The Foliar and Ear Diseases Dynamic in Autumn Wheat at the ARDS Turda During 2005 – 2011

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Abstract. The wheat crop is considered the crop with the largest cultivated area in the world. In our country, the area cultivated with wheat, represents about 40% of the area cultivated with cereals. Autumn wheat crops are affected by many diseases that cause significant quantitative and qualitative damages. The production losses varies from year to year, due to weather conditions, applied technology, the sources of inoculum and the cultivated variety. From the foliar and ear diseases encountered in the culture of wheat, powdery mildew (Erysiphe graminis f.sp. tritici fc. Oidiummonilioides), brown staining (Septoria tritici fc. Leptosphaeria tritici) rust (Puccinia spp.) and fusariosis (Gibberella spp fc. Fusarium graminearum) occurs with high intensity, especially in the years with high precipitation. In this paper is presented the dynamics of the main wheat diseases in the climatic conditions of the years 2005 - 2011, the ARDS Turda. The experiments were located by random block method in three repetitions. The biological material was represented by four wheat varieties created at ARDS Turda. The observation were made once a week from the end of April - early May until the end of July. The observation were made to 20 plants of each variety. It was noted: the number of siblings, number the leaves, leaf length, leaf width, the attack degree on the plant, specifying at each notation the phenological stage. Following observation in the experimental conditions from ARDS Turda, the frequent diseases were: powdery mildew, brown staining and fusariosa.

Keywords: wheat, dynamic, foliar disease, ear disease

Introduction. Wheat crops are damaged by numerous diseases which caused quantitative and especially qualitative yield losses under Transylvania conditions. The complex of foliar diseases: powdery mildew (Erysiphe graminis f. sp. tritici), leaf and glume blotch (Septoria tritici and Stagonospora nodorum), rusts (Puccinia striiformis, Puccinia recondita and Puccinia graminis) and tan spot (Pyrenophora tritici - repens) as well as head blight (Fusarium spp.) and ears blackening (Alternaria and Cladosporium) are the most frequently in wheat crops. Yield losses reaching to 30% from yield value depend on climatic conditions and wheat cultivar. (Nagy şi colab., 2005; Popov şi colab., 2007, citaţi de Elena Nagy şi Nagy D., 2008).

Aims and objectives. In this paper we present the foliar and ear disease dynamic in three varieties of wheat in the period 2005 - 2011, at the ARDS Turda.

Materials and methods. The biological material used was the Arieşan, Dumbrava and Turda 2000 varieties. The study of foliar and ear diseases dynamics was achieved by using the experiences of subdivided parcels method, placed in three repetitions. The common diseses in experimental field are powdery mildew (Erysiphe graminis f sp. tritici), brown rust (Puccinia recondita f.sp. tritici,) septoria leaf blotch (Septoria tritici), and head blight (Gibberella zeae fc. Fusarium roseum).
Results and Discussion. The evolution of temperatures and the precipitations during of experimentation years have influenced differently the appearance and manifestation of pathogens to wheat varieties. As for of temperatures 2005, 2006, 2010 and 2011 have been with the temperatures close to normal years and 2007, 2008 and 2009 have been warmest years. Precipitation fallen during the experimentation characterizing 2005, 2007, 2008 as excessively rainy years, 2006 and 2010 very rainy years, 2009 was a normal year in terms of precipitations and 2011 a dry year.

The dynamics attack of powdery mildew in wheat varieties. Powdery mildew attack has manifested in different percentages in all three varieties taken into study in experimentation years, depending on the resistance or susceptibility of varieties and the climatic conditions of those years. To the Arieşan and Turda 2000 variety, the first symptoms appeared in the first node phenophase and were visible to wax and baking phenophase (variety Turda 2000); variety Dumbrava only manifested the first symptoms of bellow phenophase and were visible to wax phenophase in 2005, and until blooming in 2008. The analysis of data we can say that 2008 was the year most favorable appearance of powdery mildew attack, with the highest degree attack to Arieşan variety 13.50%, in the blooming phenophase, and Turda 2000 variety with 23.50% at blooming phenophase. Dumbrava variety manifested a higher sensitivity to powdery mildew attack in the climatic conditions of 2007, with a 4.15 percentage of degree of attack in the maturity milk phenophase, but much smaller than the Arieşan and Turda 2000 variety.

The dynamics attack of septoria leaf blotch in wheat varieties. Climatic conditions in the experimentation years have favored the septoria leaf blotch attack, this has been reported to some variety in the all the years, in varying percentages. To the Arieşan variety septoria leaf blotch attack was seen since the bellows and to ripening phenophase. From the climatic point of view, 2005 (excessively rainy) was a favorable year for appearance and the manifestation of septoria leaf blotch, the degree of attack was 19.5% in the ripening phenophase. The climatic conditions of 2007, similar to those of 2005, have favored the septoria leaf blotch attack, the degree of attack being 13.00% in the wax phenophase. The drought of 2011 inhibited the development of disease, the degree of attack in this year being less than 1%. The Turda 2000 variety had a behavior similar to that Arieşan variety, degree of attack of being 21.00% in the climatic conditions of 2005 and 12.25% in 2007. Between the three variety analyzed Dumbrava variety was more susceptible to the attack, in 2005, precipitation in the later months growing season have influenced the development of the pathogen, in the maturity wax phenophase, the degree of attack was 31.00%.

The dynamics attack of rust in wheat varieties. Although appearing later during the growing season, the rust can cause significant damage in the favorable years. Due to climatic conditions, 2005 has been favorable for the rust attack. All three varieties taken into study showed rust attack, 16.0% Arieşan variety, 17.5% Turda 2000 and 18.0% Dumbrava variety. In 2006, Dumbrava variety, was more susceptible to rust, the degree of attack was 12.5%. In other years the rust was signaled only in a low percentage of green leaves rise later brothers.

The dynamics attack of head blight in wheat varieties. Between the pathogens present on the ear, the genus Fusarium pathogens have appeared towards in the end of vegetation to varieties taken into study. The attack intensity was lower in 2005 and 2006, the frequency of ears diseased not exceeding 2% in all three variety. Head blight attack has been signaled in 2010 at Dumbrava and Arieşan varieties, but with a degree of attack less than 0.30%.
**Conclusion.** Climatic conditions in the experiment years have influenced different the appearance and manifestation of pathogens at ARDS Turda field.

The main pathogens reported in the experimental field was *Erysiphe graminis f sp tritici, Puccinia recondita f.sp. tritici, Septoria tritici, Gibberella zeae* f.c. *Fusarium roseum*.

The analysis of data we can say that 2008 was the most favorable year for appearance and development of powdery mildew.

Septoria leaf blotch was manifested in all the years of experimentation to all three variety, with different intensity and degree of attack, depending on the the climatic conditions correlated with the resistance or susceptibility varieties to this pathogen.

Varieties tested manifested a good resistance to *Fusarium roseum* attack, it happened in a very low percentage during of experimentation.

REFERENCES