

## SUMMARY

*Keywords: apple, harmful fauna, useful entomofauna, stationary.*

The importance of apple, stems primarily from the therapeutic value of food and fruit. Due to technological characteristics, apples are a staple food with high weight, one of the basic components of modern human diet.

Apple culture is very old, descriptions pomology and cultural practices in the writings of many approved persons meet approx. 2000 - 3000 years before Christ (Saffo, Hippocrates, Theophrastus). High ecological plasticity of this species has allowed a wide geographic dissemination of the many varieties formed or created in various parts of the world (Vavilov 1951).

The literature shows that apple trees are most important species in the world, but was attacked by a large number of diseases and pests. Percher has compiled a list that includes no more than 80 diseases that attack this species is caused by viruses, mycoplasmosis, bacteria, 64 species of insects and mites, eight species of nematodes and at least three species of rodents.

Centers of origin of *Malus* species are geographical areas between the Caucasus, Turkestan, Altai, Pamir to China and Japan. There are several species with origins in North America: Schneider *Malus fuscata*, *Malus ioensis* Brit, *Malus coronaria* Mill, *Malus angustifolia* Michx. Genetic center seems to be the most important South Asia - West (Vavilov 1951).

Cover the entire apple crop of the temperate area, between 30-60° N latitude and 30-70° S and some small subtropical areas. High ecological plasticity of this species led to the creation of varieties adapted to various areas. Thus, apple plantations are found in both Siberia and northern China, where the temperature frequently falls to - 40°C. Analyzing insect pest attack on plantations of apple, you can see a reduction of fruit that can record every year even up to 100% in untreated plantations. For the development of forecasting models, we must know the main characteristics of pests, methods of reproduction and distribution opportunities primarily knowledge about the morphological features and the biological pest.

Thesis addresses the main study of useful and damaging insect of apple orchards in eastern Romania after application of different methods of combat in research period 2008 to 2010. Research has been conducted on the areas of two counties: Iasi and Vaslui. In Iasi, the investigations were made in three stationary as follows: stationary Vasile Adamachi Iasi - treated variant, stationary Vasile Adamachi Iasi - untreated variant and stationary of Research Station - Farm Science Miroslava. In Vaslui county, research has been undertaken on stationary of SC Loturi Service SRL Delești Vaslui. This aims to make contributions to the study of harmful and useful species through collection, identification and description of them and compare some technologies to prevent and combat.

The thesis is structured in two parts, first part containing the introduction and three chapters and second part contains 4 chapters and bibliography.

Chapter I entitled "***The importance and spread of apple culture***" contains a description of the importance of apple culture, origin and the range of cultural, climatic factors and requirements for the description of varieties. Also a brief description of the situation of apple culture in the world and in Romania.

Chapter II, "***Current status of research on useful and harmful fauna of apple orchard***" contains a comprehensive description of the research conducted to date on useful and harmful fauna of apple culture.

Contains information on:

- Current status of research on useful and harmful fauna of apple orchards in Romania;
- Research with the aim to chemical control of pests;
- Research relating to combating biological, environmental or other methods than chemical;
- Research relating to environmental pollution and pesticide residues, toxicity;
- Research on the fauna of apple orchards useful;
- Current status of research on useful and harmful fauna of apple orchards in the world;
- General considerations on useful fauna;
- Predators involved in the regulation of pest density orchards;
- Parasites involved in the regulation of pest density orchards.

Chapter III, "***The main pests reported in apple orchard, dynamic appearance, damage and their control***", contains a comprehensive description of the main pests studied.

Chapter IV, entitled "***Characterization of the natural and climatic conditions of the studied area***" contains information on the geographical location of the two counties where observations took place.

Research into useful and harmful entomofauna were held in four experimental stationaries, three of the Iasi county, and one in Vaslui. The Iasi county were selected three apple orchards belonging to Farm "Vasile Adamachi" (area treated and without treatment), research and Development Station for Fruit Farm Miroslava Iasi and Farm Delești from Vaslui. Each description of the specific nature of each county containing the description of landscape, climate characterization and study of vegetation.

Chapter V, entitled "***The purpose and objectives of the thesis, research material and method***". Thesis goal is to make a significant scientific data obtained in the course researches referring to harmful and useful entomofauna some apple plantations after application of different methods of combat.

