EVALUATION OF THE ATTACK OF YELLOW RUST (PUCCINIA STRIIFORMIS WEST.) IN TIMIŞ COUNTY IN 2020

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Abstract: *The low temperatures from 2020, which registered large differences compared to the multiannual averages, and with a low water regime inspired us to follow the dynamics of several diseases in Timiş County, including localities from all existing relief areas in the county, from the areas from meadow to mountainous mountainous areas. Among the winter wheat diseases studied was yellow rust produced by Puccinia striiformis West.At the entrance to the autumn wheat field, observations were made in seven localities, in each locality in three different fields determinations were made of the frequency and intensity of the attack of the fungus from 5 metric frames, to the standard leaf (F) and to the third leaf below the standard (F-3) on the diagonal of the fields. The degree of attack was calculated at the office and the resulting data were interpreted statistically. The comparisons were made with the average degree of attack in all localities.In order to be able to collect as much data as possible in the chosen localities, observations were made on several diseases. The localities were: Foieni, Clopodia Ştiuca, Poieni, Bethausen, Murani and Beba veche Unlike Septoria tritici Rob. and Desm. which is a great lover of cold climate, the fungus Puccinia striiformis West. which produces the yellow rust of winter wheat is thermophilic, so that the degree of attack on the F-3 leaf was low, and on the standard leaf it was almost non-existent.*

Key words: *Autumn wheat, Puccinia striiformis, yellow rust, Timiş county*

INTRODUCTION

The fungus attacks wheat, barley, rye and triticale. The disease caused by the fungus is an important problem in the countries of Western Europe, due to the climate (cold and humid) particularly favorable to this fungus. In our country, although it does not appear every year, but taking into account the damage caused by this disease in 1960-1980, when there were three cycles of attack, yellow rust disputes its primacy with brown rust that occurs with much greater intensity.

In Romania, the fungus produced massive attacks with epiphytic appearance in 1960, 1961, 1962, 1966, 1967, 1977, 1978, very strong attacks in the south of the country (Danube Plain and Dobrogea) and in central Moldova (HULEA ANA et al. 1975 , cited by HATMAN M et al. 1989).

Of course, yellow rust appeared long before wheat became a cultivated plant for consumption. The disease was first described in Europe by GADD in 1777 (ERIKSSON and HENNING, 1896). The first written reports on yellow rust and its spread in the world were written by HASSEBRAUK (1965), STUBBS (1985), LINE (2002) and LI and ZENG (2003). The presence of yellow rust has been reported by more than 60 countries.

The appearance of yellow rust epidemics is influenced by uredospores carried by the north - west and south - west winds, by the cultivated variety and the physiological race of the fungus, by the lower temperatures in spring (10 - 15° C) and the abundant precipitations during the vegetation; due to the epidemic, the leaves dry out prematurely, the growth of the ears is slowed down and the caryopsis withers.

MATERIAL AND METHODS

Observations was made in seven localities homogeneously dispersed on the surface of the entire territory of Timiș County to include all forms of relief in the region. The locations were; Beba veche, Ştiuca, Clopodia, Foieni, Murani, Bethausen and Poieni.

In each locality three fields of winter wheat was chosen and on each field five metric frames were read regarding the frequency, intensity of the degree of attack and subsequently the degree of attack was calculated. The obtained results were statistically compared with the county attack average.

RESULTS AND DISCUSSION

The degree of attack of yellow rust on the leaf F-3 in 2020 is shown in Table 1 and illustrated graphically in Figure 1.

Table 1.

Degree of attack of *Puccinia striiformis* on leaf F-3

Nr. crt.	Locslities	Repetitions			Average	Relative diff. (%)	Diff.	Significance
		R1	R2	R3				
1	Beba veche	25.65	21.33	26.45	24.48	112.18	2.66	-
2	Ştiuca	22.35	16..84	18.35	20.35	93.27	-1.47	-
3	Clopodia	30.15	29.35	26.15	28.55	130.85	6.73	-
4	Foieni	25.26	28.15	26.85	26.75	122.62	4.93	-
5	Murani	22.75	20.21	25.85	22.94	105.12	1.12	-
6	Bethausen	18.48	14.25	17.25	16.66	76.36	-5.16	-
7	Poieni	15.20	11.10	12.33	12.88	59.02	-8.94	00
8	Average	22.83	20.73	21.89	21.82	100.00	0.00	Mt.

DL5% - 7.4221; DL1% - 9.9768; DL0.1% - 14.2920.

