Abstract

of doctoral thesis entitled:

"RESEARCH REGARDING THE BIOLOGY, ECOLOGY, EPIDEMIOLOGY, PREVENTION AND CONTROL OF *BOTRYOTINIA FUCKELIANA* (DE BARY) WHETZEL PATHOGEN IN THE VINEYARDS FROM CENTRAL ZONE OF MOLDAVIA"

realized by eng. PhDs. Ionuț Drobotă

With climate change taking place on Earth, at biocenoses level its produced some changes that may increase the degree of virulence of certain pathogens. This phenomenon could be observed also on the pathogen *Botryotinia fukeliana* (for Bary) Whetzel, which produces gray mold of the vine. The disease has taken a special scale in recent years causing significant damage in vineyards, which may exceed 50% of the crop.

One of the measures that can be taken to slow the appearance of resistant rase of the pathogens to chemicals used to combat it, could be the application of substances with harmful effect on antagonists, thus prompting a reduction in natural infection.

In the doctoral thesis is an attempt to continue so far investigations in this direction, with the final goal, the establishment of methods as economic and ecological prevention and control of the pathogen *Botryotinia fukeliana* (for Bary) Whetzel.

The PhD thesis is structured on 7 chapters, covers 231 pages, 71tables and 98 figures.

In the first part of the thesis, it was made a summary of the results obtained in the country and the world regarding the theme of the doctoral thesis.

In the second part are presented the own research results made during the doctoral work, being included chapters that make reference to the characterization of natural and climatic conditions during the study, research setting goals, and material and methods of research. Here is found and most extensive chapter of the thesis, entitled "Results and discussion", the latter

accounting for a number of 95 pages containing 55 tables and 57 figures. To these are added 15 pages containing 208 bibliographic titles.

The objectives of the conducted research generated activities in the laboratory and field.

The laboratory research followed aspects concerning biology, ecology and epidemiology, and also issues concerning biological and chemical combating of *Botryotinia fuckeliana* fungus.

Field research was conducted with the main objective the behavior verification of varieties and hybrids of *Vitis vinifera* L. attack against *Botryotinia fuckeliana* fungus and optimize the treatment applied against this fungus.

With regard to biology, ecology and epidemiology of the fungus, were conducted research with the observation aim and signalize made changes, issues that have been studied less in recent years, both internally and externally.

Thus, trying to identify the main types of nutritional medium favorable for growth and development of germs *Botryotinia fuckeliana*, realizing also a classification of these ones according to favorability. Also tried to identify the fungus requirements to the physiological and biochemical factors, being tested the main carbon sources, nitrogen and mineral elements of preferred by the fungus, in the process of growth and the optimal relationship between them.

Have been studied issues concerning the modification of quality parameters of the unfermented wine, as a result of the presence of grape gray mold and also the dynamic evolution of the main mycoses in the vine in Moldova.

Also during the conduct research have been reported on the vine two micromycetes belonging to the genera *Rhizopus* and *Rhizoctonia*, that vine is mentioned as a new host.

Deepen the knowledge about the requirements of the fungus against the various factors and verification of any changes made in time, was an objective that had to be achieved for the final goal.

Another issue concerns the results achieved in biological and chemical combating of the fungus.

Testing reaction to the antagonism was made between the cultures of *Fusarium, Penicillium,* and *Trichothecium,* isolated from the plantation and pure culture of *Botrytis.* Isolation and maintenance of tested species was done on Czapek medium and maintaining the culture of *Botrytis cinerea* was done on Czapek and corn medium. Of the three fungi isolated, tested on their antagonistic, significant results were recorded at *Penicillium corylophilum* and *Trichothecium roseum.*

With regard to chemical combating have been tested substances, aiming to effectiveness and economic efficiency of them.

The substances were tested both in laboratory conditions and in the field, with the aim of identifying those substance corresponding to the set objectives, which may contribute to regulating the biocenotic balance.

In testing substances „*in vitro*" the concentrations of substances were those recommended for use in the field, the substances being tested included in the nutritive medium after the *"method including the substance in the nutritive medium (poisoned food)"* **(Baicu T. 1968).** The used medium was a very favorable one for the fungus development , namely the PDA.