Main objectives are:

- knowledge of the current state of research on harmful fauna in the apple orchards of Moldova;
- knowledge of the current state of research on the beetle fauna of apple orchards useful in Moldova;
- Identify and main characteristics of the species belonging useful and harmful fauna of apple orchards;
- Identifying beetle species useful apple orchards;
- useful comparative study of the fauna of beetles based on technology used for pest control.

To achieve objectives, perform several activities namely:

- bibliographic study of literature in the field, both globally and in our country;
- drawing up schemes of work in the field and work surfaces each variant;
- installation of various traps in the experimental field: the soil, pheromones, color, food, etc.; observations made directly in the field;
- collection of biological material in various ways: through various traps, with entomologic net by frapaj etc.
- training material to identify useful species of insects;

- analysis of biological material collected, determining species and calculation of ecological indexes of useful fauna;
- establish specific structure, abundance, dynamics and role of insect species useful in apple orchards;
- perform calculation of the main environmental indicators: abundance (A), dominant (D), constant (C), the index of ecological significance (W), etc..
- monitoring the evolution of fauna biodiversity useful for each experimental variant;
- methods adapting current forecast and warning for plant protection of apple orchards against pests, taking into account useful beetle fauna protection;
- perform calculation of biodiversity indicators of species collected beetles.

Entomological material will be collected through several methods: soil traps type Barber, with entomologic fillet by beating method, mechanical, etc..

There will also be made numerous direct observations, the field plants. Harvesting will be done periodically, at intervals between 6 and 12 days for soil traps type Barber and beating method.

At each sampling traps biological material will be labeled, the labels including: planting, harvesting date, sample number and mode of operation of the plantation (through chemical treatments and by not using chemicals). The material thus collected will be made in the laboratory, will be properly prepared and determined later.

Analysis and interpretation of data will be obtained using environmental parameters to be calculated for each species collected important. These indices are: abundance (A), constancy (C), dominance (D), the index of ecological significance (W). Also was calculated the values of biodiversity indicators of beetle collected species.

Chapter VI, entitled "**Results and Discussion**" contains the results of observations in the two years of analysis and interpretation of data obtained. Following comments on the abundance and dynamics of stationaries under study were revealed:

- Observations on species *Cydia pomonella* L. showed a high density of the pest, which is a potential threat to apple production, taking into account the economic threshold of pest (PED) is 3 to 5 moths / trap / week;

- In terms of species *Quadraspidiotus perniciosus*, in 2008-2009, the first adults appeared on 06/09/2009 (G1), second generation on 24/07/2009 and the third on 20/09/2009 after falling

on at least 90% of leaves. In 2010, the pest had 2 generations, adults first appeared in July and the last period for reporting pest was in November;

-- During the research, the first adult *Eriosoma lanigerum* species have occurred on 30/03/2009 in the bud phenophase and their last appearance was recorded on 08/05/2009, using as a treatment warning Decis 2,5 EC = 0.05% (0.75l/ha). In 2010, the first adults emerged earlier in the bud phenophase in 4-5 days, on 19/03/2010, last report them in the apple orchard was on 23/07/2010;

- In 2009 the first adult *Anthonomus pomorum* appeared in April at the buds phenophase of buds and in 2010, the first adult emergence was earlier in March.

Also in the same period, were issued warnings for pest control and chemical treatments were applied according to warnings.

The collected entomofauna using the two methods soil traps type Barber and beating method on the four stationary, is as follows:

- in stationary Vasile Adamachi Iasi – untreated, by collecting insects with soil traps type Barber and beating method we totaled 438 copies, 181 copies were determined as belonging to useful entomofauna, and 257 were determined belonging to harmful entomofauna;

- in stationary Vasile Adamachi Iasi - treated by collecting insects with soil traps type Barber and beating method we totaled the number of 220 copies, of which 120 copies were determined as belonging to useful insects, and 100 were determined belonging to harmful entomofauna;

- in Miroslava Iasi stationary were collecting insects with soil traps type Barber and beating method we totaled the number of 306 copies, 169 copies were determined as belonging to useful insects, and 137 were determined as belonging to harmful entomofauna;

- in Delesti Vaslui stationary by collecting insects with soil traps type Barber and beating method we totaled the number of 670 copies, of which 537 copies were determined as belonging to useful entomofauna, and 133 were determined as belonging to harmful entomofauna.

Chapter VII entitled "**Conclusions and recommendations**" contains the main conclusions and recommendations that were deduced from the previous chapter.

The thesis also contains "**References**" and **Appendix 1** - List of published papers.