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The Dynamic Of The Main Foliar Wheat Diseases Developing At Coast Zone Of Albania, During The Years 2011, 2012, 2013.

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Abstract:- Observations were done every week starting from filleting till milk ripening in wheat production fields. It was carried out in "Kaloshi" farm in Grabian village, Lushnja the district of Fier for the three study years (2011, 2012, 2013). Winter wheat is one of the most important and economically beneficial crops in Albania. Distribution of pathogens is a complex phenomenon – it is set by host distribution and susceptibility levels, crop management and environment**.** Based on the data received during observations about the most frequent foliar wheat diseases at coast zone Lushnje, for the three study years can be say that: Based on the data obtained during surveys conducted to determine the most frequent air diseases of wheat in the low coastal area Lushnja, for the three study years (2011, 2012, 2013) we can say that: for the three study years the first infection of Powdery mildew *(B.graminis)* are seen at the first observation, march 15, with a level by 3%, while during the mid of Aprile was 12%. During the begining of Aprile are seen infection by Septoria leaf blotch *(Septoria sp).* With a value by 3% and afetr at the end of May this value was 41 %. Brown rust *(P.recondita)* on the leaves is seen on mid of Aprile with a infection level by 1%, while at the end of may it was 38 %. Changes in disease epidemics were determined and showed the differences between the analyzed diseases.

Keywords:- Brown rust, disease incidence, Powdery mildew, Septoria leaf blotch,

I. INTRODUCTION

Diseases, including leaf diseases, are a significant risk factor which influences the quantity and quality of grain production under conditions of Albania. The spectrum and harmfulness of diseases has changed over the years [15]. Winter wheat is one of the most important and economically beneficial crops in Albania. Distribution of pathogens is a complex phenomenon – it is set by host distribution and susceptibility levels, crop management and environment [8]. Knowledge about regularity of disease emergence may play a significant role in building up an effective and sustainable control system of wheat diseases. Diseases, especially those affecting the leaves are causing important losses in yield annually; global yield losses due to wheat diseases in the field or in storage are estimated to be 20% [3]. Yield losses may amount to as much as 40% and are greatest when disease development precedes or accompanies flowering [3]. An important part of wheat research in the last two decades has been the behavior of wheat to airborne fungal diseases with particular focus on leaf rust (*Puccinia recondita* Roberge), powdery mildew (*Blumeria graminis* sp. Syd.), Septoria leaf blotch (*Septoria tritici* Rob et Desm), *Fusarium* spp). [13]. an At the Agricultural University of Tirana trial for wheat breeding has been in place in the last five decades enabling also long-term resistance trials [12]. Conditions that favors development of these diseases usually coincide with conditions that favor crop growth and their main effects are yield reduction and quality deterioration in years with the highest productive potential. The larges damage (50%) from the leaf rust was recorded during 1988 – 1990 due to high humidity during May and June [4]. Management of these diseases should be based on the use of resistant varieties since the persistence of available fungicides is not sufficient to protect the plant during the whole cycle [1].

II. MATERIALS AND METHODS

2.1. *Place of experiment*

Dynamics of development for major leafy diseases in Wheat leaf rust (*Puccinia recondita* f.sp. *tritici*; *Prt*), Septoria leaf blotch (*Septoria tritici* Rob et Desm) and Powdery mildew (*Blumeria graminis* sp. Syd) was carried out in "Kaloshi" farm in Grabian village, Lushnja the district of Fier, during the three study tears, 2011, 2012, 2013 (Imc %) at the coast zone which is located in geographic latitudes 40° 55'55.21" north, 19°37'00.10" east, in height above sea level of 1m. Annual rainfall is 730 – 957 mm per year and average annual temperatures range from 6.1°C in January and 23.1°C in June.

2.2. ***Time of diseases assessment***

Assessments of diseases were performed every 15 days starting from March 15 till June 30 (ie in total were carried 5 assessments) ranging from stage 5 to stage 10.5, according to Feekesit and according to Large, E.C. (1954).

***2.3. Sampling method*:**

In experimental trials were evaluated at random 50 plants (in five points diagonal) with 10 plants each point and were evaluated two upper leaves (a total of 100 leaves) giving each leaf the class value that corresponds from 0 to 5 and recording corresponding frequencies of leaves for each class.

