SUMMARY

Everywhere in the world, development and well-being cannot be conceived without food sources available, and corn is one of the most important (over 130 million ha). Numerous uses place this crop on the podium, along with straw cereals and rice.

This position has led to an intensification of the technologies used in obtaining maize crops, with a major impact on the environment, due to the irrational use of pesticides, chemical fertilizers and other compounds.

Research in the field of genetics in order to increase productive potential has had and have as a concern the creation of varieties with genetic resistance to pest attack (*Ostrinia, Diabrotica*, etc.).

Maize is therefore one of the field crops with a fairly large number of pests. From the data extracted from the literature (entomology, fauna, agricultural zoology, etc.), the number of pests attacking maize ecosystems belong to several systematic groups (nematodes, mites, crustaceans, myriapods, insects, rodents and birds), exceeds by much more than 100 species. According to the diet, most are polyphagous. Most of them are insects, over 60 species, and at the same time the most damaging.

Knowledge of harmful and useful entomofauna in maize agroecosystems, contributes to the support of global attitudes towards the environment for a sustainable exploitation of natural resources. The management of the control of insecticide resistance through their rational use is a continuous concern of all participants in the field (researchers, farmers, manufacturers of plan protection products, authorities, etc.).

The researches aimed to determine the structure and dinamisc of the entomofauna, its dominance, abundance and diversity as well as their behavior in different agricultural systems (conservative and intensive).

Climate change also challenges farmers to adopt measures and tillage systems that contribute to improving soil quality and soil water conservation. Conservative measures, of course, have undeniable advantages, but also contribute to the multiplication of pest populations. At the same time, conventional, intensive agriculture has a negative impact once on the development of resistance to the action of some active substances, of certain species, but also on the environment in general.

The original elements of this paper are the data that are brought from the studied region regarding: knowledge of harmful and useful fauna from maize crops, depending on tillage systems, applied cultivation technology, chemical treatments applied to control pests; the role of each useful species in keeping the pest below the economic damage threshold; dynamics of harmful species and natural predators.

PhD thesis “Research on the entomofauna of maize crops, pests encountered and their antagonists”, addresses the study of entomofauna in maize crops; harmful and

usedful species; comparative study of entomofauna in maize crops according to the precursor plant.

The paper is 199 pages long and according to the regulations in force at present, it consists of two main parts, namely: the first part entitled "The current state of knowledge" of the issue addressed at national and international level consisting of 28 pages and the second part entitled „Own research" spread over 165 pages, 120 tables and 22 figures.

The current state of knowledge includes two chapters in which are briefly presented information from the literature on the subject of the doctoral thesis and which were subsequently used to interpret and compare the data obtained in the own research and description of the natural environment of Botosani county, in this chapter being presented information regarding the geographical location, the pedoclimatic conditions and the meteorological conditions from the research period in the stationaries under study.

Part II, „Own research", consists of two chapters:

Chapter III represents the purpose and objectives of the research, the research materials and methods used. The proposed objectives were:

o Knowledge of the current state of research on harmful and useful fauna in maize crops in the northeast of the country.

o Knowledge of the literature in the field of research on useful fauna from maize crops in Romania and Neamț County.

o Identification of harmful fauna from maize crops.

o Identification of useful fauna from maize crops.

o Comparative study of useful and harmful fauna from maize crops, depending on the soil work, the precursor plant, and the treatments used.

o Calculation of ecological parameters such as: abundance (A), constancy (C), dominance (D) and ecological significance index (W).

In order to achieve the proposed objectives, several activities will be carried out, namely:

• bibliographic study of specialized literature both in the country and worldwide;

• elaboration of the work plan and realization of the experience sketch, as well as dimensioning of the experimental variants;

• billing and numbering of experimental variants;

• installation of traps in experience;

• observations made directly on the plants in the field;

• collection of biological material by different methods: using Barber-type soil traps, pheromone traps, yellow glue traps and entomological net method by tapping.

• taking samples and performing specific analyzes to quantify some indicators, such as: frequency of attack, intensity, degree of damage, etc.

• collection of captured individuals and analysis of the biological material collected by determining the species and performing the calculation of specific ecological indices of pest populations and antagonists.

• calculating the main ecological indicators: abundance (A), dominance (D), constancy (C), ecological significance index (W), etc.

