THE BEHAVIOR OF A SUNFLOWER ASSORTMENT AT THE ATTACK OF THE MAIN PATHOGENS UNDER THE CONDITIONS FROM DIDACTIC STATION OF U.S.A.M.V.B. TIMIŞOARA

COMPORTAMENTUL UNUI SORTIMENT DE HIBRIZI DE FLOAREA SOARELUI LA ATACUL PRINCIPALILOR AGENȚI PATOGENI ÎN CONDIȚIILE DE LA STAȚIUNEA DIDACTICA A U.S.A.M.V.B. TIMIŞOARA

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Abstract: *In the present paper are presented results for the year 2007 concerning behavior of an assortment of 24 sunflower lines from Monsanto on pathogen attack, in natural conditions at Didactic Station of Banat's University Of Agricultural Sciences And Veterinary Medicine Timişoara.*

Rezumat: *În prezenta lucrare sunt redate rezultatele din anul 2007 ale evaluării comportamentului unui lot de 24 de linii de floarea soarelui de proveniență Monsanto la atacul agenților patogeni, în condiții de infecție naturală, la Stațiunea Didactică a Universității de Ştiințe Agricole şi Medicină Veterinară a Banatului Timişoara.*

Key words**:** *sunflower, pathogens, natural conditions*
Cuvinte cheie: *floarea soarelui, agenți patogeni, condiții naturale*

INTRODUCTION

Taking in consideration the necessity of enlargement of the hybrid assortment in Romania, the main producers of sunflower hybrid are conducting a large number of tests with their lines and hybrids in our country. One of the Monsanto trials with sunflower lines, between 2006 and 2007, was placed at Didactic Station of Banat's University Of Agricultural Sciences And Veterinary Medicine Timişoara. The purpose of the trials was to see which sunflower line is the most adapted to the environment and to technology conditions (1, 2, 3, 4).

MATERIAL AND METHOD

The trial was organized after the single factor with three repeats model where the experimental factor was the 28 Monsanto lines. The name ROPE is a generic name given by Monsanto just to ensure an impartial evaluation. During the vegetation period we observed the behavior of the biologic material at the pathogens attack. For this purpose we take notes of the frequency and intensity of attack. Afterwards there was done the statistic interpretation of the field results. The witness for statistic report was the experimental average.

In the year 2007 the environment conditions was favorable for pathogens attack in the second part of the vegetation period. This situation is due to the rains which concentrate in heavy rains all over the vegetation interval. If we take in consideration the data for the amount of water from the rain it looks like we have almost a normal year but the amount of water came from short but heavy rains which are not good for both, plants and soil. Regarding to temperatures from the year 2007 there was an alternation between short and heavy rains with long periods of time with extreme heat. Also, the winter was very favorable to the pathogens because of the absence of frost days. If we look at figure 1, from the start of the year, between January and April, the average of temperatures exceed with 3 degrees Celsius the multi annual averages. During the period between May and August there were a lot of days with

temperatures over 40 °C.

All the sunflower technology steps was respected and coordinated with the weather conditions.

Over the vegetation period there was made a diseases motoring and a succession of evaluations of attack frequency and intensity of this diseases. All we can say about these evaluations is that they pop out the conclusion that there were two groups of diseases:

- one group which affect just a few plants, so this diseases was present in the field but their attack was under the treatment threshold and from this group was pathogens as *Phomopsis helianthi and Sclerotinia sclerotiorum*;

- the second group was a group of pathogens which take advantage of the plants weather stress and have a massive apparition, in this group was *Phoma macdonaldi* and *Alternaria sp.*

In this paper, the experimental results for the second group of pathogens *Phoma macdonaldi* and *Alternaria sp.* will be presented.

Statistics was calculated after the method for one experimental factor. Witness for the statistic interpretation of the results was the experimental average for both fungi.

RESULTS AND DISCUSSIONS

The pathogen bonitation target from the sunflower experimental field was to point out that the dynamics in the year 2006 the main pathogens was *Alternaria sp.* and *Phoma macdonaldi.*

Table 1.