2.4. Assessment of diseases

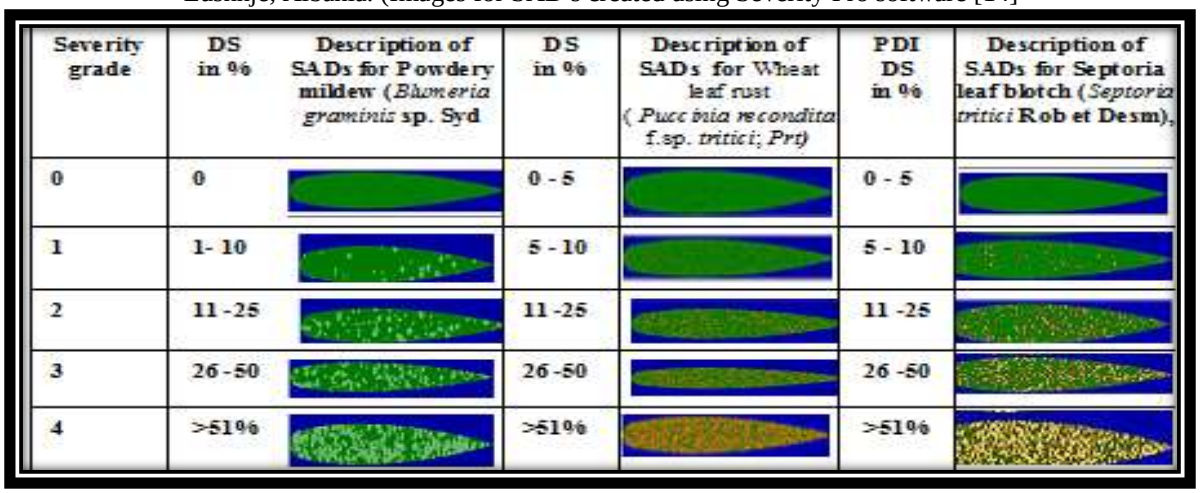
Assessment of Wheat leaf rust (*Puccinia recondita* f.sp. *tritici*; *Prt*), Septoria leaf blotch (*Septoria tritici* Rob et Desm) and Powdery mildew (*Blumeria graminis* sp. Syd) is realized using the five class (degrees) system, which is based on physiological reactions and pustule size in affected organs. For Powdery mildew (*Blumeria graminis* sp. Syd) we have modified scales from 0-9 by [10]. For Wheat leaf rust (*Puccinia recondita* f.sp. *tritici*;*Prt*), we have modified scales from 0-9 of Coob by[11]. For Septoria leaf blotch (*Septoria tritici* Rob et Desm) we have modified scales from 0-9 [5]. These modifications are presented by Vrapi.H. et al 2011[14]. See. Figure No. 1.The main parameter for quantitative evaluation of diseases was the disease intensity I (DS), which is given by the formula:

$$I(DS) = \% s / S * 100 \qquad [5]$$

Where: I = intensity of the disease, s = % of leaf area affected by disease, S = % total leaf area

The medium McKinney index [9], has been used for the severity of the diseases $I = \Sigma\{(ni*xi)/N \bullet X\} \bullet 100$. Where: I = McKinney index, Σ = Total of productions ni.*xi, ni = frequency or number of plants observed for each class, xi = value of each class, N = total number of plants assessed, X = value of the highest class.

Figure 1 Standard area diagrams used to estimate Wheat leaf rust (*Puccinia recondita* f.sp. *tritici*; *Prt*) , Septoria leaf blotch (*Septoria tritici* Rob et Desm and Powdery mildew (*Blumeria graminis* sp. Syd in the Lushnje, Albania. (Images for SAD s created using Severity Pro software [14]



2.5. **Statistical data analysis**

Data processing for all environments test for variance, was done using analysis of variance (ANOVA) and three factorial analysis was done by using statistical program ASSISTAT (2013) - Website http://www.assistat.com By Francisco de AS the DEAG-CTRN-Silva UFC [2].

Comparisons of averages of disease index (IMC in%) with variant control (without treatment) was performed using the Tukey Kramer test for two levels of probability p = 0:05 and p = 0:01 with SAS statistical program 2009 [16].