Chapter IV. Results and discussions present studies on the structure, dynamics and of some ecological parameters of the entomofauna collected in the stationary studied. To carry out research on the entomofauna collected from the maize crop, Barber type soil traps were used from April to July.

The experience was organized in 3 variants:

- V1 maize in monoculture;
- V2 corn after sunflower;
- V3 corn for wheat;

Situation of entomofauna harvests collected with the help of Barber type soil traps in maize crops in the V1 variety, monoculture maize in 2018, at Ghiorghieşti stationary, Neamț county

For 2018, the samples were collected on the following dates: 29.04.2018; 17.05.2018; 29.05.2018; 13.06.2018 and 01.07.2018.

- In total, during the observation period, 1322 specimens belonging to 59 species (taxa) were collected at traps 1-6. Most specimens were collected at the first harvest 649, followed by the harvest of the second harvest, respectively 328 specimens. At harvest number three we collected 130 specimens, 121 specimens at the last harvest. The fewest specimens were harvested at the fourth harvest, namely 94.

- The highest share among them has the species Epicometis hirta with a number of 172 individuals collected, followed by *Agriotes lineatus*, with 140 individuals collected, *Dermestes laniarius* (102 specimens), *Formicomus pedestris* (105 specimens), *Tanymecus dilaticollis* (83 specimens) , but also the presence of the species *Harpalus aeneus* (37 specimens), *Pterostichus cupreus* (73 specimens), *Opatrum sabulosum* (67 specimens), Hymenopters (ants) (52 specimens), the rest of the specimens had values between 48 and 1 specimen.

Out of the total of 1322 specimens collected in this variant, 33.43%, respectively 442 specimens are represented by antagonists, which belongs to 15 species. The following share has the highest share: *Formicomus pedestris* (22.78), *Dermestes laniarius* (23.13%), *Pterostichus cupreus* (15.84) and *Harpalus distinguendus* (10.41), the rest of the species (11), had values between 6.51 and 0.65%.

These species have been calculated: Abundance (A), Constancy (C), Dominance (D) and seqnifiance ecological indicators (W).

The largest abundance (A) of the species was: *Epicometis hirta* with 172 specimens, *Agriotes lineatus* with 140 specimens collected, *Dermestes laniarius* with 102 specimens, *Formicomus pedestris* (105 specimens), *Tanymecus dilaticollis* (83 specimens), *Pterostichus* cupreus (73 specimens), *Opatrum sabulosum* (67

specimens), *Harpalus distinguendus* (48 specimens), the rest of the specimens registered values between 37 and 1 specimen.

- dominance (D) was between 0.08 and 13.01. It had the highest dominance, *Epicometis hirta* (13.01), followed by the species: *Agriotes lineatus* (10.59), *Dermestes laniarius* (7.72) *Tanymecus dilaticollis* (6.28), *Pterostichus cupreus* (5.52 *), Opatrum sabulosum* (5.07), *Harpalus distinguendus* (3.63), *Orchestes quercus* (2.65), *Psylliodes attenuata* (2.57), *Cassida nobilis* (2.42), *Harpalus calceatus* (2.27), *Hymenoptera* (ants) 2.27. The rest of the species have dominance values between 2 and 1.06, and the rest of the species have dominance values below 1;

- the constancy (C) of the collected species had values between 4.55 and 27.27. The species with the highest values were: *Agriotes lineatus, Dermestes laniarius, Epicometis hirta, Formicomus pedestris* and *Tanymecus dilaticollis* (27,27). Of the 57 species (taxa) identified, 19 recorded values of constancy below 5.

- the ecological sign index (W) had values between 0.003 and 3.548. Higher values of 1.00 were recorded for a number of 7 species, namely: *Agriotes lineatus, Epicometis hirta, Formicomus pedestris, Dermestes laniarius, Tanymecus dilaticollis, Pterostichus cupreus, Opatrum sabulosum.*

Situation of entomofauna harvests collected with the help of Barber-type soil traps in maize crops at variant V2, maize with sunflower precursor plant, in 2018, at Ghiorghieşti stationary, Neamţ county

