

DYNAMICS OF THE APPEARANCE THE *DIABROTICA VIRGIFERA VIRGIFERA*, IN THE CORN CROPS OF NEAMȚ COUNTY, UNDER THE CONDITIONS OF 2020 IN DIFFEREND TILLAGE SYSTEM

PLESESCU (ENACHE) MARIANA, TALMACIU MIHAI, TALMACIU NELA, HEREA MONICA

Keywords: maize, adult, conventional tillage

ABSTRACT

In order to establish the optimal moment of carrying out the treatments for the control of the adults, the dynamics of the appearance for *Diabrotica virgifera virgifera* is very important step in warning of treatments and their effectiveness.

The research was carried out, in the corn cultivars from Neamt County. The biological material collected using sticky yellow traps during the year 2020 from June to September.

The experience and randomization were organized according to the mode of protection of culture and according to the treatment applied, and thus resulted in three variants as follows three variants : variant 1 - no tillage work system, variant 2, minimum tillage work system and variant 3 , conventional tillage work system. In all variants the soil have was treated with granulated FORCE G 1.5 insecticide, active ingredient 1.5%, (Syngenta) at a dose of 15 kg ha.

During the entire period of observation, a total of 5810 adult specimens of *Diabrotica virgifera virgifera* were collected, where the first alert of the adult was made on 15 June, and its last registration was on 15 September.

INTRODUCTION

Maize (*Zea mays*), also called corn, is possible to have originated in central Mexico about 7000 years ago from a wild grass, and americans people transformed maize into a better source of food. Corn is considered to be one of the world's most cultivated plants, thanks to its numerous advantages, its products being used both in human nutrition, in industry and in animal nutrition.

With a relatively long vegetation period of about 200 days, its very expose to, numerous fitofagous from various systematic groups: mites, miriapods, nematode, insects, mammals and birds find food and shelter in the corn ecosystems. But the biggest losses are caused by insects (Bărbulescu, 1979).

The most dangerous pests of corn culture, in climatic condition from our

country are: *Tanymecus dilicollis* Gyll.(maize leaf weevil), *Agriotes spp.* (Wire worms) *Ostrinia nubilalis* Hb. (European corn borer), *Diabrotica virgiiifera virgiiifera* LE Conte (Western worm of the corn roots), *Agrotis spp.*(cutworms).

Stopping the use of neonicotinoids, also favored the numerical development of polulations of *Diabrotica virgifera virgifera* and became the most dangerous pest and very difficult to control.

For the first time, the adult was reported in Moldova, in 2010, in the corn hybridization fields. During the vegetation period, the farmers sprayed with foliar insecticides, and have kept below the economic threshold of damaging this pest. At this moment, *Diabrotica virgifera virgifera*, it's the most important pest in corn crop. The losses in yield are very significant.

MATERIAL AND METHOD

The observations were performed during the vegetation period, in the year 2020, in a corn crop located in Ghigoiesti stationary, Neamt County. The pre plant being the corn, in the monoculture for three years. The presented data in the work have been collected.

Experience has consisted of three variants with six repetitions, as follows: In setting up the experience we used two hybrids of Dekalb, by Bayer, DKC3969 and DKC4670, one early and one mid-early

The planting 19.04.2019 and the length of the experience was 400 m.

Variant 1: No tillage – planting was done directly in stubble. the seeds are untreated, but the under the ground treatment, with granulated FORCE G 1.5 insecticide, active ingredient tefluthrin 1.5%, (Syngenta) at a dose of 15 kg ha, with Microgranulator, from panting machine.

Hybrid DKC 3969, 89 RM and hybrid DKC 4670, 96 RM monoculture 3 years;

During the vegetation, we apply 2 treatments with CALYPSO 480 SC, the active ingredient, thiacloprid 480g/L (Bayer) at a dose of 150 ml/ha, every application.

Variant 2: minimum tillage and Ground treatment with granulated insecticide FORCE G 1.5. The soil was worked superficially, to a depth of 15 cm, without turning the furrow.

Hybrid DKC 3969, 89 RM and hybrid DKC 4670, 96 RM. We performed with planting, ground treatment, with granulated FORCE G 1.5 insecticide, active ingredient, tefluthrin 1.5%, at a dose of 15 kg ha, with Microgranulator

RESULTS AND DISCUSSIONS

The total number of adults collected from the apparence respectively June and until the last collection of 15 September is 5810 specimens, of all three variants (Fig.1) taken into the study.

and 2 treatments during the period of Vegetation with CALYPSO 480 SC, the active substance Thiacloprid 480g/L (Bayer) at a dose of 150 ml/ha, every application.