III. RESULTS AND DISCUSSION

3.1. Climatical conditions at coast zone during the years 2011, 2012, 2013.

The average climatical data about temperature and raining for the three study years (2011, 2012, 2013) are shown at the table 4.19 and at the graphic 4.13. From the table it can see that: During the year 2011, the spring has been humid and with the low temperatures especially on March and at the begining of Aprile,where the mean temperature was between 7.2 **°C** to 14.9 **°C** untill at mid Aprile,but as a three annual it has a deviation by -0.31**°C** lower than the mean of three annual for March and -0.22**°C** for Aprile as well as -0.37**°C** for the

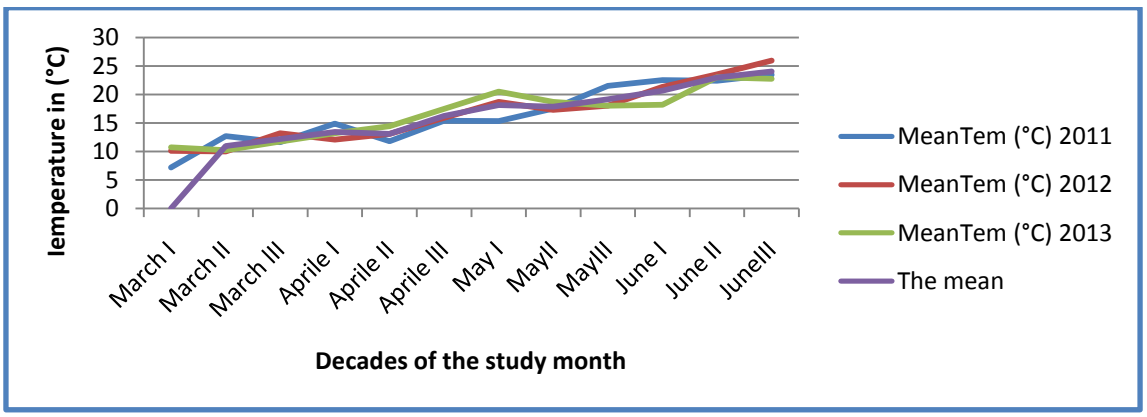
May. This has created an retardion on intense develloping of the foliar wheat diseases like *Septoria sp.,P.recondita, B, graminis* for the year 2011 (tab. 4.19 and graphic 4.13)

Also, for the year 2012 the spring has been humid, caracterised with higher temperatures than at the year 2011 especially during march and at the begining of aprile,where the mean temperature was between 10.7 **°C** to 13.2 **°C** untill at mid of Aprile,but as three annual mean it has a deviation by + 0.29**°C** more than the three annual mean of March and -0.54**°C** for Aprile as well as -0.38 **°C** for the May. This has influenced for the earlyy developing of *B.graminis,*while later developing of dieseases has been like one year ago, 2001(see tab. 4.19 and graphic 4.13)

For the year 2013, the spring has been also humid, but with the temperature higher than at the years 2011, 2012,especially during the march and at the begining of aprile,where the mean temperature was between 10.1**°C** to 12.1**°C** untill at mid of aprile,but it has a deviation by +0.05 **°C** more than the three annual mean temperature for the march and + 0.77 **°C** for the aprile as well as by +0.68 **°C** for the may. Warm raining weather on aprile (24 mm) has influences for e intense developing of specific foliar wheat diseases like *Septoria sp.*,P.*recondita, E.graminis* (see tab.3.1 and graphic 3.1).

Table no. 3.1. Data on the mean temperature °C and the sum of raining in mm for the March, April, May and June at Grabian, Lushnje, in decades, for the year 2011,2012,2013.

Place of study	decades	Year 2011		Year 2012		Year 2013		The mean Temp 2011-2012-2013
		MeanTem (°C)	Raining mm	Mean tem (°C)	Raining mm	Mean tem. (°C)	Raining mm	
Grabian Lushnje	**March I**	7.2	32	10.1	54	10.7	32	9.33
	March II	12.7	45	10	48	10.2	69	10.96
	March III	11.6	15	13.2	25	11.7	76	12.16
	Mean	10.5	30.66	11.1	42.33	10.86	59	10.81
	Aprile I	14.9	54	12.1	14	13.2	24	13.4
	Aprile II	11.8	23	13.1	35	14.4	35	13.1
	Aprile III	15.36	34	15.91	40	17.45	13	16.24
	Mean	14.02	37	13.7	29.66	15.01	24	14.24
	May I	15.3	10	18.7	5	20.5	25	18.16
	MayII	17.5	33	17.3	15	18.7	10	17.83
	MayIII	21.5	2	18	23	18	10	19.16
	Mean	18.1	15	18	14.33	19.066	15	18.38
	June I	22.5	12	21.3	10	18.2	5	20.66
	June II	22.4	0	23.5	3	23	10	22.96
	JuneIII	23.45	3	25.91	0	22.73	16	24.03



Graphic no 3.1. Data on the mean temperature °C and the sum of raining in mm for the March, April, May and June at Grabian, Lushnje, in decades, for the year 2011,2012,2013.