 At the 6 traps, at the 5 harvesters 890 specimens were collected, belonging to a number of 53 species (taxa), the species with the largest number of specimens collected: *Agriotes lineatus* with 179 specimens collected. Then: *Tanymecus dilaticollis* (96 specimens), *Epicometis hirta* (68 specimens), *Pterostichus cupreus* (55 specimens), *Opatrum sabulosum* (52 specimens), the other species recorded between one and 48 specimens. speciei fata de total deexemplare number au auut speciile*: Epicometis hirta* Poda (55.66%), *Pterostichus cupreus* L (18.01%), Heteropters (*Heteroptera*) %), *Dermestes laniarius* L L. (1.28%), *Anthicus antherimus* and *Gryllus campestris* L (1.81%), *Arachnida* and *Phyllotreta vittula* (1.12%) and *Opotrum* L. Other celebrities had a percentage between 0.049% and 0.78%

 If we refer to antagonists (useful fauna) out of the total of 890 specimens collected, 25.85% is represented by it.

Thus, 230 specimens belonging to a number of 19 species were collected. The largest share had three species, *Pterostichus cupreus* (20.75%), *Harpalus distinguendus* (18.11%) and *Anthicus antherimus* (11.32%). The rest of the species (18) had values between 0.38 and 7.55%

Regarding the values of ecological indices, it results that:

- The largest abundance (A) of the species was: *Agriotes lineatus* with 179 specimens, *Tanymecus dilaticollis* (96 specimens), *Epicometis hirta* (68 specimens), Pterostichus cupreus (55 specimens), *Opatrum sabulosum* (52 specimens), they

recorded between one and 48 specimens. Out of the total number of 33 species (taxa), they had a low abundance, from one to 9 specimens.

- The constants (C) of the collected species had values between 3.33 and 20. The species with the highest values were: *Agriotes lineatus, Dermestes laniarius, Dorcadion pedestre, Harpalus distinguendu*s.

- dominance (D) of the species (taxa) recorded the following values: *Agriotes lineatus* (20,11), *Tanymecus dilaticollis* (10,79), *Epicometis hirta* (7,64), *Pterostichus cupreus* (6,18), *Opatrum sabulosum* (5 , 84), *Harpalus distinguendus* (5.39), *Cassida nobilis* (3.48), *Arahnida* (3.37), The other species had values between 2.70 and 1.00;

- The most significant ecological signs (W) had a higher value of 1.00 in a number of 5 species, namely: *Agriotes lineatus* (4,022), *Tanymecus dilaticollis* (2,157), *Epicometis hirta* (1,273), Op (1,273), *Harpalus distinguendus* (1,078). The rest of the species had values of the ecological significance index between 0.004 and 0.539

Situation of entomofaune crops harvested using Barber-type soil traps in maize crops in the V3 variant, in 2018, at Ghigoieşti stationary.

In total, 903 specimens were collected from traps 1-6 belonging to more groups of species (taxa).

The situation on the traps at the five harvested sites is as follows: In the trap one, during the vegetation period, five crops were made and 32 species (taxa) were collected with a total of 167 specimens. The most specimens were collected at the first harvest, 79 specimens, followed by the second harvest with 36 specimens. The fewest specimens were collected at harvests V1 and IV, between 9-26 specimens

- If we refer to the collected antagonists, out of the total number (903) of specimens collected in this variant, 26.14% is represented by it. Thus, 236 specimens belonging to a number of 16 species were collected. The largest share was held by two species *Dermestes laniarius* (27.66%) and *Harpalus distinguendus* (18.18%). The rest of the species (15) had a value between 0.79 and 7.11%

- Referring to the number of traps in which each species was collected, in 2018 in the V3 variant it is found that the highest percentage in terms of the number of specimens of the species is the same. speciile: *Agriotes lineatus* (16.96%), *Tanymecus dilaticollis* (9.09%), *Epicometis hirta* (8.43%), *Dermestes laniarius* (7.76%), *Harpalus distinguendus* (5.1%), *Anthicus antherinus* (4.99%), *Opatrum sabulosum* (4.55%), *Dorcadion pedestre* (2.32%), *Phyllotreta vittula* (2.99%), *Formicomus pedestris* and *Silpha obscura* (2.22%), *Pterostichus cupreus* (2%). *Coccinela 7-puncatata* (1.88%), Arahnide (1.88%), *Pseudocleonus cinereus*, *Pseudophonus rufipes* and *Tanymecus palliatus* (1.55%), *Pentodon idiota* (1.33%), *Phyllotreta ondulata* (1.11%) and *Gryllus campestris* (1%). The other species had a percentage between 0.11% and 0.89%

Situation of entomofaune crops harvested using Barber-type soil traps in maize crops in the V3 variety, in 2018, at Ghigoieşti stationary.