Variant 3: conventional tillage work system. In this variant, the soil it was worked in classical system, with autunum plowing.

Hybrid DKC 3969, 89 RM and hybrid DKC 4670, 96 RM.

This variant used untreated seeds, just soil with granulated FORCE G 1.5 insecticide, active ingredient tefluthrin 1.5%, (Syngenta) at a dose of 15 kg ha, with Microgranulator, and 2 treatments during the vegetation period with CALYPSO 480 SC, the active substance Thiacloprid 480g/L (Bayer) at a dose of 150 ml/ha, every application.

The plant emergence place on 25 May because the climatic condition in the spring, very cold and dry.

For the determination of the adult emergence dynamics, have been used yellow glue traps, 6 in each variant, respectively 18 traps.

The traps were placed on 10 June, on each repetition, starting from 10 m from the edge of the experience, continuing at distances of 50 m along the length of the variant. They were collected every 2 weeks and the traps were changed once a month.

Observations and collections were made regularly, at two weeks' interval. With each observation noting:

- the date on which the determination was made,
- the number of adults in each trap;
- the repetition;
- experimental version.

The appearance of the first adults was observed in mid-June (table1), with the first data collected on 10 June. Migration from the ground has taken place since June. Between June and September it was observed that the highest average number of adults was

collected in early July (123 adults in the trap) and the lowest number of adults was recorded in September (12 adults).

The no tillage system with insecticide on the ground (table 1) compared to conventional tillage, are recorded a larger number of specimens collected (220).

The maximum number of adults, as in the case of the no tillage variant, shall be recorded at the beginning of July. We specify that the maximum number of adults found in the trap is 110, 12 adults less than the standard.

The observations made in the period from June to September, as regards the attack of larvae on corn roots, are most severe at the beginning of June. The attack of adults on leaves and the most intense inflorescence is recorded after mid-June and late July.

The damage of larvae has been the destruction of the root system by the consumption of the absorbent brushes

and then their penetration into the adventive roots.

Phenotypic, the larval attack led to plant collapse and the bending of the strains in the form of a "swan neck", the degree of attack on the untreated variant being very high (60%). The adult attack on the leaves showed through longitudinal striped holes along the ribs, followed by their yellowing. The degree of attack being 45 % on the untreated variant, compared with 20 % on the variants of the insecticide treatment.

After mid-June and during July, adults fed themselves with silk and pollen, in the untreated version, fed themselves with freshly formed grains.

From Table 3, it is noted that there are substantial differences between the conventional system in no tillage.

The conventional system has in 10 July less 55 adults in trap than no tillage variant.

CONCLUSIONS

1. The first adult alert was made on June 10th. At the first collection, 434 adults were registered in all 3 variants, 150 adults in Variant 1, 148 adults in variant 2 and 136 adults in variant 3.

2. The total number of adults collected from all 3 variants throughout the period of observation from June until September was 581.

BIBLIOGRAPHY

1. Adam Floarea, Popescu Gh., Grozea Ioana, 2008 - *Stigmatrophic activity a new pest Diabrotica virgifera virgifera Le Conte connected within a "Pioneer" maize diversity*, Lucrări științifice -Agricultură, Ed. Agroprint, Timișoara., vol 40, pag.337-342.

2. Bărbulescu Al. și colab. 1979 - *Comportarea unor hibridi de porumb față de atacul sfredelitorului (Ostrinia nubilalis Hb.). Probleme de protecția plantelor, București, nr.7.*

3. Popescu Gh., Adam Floarea, Oriol Irina, 2008– *Interacțiunea dintre componentele patosistemelor porumbului*

și factorii climatici prin analiza de tip ANOVA și corelații Bravais –Pearson, Lucrări Științifice, Ed. Agroprint, Timișoara vol.40, pag. 470-473

4. Rogojanu V., Perju T., 1979 – *Determinator pentru recunoașterea daunătorilor plantelor cultivate*. Editura Ceres, București.

5. Roșca I., 1997 – *Implicațiile prezentei speciei Diabrotica virgifera virgifera Le Conte asupra tehnologiei culturii porumbului în România*. Lucrări Științifice U.S.A.M.V. Iași, vol. 40, Seria Agronomie, pag. 551-560.