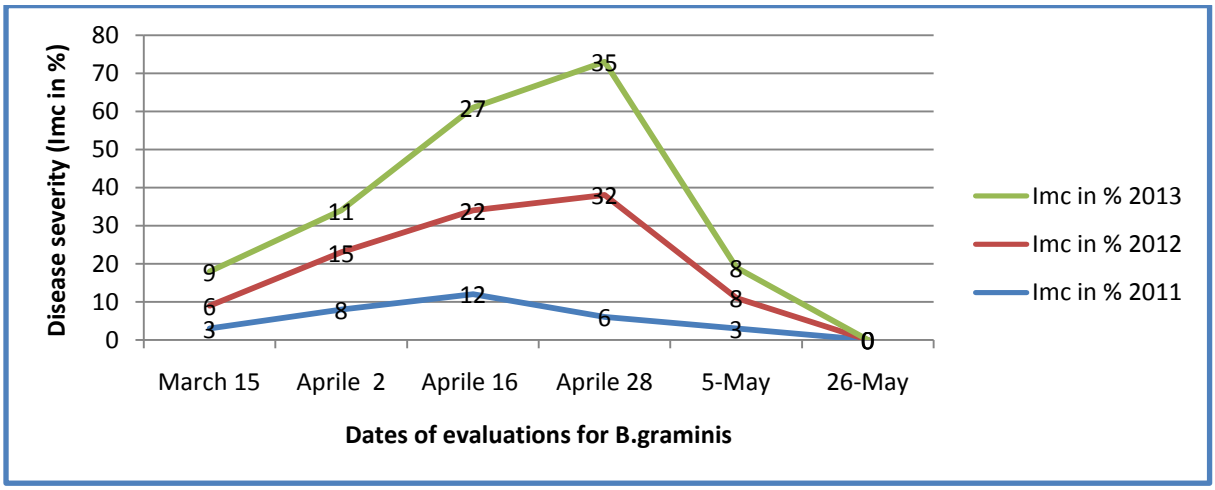
3.2 Observations about the most frequent foliar wheat diseases at coast zone,Lushnje, for the three study years

Based on the data received during observations about the most frequent foliar wheat diseases at coast zone,Lushnje, for the three study years where are shown at the table no 3.2; and graphics for each diseases no.3.2, 3.3 and 3.4 it can be say that:

Table no. 3.2. Data on disease intensity(DS) for the three foliar wheat diseases and their dynamic at the coast area for the year 2011-2012-2013.

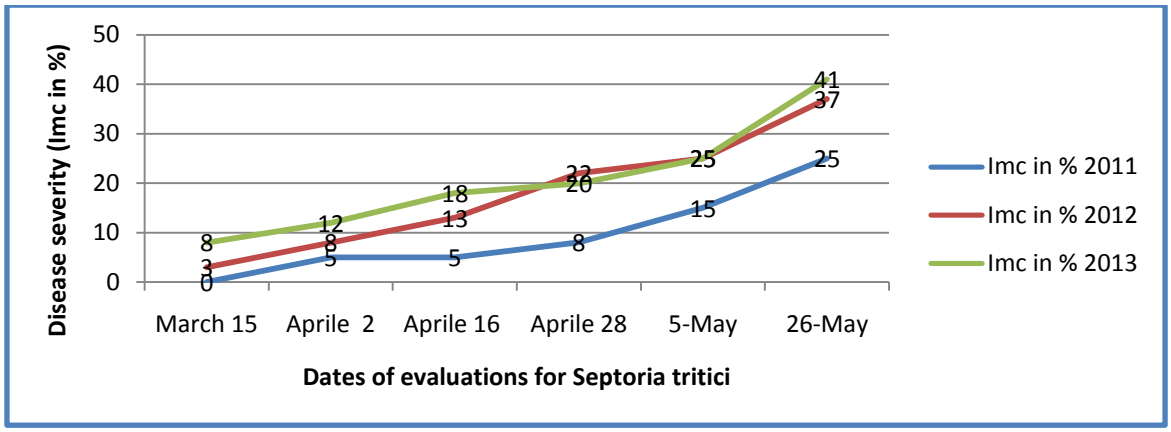
No	Observation date	Disease severity Imc in % for *S.tritici*			Disease severity Imc in % for *P.recondita*			Disease severity Imc in % for *B.graminis*		
		2011	2012	2013	2011	2012	2013	2011	2012	2013
1	**March 15**	**0**	**3**	**8**	**0**	**0**	**0**	**3**	**6**	**9**
2	**Aprile 2**	**5**	**8**	**12**	**0**	**1**	**6**	**8**	**15**	**11**
3	**Aprile 16**	**5**	**13**	**18**	**2**	**7**	**13**	**12**	**22**	**27**
4	**Aprile 28**	**8**	**22**	**20**	**6**	**15**	**21**	**6**	**32**	**35**
5	**May 13**	**15**	**25**	**25**	**10**	**21**	**28**	**3**	**8**	**8**
6	**May 28**	**25**	**37**	**41**	**23**	**27**	**38**	**0**	**0**	**0**