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- If we refer to the collected antagonists, out of the total number (903) of specimens collected in this variant, 26.14% is represented by it. Thus, 236 specimens belonging to a number of 16 species were collected. The largest share was held by two species *Dermestes laniarius* (27.66%) and *Harpalus distinguendus* (18.18%). The rest of the species (15) had a value between 0.79 and 7.11%

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Regarding the values of ecological indices, the results are as follows abundance (A) recorded the following values: *Agriotes lineatus* (153 specimens), *Tanymecu*s *dilaticollis* (82 specimens), *Epicometis hirta* (76 specimens*), Dermestes laniarius* (70 specimens), *Harpalus distinguendus* (46 specimens), *Opatrum sabulosum* (41 specimens), the other species recorded between one and 29 specimens.

- the constancy (C) of the collected species (taxa) had values between 4 and 24. The most constantial values (4) had a number of 19 species.

- dominance (D) had the highest values in the species:*Agriotes lineatus* (16,944), *Tanymecus dilaticollis* (9,081), *Epicometis hirta* (8,416), *Dermestes laniarius* (7,52), *Opatrum sabulosum* (4.54), *Dorcadion pedestre* (3,212), *Phyllotreta vittula* (2,99), *Formicomus pedestris* and *Silpha obscura* (2,215). The other species had between 1,993 and 0.11;

- The ecological sign index (W) has had values greater than 1.00 to a number of 5 species. These were: *Agriotes lineatus* (3,388), *Tanymecus dilaticollis* (2,179), *Epicometis hirta* (2,019), *Dermestes laniarius* (1,86), *Harpalus distinguendus* (1,01)

During the observation period in 2018 for the 3 variants, 97 species and taxa were collected with a total of 3155 specimens in which: 1322 specimens in V1, 890 specimens in V2, 903 specimens in V3.

Taking as a whole the 3 varieties of preceding plants, it is observed that the number of specimens collected in the case of V1 varieties, maize in monoculture, represents 42% of the total species, 28% in the case of summer and 2 variant V3, corn after autumn wheat

The largest number of specimens was recorded at the end of April, at the first harvest, when 1448 specimens were collected from all 3 wadding, and the fewest in July, at the last harvest, respectively 294 specimens.

Situation of entomofauna harvests collected with the help of Barber-type soil traps in maize crops in the V1 variety, monoculture maize in 2019, at Ghigoiești stationary, Neamț county

Harvest dates: 01.05, 21.05, 03.06, 19.06, 02.07

The situation on the 6 traps during the research is as follows: at trap number 1, a number of 358 individuals were collected during the observation period, belonging to a number of 62 species and taxa.

Most specimens were collected at the third harvest, respectively 150 specimens, and the fewest were collected at the 4th harvest, respectively 40 individuals. This is due to the field conditions and the rains that clogged the samples.

The largest share among them has the species Colembole spp, and represents 707 individuals collected, followed by *Epicometis hirta*, in number of 184 individuals collected.

- Regarding the collected antagonists, out of the total number of 2205 specimens collected for this variant in 2019, a percentage of 18.05% is represented by it. Thus, during the observation period for variant V1, a number of 398 specimens were collected, belonging to a number of 35 species. The highest share was held by the species: Arahnida (23.35%), Hymenoptera (ants) (22.94%), *Dermestes laniarius* (20.38%) and *Formicomus pedestris* (11.34%). The other species (33) recorded percentages between 0.13 and 4.86%

In this case, the value of the V1 variant of the V1 variant, from the firm framework, is as follows:

- The largest abundance (A) of the species was: Colembole (707 specimens), *Epicometis hirta* (184 specimens), Arahnide (173 specimens), Hymenoptera (ants) (170 specimens), *Opatrum sabulosum* (158 specimens), *Dermestes laniarius* (151 specimens), *Formicomus pedestris* (84 specimens), *Tanymechus dillaticolis* (82 specimens), *Gryllus campestris* (70 specimens) and *Armadilidium vulgare* (51 specimens). The other species had between 1 and 48 specimens;

- consistency (C) of the collected species had values between 3 and 20. The highest values were recorded by the species: *Agriotes lineatus*, *Anthicus humilis*, Arahnide, *Coccinella 7 punctata*, Colembole, *Corymbites latus, Dermestes*

laniarius, Diabrotera virgifera virgifera, Diptera, *Epicometis hirta, Harpalus distinguendus,* Hymenoptera (ants), *Opatrum sabulosum, Tanymechus dillaticolis* (20). The rest of the species recorded values lower than 20.

