THE TESTING OF EFFECTIVENESS AND ECONOMICAL EFFICIENCY OF SOME FUNGICIDES APPLIED TO VINES AGAINST *BOTRYOTINIA FUCKELIANA* (DE BARY) WHETZEL FUNGUS, IN S.D.E. "V. ADAMACHI" IAŞI CONDITIONS

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Against grape vine gray mold has been elaborated different control plans. Most researchers discovered that the treatments had the highest efficiency when it is applied in the next phenological moments: to the flower shake-up; to the grape compaction and to the grape greenness stadium.

To accomplish the experiences contained in this paper, we attend to the phenological phases of Feteasca regală genus, following the optimization of the treatments plan, applied against grape vine gray mold.

In the paper are presented 3 new treatments plan, starting with the basic plan which included 3 treatments and continued with a cyclic elimination of treatments in every phenological moment.

Experiences were achieved in 2007-2008 agricultural year, in the experiments were tested a number of 4 fungicides with different active substance and method of action.

The main objectives were determining the effectiveness and efficiency of fungicides tested, and checks the opportunity of application phytosanitary treatments against gray mold disease of Vine, in the 3 phenology set points.

Effectiveness and economic efficiency of fungicides was calculated taking into account the cost of plant protection products, the level of yields obtained (determined by gravimetric method), correlated with the degree of attack produced by the fungus Botryotinia fuckeliana (by Bary) Whetzel.

To determine the opportunity of application the 3 treatments against gray mold of vine, in the 3 phenology set points, it was made a comparative analysis of influence factors from the variants and also between the 4 experiments.

Analyzing the yields obtained it was found significant differences between the 4 experiments and between the variants.

Regarding the degree of attack recorded in the 4 experiments it was found that in the conditions of agricultural year 2007-2008 there were no notable differences.

***Key words**: testing, effectiveness, fungicides Botryotinia fuckeliana*

MATERIAL AND METHOD

The experiences established in 2008 were bifactorial type, being placed using "aleatory blocks" methods. The followed factors were: the moment when the treatments were applied and the fungicides used. Every experience contained 80 vines grouped in 4 variants (V1, V2, V3, V4), each of them with 4 repetitions (R1, R2, R3, R4).

In the experiences it had been used 4 fungicides: Teldor 500 SC (A1), Topsin 70 PU (A2), Dithane M-45 (A3), and Carbendazim 500 SC (A4). The fungicides were used successively in the experiences so that all fungicides could be applied in every variant and phenological moment.

Inside of the 4 repetition from first experience, at the first moment T_1 (*when the flower shake-up*), the fungicides were used in this way: A_1 fungicide was applied in V_1 variant, A_2 in V_4, A_3 in V_3 and A_4 in V_2.

The second moment T_2 (*to the grape compaction*), A_1 fungicide was applied in V_2 variant, A_2 in V_1, A_3 in V_4 and A_4 in V_3.

The third moment T_3 (to *the grape greenness stadium*), A1 in V3, A2 in V2, A3 in V1 and A4 in V4.

RESULTS AND DISCUSSIONS

From the 4 used fungicides in the experiences the most expensive was Teldor 500 SC product and the cheapest was Dithane M_{45} product.

References prices of the tested products were the products presented by Alcedo firm in **Technical and financial offer for phyto-sanitary products, fertilizers and seeds – 2007.**

Table 1

The cost and quantity of fungicides used in experiences in 2007 year

The fungicide	The price (lei/1l)	The quantity used at one treatment	The total quantity used - kg./l	Total cost of the treatments in the 4 experiences (lei)	The price (lei / ha)
A_1-Teldor 500 SC	191	0,02	0,18	34,38	191
A_2-Topsin 70 PU	50	0,024	0,22	10,80	60
A_3-Dithane M-45	19	0,04	0,36	6,84	38
A_4-Carbendazim 500 SC	43	0,03	0,27	11,61	64,5

Forward we will calculate the economically efficiency of the tested products using burden method, correlated with the attack level produced by *Botryotinia fuckeliana* fungus.