Develop a system of integrated combat of pests and diseases of the vines, are critical to avoiding side effects that occur as a result of the using to much products that influencing the fermentation, fungicide systemic resistance, increased attack from pests and pathogens.

In the case of gray mold, produced by fungus *Botryotinia fuckeliana,* was the emergence of resistant breeds to treatment with benzimidazols, breeds that have proven to be very virulent even compared to varieties with greater resistance as *Cabernet Sauvignon.*

At that time researchers in the working group OILB to integrated combat have solved this problem by using products with high efficiency based on vinclozolin (Ronilan) and glicofen (Rovral) (**Baicu T., Săvescu A., 1986).**

At present, to combat the pathogen *Botryotinia fuckeliana* is used most frequently a scheme composed of 3 treatments with fungicides. Typically treatments are applied according to the criterion of variety in phenology, the following points: to the joggle of flowers, at compacting grapes and at the entrance in ripe of the grapes.

In the experiments carried out in the field were tested scheme 3 new treatments, from the basic layout with 3 treatments and gradually eliminating one treatment every phenology time.

The fungicide choice was made taking into account a number of issues such as: the action of fungicide (systemic action or contact), the efficacy of fungicide shown in testing "*in vitro*", and also the cost of fungicide.

In the experiments, have been tested a number of 4 fungicides such as: Teldor 500 SC, Topsin 70 PU, Carbendazim 500 SC and Dithane M45.

Each experience has included a number of 80 logs. They were grouped in 4 variants (V1, V2, V3, V4), in 4 rehearsals (R1, R2, R3, R4).

Each variation was represented by 5 logs, and 20 logs on variation for each experience.

Economic efficiency of the products tested was calculated by the gravimetric method, correlated with the degree of attack produced by fungus *Botryotinia fuckeliana* and quality of grapes harvested from the experience.

Following analysis obtained yields and the degree of attack in the 4 experiences can be concluded that the most effective of the tested fungicides are Teldor 500 SC and Carbendazim

500 SC. Of these fungicides Teldor 500 SC presented the highest efficiency, however, the difference of about 3 percent against fungicide carbendazim500 SC, does not justify the high price of fungicide Teldor 500 SC, in the year 2007.

Taking into account all this, we consider that in the conditions in the agricultural year 2006-2007 the highest economic efficiency in combating the gray mold showed the fungicide Carbendazim 500 SC.

Following analysis of data on the attack level registered in the experimental variants in the crop year 2007 - 2008, it was found that the biggest effectiveness occurred in variant 3 in which have been used the fungicides Dithane M45, Carbendazim 500 SC and Teldor 500 SC.

Regarding the highest economic efficiency, it has been registered in variant 4, which were used the fungicides Topsin 70 PU, Dithane M45 and Carbendazim 500 SC.

By correlating the yields obtained with the attack level registered in the 2007-2008 crop year, the experimental variants, it can be concluded that the V4 is the version in what the production growth was high, and the attack level was small.

As regards the opportunity to carry out a 3 treatments against vine gray mold, in the 3 phenologic established moments, it was found that it primarily depends upon the climatic conditions of the area occupied by the vine. Thus, in the crop year 2006 - 2007, which was very dry, with rain in the last part of the vegetation of the vine, the application of first 2 phytosanitary treatments against gray mold, was not justified.

Analyzing the obtained yields and the degree of attack registered during the 2 experimental years, it highlights the importance of applying the treatment 3 (through increased production correlated with a low level in the degree of attack).

As a result of these experiences can be concluded that all the 3 moments for the implementation of treatments against gray mold are important, but in a situation where we have advanced means of forecasting the weather conditions may be applied only 2 treatments with anti gray mold phyto sanitary products.

In the last part of this chapter has proceeded to statistical analysis by calculating the differences limit (DL), observing that the data are provided in the statistical point of view during the 2 years of then trial.

The last aspect of this chapter follow to analyze the economic efficiency of the vine, and review the major technical and economic indicators in the variety Fetească regală.