ON THE BEHAVIOR OF A SUNFLOWER ASSORTMENT TO THE ATTACK BY MAIN PATHOGENS UNDER THE CONDITIONS OF THE DIDACTIC STATION OF THE USAMVB 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 2006 concerning the behaviour of an assortment of 25 sunflower hybrids from Monsanto to pathogen attack, in the natural conditions of the Didactic Station of the Banat's University of Agricultural Sciences and Veterinary Medicine in Timişoara.*

***Rezumat:** În prezenta lucrare sunt redate rezultatele din anul 2006 a evaluării comportamentului unui lot de 25 de hibrizi 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 on their hybrids. One of the Monsanto trials in the year 2006 was done at Didactic Station of Banat's University Of Agricultural Sciences And Veterinary Medicine Timişoara to see which are the most adapted to the environment and 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 26 Monsanto hybrids. The name ROPE is a generic name given by Monsanto just to ensure an impartial evaluation. During the vegetation period we observed the behaviour 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.

The environment conditions in the year 2006 was favourable for pathogens attack, data of this conditions are in the table 1.

RESULTS AND DISCUSSIONS

The pathogen bonitation from the trial was point out that in the year 2006 the main pathogens were *Alternaria sp*. and *Phoma macdonaldi*. In table 2 are results concerning *Alternaria sp.* frequency and intensity of attack.

Table 1

Climatic data from April – September 2006 period

Month / Specification	April	May	June	July	August	September
Average temperature (°C)	12.4	16.2	19.5	23.6	20.1	17.3
Rain total (mm)	78.0	50.2	87.8	50.4	98.0	52.0

Table 2

Frequency and intensity of attack for Alternaria sp. fungus on sunflower trial

No	Hybrid	Alternaria sp. – frequency %						Alternaria sp. – intensity %					
		R1	R1	R3	Average	Dif.	Signif	R1	R1	R3	Average	Dif.	Signif
1	ROPE-1	15	8.3	5	9.43	-4.5	-	2	1	1	1.33	-2.96	00
2	ROPE-2	15	8.3	5	9.43	-4.5	-	3	1	2	2	-2.29	00
3	ROPE-3	15	13.3	15	14.43	0.5	-	4	7	3	4.66	0.37	-
4	ROPE-4	10	8.3	5	7.76	0.5	-	5	6	5	5.33	1.04	-
5	ROPE-5	10	8.3	10	9.43	-4.5	-	1	1	1	1	-3.29	000
6	ROPE-6	10	11.6	15	12.20	0.5	-	5	9	9	7.66	3.37	xxx
7	ROPE-7	5	8.3	10	7.76	0.5	-	8	7	9	8	3.71	xxx
8	ROPE-8	5	5	5	5.00	-4.5	-	1	2	1	1.33	-2.96	00
9	ROPE-9	5	8.3	10	7.76	0.5	-	5	6	8	6.33	2.04	x
10	ROPE-10	10	6.6	5	7.20	-4.5	-	3	3	1	2.33	-1.96	0
11	ROPE-11	10	20	35	21.66	5.5	-	8	8	8	8	3.71	xxx
12	ROPE-12	10	11.6	15	12.20	0.5	-	5	7	4	5.33	1.04	-
13	ROPE-13	5	6.6	10	7.2	-4.5	-	1	3	1	1.66	-2.63	00
14	ROPE-14	10	11.6	15	12.20	0.5	-	7	5	5	5.66	1.37	-
15	ROPE-15	10	11.6	15	12.20	0.5	-	8	5	7	6.66	2.37	x
16	ROPE-16	5	5	5	5.00	-4.5	-	2	2	4	2.66	-1.63	-
17	ROPE-17	20	16.6	15	17.2	5.5	-	8	9	6	7.66	3.37	xxx
18	ROPE-18	10	8.3	10	9.43	-4.5	-	1	2	2	1.66	-2.63	00
19	ROPE-19	10	10	10	10	0.5	-	6	7	7	6.66	2.37	x
20	ROPE-20	5	5	5	5.00	-4.5	-	2	1	1	1.33	-2.96	000
21	ROPE-21	5	5	5	5.00	-4.5	-	3	3	4	3.33	-0.96	-
22	ROPE-22	5	5	5	5.00	-4.5	-	1	1	1	1	-3.29	000
23	ROPE-23	10	8.3	5	7.76	0.5	-	7	6	7	6.66	2.37	x
24	ROPE-24	15	10	5	10.00	0.5	-	8	6	6	6.66	2.37	x
25	ROPE-25	10	6.6	5	7.20	-4.5	-	1	3	3	2.33	-1.96	0
26	Average	9.3	6.1	6.3	7.31	Wt.	-	4.2	4.4	4.2	4.29	Wt.	-
		DL 5%=5.9	DL 1%= 7.9	DL 0.1%=10.4				DL 5%= 1.8	DL 1%= 2.4	DL 0.1%= 3.1			

The frequency of attack point out average amplitude between 5-21.66 %. Statistic results show that the attack frequency have average values under the significance limit. Anyway, the highest differences reported to experimental average, with a value of 5,5 %, was at hybrid ROPE 11 and the lowest difference, with a value of – 4,5 was at hybrids ROPE 1, ROPE 2, ROPE 5, ROPE 8, ROPE 10, ROPE 13, ROPE 16, ROPE 20, ROPE 21, ROPE 22 and ROPE 25. This results point out that in despise of the attack, a large number of the hybrids remain at a lower attack frequency.