- dominance (D) had the highest values of the species: Colembole.(32,063), *Epicometis hirta* (8,345), Arahnids (7,846), Hymenoptera (ants) (7,710), *Opatrum sabulosum* (7,166), *Formicomus pedestris* (3,810), *Tanymechus dillaticolis* (3,719) and *Gryllus campestris* (3,175). The other species had between 2.31 and 0.04;

- The ecological sign index (W) has had values greater than 1.00 to a number of 6 species. These were: Colembole, Epicometis hirta, Arahnide, Hymenoptera (ants), *Opatrum sabulosum* and *Dermestes laniarius*

Structure, dynamics and abundance of entomofauna collected in 2019 from corn crops in the V2 variety, corn after sunflower.

The situation on the 6 traps is as follows: at trap number 1, a number of 270 individuals were collected during the observation period, belonging to a number of 55 species and taxa. Most specimens were collected at the last harvest, respectively 66 specimens, and the fewest were collected at the 1st harvest, respectively 45 individuals. This is due to the field conditions and the rains that clogged the samples.

Regarding antagonists (useful entomofauna), out of the total number of 1952 specimens collected for this variant in 2019, a percentage of 31.04% is represented by it.

Thus, during the observation period for variant V2, a number of 436 specimens were collected, belonging to a number of 31 species. The largest share was held by two, *Dermestes laniarius* and *Formicomus pedestris*, both with a percentage of 26.73%. The other species (29) recorded percentages between 0.17 and 2.64%

For a more in-depth analysis of the results obtained in Variant V2, in 2019, a series of ecological and more important indices were calculated, such as:

- The largest abundance (A) of the species: Colembole (371 specimens), Arahnide (234), *Tanymecus dilaticollis* (163), *Dermestes laniarius* (162 specimens), *Formicomus pedestris* (162 specimens), Hymenoptera (15)), *Agriotes lineatus* (107 specimens), *Epicometis hirta* (95 specimens), *Opatrum sabulosum* (83 specimens), *Armadillidium vulgare* (73 specimens), the remaining species between 1 and 37 specimens

- The constants (C) of the collected species had values between 3 and 20. The species with the highest values were constants: Colembole, Arahnide, *Dermestes laniarius, Agriotes lineatus*, Diptera (20), *Tanymecus dilaticollis*, Hymenoptera (ants), *Epicometis hirta*, Aphids, *Coccinella 7 punctata* (17). The most significant values (10.7 and 3) had a number of 41 species (taxa).

- Dominance (D) had the highest values of the species: Colembole (19.01), Arahnide (11.99), *Tanymecus dilaticollis*, (8.36), *Dermestes laniarius* and *Formicomus pedestris* (8.3), Hymenoptera (ants) (7.84), *Agriotes lineatus* (5.49), *Epicometis hirta* (4.86), *Opatrum sabulosum* (4.25*), Armadillidium vulgare* (3.73),

Diptera (1.90), *Diabrotica virgifera virgifera* (1.18). The other species had between 0.5 and 0.05;

- The ecological sign index (W) has had values greater than 1.00 to a number of 7 species. These were: Colembole (3.8), Arahnids (2.39), *Tanymecus dilaticollis,* (1.39), *Dermestes laniarius (*1.65), *Formicomus pedestris* (1.1), Hymenoptera (ants) (1.3), *Agriotes lineatus* (1.09).

Structure, dynamics and abundance of entomofaunei collected in 2019 from maize crops in the V3 variety, maize after wheat as a precursor plant.

The situation on the 6 traps during the observation period at variant V3, is the following: at the trap with number 1, a number of 322 individuals were collected during the observation period, which belong to a number of 38 taxa.

Most specimens were collected at the third harvest, respectively 111 specimens, and the fewest were collected at the 5th harvest, respectively 16 individuals. At the first harvest, 104 specimens were collected, and at the second and fourth, 46 and 45 specimens, respectively.