Following the comparative analysis of data regarding the yields obtained in the 4 experiments, and also the variants within them:

- from the 4 experiments, the growth of production was higher in 4 experience, achieving a growth of production of a witness to 45.07%;

- the variationts that have achieved the largest production increases were V2 (21.88%) and V4 (18.27% growth of production from witness).

The basic schemes with fungicides applied against gray mold in variants 2 and 4, were shown in *Table 2*.

Table 2

Increases of production analyzed on experiences and variants in the agricultural year 2007 - 2008

	V1	V2	V3	V4	Increases of production / experiences
Exp.1	93,75	129,33	112,98	108,65	111,18
Exp.2 (without T3)	102,40	137,50	95,19	116,83	112,98
Exp.3 (without T2)	104,81	76,44	98,56	83,17	90,75
Exp.4 (without T1)	148,56	144,23	123,08	164,42	145,07
Increases of production / variants	112,38	121,88	107,45	118,27	

Table 3

The basic schemes with fungicides applied against gray mold in variants 2 and 4

	V2	V4
T1	Carbendazim	Topsin
T2	Teldor	Dithane
T3	Topsin	Carbendazim

Analyzing the effectiveness and economic efficiency of fungicides, depending on the yields obtained in the treatment used schemes, in terms of agricultural year 2007 - 2008, the greatest efficacy was observed in variant 2 where it have been used the fungicides Carbendazim, Teldor and Topsin.

In terms of economic efficiency the highest, it was in variant 4, where it was used the fungicides Topsin, Dithane and Carbendazim.

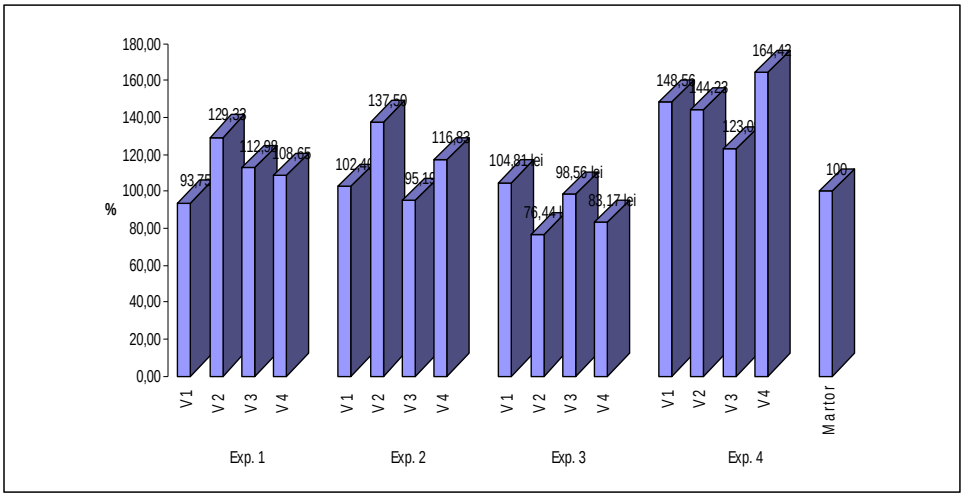

Figure 1 **The yields obtained in experimental variants (%)**

To check out the opportunity of carrying out 3 treatments against gray mold of vine, in the 3 phenology determined times, it was analyzed the attack level registered in the 4 experiments in which successively removed one treatment.

It was found that in conditions of the agricultural year 2007-2008 there were no significant differences regarding the attack level recorded in the 4 experiments. Somewhat surprisingly, the experience 1 in which the treatment were made in all the 3 phenology set points, the attack was slightly higher compared to other 3 experiments. This can be explained by the presence of weeds which were many into location of this experience, weeds that have maintained a moist microclimate, favorable to the development of the pathogen *Botryotinia fuckeliana*.

