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THE OVERSEE OF MYCOTICAL ROTS AND CHEMICAL INFLUENCE ON THEIR ATTACK ON SUNFLOWER

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Abstract

The attack of some pathogens which produce mycotical rots in sunflower can have special effects on production, especially when they occur in favorable phase of vegetation and in conditions which ensure the expression of specific pathogens involved. The pathogens affecting sunflower crop, producing mycotical rots in different vegetation phases, are:

- in the phase of germination- rising: Plasmopara helianthi, pathogen responsible for of sunflower manna, Sclerotinia sclerotiorum- fungus which produce sunflower white rot, Botrytis cinerea – pathogen agent which causes sunflower's grey mold;

- in phases of vegetation starting with 2-4 leaves until can produce mycotical rots at harvest: Sclerotinia sclerotiorum- leaves white rot, mild-stalks rot and head rot; Diaporthe helianthi- brown spot and breaking strain; Phoma macdonaldi- black spot; Alternaria helianthi- leaf blight; Botrytis cinerea - head gray rot.

To eliminate production losses caused by pathogens that produce mycotical rots in the vegetation phases presented, it is imperative to combine essential links of the integrated protection with positive consequences of obtaining a superior harvest both qualitatively and quantitatively.

The intervention of some elements of integrated protection, in assurance of sunflower crops from the attack of pathogens which are producing mycotical rots at seeds and in vegetation, is dependent on the parasite biology, his way of live with host plant, burden of infectious, on the resistance of biological material, climate conditions. According to the mentioned, some technological links can interfere in reducing the attack.

MATERIAL AND METHODS

The studies had followed determining effectiveness of chemical intervention using some active principles in preventing and combating some sunflower specific pathogens.

Chemical intervention is used in stopping the attack of pathogens responsible for mycotical rots like: *Sclerotinia sclerotiorum, Botrytis cinerea, Plasmopara helianthi* and *Diaporthe helianthi,* which in favorable conditions may compromise the crops.

Experiences were made at ICDPP Bucharest, Mycology Laboratory and arranged by randomized blocks scheme. For the experience regarding efficiency of the seed treatments against manna, a sunflower static field and Favorit hybrid had been used.

The experience regarding *Sclerotinia sclerotiorum* and *Botrytis cinerea's* attack consisted in the testing of the effectiveness of administering some products at seeds and in vegetation, recognized as antibotritics. F-206 hybrid had been used.

The infection was done by incubation of the mycelium on the autoclave oat seed. For protecting the sunflower against *Phomopsis helianthi* systemic fungicides and products which contain in their composition systemic and contact substances had been used. The biological material used was the hybrid Florom 328. Products were applied in recommended doses and concentrations and after sunflower treatment's intervention scheme.

For every variant the frequency was noted and the efficacy of treatment was calculated.

The dates obtained were compared with the witness (untreated variant) and were analyzed from a statistical viewpoint.

RESULTS AND DISCUSSION

The research regarding testing chemicals applied on sunflower seed against manna attack (*Plasmopara helianthi*) at primary infection, showed a high frequency of the attack at witness, with a value F= 30.1%. Products based on active principles with specific action and products combined with another substance had been tested (table 1).

The data from Table 1 show that the product based on metalaxil, conditioned as pasta had reduced attack frequency at 1.8% comparing with untreated variant with F= 30.1%. Metalaxil in powder form (Apron 35 SD) decreased the frequency of the attack at 2.1%. A similar reduction was recorded at imazalil (Magnate 50 ECNA) with F= 2.1%. Between product based on oxadixil, the product Ostenal C75 PTS, 4 kg/t had been nodded, with a severe reduction of the frequency until 0.3%.

A higher value of the attack frequency, comparing with other variants, was registered at Ostenal MT (oxadixil 28%+metiltiofanat 47%) with F = 2.9%.

Calculating the effectiveness of the treatment, the dates for the table show the correlation between attack frequency and effectiveness of the substances. The most effective products were those with a low frequency. Ostenal C 75 PTS showed the higher effectiveness, E= 98%.

Statistically analyzing, the data regarding manna attack frequency, it had been seen that at all variants, was significantly negative, which means that attack value was very reduce comparing with the witness.

