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RESISTANCE OF WINTER WHEAT TO THE LESION BY SEPTORIA SPOT DEPENDING ON THE VARIETY

The results of the study of the lesion of winter wheat depending on the variety are given. It is determined that the highest prevalence and degree of the lesion of wheat plants by septoria spot is observed in the boot stage. Under the conditions favorable for development of septoria spot agent the varieties Pyvna , Shestopalivka, Dykanka, Vasylyna and Tronka have lower degree of lesion.
Keywords: *winter wheat, variety, septoria spot*

Introduction. In modern grain production the problem of crop protection is still urgent and its solution needs a lot of efforts and money. The demand of the world market in an ecologically clean agricultural products leads to the tendency to reduce the usage of chemical plant protection against pathogenic organisms. An alternative to the use of pesticides is a genetic protection, cultivation of resistant varieties and hybrids [1].

Its success is ensured by constant selective work, the introduction of newly created forms of resistance genes that are effective against various pathogenic agents [2].

Agriculture of Ukraine in recent years has reached a stable positive dynamics and has become one of the leading sectors of the economy. Plant production is sometimes much higher than in 1990. But more than a third of cultivated agricultural yields is not complete as a result of negative activity of pests, plant pathogenic agents and weeds. Despite enormous advances in plant protection science, there are still many problems that need urgent solution [3].

The degree of harmfulness of septoria spot depends on the period of crop infection. Severe lesion of plants in autumn leads to the death of 10-40% of the stems during the wintering, and as a result the density of plant standing is reduced. Lesion in the tillering phase hampers root development, reduces the number of stalks and ears [4].

Today in Ukraine one of the urgent problems is the creation of winter wheat varieties resistant to Septoria spot, in particular the most common and harmful - speckled leaf blotch (pathogenic agent *Septoria tritici Rob. Et Desm.*), which specific share in complex of common diseases of winter wheat is in different regions of Ukraine from 7 to 25% [1]. Therefore, the study of the resistance of new varieties of winter wheat and detection the phase of the largest lesion by Septoria spot is relevant.

Materials and methods. The research was conducted during the years 2011-2012 at the experimental field of the Department of Plant Protection and Quarantine of Uman National University of Horticulture. The subject of the research - winter wheat varieties of domestic and foreign selection included in the Catalogue of plant varieties available for distribution in Ukraine in 2011. The objects of research were pathogenic agents of speckled leaf blotch (*Septoria spp*). Varieties were sown on plots of the total area 5 m² in fourfold repetition. Intensity, prevalence of the disease was determined in the milk stage according to practical standards [5-6].

Weather conditions during the growing period in 2011 were mostly favorable for the pathogenic agents of speckled leaf blotch. The first symptoms of lesion were found out at the beginning of the third decade of March. In 2012 the symptoms of the disease were found out in the tube phase of plants, i.e., in the second decade of May. Significant fluctuations of average daily temperatures didn't contribute to the development and dissemination of Septoria spot.

Results and discussion In the stage of tillering in 2011 the degree of manifestation of the disease during the first calculation was 1.0-1.5 %, and the prevalence of the disease – 30,0-40,0%. Significant difference between varieties wasn't found (*Table 1*).

After 30 days the degree of Septoria spot manifestation was significantly higher and ranged from 12,0-19,3%, depending on the variety, but the number of infected

plants increased insignificantly. During the spring tillering phase relative resistance to Septoria spot was observed by the varieties Pyvna, Vasylyna and Perlyna Lisostepu. In 2012 there were no symptoms of disease in the phase of tillering.

Table 1

Lesion of winter wheat leaves by speckled leaf blotch in spring tillering stage, depending on the variety

Variety	2011			
	Level of disease manifestation (R)		Prevalence of the disease (P)	
	1-st calculation	2-nd calculation	1-st calculation	2-nd calculation
Shestopalivka	1,5	15,0	40,0	44,0
Pyvna	1,2	12,0	45,0	48,0
Dykanka	1,0	18,1	30,0	35,0
Vasylyna	1,5	13,0	30,0	32,0
Tronka	1,5	19,3	45,0	48,0
Kopylivska	1,0	18,5	30,0	32,0
Myronivska 61	1,5	15,4	35,0	40,0
Zemliachka odeska	1,0	16,7	40,0	48,0
Perlyna Lisostepu	1,3	13,5	30,0	42,0
Nyva Kyivshchyny	1,5	19,2	45,0	45,0
Yaroslavna	1,2	16,5	40,0	44,0
Lastivka odeska	1,0	18,6	30,0	36,0
HIP_{05}	*0,1*	*0,8*	*1,5*	*1,8*

In the boot stage the lesion of winter wheat by speckled leaf blotch plants during the years of research differed considerably. Weather conditions for the development of pathogenic agent of septoria spots were more favorable in 2011 (*Table 2*).