6. Săpunaru T., Mihai Tr., Tifache T., 1992 – *Comportarea hibridilor de porumb zonați în Moldova și a celor creați la S.C.A. Podu-Iloaiei la atacul sfredelitorului (Ostrinia nubilalis Hb.). Cercetări agronomice în Moldova, Iași, .vol.1, pag. 95.*

7. Săpunaru T., Georgescu T., Tălmăciu M., 1995 – *Dinamica structurii speciilor și pagubelor produse de*

principalii dăunători în culturile de porumb din Moldova (1972-1993). Cercetări Agronomice din Moldova, vol. 1-2 , pag. 103.

8. Varvara M., Andriescu I., Moglan I., 1981 - *Unele aspecte ale compoziției și structurii mezofaunei din câmpurile experimentale de porumb, Comunicări științifice , Inst. de Inv. Sup. Constanța , pag. 39 - 44.*

Table 1

The dynamics of the appearance of adult in no tillage

Data collected	Variant 1 – No tillage						total
	R1	R2	R3	R4	R5	R6	
10 June	31	28	24	20	18	29	150
20 June	83	93	72	70	73	68	459
10 July	83	123	86	112	81	81	566
30 July	80	98	71	73	110	73	505
20 August	27	45	38	46	56	33	245
20 September	12	14	23	20	23	21	133
TOTAL	316	401	314	341	361	305	2038

Table 2

The dynamics of the appearance of adult in minimum tillage

Data collected	Variant 2 – Minimum tillage						total
		R2	R3	R4	R5	R6	
10 June	27	28	36	10	18	29	148
20 June	99	89	87	78	73	68	494
10 July	103	106	86	82	81	81	539
30 July	80	78	71	73	72	73	447
20 August	34	33	43	46	34	25	215
20 September	27	11	16	16	23	18	111
TOTAL	370	345	339	305	301	294	1954

Table 3

The dynamics of the appearance of adult in conventional tillage

Data collected	Variant 3 - conventional tillage						total
	R1	R2	R3	R4	R5	R6	
10 June	17	28	24	20	18	29	136
20 June	78	88	98	70	73	68	475
10 July	83	98	86	82	81	81	511
30 July	80	78	71	73	72	73	447
20 August	27	21	56	16	21	18	159
20 September	15	16	12	17	11	19	90
TOTAL	300	329	347	278	276	228	1818

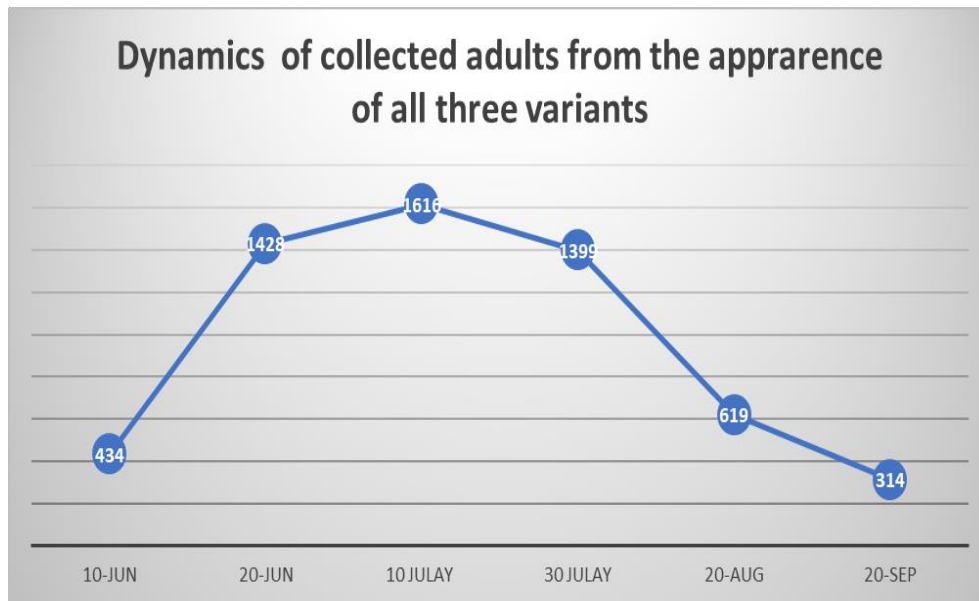


Fig. 1. Dynamics of adult appearance in the three variants



Fig. 2. Leaves attack of *Diabrotica virgifera virgifera*



Fig. 3. Silk attack