Table 4

The attack level recorded in experiments and variants in agricultural year 2007 - 2008

	V1	V2	V3	V4	AL%/ experiences
Exp.1	8,66	3,5	4,83	3,92	5,23
Exp.2 (without T3)	5,55	5,35	4,47	4,07	4,86
Exp.3 (without T2)	4,78	5,07	2,13	3,94	3,98
Exp.4 (without T1)	6,33	5,88	2,47	2,18	4,22
AL%/variants	6,33	4,95	3,48	3,53	

Analyzing the attack level recorded on the variants was found that it was the lowest in variants 3 and 4 in all 4 experiments. In these variants the basic schemes that were applied the fungicides were presented in *table 5*.

Table 5

The basic schemes with fungicides applied against gray mold in variants 3 and 4

	V3	V4
T1	Dithane	Topsin
T2	Carbendazim	Dithane
T3	Teldor	Carbendazim

After analyzing the data regarding the attack level registered in the experimental variants in conditions of the agricultural year 2007 - 2008, it was found that the greatest efficacy was observed in variant 3 where have been used the fungicides Dithane, Carbendazim and Teldor.

In terms of economic efficiency the highest, it was in variant 4, were it was used the fungicides Topsin, Dithane and Carbendazim.

Making a correlation between the yields obtained with the attack level registered in agricultural year 2007-2008, the experimental variants, it can be concluded that the V4 is the one where the production growth was high and the attack level was lower.

Regarding the opportunity to carry out a 3 treatments against gray mold of Vine, in the 3 phenology set points, it was found that it depends primarily on climatic conditions of the area under vines.

Analyzing the production obtained and the attack level registered in the experimental field, shows the importance of applying treatment 3 (the increase of production obtained, correlated with a low attack level).

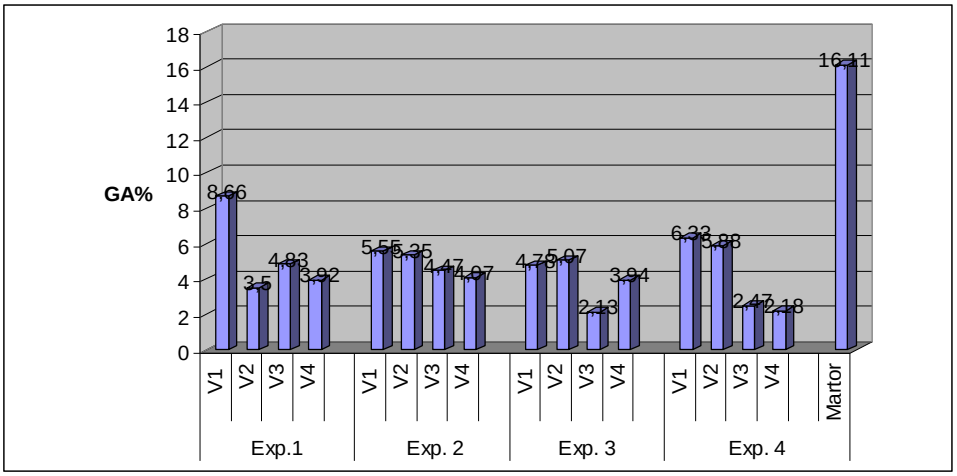

Figure 2 **The atack level registered in the experimental variants (%)**

CONCLUSIONS

Taking into account all factors involved in conducting experiments can be detach the following conclusions:

Analyzing the effectiveness and efficiency of economic fungicides, depending on the yields obtained in the treatment schemes used, in terms of agricultural year 2007 - 2008, the greatest efficacy was observed in variant 2 in which have been used the fungicides Carbendazim, Teldor and Topsin.

In terms of economic efficiency the highest, it was in variant 4, were it was used the fungicides Topsin, Dithane and Carbendazim.

After analyzing the data regarding the attack level from the experimental variants in the agricultural year 2007 - 2008, it was found that the greatest efficacy was observed in variant 3 where have been used the fungicides Dithane, Carbendazim and Teldor.

In terms of economic efficiency the highest, it was in variant 4, were it was used the fungicides Topsin, Dithane and Carbendazim.

As a result of these experiences it can be concluded that all 3 points of application of treatments against gray mold are important, noting that in the situation where we have efficient means of forecasting weather conditions may be applied only 2 treatments with plant protection products.

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