Table 2

Lesion of winter wheat leaves by speckled leaf blotch in boot stage, depending on the variety %

Variety	2011		2012	
	1	2	1	2
Shestopalivka	19,3	40,0	7,3	30
Pyvna	15,4	50,0	7,3	60
Dykanka	19,6	78,0	7,5	90
Vasylyna	19,7	83,0	7,8	86
Tronka	19,8	70,0	7,6	80
Kopylivska	30,3	45,0	7,5	22
Myronivska 61	33,2	100,0	7,8	80
Zemliachka odeska	29,2	90,0	7,8	90
Perlyna Lisostepu	34,5	100,0	7,8	80
Nyva Kyivshchyny	33,3	60,0	7,2	45
Yaroslavna	31,6	65,0	7,1	32
Lastivka odeska	26,7	60,0	7,3	31
HIP_{05}	*1,3*	*3,8*	*0,3*	*3,4*

Note. *1 – Level of disease manifestation (R), 2 – prevalence of the disease (P).*

The level of Septoria spot manifestation in 2011 was in the range 15.4-33.5%. The lowest degree of disease manifestations was observed by the variety sort of Pyvna (15.4%), and the

highest – by the variety Perlyna Lisostepu (34.5%). Prevalence of septoria spot in 2011 was also high. Depending on the variety, it ranged from 45% to 100%. In 2012 the degree of manifestation of the disease in comparison with 2011 was much lower: within 7,1-7,8%. Prevalence of Septoria spot was from 22% (variety Kopylivchanka) to the lesion of plants by 90% (variety Dykanka). Between the degree of manifestation of Septoria spot on plants and their level of prevalence there were no direct relationship established.

The level of speckled leaf blotch manifestation in the ear formation stage in 2011 ranged from 12,8 to 24,4%, depending on the variety, and prevalence – from 45 to 90% (*Table 3*). Indicators of the intensity were the lowest by the varieties Pyvna, Kopylivchanka, and the highest – by the varieties Zemliachka Odeska, Nyva Kyivshchyny, Yaroslavna and Lastivka Odeska.

Table 3

Lesion of winter wheat leaves by speckled leaf blotch in ear formation stage, depending on the variety %

Variety	2011		2012	
	1	2	1	2
Shestopalivka	17,8	75,0	2,0	30
Pyvna	17,8	45,0	2,2	25
Dykanka	18,8	87,0	6,0	90,0
Vasylyna	19,8	85,0	8,5	90,0
Tronka	22,4	70,0	7,4	72,0
Kopylivska	12,8	60,0	3,0	12,0
Myronivska 61	23,2	85,0	3,0	25,0
Zemliachka odeska	24,3	92,0	4,0	14,0
Perlyna Lisostepu	24,4	88,0	7,5	70,0
Nyva Kyivshchyny	32,2	90,0	6,7	90,0
Yaroslavna	24,4	90,0	3,5	50,0
Lastivka odeska	21,8	90,0	3,5	75,0
HIP_{05}	*0,8*	*4,1*	*0,2*	*3,7*

Note. *1 – Level of disease manifestation (R), 2 – prevalence of the disease (P).*

In 2012, high resistance to disease was observed by the varieties Shestopalivka, Kopylivchanka, Zemliachka Odeska and Myronivska 61. The highest degree of lesion and the prevalence of Septoria spots were found by the varieties Dykanka, Vasylyna and Nyva Kyivshchyny.

Conclusions. The lesion of winter wheat by speckled leaf blotch depends on the weather conditions, vegetation stages of culture and class. The highest prevalence and degree of lesion of winter wheat by speckled leaf blotch is observed in the boot stage. Under conditions favorable for the development of the pathogenic agent of Septoria spots the lower degree of lesion have the varieties Pyvna, Shestopalivka, Dykanka, Vasylyna and Tronka.

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Анотація

Сухомуд О.Г.

Стійкість пшениці озимої до ураження септоріозом залежно від сорту

Наведено результати вивчення ураження пшениці озимої залежно від сорту. Встановлено, що найвища розповсюдженість та ступінь ураження рослин пшениці септоріозом становить у фазі виходу рослин у трубку. В умовах сприятливих для розвитку збудника септоріозу менший ступінь ураження мають сорти Пивна, Шестопалівка, Диканька, Василина і Тронка.

Ключові слова: *пшениця озима, сорт, септоріоз*

Аннотация

Сухомуд А.Г.

Устойчивость пшеницы озимой к поражению септориозом в зависимости от сорта

Приведены результаты изучения поражения озимой пшеницы в зависимости от сорта. Установлено, что высокая распространенность и степень поражения растений пшеницы септориозом составляет в фазе выхода растений в трубку. В условиях благоприятных для развития возбудителя септориоза меньшую степень поражения имеют сорта Пивная, Шестопаловка, Диканька, Василиса и Тронка.

Ключевые слова: *пшеница озимая, сорт, септориоз*