

BEHAVIOR OF SOME SOYBEAN BREEDS AT THE ATTACK OF DOWNY MILDEW ON PERONOSPORA MANSHURICA UNDER PEDOCLIMATIC CONDITIONS OF SAG, TIMIS COUNTY

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Abstract: Soybean culture, among viruses and bacteriosis is affected as well by damaging fungi like *Peronospora manshurica*, who is the main issue of this paper. The study of the behaviour of some soybean breeds at infestation with downy mildew *Pseudoperonospora manshurica* (Naumov) Syd.In Gaum. was conducted in two experimental years at agricultural farm Agro Iachim SRL. The experience was placed in randomised blocks with 4 variants each three repetitions. The variant surfaces were 25 sqm each. The studied soybean breeds were Triumf (control variant), Danubian, Atlas and Columna. Along vegetation period sometreatments with the product Ridomil Glod MZ 68 WG were made. In order to prevent the pathogens *Alternaria* sp., *Botrytis* sp. And *Sclerotinia* sp., before blossom stage treatments with Calidan (iprodion 175 g/l + carbendazim 87,5 g/l) were applied. The observation were made beginning with BBCH stadium 60, at 20 days intervals analysing 10 plants, 10 leaves per plant and three leaflets per leaf. The frequency and the attack intensity were analysed and statistically evaluated. A good control degree was obtained by breed Columna which exerted an intensity attack level of 11% as well the breed Triumf where the attack intensity was 50% related to mean of experience.

Key words: soybean, pathogen, *Peronospora manshurica*, attack intensity, control

INTRODUCTION

Soybeans are an important global crop, providing oil and protein. In the United States, the bulk of the crop is solvent-extracted with hexane, and the "toasted" defatted soymeal (50% protein) then makes possible the raising of farm animals (e.g. chicken, hog, turkey) on an industrial scale never before seen in human history. A very small proportion of the crop is consumed directly by humans. Soybean products do, however, appear in a large variety of processed foods.)

The fungus *Peronospora manshurica* affects cultural and wild-growing soya, causing reduction of assimilating surface of leaves, resulting in yield decrease by 40% and reduction of oil contents to 1.07%; seed germination decreases by 30%, and weight of seeds is reduced by 5-50%. Control measures are maintenance of crop rotation, autumn plowing, early terms of sowing, destruction of wild-growing soya, seed dressing, and treatments of plants during vegetation, and use of resistant varieties.

MATERIAL AND METHODS

The study of the behaviour of some soybean breeds at infestation with downy mildew *Pseudoperonospora manshurica* (Naumov) Syd.In Gaum. was conducted in two experimental years at agricultural farm Agro Iachim SRL. The experience was placed in randomised blocks with 4 variants each three repetitions. The variant surfaces were 25 sqm each. The studied soybean breeds were Triumf (control variant), Danubian, Atlas and Columna. Along vegetation

period some treatments with the product Ridomil Glod MZ 68 WG were made. In order to prevent the pathogens *Alternaria* sp., *Botrytis* sp. And *Sclerotinia* sp., before blossom stage treatments with Calidan (iprodion 175 g/l + carbendazim 87,5 g/l) were applied. The observation were made beginning with BBCH stadium 60, at 20 days intervals analysing 10 plants, 10 leaves per plant and three leaflets per leaf. The frequency and the attack intensity were analysed and statistically evaluated.

RESULTS AND DISCUSSIONS

The observations in year 2007 were made beginning with the BBCH stadium 60, at 20 days intervals, first notation at 26.06.2007. The results are presented in table 1, 2 an 3 and figure 1,2,3 as follow.