In order to have a better image of the hybrids behaviour at Alternaria sp attack, the statistic results for intensity of attack have a higher variation than frequency of attack. And because the intensity of attack give us the idea of the damage done by any pathogen, we can appreciate after this results that the most resistant hybrids at *Alternaria sp.* was ROPE 5 and ROPE 20 and ROPE 22 which registered a very significant negative difference on witness. Also we have to show that the most sensible hybrids at the pathogen was , ROPE 6, ROPE 7, ROPE 11 and ROPE 17 because they registered a very significant difference on witness.

The second pathogen present in the experimental field, *Phoma macdonaldi,* is one of the endemic pathogens of sunflower from this region. The frequency results point out that the attack is not so strong but all the hybrids where infected. Also it can be observed that the differences of the attack frequency averages are much closed for the majority of the hybrids, table 3.

The statistic interpretation point out that the higher difference was at ROPE 6 with a distinct significant difference on the witness. The lowest difference was registered at ROPE 10 with a significant difference on the witness.

Intensity of attack had approximately the same trend as attack frequency. Statistic interpretation point out a maximal lose of crop due *Phoma macdonaldi* attack, was at hybrid ROPE 6, with a very significant difference on the witness. The lowest difference was registered at ROPE 6 with a significant difference on the witness.

CONCLUSIONS

Experimental results and statistic interpretation point out the following conclusions:

1. Fungus *Alternaria sp.* was present in all experimental trials, and the best behaviour on this fungus attack was at hybrids ROPE 5 and ROPE 20 and ROPE 22 which registered a very significant negative difference of attack intensity on witness.
2. For the fungus *Phoma macdonaldi* attack, the best behaviour measured in the attack intensity was at hybrid ROPE 6, the same hybrid obtained the lowest difference on witness of the attack frequency.

Table 3.

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

No	Hybrid	*Phoma macdonaldi* – frequency %						*Phoma macdonaldi*. – intensity %					
		R1	R1	R3	Average	Dif.	Signif	R1	R1	R3	Average	Dif.	Signif
1	ROPE-1	40	15	20	25	-0.5	-	15	5	5	8.33	1.01	-
2	ROPE-2	20	10	10	13.3	-12.2	-	5	5	1	3.66	-3.66	-
3	ROPE-3	65	40	35	46.6	21.1	x	20	10	10	13.33	6.01	x
4	ROPE-4	5	5	5	5.00	-20.5	-	1	1	1	1.00	-6.32	0
5	ROPE-5	50	30	30	36.6	11.1	-	15	10	10	11.66	4.34	-
6	ROPE-6	60	50	45	51.6	26.1	xx	20	15	15	16.66	9.34	xxx
7	ROPE-7	10	10	15	11.6	-13.8	-	1	1	5	2.33	-4.99	-
8	ROPE-8	15	10	10	11.6	-13.8	-	5	1	1	2.33	-4.99	-
9	ROPE-9	10	15	10	11.6	-13.8	-	1	5	1	2.33	-4.99	-
10	ROPE-10	5	10	5	6.6	-18.8	0	1	1	1	1.00	-6.32	x
11	ROPE-11	25	60	30	38.3	12.8	-	10	15	10	11.66	4.34	-
12	ROPE-12	40	35	40	38.3	12.8	-	15	10	10	11.66	4.34	-
13	ROPE-13	15	15	15	15.0	-10.5	-	5	5	1	3.66	-3.66	-
14	ROPE-14	20	50	25	31.6	6.13	-	5	10	10	8.33	1.01	-
15	ROPE-15	40	55	40	45.0	19.4	x	5	15	10	10.00	2.68	-
16	ROPE-16	30	30	35	31.6	6.1	-	10	10	10	10.00	2.68	-
17	ROPE-17	50	10	20	26.6	1.1	-	15	5	10	10.00	2.68	-
18	ROPE-18	30	15	20	21.6	-3.8	-	10	5	5	6.66	-0.66	-
19	ROPE-19	35	25	35	31.6	6.13	-	10	5	5	6.66	-0.66	-
20	ROPE-20	15	5	15	11.6	-13.8	-	5	1	5	3.66	-3.66	-
21	ROPE-21	45	10	15	23.3	-2.2	-	15	5	5	8.33	1.01	-
22	ROPE-22	30	10	15	18.3	-7.2	-	10	1	5	5.33	-1.99	-
23	ROPE-23	25	20	30	25.0	-0.5	-	15	5	10	10.00	2.68	-
24	ROPE-24	45	15	20	26.6	1.1	-	15	5	10	10.00	2.68	-
25	ROPE-25	50	20	30	33.3	7.8	-	15	10	10	11.66	4.34	-
26	Average	31	22.8	22.8	25.5	Wt.	-	9.38	6.19	6.38	7.32	Wt.	-

DL 5%=16.01 DL 1%= 21.35 DL 0.1%=27.81 DL 5%= 5.0 DL 1%= 6.7 DL 0.1%= 8.7

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