Frequency and intensity of attack for *Phoma macdonaldi* fungus on sunflower trial

Nr crt	Lines	*Phoma macdonaldi* – frequency %						*Phoma macdonaldi* – intensity %					
		R1	R2	R3	Average	Dif.	Signif	R1	R2	R3	Average	Dif.	Signif
1	ROPE-1	65	60	60	61.6	4.1	-	5	5	5	5	-1	-
2	ROPE-2	60	60	55	58.3	0.8	-	5	5	10	6.6	0.6	-
3	ROPE-3	65	50	60	58.3	0.8	-	10	1	5	5.3	-0.7	-
4	ROPE-4	65	65	60	63.3	5,8	-	15	5	5	8.3	2.3	-
5	ROPE-5	60	65	70	65	7.5	-	5	5	15	6.6	0.6	-
6	ROPE-6	40	50	50	46.7	-10.8	00	5	5	5	5	-1	-
7	ROPE-7	50	55	50	51.6	-5.9	-	1	5	5	3.6	-2.4	-
8	ROPE-8	60	55	60	58.3	0.8	-	5	1	5	3.6	-2.4	-
9	ROPE-9	70	65	60	61.6	4.8	-	15	5	10	10	4	-
10	ROPE-10	70	65	65	66.6	9.1	*	15	5	10	10	4	-
11	ROPE-11	70	70	60	63.3	5.8	-	15	10	10	11.6	5.6	*
12	ROPE-12	70	60	55	61.6	4.1	-	15	5	5	8.3	2.3	-
13	ROPE-13	50	45	50	48.3	-9.2	0	5	1	5	3.6	-2.4	-
14	ROPE-14	70	60	65	65	7.5	-	15	10	5	10	3.4	-
15	ROPE-15	55	50	40	48.3	-9.2	0	5	5	1	3.6	-2.4	-
16	ROPE-16	40	50	40	43.3	-14.2	000	1	5	1	2.3	-3.7	-
17	ROPE-17	55	60	60	58.3	0.8	-	5	5	5	5	-1	-
18	ROPE-18	50	50	45	48.3	-9.2	0	5	5	1	3.6	-2.4	-
19	ROPE-19	40	45	45	43.3	-14.2	000	1	1	1	1	-5	-
20	ROPE-20	70	70	60	66.6	9.1	*	15	10	5	13.3	7.3	* *
21	ROPE-21	60	65	70	65	7.5	-	5	5	10	6.6	0.6	-
22	ROPE-22	65	55	60	60	2.5	-	5	5	5	5	-1	-
23	ROPE-23	60	65	70	65	7.5	-	5	5	5	5	-1	-
24	ROPE-24	60	60	65	61.6	4.1	-	5	5	5	5	-1	-
25	ROPE-25	50	40	45	45	-12.5	00	1	1	5	2.3	-3.7	-
Average		58.8	57	56.8	57.5	Wt.	-	7.4	4.8	5.8	6	Wt.	-
		DL 5 % = 7.8; DL 1 % = 10.5; DL 0,1 % = 13.7						DL 5 % = 5.2; DL 1 % = 7.0; DL 0,1 % = 9.1					

In table 1 there are the results for attack frequency and intensity for fungus *Phoma macdonaldi*. As it became from the table the averages for attack frequency have a general variation between 43.3 % for the line ROPE-16 and 66.6 % for the lines ROPE – 10 and ROPE – 20. The attack intensity has values situated between 1% at the line ROPE – 19 and 13.3 % at line ROPE – 20.

Statistic analysis points out that the most sensitive line was ROPE 20 because this line has a value significant of attack frequency and a distinctly significant value for the attack intensity. After the values of attack frequency, the most resistant lines at fungus *Phoma macdonaldi* attack was ROPE – 19 and ROPE – 16, because their values registered a very significant negative difference comparing with witness.

In table 2 are results concerning *Alternaria sp.* frequency and intensity of attack. As it can be seen in this table, the attack intensity value was below the experimental average threshold and there is no significance on this value. The highest values of attack intensity was at lines ROPE – 10, ROPE – 11, ROPE – 19, ROPE – 20, ROPE – 23 and ROPE – 25 with an average of 8.3 %. The lowest attack intensity values was at lines ROPE – 1, ROPE – 3, ROPE – 5, ROPE – 9, ROPE – 12, and ROPE – 15.

