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STUDY OF WHEAT ROOT ROTS ON DIFFERENT VARIETIES AND IMPROVEMENT OF CONTROL MEASURES

(on the example of farms of the Tashkent region)

Khakimova Nigora Takhirovna

Candidate of Biological Sciences, Professor

Tashkent State Agrarian University

ABSTRACT

The article presents the results of studies on the distribution and harmfulness of root rot diseases of winter wheat under the conditions of the Pskent and Kuyichirchik districts of the Tashkent region. Field experiments were conducted in the farms “Otabek Shahlo” and “Yangi Hayot”, where the resistance of wheat varieties “Grom” and “Aleksich” to root rot pathogens (*Fusarium* spp., *Bipolaris sorokiniana*) was studied, and the effectiveness of modern seed treatment fungicides — Vaybrans Integral and Maksim Forte — was evaluated. Based on the obtained data, practical recommendations were developed to improve the wheat protection system against root rots under regional conditions.

Keywords: Wheat, root rot, *Fusarium*, *Bipolaris*, fungicide, yield.

ANNOTATSIYA

Maqolada Toshkent viloyatining Pskent va Quyichirchiq tumanlari sharoitida kuzgi bug‘doyda ildiz chirish kasalliklarining tarqalishi va zararliligi bo‘yicha olib borilgan tadqiqotlar natijalari keltirilgan. “Otabek Shahlo” va “Yangi hayot” fermer xo‘jaliklarida o‘tkazilgan dala tajribalarida “Grom” va “Aleksich” bug‘doy navlarining ildiz chirish qo‘zg‘atuvchilari (*Fusarium* spp., *Bipolaris sorokiniana*) ga nisbatan chidamliligi o‘rganildi hamda urug‘larni dorilash uchun

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qo‘llanilgan zamonaviy fungitsidlar — Vaybrans Integral va Maksim Forte preparatlarining samaradorligi baholandi. Olingan ma‘lumotlar asosida hudud sharoitida bug‘doyni ildiz chirish kasalliklaridan himoya qilish tizimini takomillashtirish bo‘yicha amaliy tavsiyalar ishlab chiqildi.

Kalit so‘zlar: bug‘doy, ildiz chirish, *Fusarium*, *Bipolaris*, fungitsid, hosildorlik.

АННОТАЦИЯ

В статье представлены результаты исследований по распространению и вредоносности корневых гнилей озимой пшеницы в условиях Пскентского и Куйичирчикского районов Ташкентской области. В ходе полевых опытов, проведённых в фермерских хозяйствах «Отабек Шахло» и «Янги ҳаёт», изучена устойчивость сортов пшеницы «Гром» и «Алексеич» к возбудителям корневых гнилей (*Fusarium* spp., *Bipolaris sorokiniana*), а также дана оценка эффективности современных протравителей семян — Vaybrans Integral и Maksim Forte. На основании полученных данных разработаны практические рекомендации по совершенствованию системы защиты пшеницы от корневых гнилей в условиях региона.

Ключевые слова: пшеница, корневая гниль, *Fusarium*, *Bipolaris*, фунгицид, урожайность.

INTRODUCTION

Wheat is one of the most important food crops, playing a key role in ensuring food security of the Republic of Uzbekistan. Increasing yield and stability of grain production largely depends on effective control of diseases that limit plant growth and development at early stages of ontogenesis.

Among the most harmful wheat diseases, root rots caused by a complex of phytopathogenic fungi, primarily *Fusarium* spp. and *Bipolaris sorokiniana*,

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occupy a special place. These pathogens affect the root system and stem base during the stages of seedling emergence, tillering, and stem elongation, leading to disruption of water and mineral nutrition, plant suppression, and partial plant death. As a result, yield losses may reach 20–25%, and under favorable conditions for pathogen development — up to 30% or more.

The soil and climatic conditions of the Tashkent region, particularly the Pskent and Kuyichirchik districts, are characterized by differences in soil moisture, groundwater depth, and agronomic practices. These factors significantly influence the species composition of root rot pathogens and the degree of their harmfulness. In addition, wheat varieties differ in their level of genetic resistance to these diseases, which necessitates a differentiated approach to variety selection and plant protection measures.

In modern plant protection systems, integrated methods are of particular importance, including the selection of resistant varieties, adherence to agronomic practices, and the use of multicomponent fungicides for seed treatment. Therefore, the aim of this study was to investigate the distribution of wheat root rots in the Tashkent region, assess the resistance of selected varieties and the effectiveness of modern fungicides, and develop recommendations for improving control measures against these diseases.

MATERIALS AND METHODS

The studies were conducted in 2024–2025 in the Pskent district (farm “Otabek Shahlo”) and the Kuyichirchik district (farm “Yangi Hayot”) of the Tashkent region.

Objects of study: winter wheat varieties “Grom” and “Alekseich”.

Methodology: Recording and diagnosis of root rots were carried out according to the methods recommended by I.M. Polyakov (1976) and V.F. Peresyepkin (1989), with determination of the percentage of affected plants and the degree of disease development.