Table1

Effectiveness of some fungicides used in sunflower seeds treatment against *Plasmopara helianthi* attack

Name	Active substance	Dose (kg(l)/t)	Attack frequency (%)	Signif.	Effectiveness (%)
Apron 35 SD	metalaxil 35 %	4.0	2.1	000	93.0
Apron XL 350 SD	metalaxil M 350 g/l	3.0	1.8	000	94.0
Galben 35 SD	benalaxil 35 %	4.0	2.2	000	92.6
Magnate 50ECNA	imazalil 500 g/l	2.0	2.1	000	93.0
Apron FI 225 FS	metalaxil 175 g/l+fenpiclonil 50 g/l	10.0	2.3	000	92.3
Galben Super SD	benalaxil 37%+mancozeb 23%	5.0	2.5	000	91.6
Ostenal MT	oxadixil 28%+metiltiofanat 47%	4.0	2.9	000	90.3
Ostenal C75 PTS	oxadixil 25%+ carbenadazim 75%	4.0	0.3	000	99.0
Witness	-	-	30.1	-	-

DL 5% = 0.101325; DL 1% = 0.152162; DL 0.1% = 0.242375

In Table 2 are listed the data regarding *Sclerotinia slerotiorum* and *Botrytis cinerea* attack on sunflower seed.

The attack frequency in the witness was 36.1%, value considered high. The frequency of the attack in the treated variants had values between 2.8 at procimidon 2 l/t (Sumilex 50 FL) and 5.2 % at metiltiofanat (Metoben 70 PU). Low values comparing with witness were calculated at variants: carbendazim (Derosal 50 WP) with F = 3.6%, procimidon (Sumilex 50WP) with F= 3.5%, carbendazim with F = 3.6%., Rovral TS with a frequency of 3%. The highest value of the frequency were recorded at metiltiofanat 2 kg/t (F=5.2 %), benalaxil +mancozeb with F = 5.1%, metiltiofanat +tiuram 2.5 kg/t with F = 4.9%. Due to the calculus on the efficacy of treatment, the highest value were observed at Sumilex 50 FI with E = 92.3%. In variants Derosal, Rovra TS, Sumilex 50 WP effectiveness was 90%. The lower value of effectiveness was recorded as Galben Super SD with E = 86.1%.

Table 2

Effectiveness of some fungicides used in sunflower seed treatment against *Sclerotinia sclerotiorum* and *Botrytis cinerea* attack

Name	Active substance	Dose (kg(l)/t)	Attack frequency (%)	Signif.	Effectiveness (%)
Sumilex 50 WP	procimidon 50%	1.0	3.5	000	90.3
Sumilex 50 FI	procimidon 50%	2.0	2.8	000	92.3
Tiramet 60 PTS	metiltiofanat 20%+tiuram 40%	2.5	4.9	000	86.4
Benlate 50 WP	benomil 50%	2.0	4.4	000	87.8
Galben Super SD	benalaxil 37%+mancozeb 23%	5.0	5.1	000	85.6
Ostenal MT	oxadixil 28%+ metiltiofanat 47%	4.0	4.9	000	86.4
Rovral TS	iprodion 35%+ carbendazim17.5%	2.0	3.0	000	91.7
Bavistin 50 WP	carbendazim 50%	2.0	4.4	000	87.8
Metoben 70 PU	metiltiofanat 70%	2.0	5.2	000	85.6
Ronilan 50WP	vinclozonil 50%	2.0	4.8	000	86.7
Derosal 50 WP	carbendazim 50%	2.0	3.6	000	90.0
Witness	-	-	36.1	-	-

DL 5% =0.1999583; DL 1% =0.356325; DL 0.1% =0.492816

Against the attack of *Sclerotinia sclerotiorum* and *Botrytis cinerea* the influence of some substance applied in vegetation was followed. Products based on procimidon, carbendazim, iprodion, vinclozonil, fusilazol, fenpromimorf (Table 3).

The attack frequency value at mycotical rots produced by *Sclerotinia sclerotiorum* and *Botrytis cinerea* at witness was 41.8%. At tested products a low value of attack frequency in comparing with untreated variant was recorded at Konker SC with F = 3.6%, followed by iprodion cu F= 3.9% and procimidon 50WP with F = 4 %. The highest value of attack frequency was observed at Corbel EC 1 l/ha with F = 6%.

Due to the attack frequency results, the highest effectiveness value were obtained at Konker SC 1.25 l/ha with E = 92.9% and Rovral 50WP 1 kg/ha with E = 90.6%.

