on each grade
- n= total number of attack cases

RESULTS AND DISCUSSIONS

The climate conditions of the year 2018/2019, due to the high temperatures during the September-October period and the lack of rainfall, were very favorable for the attack of the pest *Athalia rosae*.

For the prevention of the attack the seed treatment was used with Lumiposa 625 FS, in the dose of 40 ml/500 thousand seeds (table 1).

Table 1.
The degree of attack produced by the Athalia rosae species in the rapeseed culture in the autumn of 2018

O.	Variant	Dosis	F%	I%	GA%	E%
1	Untreated control group	-	64	54.31	34.75	-
2	Lumiposa 625 FS	40ml/500 thousand seeds	5	12	0.6	98.3

Following the observations and determinations made on the attack produced by Athalia rosae, an attack degree of 34.75% was recorded in the untreated variant as a control group compared with the variant treated with Lumiposa 625 FS, in the dose of 40 ml/500 thousand seeds, at which the attack degree was 0.6%.

Rapeseed wasp (Athalia rosae) recorded in the autumn of 2018 very high densities, over P.E.D. of 2 larvae/plant.

From the analysis of the values obtained regarding the frequency and intensity of the attack produced by the Athalia rosae pest in the rape crop in the autumn of 2018, it results that the variant where treatment was applied to seeds registered low values of 5% in the case of frequency and 12% for the intensity of the attack, compared to the untreated control group, where there were 64% values for the frequency and 54% for the intensity of the attack (fig. 1).

Fig. 1: Attack produced by the larvae of the Athalia rosae species in the untreated control variant (original)

As shown in the table above, the efficacy of the only insecticide approved for the rapeseed treatment against harmful entomofauna was 98.3%, which recommends that it be introduced in the pest control scheme to this crop (fig. 2).

Fig.2: Attack of larvae of the Athalia rosae species in the variant where seed was treated with the Lumiposa 625 FS product (original)

Following the identification in the rapeseed field of the larvae of Athalia rosae a vegetation treatment was carried out, in September with one of the following products: Decis Mega 50 EW; Proteus 110 OD; Mospilan 20 SG and Fastac 10 EC (table 2).

Table 2

The effectiveness of insecticides used in the control of the Athalia rosae species in rapeseed crop in autumn 2018

O.	Variant	Dosis(l/kg/ha)	F%	I%	GA%	E%
1	Untreated control group	-	60.00	54.31	32.64	0.00
2	Decis Mega 50 EW	0.15	5.00	18.25	0.91	97.30
3	Proteus 110 OD	0.30	8.15	8.32	0.67	98.00
4	Mospilan 20 SG	0.15	7.00	10.32	0.72	97.80
5	Fastac 10 EC	0.20	9.35	8.20	0.76	97.70

Although the efficiency of the tested insecticides was broadly close, ranging from 97.30% to 98.00%, the Proteus 110 OD and Mospilan 20 SG products were noted, due to the systemic component they contain, which offered a much longer period of protection in comparison with the insecticides with contact action (fig. 3).

Fig.3: Aspect from the rapeseed crop after treatment in vegetation with the Proteus 110 OD product (original)

CONCLUSIONS

Athalia rosae is one of the species that can cause significant damage to the rapeseed crop, especially in hot and dry autumns, as it is the case this year.

The most harmful stage is the larva one, when an individual consumes in 24 hours food as double its weight.

Following the emergence of the rapeseed crop in the autumn, daily monitoring is recommended, as in the cotyledon phase – 4 leaves, a crop can be completely compromised in less than 48 hours depending on the frequency of the attack.

BIBLIOGRAPHY

Bărbulescu, A., Popov, C., Mateiaş, M.C., 2002 – *Diseases and pests of field crops*. Chapter Rapeseed crop: 184-193, Ceres Publishing House, Bucharest. BEREA

Bărbulescu, Al., Mateiaş, M. C., Popov, C., Voinescu, I., Guran, Maria, Raranciuc, Steluţa, Mincu, Mihaela, Spiridon, Cristina, Stanciu, M., 1996 a –*The evolution of some diseases and pests of cereals, technical plants and fodder in the year 1995*. Problems of plant protection, XXIV, 1: 41-60

Bîlteanu, Gh., 2001 – *Phytotechny. vol 2,* Ceres Publishing House, Bucharest: 90-112

Buzdugan, L., 2006 – *Rapeseed a culture of the future.* Agricultural profit, no. 28, 29, 30

Popov, C., 2003 a – *Research on the protection of cereals, legumes for grains, technical plants and fodder for pathogens and pests, carried out in 2002.*Problems of plant protection, XXXI, 2: 7-84.

Popov, C., 2004 a – *Synoptic picture with the harmful insects from the rapeseed crops found in Romania.*Problems of plant protection XXXII, 1: 113-118.

Popov, C., Bărbulescu, A., 2007 – *50 years of scientific activity in the*

domain of field crop protection against diseases and pests. An. I.N.C.D.A. Fundulea, Jubilee volume, LXXV: 371-404.

Popov, C., Bărbulescu, A., Raranciuc, Steluţa, Mateiaş, M.C., 2007 – *Results obtained in the field of plant protection, from 1957-2007, in the research on diseases and pests of cereals, legumes for grains, technical plants and fodder.* Problems of plant protection, XXXV (1): 25-78

Popov, C., Raranciuc, Steluţa, Cană, Lidia, Vasilescu, S, Rotărescu Mihaela, Spiridon Cristina, 2006 b – *Technological sequences recommended for the prevention and control of diseases and pests, when setting up crops of corn, sunflower, rape, flax, alfalfa, soybeans, beans and field peas*. Problems of plant protection, XXXIV, 1-2: 87-96.

Rîşnoveanu, Luxiţa, 2010 – *The influence of some phytotechnical factors on the population of pests at the autumn rapeseed in the area of North-East Bărăgan*. PhD dissertation. USAMV Bucureşti

Sin, G., Picu, I., Popescu, Alexandrina, Popov, C., Moga, I., Tabără, V., Alionte, G., Chiru, S., Tianu, A., Gherman, I., Maruşca, T., Boruga, I., Nistor, D., Gheorghe, D., Canarache, A., Coşoveanu, R., Bularda, M., Petcu, G., Dorneanu, A., Negrilă, E., Popa, M., Săulescu, N. N., Verzea, M., Antohe, I., Bude, A., Ittu, G., Schitea, Maria, Stanciu, D., Haş, I., David, Ionica, 2005 – *Technological management of field crops.* Chapter Rapeseed crop: 162-168, Ceres Publishing House, Bucharest

Trotuş, Elena, Popov, C., Rîşnoveanu, Luxiţa, Stoica, V., Mureşan, Felicia, Nae, Margareta, 2009 – *Management of rapeseed crop protection against the attack of harmful insects*. An. INCDA Fundulea, LXXVII: 211-222.