Table 1

The attack intensity of *Peronospora manshurica* at 26.06.2007, related to mean of experience

Variant	Repetition I	Repetition II	Repetition III	Mean	Relativ. Diff.	Dif. abs.	Sign. dif.
Medi exp.	1.87	1.55	1.20	1.54	100.00	0.00	-
Triumf V1	0.97	0.49	0.54	0.67	43.29	0.87	-
Danubian V2	4.81	4.33	3.58	4.24	275.32	-2.70	00
Atlas V3	1.49	1.30	0.64	1.14	74.24	0.40	-
Columna V4	0.22	0.08	0.07	0.12	8.01	1.42	-
DL5% = 1.82		DL1% = 2.66		DL0.1% = 3.99			

Table 2

The attack intensity of *Peronospora manshurica* at 20.07.2007, related to mean of experience

Variant	Repetition I	Repetition II	Repetition III	Mean	Relativ. Diff.	Dif. abs.	Sign. dif.
Medi exp.	6.89	6.18	5.34	6.14	100.00	0.00	-
Triumf V1	1.85	1.80	1.94	1.86	30.36	4.27	+++
Danubian V2	8.48	7.25	5.94	7.22	117.71	-1.09	-
Atlas V3	14.76	13.51	11.99	13.42	218.69	-7.28	000
Columna V4	2.48	2.07	1.52	2.02	32.97	4.11	+++
DL5% = 1.28		DL1% = 1.87		DL0.1% = 2.80			

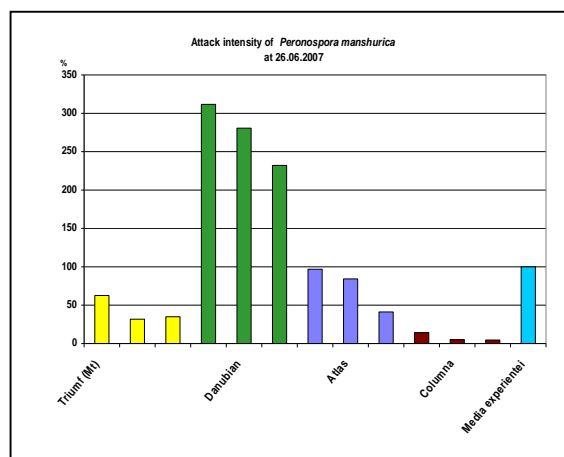


Figure 1: The attack intensity of *Peronospora manshurica* at 26.06.2007, (first bonitation)

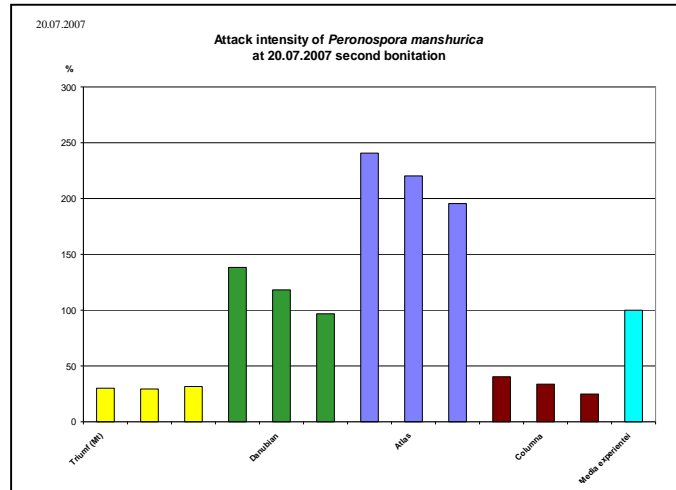


Figure 2: The attack intensity of *Peronospora manshurica* at 20.07.2007, (second bonitation)

Table 3

The attack intensity of *Peronospora manshurica* at 18.08.2007, related to mean of experience

Variant	Repetition I	Repetition II	Repetition III	Mean	Relativ. Diff.	Dif. abs.	Sign. dif.
Medi exp.	6	5.22	4.15	5.12	100.00	0.00	-
Triumf V1	5.67	6.02	4.63	5.44	106.18	-0.32	-
Danubian V2	8.52	7.55	5.94	7.34	143.20	-2.21	00
Atlas V3	5.17	4.20	3.20	4.19	81.78	0.93	-
Columna V4	4.67	3.11	2.83	3.54	69.03	1.59	+
DL5% = 1.11		DL1% = 1.61		DL0.1% = 2.42			