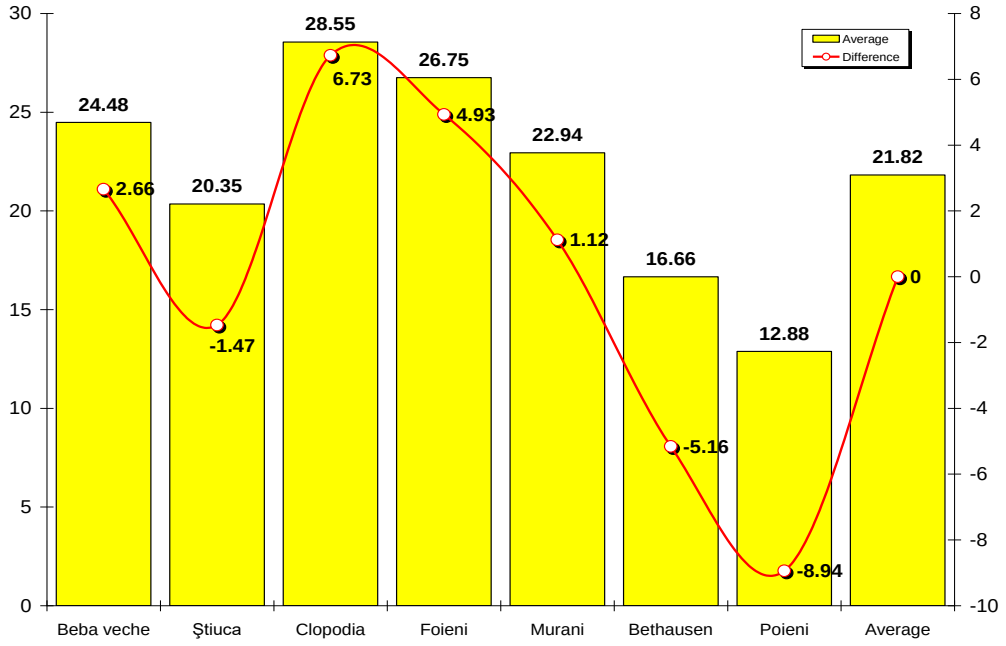

Fig. 1. Degree of attack of *Puccinia striiformis* on leaf F-3

The values of the differences of the yellow rust attack were quite fluctuating in the seven localities, but with the exception of Poieni locality, the differences were not statistically assured.

In Poieni, the difference was distinctly insignificant with a value of -8.94. This difference is probably due to the fact that in 2020, the temperatures were very low, the town is in a mountainous area where temperatures are even lower than in the meadow area, and rainfall very much in the first half of the year.

Table 2 and Figure 2 show the experimental data on the degree of yellow rust attack in the seven localities and the statistical analysis of the results compared to the average of the localities.

Table 2

Degree of attack of Puccinia striiformis on leaf F

Nr. crt.	Locslities	Repetitions			Average	Relative diff. (%)	Diff.	Significance
		R1	R2	R3				
1	Beba veche	6.78	7.57	8.75	7.70	125.94	1.59	-
2	Ştiuca	2.95	4.87	5.78	4.53	74.15	-1.58	-
3	Clopodia	10.10	8.57	9.87	9.51	155.60	3.40	*
4	Foieni	8.75	9.15	7.65	8.52	139.30	2.40	-
5	Murani	5.79	6.67	5.79	6.08	99.50	-0.03	-
6	Bethausen	3.75	4.25	4.85	4.28	70.06	-1.83	-
7	Poieni	4.15	2.35	0.00	2.17	35.44	-3.95	0
8	Average	6.04	6.20	6.10	6.11	100.00	0.00	Mt.

DL5% - 3.1155; DL1% - 4.1878; DL0.1% - 5.9992.

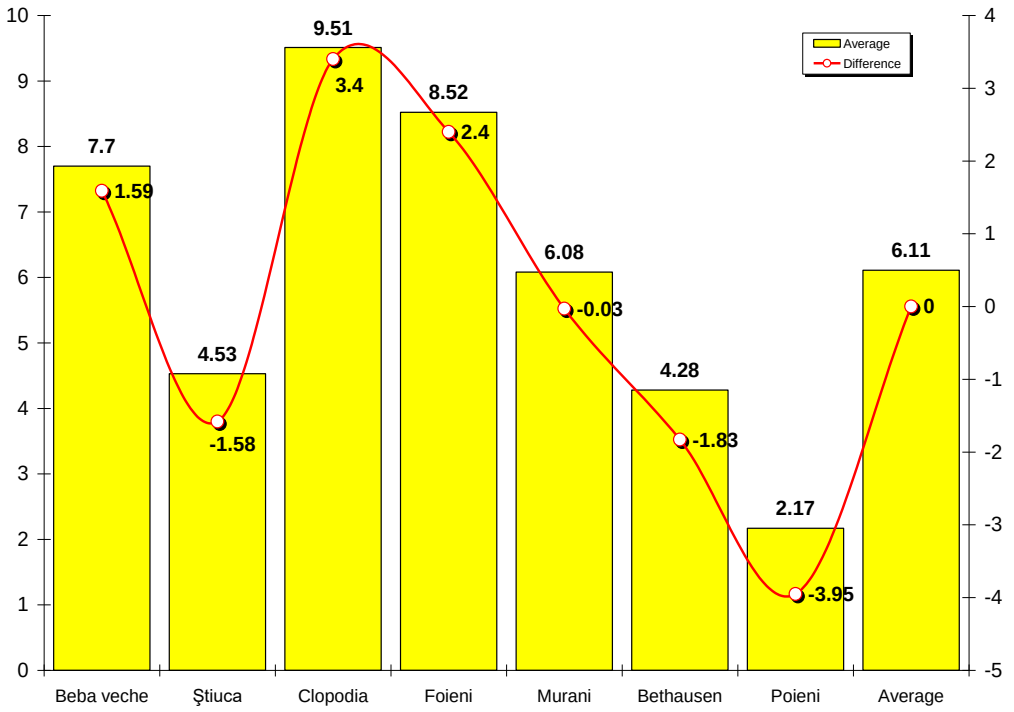

Fig. 2. Degree of attack of Puccinia striiformis on leaf F

The results regarding the yellow rust attack were quite homogeneous, so that after the statistical analysis most of the differences were not statistically assured, except for two localities, namely Clopodia and Poieni.

In Clopodia locality, which is the southernmost locality of the county, the difference of 3.40 is statistically assured as significant, and in Poieni locality there was a difference of -3.95, statistically assured as insignificant.

CONCLUSIONS

Yellow rust attack was moderate to worse in 2020.

The low temperatures associated with rain drought, did not affect positively the yellow rust attack

The locality of Poieni being in a mountainous area, where the temperatures are lower, the rust attack was lower.

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