For the year 2011 the first infection of *B.graminis* are seen at the first observation, march 15, with a level by 3%, while during the mid of aprile was 12%. For the year 2012 the first infection by *B.graminis* are seen at the first observation, March 15, with a level by 6% and after during the Aprile the infection level was 32%. For the year 2013 the first infections by *B.graminis* are seen at the first observation, March 15, with a level by 9%, and during mid of Aprile the infection level was 35%.(see table no.3.2 and graphic no 3.2).



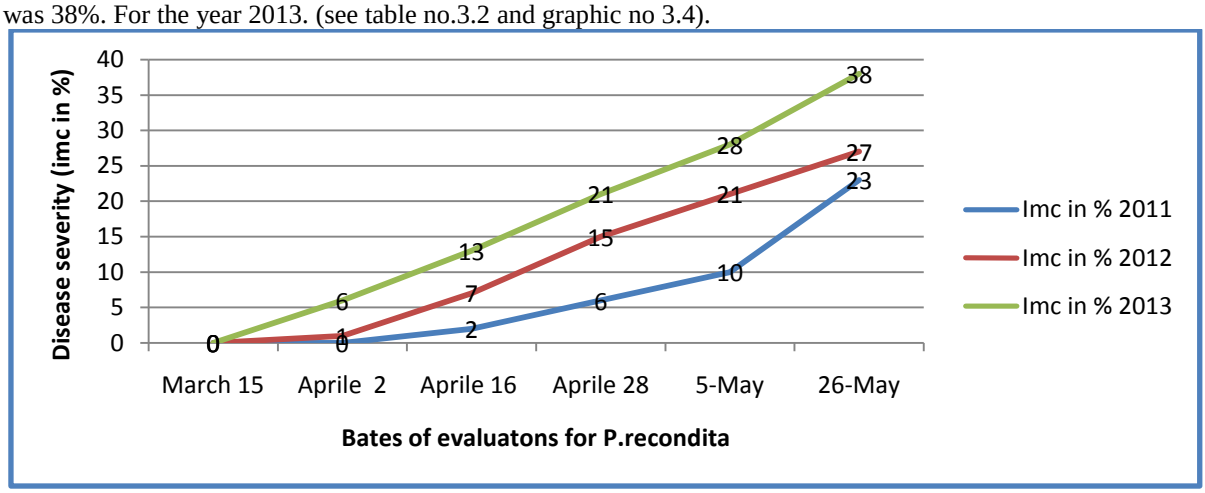
Graphic no 3.2. Data on dynamic of *B.graminis* developing during three study years,2011,2012,2013 (Imc in %) at the coast zone.

During the begining of Aprile for the year 2011 are seen infection by *Septoria sp* with a value by 5% and afetr at the end of May this value was 25 %. For the year 2012 during the begining of March infection by *Septoria sp* are seen, with a level by 3% and after at the end of May with e level infection by 37% being in the same time the most importante wheat disease in our country. For the year 2013 during the begining of march infections by *Septoria sp* are seen with a level by 8%,while at the end of may the infection level was 41%. (see table no.3.2 and graphic no 3.3).