The frequency of attack for fungus *Alternaria sp.* on sunflower points the line ROPE – 1 with the highest value, 21.6 % and a very significant statistic difference on experimental witness. With significant differences on attack frequency was registered lines ROPE – 12, ROPE – 13 and ROPE – 15. The most tolerant line on *Alternaria sp.* attack was ROPE – 8 with a significant negative difference on witness for fungus attack frequency.

Table 2.

Frequency and intensity of attack for *Alternaria sp* fungus on sunflower

Nr crt	Lines	*Alternaria sp* – frequency %						*Alternaria sp.* – intensity %					
		R1	R2	R3	Average	Dif.	Signif	R1	R2	R3	Average	Dif.	Signif
1	ROPE-1	20	25	20	21.6	10.4	* * *	5	1	5	3.7	-2.2	-
2	ROPE-2	15	10	15	13.3	2.1	-	5	3	10	6	0.1	-
3	ROPE-3	10	10	5	8.3	-2.9	-	5	5	1	3.7	-2.2	-
4	ROPE-4	15	10	10	11.6	0.4	-	10	5	5	6.7	0.8	-
5	ROPE-5	10	5	10	8.3	-2.9	-	5	1	5	3.7	-2.2	-
6	ROPE-6	5	5	5	5	0.4	-	7	5	1	4.3	-1.6	-
7	ROPE-7	15	10	10	11.6	-2.9	-	5	8	5	6	0.1	-
8	ROPE-8	10	15	5	10	-6.2	0	5	5	10	6.7	0.8	-
9	ROPE-9	10	10	5	8.3	0.4	-	1	5	5	3.7	-2.2	-
10	ROPE-10	20	15	15	16.6	-1.2	-	15	5	5	8.3	2.4	-
11	ROPE-11	15	20	15	16.6	-2.9	-	5	10	10	8.3	2.4	-
12	ROPE-12	15	15	10	13.3	5.4	*	1	5	5	3.7	-2.2	-
13	ROPE-13	20	20	10	16.6	5.4	*	5	10	10	8	2.1	-
14	ROPE-14	15	20	10	15	2.1	-	5	5	10	6.6	0.7	-
15	ROPE-15	5	10	5	6.6	5.4	*	1	5	5	3.7	-2.1	-
16	ROPE-16	5	10	10	8.3	3.8	-	1	10	5	5.3	-0.6	-
17	ROPE-17	10	5	5	6.6	-4.6	-	1	5	5	4.6	-1.3	-
18	ROPE-18	5	10	5	6.6	-2.9	-	1	5	5	4.6	-1.3	-
19	ROPE-19	15	10	10	11.6	-4.6	-	5	10	10	8.3	2.4	-
20	ROPE-20	20	15	15	16.6	-4.6	-	10	5	10	8.3	2.4	-
21	ROPE-21	15	5	10	10	0.4	-	5	5	5	5	-0.9	-
22	ROPE-22	10	10	5	8.3	5.4	*	5	10	5	6.6	0.7	-
23	ROPE-23	10	15	5	10	-1.2	-	5	10	10	8.3	2.4	-
24	ROPE-24	15	10	10	11.6	-2.9	-	5	5	10	6.6	0.7	-
25	ROPE-25	10	15	10	11.6	-1.2	-	5	10	10	8.3	2.4	-
Average		12.6	11.6	9.4	11.2	Wt.	-	4.9	5	7.8	5.9	Wt.	-
		DL 5 % = 4.9 DL 1 % = 6.6 DL 0,1 % = 8.6						DL 5 % = 2.7 DL 1 % = 3.2 DL 0,1 % = 4.3					

CONCLUSIONS

Experimental results and statistic interpretation point out the following conclusions:

1. For the fungus *Phoma macdonaldi* attack, the best behavior and we appreciate as the most tolerant line was ROPE – 16 and ROPE – 19 because they have the lowest values of attack frequency with a very significant negative difference on witness, and also the same lines have one of the lowest values of attack intensity.

2. Fungus *Alternaria sp.* was present in all experimental trials, and the best behaviour on this fungus attack was at line ROPE – 8 which registered a significant negative difference of attack frequency on witness.

LITERATURE

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