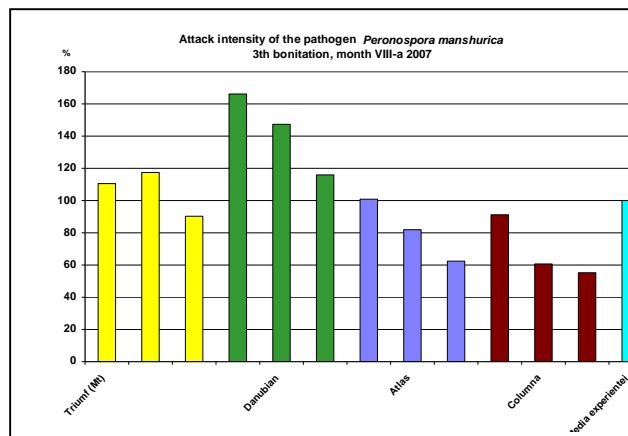


Figure 3: The attack intensity of *Peronospora manshurica* at 18.08.2007, (third bonitation)

The pathogen presence amplified it selves in all variants at the third bonitation from 18.08.2007, recording a attack intensity of 106% for Triumpf, 143% in V₂ Danubian, 81% Atlas and 70% in V₄ Columna, results related to mean of experience.

In year 2008 the observations were carried out beginning with 30.06.2008 at 20 days interval. The results obtained in experimental year 2008 are presented in the next tables and figures

Table 4

The attack intensity of *Peronospora manshurica* at 30.06.2008, related to mean of experience

Variant	Repetition I	Repetition II	Repetition III	Mean	Relativ. Diff.	Dif. abs.	Sign. dif.
Medi exp.	2.09	1.9	1.41	1.80	100.00	0.00	-
Triumpf V1	1.24	1.13	0.43	0.93	51.85	0.87	++
Danubian V2	4.22	3.81	3.44	3.82	212.41	-2.02	000
Atlas V3	2.55	2.51	1.69	2.25	125.00	-0.45	0
Columna V4	0.37	0.15	0.08	0.20	11.11	1.60	+++
DL5% = 0.42		DL1% = 0.62		DL0.1% = 0.93			

Table 5

The attack intensity of *Peronospora manshurica* at 21.07.2008, related to mean of experience

Variant	Repetition I	Repetition II	Repetition III	Mean	Relativ. Diff.	Dif. abs.	Sign. dif.
Medi exp.	4.22	7.28	4.86	5.45	100.00	0.00	-
Triumpf V1	5.29	4.75	4.31	4.78	87.71	0.67	-
Danubian V2	6.54	5.54	4.12	5.40	99.02	0.05	-
Atlas V3	11.14	9.86	9	10.00	183.37	-4.55	-
Columna V4	3.91	2.5	2.04	2.82	51.65	2.64	-
DL5% = 4.79		DL1% = 6.96		DL0.1% = 10.45			

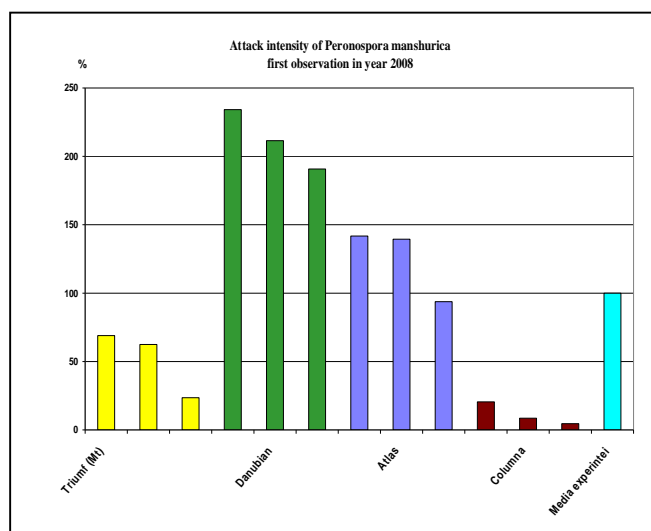


Figure 4: The attack intensity of *Peronospora manshurica* at 30.06.2008, (first bonitation)