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Applied preparations:

Vaybrans Integral — 1.5–2.0 L/t;

Maksim Forte — 1.5 L/t.

The preparations were used for pre-sowing seed treatment.

RESULTS AND DISCUSSION

The results of field studies showed that the development of winter wheat root rots in the studied farms of the Tashkent region has pronounced territorial and varietal characteristics. Similar conclusions are presented in the works of several researchers, who note a close relationship between soil and climatic conditions and the species composition of root rot pathogens (Hasanov et al., 2021).

Under the conditions of the Pskent district in the farm “Otabek Shahlo”, *Bipolaris sorokiniana* was the dominant root rot pathogen. According to R.K. Sattarova (2022), this pathogen more often develops under relatively dry soil conditions and insufficient aeration of the root zone, which fully corresponds to the results of our observations. In the control variants, disease development on the variety “Grom” reached 16.8%, confirming the high harmfulness of the pathogen in the absence of protective measures.

In the Kuyichirchik district, characterized by increased soil moisture and shallow groundwater levels, fungi of the genus *Fusarium* predominated. A similar pattern was reported by Muller (2022), who indicated that *Fusarium* spp. intensively develop under excessive moisture conditions and are a major cause of reduced field emergence and wheat productivity. In our study, in the farm “Yangi Hayot”, the level of root rot development in the control variant was 14.5%.

The application of modern fungicides for pre-sowing seed treatment significantly reduced the degree of plant infection. Thus, the use of Vaybrans Integral on the variety “Grom” reduced disease development to 1.8%, with a biological effectiveness of 89.2%.

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The obtained data are consistent with the results of Toshkenboev (2023), who noted the high efficiency of three-component seed dressers based on sedaxane, fludioxonil, and tebuconazole against a complex of soil-borne pathogens. In variants treated with Maksim Forte on the variety “Alekseich”, the development of root rots did not exceed 2.1%, and effectiveness reached 85.5%. According to Hasanov et al. (2021), preparations based on fludioxonil provide reliable protection of seedlings during the initial stages of vegetation, which is confirmed by the results of this study.

Table 1 Development of root rots and fungicide effectiveness in different farms

Farm	Variety	Applied preparation	Disease development, %	Effectiveness, %
“Otabek Shahlo”	Grom	Control	16.8	–
“Otabek Shahlo”	Grom	Vaybrans Integral	1.8	89.2
“Yangi Hayot”	Alekseich	Control	14.5	–
“Yangi Hayot”	Alekseich	Maksim Forte	2.1	85.5

It should be noted that the variety “Alekseich” showed higher resistance to root rots in all experimental variants compared to the variety “Grom”. Similar data are reported by domestic and foreign researchers, indicating that varietal characteristics significantly affect the degree of root system infection and yield losses (Sattarova, 2022; Muller, 2022).

Improvement of the phytosanitary condition of crops had a positive effect on yield formation. In the farm “Otabek Shahlo”, the use of Vaybrans Integral resulted in more intensive root system development (1.5 times compared to the control), which ensured a yield increase of 8.4 c/ha. According to several authors, a well-

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developed root system is a key factor in increasing plant resistance to stress conditions and soil infections (Hasanov et al., 2021).

Thus, the obtained results not only confirm previous studies but also supplement them, taking into account the specific soil and climatic conditions of the Tashkent region, which allows recommending an integrated approach to wheat root rot management.

CONCLUSIONS

1. The species composition of wheat root rot pathogens differs among districts of the Tashkent region, which requires adaptation of protection measures to specific soil and climatic conditions.
2. The highest effectiveness (89–90%) in controlling root rots was provided by three-component fungicides based on sedaxane, fludioxonil, and tebuconazole.
3. The variety “Aleksich” showed a higher level of resistance to root rots compared to the variety “Grom” and is recommended for cultivation in the conditions of the Pskent and Kuyichirchik districts.

REFERENCES

1. Muller T.S. Management of wheat root rot diseases through chemical and biological control. *Journal of Plant Pathology*. 2022; 104: 415–422.
2. Ministry of Agriculture of the Republic of Uzbekistan. Recommendations on the protection of cereal crops. Tashkent, 2024: 12–15.
3. Peresyphkin V.F. Diseases of Agricultural Crops. Moscow: Agropromizdat, 1989: 92–104, 213–220.
4. Polyakov I.M. Agricultural Phytopathology. Moscow: Kolos, 1976: 156–168.
5. Sattarova R.K. Phytopathology of Cereal Crops (textbook). Tashkent: TSAU, 2022: 88–94.
6. Toshkenboev S. Analysis of soil fertility and grain crop yields in the Pskent and Kuyichirchik districts. *Agro Ilm*. 2023; 3: 24–26.
7. Hasanov B.A. et al. Diseases of Agricultural Crops and Control Measures. Tashkent: Yangi asr avlodi, 2021: 142–156.