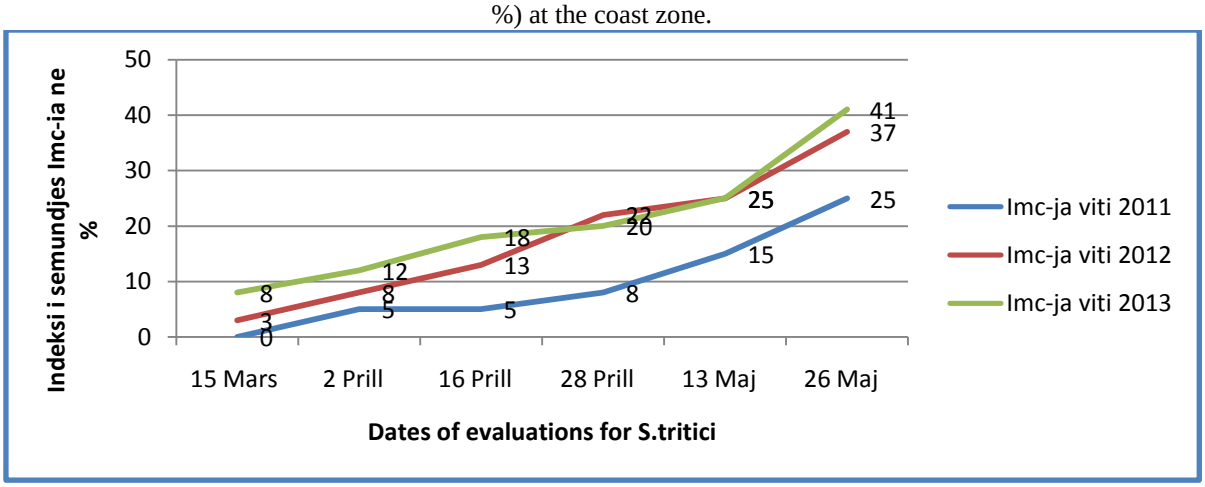


Graphic no 3.3. Data on the dynamic of Septoria leaf blotch **(***Septoria tritici)* developing during the three years of study 2011,2012,2013 (Imc in %) at the coast zone.

For the year 2011 the first infection *P.recondita* on the leaves is seen on mid of aprile with a infection level by 2%, while at the end of may it was 23 %. *P. recondita* on leaves is seen at the begining of aprile with a infection level by 1%, but at the end of aprile had a value by 27%. For the year 2012 the first infection by *B.graminis* are seen at the first observation, march 15, with a level by 6% and after during the aprile the infection level was 32% *P.recondita* is seen at the begining of aprike with e infection level by 6%, but at the end of may the level was 38%. For the year 2013. (see table no.3.2 and graphic no 3.4).



Graphic no 3.4. Data on dynamic of *B.graminis* developing during three study years,2011,2012,2013 (Imc in %) at the coast zone.



Graphic no 4.16. Data on the dynamic of wheat septoria develloping during the three study tears,2011,2012, 2013 (Imc %) at the coast zone

IV. CONCLUSIONS

Based on the data obtained during surveys conducted to determine the most frequent air diseases of wheat in the low coastal area, Lushnja, during the three study tears,2011,2012, 2013 (Imc %) at the coast zone we can say that:

1. For the year 2011 the first infection of *B.graminis* are seen at the first observation, march 15, with a level by 3%, while during the mid of aprile was 12%. For the year 2012 the first infection by *B.graminis* are seen at the first observation, March 15, with a level by 6% and after during the Aprile the infection level was 32%. For the year 2013 the first infections by *B.graminis* are seen at the first observation, March 15, with a level by 9%, and during mid of Aprile the infection level was 35%.

2. During the begining of Aprile for the year 2011 are seen infection by *Septoria sp* with a value by 5% and afetr at the end of May this value was 25 %. For the year 2012 during the begining of March infection by *Septoria sp* are seen, with a level by 3% and after at the end of May with e level infection by 37% being in the same time the most importante wheat disease in our country. For the year 2013 during the begining of march infections by *Septoria sp* are seen with a level by 8%,while at the end of may the infection level was 41%.

3. For the year 2011 the first infection *P.recondita* on the leaves is seen on mid of aprile with a infection level by 2%, while at the end of may it was 23 %. *P. recondita* on leaves is seen at the begining of aprile with a infection level by 1%, but at the end of aprile had a value by 27%. For the year 2012 the first infection by *B.graminis* are seen at the first observation, march 15, with a level by 6% and after during the aprile the infection level was 32% *P.recondita* is seen at the begining of aprike with e infection level by 6%, but at the end of may the level was 38%. For the year 2013.

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