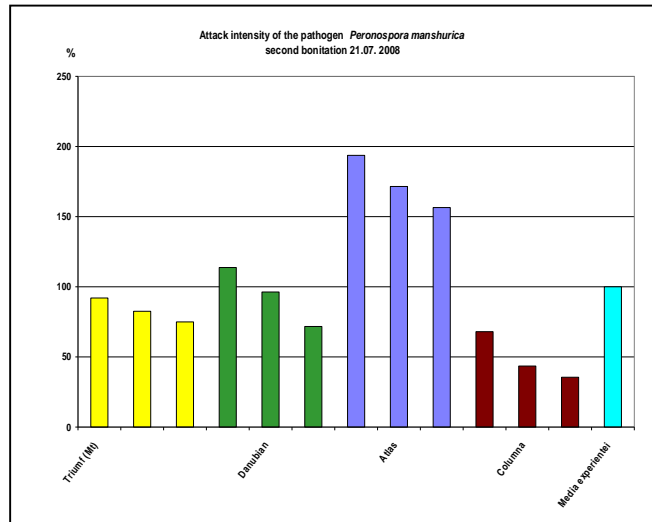


Figure 5: The attack intensity of *Peronospora manshurica* at 21.07.2008, (second bonitation)

At the last bonitation in the year 2008 realized in 18.08, variant 1 Triumf exerted significant result related to mean of experience. The lowest control degree was achieved by Atlas V₃, variants V₂ and V₄ presented the same situation like mean of experience, table 6.

Table 6

The attack intensity of *Peronospora manshurica* at 18.08.2008, related to mean of experience

Variant	Repetition I	Repetition II	Repetition III	Mean	Relativ. Diff.	Dif. abs.	Sign. dif.
Medi exp.	18.48	29.01	25.9	24.46	100.00	0.00	-
Triumf V1	15.09	13.88	10.99	13.32	54.45	11.14	+
Danubian V2	33.42	31.41	23.83	29.55	120.81	-5.09	-
Atlas V3	46.43	44.02	41.22	43.89	179.41	-19.43	000
Columna V4	30.95	26.76	27.59	28.43	116.23	-3.97	-
DL5% = 8.76		DL1% = 12.75		DL0.1% = 19.12			

CONCLUSIONS

In the experimental year 2007 the pathogen *Peronospora manshurica* was present in soybean crop in relatively low degree at first bonitation, only bred Danubian exerted a high sensibility, the attack intensity achieved 275% related to mean of experience.

Statistically the variant V₁ breed Triumf was very significant related to mean of experience. Very insignificant results were obtained in variant V₃ Atlas breed.

On the third bonitation realized at 18.08.2007 the pathogen was more expressive, recording an attack intensity of 106% at Triumf, 143% in the V₂ Danubian, 81% V₃ and 70% V₄ Columna breed, results related to mean of experience.

Very significant differences were recorded in year 2008, at the first bonitation in 30.06.2008 related to the mean of experience in the case of variant V₄ and significant in variant

V₁. Very insignificant results were exerted in variant V₂ and V₃. A high control degree was achieved in variant with Columna breed, 11% and Triumf were the control degree was up to 50.

In August, the attack intensity of *Peronospora manshurica* in variant V₁ was 50%, proved to be the best variant. The variants V₂ and V₄ (Danibian and Columna) exerted the same percentage as mean of experience.

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