Regarding antagonists, out of the total number of 1513 specimens collected for this variant in 2019, a percentage of 16.06% is represented by it. Thus, during the observation period for variant V3, a number of 243 specimens were collected, belonging to a number of 28 species.

The highest share was held by three species, *Dermestes laniarius* with a percentage of 29.63%, *Formicomus pedestris* with a percentage of 22.22 %% and *Idiochroma dorsalis* with a percentage of 15.64. The other species (26) recorded percentages between 0.41 and 6.17%.

For a more in-depth analysis of the results obtained, a series of the most important ecological indices were calculated, such as:

- The largest abundance (A) of the species was: Arachnids (208 specimens), *Tanymecus dilaticollis* (164 specimens), Hymenoptera (Ants) (159 specimens), Colembole (148 specimens), *Armadillidium vulgare* (129 specimens) (127 specimens), *Dermestes laniarius* (72 specimens), *Agriote*s spp. (66 specimens), *Formicomus pedestris* (54 specimens), *Epicometis hirta* (51 specimens). The other species had between 1 and 42 specimens;

- Constancy (C) of the collected species had values between 3 and 20. Species with the highest values were constants: *Tanymecus dilaticollis*, Hymenoptera (Ants), *Armadillidium vulgare*, *Opatrum sabulosum* with values of constancy 20, Arahnide, Colembole, *Dermestes laniarius*, *Agriotes* spp., E*picometis hirta,* with values of constancy of 17. The rest of the species had values of constancy between 3 and 10.

- dominanţa (D) a avut valorile cele mai mari la speciile: *Epicometis hirta* (66,18), *Dermestes laniarius (*3,48), *Pterostichus cupreus* (2,85), *Harpalus distinguendus*, *Dorcadion pedestre* (1.77), *Formicomus pedestris* (1.67), *Silpha obscura* (1.62), *Anthicus antherimus* (1.33) Arahnida (1.28), *Longitarsus anchusae* şi *Phyllotreta vittula* 08), *Coccinella septempunctata* and *Opatrum sabulosum*

(0.79), Diptera (0.74), Heteroptera (0.59), Hymenoptera (viespi) and *Agriotes lineatus* (0.54). The other species had between 0.5 and 0.05;

- The ecological sign index (W) has had values greater than 1.00 to a number of 6 species. Arahnide (2.29), *Tanymecus dilaticollis* (2.17), Hymenoptera (Ants) (2.10), Colembole (1.63), *Armadillidium vulgare* (1.71), *Opatrum sabulosum* (1.68).

During the observation period from 2019 on the 3 variants, 122 species and taxa were collected with a total of 5678 specimens in which: 2205 specimens in variant V1, 1952 specimens in variant V2 and 1521 specimens in variant V3.

Considering the 3 varieties of preliminary plants as a whole, it is observed that the number of specimens collected in the case of variety V1, maize in monoculture, represents 38.83% of the total species, 34.38% in the soil and 26.79% in the case of variant V3, maize after winter wheat.

If we carefully analyze the two years of study, we can see the influence of climatic conditions on the number of specimens, so in 2018 35.72% fewer specimens were collected than the number of specimens collected in 2019 (5670 specimens). Thus, during the research period, a total of 8833 specimens were collected, belonging to a number of 164 species and taxa.

Situation of entomofaunas harvests collected by the method of soil surveys in maize crops at Ghigoiești stationary, Neamț county.

In addition to the collection by the method of Barber-type traps, when conducting research on entomofaunei in maize crops in relation to the preceding plant, we also used the collection by the method of soil surveys but also pheromone traps, in order to have an image clearer on the species and taxa of maize ecosystems in the region of Moldova.

Thus, the data collection was carried out from April to July, during two years 2018 and 2019. The collection of the collected material was done periodically, for 15-20 days in the 3 experimental variants:

- V1 maize in monoculture;
- V2 corn after sunflower;
- V3 corn for wheat;

The situation of the data collected in 2018 for variant 1, corn in monoculture, Ghigoiești stationary.

By the method of soil surveys, a total of 228 individuals (larvae and adults) were collected at the four harvests, belonging to 13 (taxa) species. The species with the largest number of specimens collected by this method was Diabrotica virgifera virgifera (larvae), with a number of 78 specimens.