Table 3

Influence of fungicide used in vegetation over *Sclerotinia sclerotiorum* and *Botrytis cinerea* at sunflower

Name	Active substance	Dose (kg(l)/t)	Attack frequency (%)	Signif.	Effectiveness (%)
Sumilex 50 WP	procimidon 50%	1.0	4.0	000	90.4
Sumilex 50 FI	procimidon 50%	2.0	4.5	000	89.2
Ronilan 50WP	vinclozonil 50%	1.0	5.0	000	88.0
Rovral 50WP	Iprodion 35%	1.0	3.9	000	90.6
Bavistin 50 DF	carbendazim 50%	1.0	4.3	000	87.3
Bavistin FI	carbendazim 50%	1.5	5.0	000	88.0
Sportack 45 EC	procloraz 450 g/l	1.0	6.0	000	85.6
Corbel EC	fenpropimorf 750 g/l	1.0	4.3	000	89.7
Alert	fusilazol 125g/l+ carbendazim 250g/l	0.4	5.2	000	87.6
Calidan SC	iprodion 17.5% + carbendazim 8.75%	0.6	5.3	000	87.3
Konker SC	vinclozolin 250g/l+ carbendazim 165g/l	1.25	3.6	000	91.4
Alto Combi 420	ciproconazol 120g/l+ carbendazim 300g/l	0.5	5.0	000	88.0
Witness	-	-	41.8	-	-

DL 5% =0.265153; DL 1% =0.478461; DL 0.1% = 0.591615

Table 4

Influence of fungicide used in vegetation on the attack of *Diaporthe helianthi*

Name	Active substance	Dose Kg(l)/t	Attack frequency (%)	Signif.	Effectiveness (%)
Bavistin FL	carbendazim 50%	1.5	2.4	000	96.1
Baycore 300 EC	bitertanol 300g/l	2.0	3.4	000	94.0
Benlate 50 WP	benomil 50%	1.5	3.5	000	93.8
Corbel SC	fenpropimorf 750 g/l	0.4	8.0	000	85.8
Impact 125 SC	flutriafol 125 g/l	1.5	3.4	000	94.0
Mirage 45 EC	procloraz 45%	1.0	3.5	000	93.8
Punch 40 EC	fusilazol 40%	0.4	3.0	000	94.7
Trimidal 9 EC	nuarimol 90 g/l	1.5	3.1	000	94.5
Trifmine 30 WP	trifumizol 30%	1.0	3.5	000	93.8
Alto Combi 420	ciproconazol 120 g/l+carbendazim 300g	0.5	3.0	000	94.7
Konker SC	vinclozonil 250 g/l + carbendazim 165 g/l	1.25	3.2	000	94.3
Ronilan 50 WP+ Bavistin 75	vinclozolin 250 g/l+ carbendazim 75	0.5+ 0.75	2.5	000	95.6
Witness	-	-	56.7	-	-

DL 5% = 0.169461; DL 1% = 0.272358; DL 0.1% = 0.401615

The data from Table 4 render the effectiveness of some fungicides on the *Diaporthe helianthi* attack. Monitoring the influence of various substances on the attack frequency of brown steam canker was establish that, comparing with untreated variant which had a frequency of 56.7%, at treated variants the attack

decreased at carbendazim 50% (Bavistin 1.5 l/ha) and Rovral 50WP+ Bavistin 75 0.5 +0.75 kg/ha) reaching 2.4% and F = 2.5%. At those variants has been also determined the highest value of effectiveness, over 95%. A lower influence over the attack frequency was obtained by fenpropimorf (Corbel EC 0.4 l/ha), F = 8% and the effectiveness was E = 85.8%. In other variants the value of attack frequency was close, between 3 and 4.5%.

CONCLUSIONS

1. For pathogens that are transmitting through the soil, the attack is influenced by the inoculums, the compliance of agrophytotehnical measure and by the preventive treatment applied at seed.
2. Seed treatment against the infection produced by *Plasmopara helianthi* has severely reduced the attack frequency. The product based on metalaxil and oxadixil plus carbendazim had the highest effectiveness.
3. The attack produced by *Sclerotinia sclerotiorum* and *Botrytis cinerea* at sunflower seed was decreased by treating the seeds with products based on procimidon (E = 92.3%) and the complex iprodion and carbendazim (E = 91.7%).
4. The presence of fungus like *Botrytis cinerea* and *Sclerotinia sclerotiorum* in vegetation can be controlled if we apply products based on viniclozolin and carbendazim (effectiveness 91.4% - Konker SC-1.25 l/ha), procimidon (effectiveness 90.4% - Sumilex 50 WP - 1 l/ha).
5. The most effective products used to control *Diaporthe helianthi* were Bavistin FL- 1.5 l/ha with effectiveness 96.1% and the combination Ronilan 50WP + Bavistin 75 0.5+0.75 kg/ha with effectiveness 95.6% and Konker SC- 1.25 kg/ha with E= 94.3%.
6. Konker can be recommended in vegetation for controlling the fungus which are producing mycotical rots in sunflower.

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