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**AGROTECHNOLOGICAL METHODS  
OF PEST CONTROL OF SPRING WHEAT**

*To obtain a good yield of grain crops, including spring wheat, specialists use various techniques to prevent grain losses. One of the factors affecting the yield of spring wheat is the impact of pests. There are about 300 species, but 140 of them are the most significant. Their degree of harmfulness depends on climatic conditions and the phase of vegetation of plants [4].*

*The main pests of spring wheat are: wheat thrips, meadow moth, bug harmful turtle, bread beetle, dark nutcracker, striped nutcracker, bread bug, common cereal aphid, gray grain scooper and other insects.*

*The following methods of control are used to combat these pests: agrotechnological, biological and chemical [6].*

*Agrotechnical methods include: observing crop rotation, sowing dates, plowing and weeding the soil on time, timely harvesting of grain crops, cleaning of plant residues from fields. In addition, it is important to use high-quality varieties.*

*Keywords: Spring wheat, agrotechnological methods, silverbeard, pests, sowing dates, varieties.*

**Introduction**

Spring wheat plays an important role in agriculture, but its yield and quality are often threatened by various pests. Agrotechnological methods are widely used to combat them, which have a significant impact on the production process and the surrounding ecosystem. The effective use of agrotechnologies helps to reduce the harmful effects on crops, improve the quality of crops, preserve biodiversity

and natural resources, and also contributes to the sustainable development of agriculture [7,8].

In this review, we will look at various agrotechnological methods used to control spring wheat pests and their impact on the sustainability of cultivated plants, the ecosystem and the environment. A detailed analysis of these methods will allow for a better understanding of their role in modern agriculture and take into account the need to take them into account when developing sustainable farming strategies [10].

### **Materials and methods**

The use of such agricultural techniques as variety selection, crop rotation, depth of tillage, timing of sowing and harvesting, etc. They can effectively affect the habitat of pests, thereby reducing crop losses and reducing its quality from phytophages. At the same time, the effect of one or another agrotechnical technique in different agro-climatic zones will manifest itself differently, therefore, it is necessary to choose agricultural techniques taking into account the soil and climatic characteristics of a particular area, or even a separate farm, as well as taking into account the frequently occurring types of wheat phytophages [5].

### **Results and discussion**

With the help of scientifically based crop rotation in the fields, it is also possible to reduce the number of pests and the degree of development of diseases in the fields. The cultivation of wheat by wheat contributes to the creation of favorable conditions for the growth of the number of gray grain scoops, wheat thrips, cereal flies, and the accumulation of root rot infection. When growing certain crops, it is important to observe spatial isolation from related and wild species that have common pests, such as, for example, not to place grain and wheat crops nearby, since the appearance of bread beetles and their migration to fields with crops is possible [9]. To reduce the harmful effects of phytophages and phytopathogens on wheat agrobiocenoses, all types of soil treatments and the timeliness of their implementation are important. Many pests of spring wheat are closely related to the soil, this is their habitat for a long time or for the period of passing some phase of development (egg, larva, pupa). All types of loosening destroy the soil crust, which contributes to the normal growth and development of plants, and make them less susceptible to harmful organisms. With high-quality and timely steam treatment, the stock of wintering pests decreases sharply. On small non-fallow tillage systems, there is a higher number of insects, compared with dump plowing, by 11.6–64.1 %. At the same time, as the researchers note, in addition to phytophages, entomophages such as ladybug are also more common here. The colonization of fields with shallow tillage with grain striped and stem fleas, cicadas, wheat thrips is explained by more favorable conditions for their