- Regarding the dynamics of collections, it is found that the largest number of specimens was harvested on June 18 with 70 specimens, larvae and adults, followed by the second and fourth collection with 65 and 63 specimens, respectively.

- It is also observed that the highest percentage is held by species harmful to maize cultivation, such as *Diabrotica virgifera virgifera* (larvae) (34.21%), *Agriote*s *lineatus (*larvae) (23.68%) and *Tanymecus dillaticolis* (20.18 %).

The situation of the data collected in 2018 for the variant, corn with sunflower precursor plant, variant V2, in Ghigoiești stationary

Following the collections after the 4 harvests for variant V2, a total of 190 individuals belonging to a total number of species (taxa) were accumulated. The highest share with a total number of specimens collected is represented by Agriotes lineatus (larvae and adults) (72 specimens), with a percentage of the total individuals collected of 37.89%.

The situation of the data collected in 2018 for variant V3, corn with pre-harvested winter wheat plant, in Ghigoiești stationary.

After collecting the 4 harvests from variant number 3, a total number of 268 specimens was collected, belonging to 29 species (taxa). The largest share has *Agriotes lineatus* (larvae) (62 specimens), with a percentage of 23%.

In order to have a more detailed image, the analysis of the abundance of occurrence during the observation period in 2018 was performed.

The total number of specimens collected by the ground survey method was 679 specimens. The largest number of specimens collected was recorded in variant V3, maize with wheat precursor plant, respectively 239, and the smallest number was collected in variant V2 with sunflower as precursor plant, respectively 190. The species with the largest number of specimens collected is *Agriotes lineatus* (188 larvae and 27 adult specimens), followed by *Tanymecus dilaticollis* (115 specimens) and *Diabrotica virgifera viegifera* (78 specimens). The presence of western worm larvae is found only in variant V1, with precursor maize.

Situation of data collected by the method of soil surveys in 2019 for variant 1, maize in monoculture.

After collecting the 4 harvests from variant V1, a total of 425 individuals were added, belonging to 22 species and taxa. The most abundant species is Diabrotica virgifera virgifera, from which a total number of 167 specimens (10 adults and 157 larvae) were collected.

Situation of data collection by the method of soil surveys in 2019 for variant 2, corn after sunflower as a precursor plant.

After collecting the 4 harvesters from variant V2, corn after sunflower, a total of 245 specimens, larvae and adults belonging to a number of 16 species were collected in 2019. The most abundant species is *Agriotes lineatus* (18 adult specimens and 52 larvae).

Situation of data collection for variant V3, in 2019, maize with pre-harvested winter wheat.

Following the four harvests, during the observation period, a number of 268 specimens, larvae and adults, belonging to a number of 29 species and taxa, were

collected by the ground survey method. The largest number of individuals was recorded in the species Agriotes linetus (larvae and adults), respectively 25 adult specimens and 39 larvae.

In order to have a deeper situation, the analysis of the abundance of occurrence during the observation period in 2019. The total number of specimens collected by the method of ground surveys was 940 specimens, belonging to 48 species (taxa). The largest number of specimens collected was recorded in variant number 1, monoculture corn, respectively 425, and the smallest number was collected in variant number 2 with sunflower as a precursor plant, respectively 245; in variant V2, with a plant preceding autumn wheat, a number of 270 specimens were collected.

Following the analysis of the 2 years, the first method of soil survey was collected a number of 1617 specimens, belonging to 63 species (taxa). The highest number of specimens (429 larvae and adults) was recorded in the species *Agriotes lineatus*, followed by *Diabrotica virgifera virgifera* (245 larvae and adults) and Tanymecus dillaticolis (231 specimens).

The situation of the collections of adults of the species *Diabrotica virgifera virgifera* at the pheromone traps, in Ghigoieşti stationary, during the years 2018-2019.

In 2018, for variant V1, the situation of the collections is as follows:

- The appearance of the first adults was reported in mid-June, the first data being collected on 13 June.
- Between June and August it was observed that the highest average number of adults was collected at the beginning of July (101 adults in the trap), and the lowest number of adults was recorded in August (16 adults). At the harvest of July 12, the maximum flight was reached, and a number of 569 specimens were registered, the average of the 6 traps. The migration in the soil of the adults starts after this date, the lowest number of collected adults is registered in August, respectively 134 specimens.