wintering: remnants of stubble, straw. One of the promising ways to combat harmful organisms is to choose wheat varieties that are resistant to their effects. In addition, varieties react differently to pest damage, some dramatically reduce productivity, while others are not noticeably oppressed. For example, this can be well observed in sucking insects – aphids and bedbugs. The bug is a harmful turtle that damages rapidly maturing varieties less. When choosing the sowing period, it is important to take into account: the degree of coincidence of the wheat development phase with the period of the greatest number and activity of the phytophage, the age of the damaged plant, on which the nature of the damage depends, as well as the formation of tissues in the culture that prevent the penetration of the pest. Sowing wheat in the recommended optimal time makes it possible to obtain friendly seedlings, which increases their resistance against damage by pests and damage by pathogens. For example, when sowing wheat in early May, the damage to the gray grain scoop was 72%, on May 10–15 – 32 and 15%, respectively, and on May 25 – 7 % of the grains [2]. Pests develop and feed not only on crops, but also on weeds inside the agrobiocenosis of wheat, as well as near crops on natural sites. Often in the early spring period, when there are no seedlings of the crop yet, many pests feed on weeds, from which they then migrate to the fields (Lepidoptera, diptera, etc.). The nectar of many flowering weeds serve as food for butterflies of the scooper scale, meadow moth, which increases their fertility. Therefore, weeds are an additional feed resource for many pests, and combating them is an important agrotechnical technique. The timing of wheat harvesting affects crop shortages associated with harmful organisms, as well as the conditions for completing their development. For example, cleaning in a short time causes the death of the larvae of a harmful turtle, and adult bedbugs do not have time to gain the necessary mass for successful overwintering [3]. Therefore, it is very important to start harvesting from fields with a high pest density in order to reduce crop losses and the number of harmful organisms. High-quality harvesting of wheat, carried out within the recommended time frame, will create unfavorable conditions for the habitat of phytophages, depriving them of nutrition, and therefore they will go into winter unprepared, which will lead to their significant death [1].

### **Conclusions**

The use of agrotechnological methods for pest control of spring wheat effectively reduces the harmful effects on the crop, contributes to the sustainable development of the ecosystem and increases productivity.

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## **ЖАЗДЫҚ БИДАЙ ЗИЯНКЕСТЕРІМЕН КҮРЕСУДІҢ АГРОТЕХНОЛОГИЯЛЫҚ ӘДІСТЕРІ**

*Дәнді дақылдардан, соның ішінде жаздық бидайдан жақсы өнім алу үшін мамандар астық өнімінің төмендеуін болдырмау үшін әртүрлі әдістерді қолданады. Жаздық бидайдың өнімділігіне әсер ететін факторлардың бірі – зиянкестердің әсері. Олардың 300-ге жуық түрі бар, олардың 140-ы өте көп таралған. Олардың зияндылық дәрежесі климаттық жағдайларға және өсімдіктердің вегетациялық кезеңіне байланысты. Жаздық бидайдың негізгі зиянкестері: бидай трипсі, шабындық көбелегі, төсек құрты, зиянды тасбақа, нан қоңызы, қараңғы шелкунчик, жолақты шелкунчик, нан түйіршіктері, кәдімгі дәнді тли, сұр астық құрты және басқа да*

*жәндіктер. Бул зиянкестермен күресу үшін келесі бақылау әдістері қолданылады: агротехнологиялық, биологиялық және химиялық.*

*Агротехникалық әдістерге мыналар жатады: ауыспалы егіс, себу мерзімдерін сақтау, топырақты уақытында жырту және арамшөптерден тазарту, дәнді дақылдарды уақтылы жинау, егістіктен өсімдік қалдықтарын жинау. Сонымен қатар, сапалы сорттарды қолдану маңызды.*

*Кілтті сөздер: жаздық бидай, агротехнологиялық әдістер, ауыспалы егіс, зиянкестер, себу мерзімі, сорттар.*

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## **АГРОТЕХНОЛОГИЧЕСКИЕ МЕТОДЫ ПРИ БОРЬБЕ С ВРЕДИТЕЛЯМИ ЯРОВОЙ ПШЕНИЦЫ**

*Для получения хорошей урожайности зерновых культур, в том числе яровой пшеницы, специалисты используют различные приемы для предотвращения потерь зерна. Одним из факторов, влияющим на урожайность яровой пшеницы, является воздействие вредителей. Их насчитывается около 300 видов, но 140 из них наиболее значимы. Их степень вредоносности зависит от климатических условий и фазы вегетации растений.*

*Основные вредители яровой пшеницы являются: пшеничный трипс, луговой мотылёк, клоп вредная черепашка, хлебный жук, щелкун тёмный, щелкун полосатый, хлебный клопик, обыкновенная злаковая тля, серая зерновая совка и другие насекомые.*

*Для борьбы с этими вредителями применяются следующие приемы борьбы: агротехнологические, биологические и химические.*

*К агротехническим методам относятся: соблюдение севооборота, сроков посева, вспашка и прополка почвы в срок, своевременная уборка урожая зерновых культур, уборка растительных остатков с полей. Кроме того, важно использовать качественные сорта яровой пшеницы, устойчивые к воздействию вредителей.*

*Ключевые слова : яровая пшеница, агротехнологические методы, севооборот, вредители, сроки посева, сорта.*



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