In variant V2, the collection situation is as follows:

- Between June and August it was observed that the highest average number of adults was collected at the beginning of July (84 adults in the trap), and the lowest number of adults was recorded in August (3 adults).
- The total number of specimens was 1540 adult specimens, with the highest catch on 12.07.2018, respectively 467 specimens, and the lowest collection (98 specimens) was registered on 11.08.2018.
- The migration of adults in the soil begins the soup on July 12. The effectiveness of the insecticide treatment on the ground is found, compared to the standard variant, without treatment, with 17% fewer specimens compared to the standard variant, without treatment.

In variant V3, where we used the treatment of seeds with the insecticide Seedopris 600 FS, the situation of the collections is as follows: between June and August it is found that the highest average number of adults was collected at the

beginning of July (98 adults in trap), and the lowest number of adults was recorded in August (9 adults).

Following the data collected in 2018, it is found that the best results were obtained in the case of variant V3, which benefited from the treatment of the seed with insecticide (Seedoprid 600 FS), in which the lowest number of specimens was collected, respectively 1511, compared to 1918 copies in the standard version and 1540 copies in the V2 version.

In 2019, during the five harvests of the six traps in variant V1, without treatment the following is found: The appearance of the first adults was reported in mid-June, the first data being collected on June 18.

In variant V2, the data collection situation is as follows:

Between June and August, it was observed that the highest average number of adults was collected at the beginning of July (88 adults in the trap), and the lowest number of adults was recorded in August (16 adults). The total number of specimens was 1629 adult specimens, with the highest catch on 12.07.2018, respectively 506 specimens, and the lowest collection (121 specimens) was registered on 16.08.2018. The migration of adults in the soil begins the soup on July 12.

In variant V3, where we used the treatment of Seedopris 600 FS insecticide seeds, the situation of the collections is as follows: between June and August it is found that the highest average number of adults was collected at the beginning of July (98 adults in the trap) , and the lowest number of adults was recorded in August (9 adults).

The total number of specimens was 1511 adult specimens, with the highest catch on 12.07.2018, respectively 487 specimens, and the lowest collection (81 specimens) was registered on 11.08.2018. The migration of adults in the soil begins the soup on July 12. The efficiency of the seed treatment is found, compared to the standard variance. There are no significant differences between the two variants with insecticide treatment.

Following the data collected in 2019, it is found that the best results were obtained in the case of variant V2, which benefited from the treatment of the soil with the insecticide Force G, in which the lowest number of specimens was collected, respectively 1650, compared to 2008 copies in the standard version and 1676 copies in the V3 version.

Recommended treatments in agricultural practice for the control of pest species attacking in maize crops and treatments carried out in Ghigoiești during the observation period

In Romania, a series of insecticides are approved to control these pests. Lately, many of the active substances regularly lose their marketing authorizations and subsequent use. Among which we mention: Calypso 480 SC (thiacloprid 480 g / l), (at this moment the marketing authorization is withdrawn) in the dose of 0.150 l / ha, for *Diabrotica virgifera virgifera*; Decided mega 50 EW (deltamethrin 50 g / l),

at a dose of 0.250 l / ha, for *Diabrotica virgifera virgifera*; Fastac Activ (alpha-cypermethrin 50 g / l), at a dose of 0.6 l / ha, for *O. nubilalis*; FASTER 10 EC (cypermethrin 100 g / l), at a dose of 0.150 l / ha, for *D. virgifera virgifera*; FURY 10 EC (zeta-cypermethrin 10%), at a dose of 0.2 l / ha adults (1-2 treatments), for *Diabrotica virgifera virgifera*, etc.

The treatments applied to the corn culture in Ghigoiesti, during the observation period.

In 2018, the sowing work was carried out on 18.04. Along with the sowing, the treatment with Force G indecticide, the active substance tefluthrin 1.5%, was applied to the soil at a dose of 15 kg / ha. It was incorporated by means of the seed drill microgranulator.

In 2019, the sowing work was carried out on 24.04.2019. Before sowing, the insecticide was used to treat the seed with Seedoprid 600 FS, the active substance 600 g / l imidacloprid (Adama), in a dose of 10 l / T of grains.

Two weed control measures were carried out to control weeds.

The climatic conditions of 2019 favored the appearance of numerous pests and phytopathogens. In order to control and combat them, the application of chemical treatments was required.