

THE EFFECT OF MINERAL FERTILIZER NORMS ON THE PERIOD OF AUTUMN WHEAT DEVELOPMENT AND IRRIGATION REGIME IN DIFFERENT SOIL CLIMATE CONDITIONS

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Abstract: the development of the grain sector is closely connected with many factors. Among them, the adaptation of varieties to different soil-climatic conditions, morphological and biological characteristics, mineral fertilizers and irrigation regimes depend on the optimal growth and development of the plant. These factors affect the growth and development of winter wheat. Besides, during the period from shooting stage of winter wheat to spiking period, intensive formation of reproductive organs, rapid yield accumulation of vegetative mass has been also observed. The acceleration of the growth process depends to some extent on the external medium, primarily on temperature and humidity.

Keywords: winter wheat, varieties, fertilizer, irrigation, norm, amount, growing, agrotechnical, indicator.

ВЛИЯНИЕ НОРМ МИНЕРАЛЬНЫХ УДОБРЕНИЙ НА ОСЕННИЙ ПЕРИОД РАЗВИТИЯ ПШЕНИЦЫ И РЕЖИМ ОРОШЕНИЯ В РАЗНЫХ ПОЧВЕННЫХ УСЛОВИЯХ

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Аннотация: развитие зернового сектора тесно связано со многими факторами. Среди них адаптация сортов к различным почвенно-климатическим условиям, морфологические и биологические характеристики. Минеральные удобрения и режимы полива зависят от оптимального роста и развития растения. Эти факторы влияют на рост и развитие озимой пшеницы. Кроме того, в период от всхода озимой пшеницы до колосьев наблюдается интенсивное формирование репродуктивных органов, быстрое накопление урожая вегетативной массы. Ускорение процесса роста в некоторой степени зависит от внешней среды, в первую очередь, - от температуры и влажности.

Ключевые слова: озимая пшеница, сорта, удобрение, полив, норма, количество, выращивание, агротехника, показатель.

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INTRODUCTION.

Appropriate conditions for normal growth and development of winter wheat have been created only when the soil moisture, fertilizer norms are in optimal amounts. The yield accumulation period and shooting are the longest development period of the winter wheat during which the decrease in air and soil temperature also causes a certain change in the duration of the yield accumulation and shooting period. [1; 18-20 p., 2; 161-165 p.].

Taking into account the above, our research showed that in the condition of typical gray soils in the upper part of Kashkadarya oasis (Shakhrisabz district) and light gray soils in the lower part (Karshi district), the growth of winter wheat varieties varies depending on irrigation and fertilization norms (Table 1).

The object of the research.

For instance, according to the yield of accumulation period, shooting and flowering period of winter wheat varieties studied in the research when planted in the conditions of typical upper gray soils (Shakhrisabz district); was 40-50; 138-148; 180-194 and 187-201 days, these indicators equalled to 47-56, 131-142; 170-182 and 177-190 days, respectively in the average variants which planted in conditions of low light gray soils. (Karshi district) (Table 1).

Table 1. The influence of irrigation and fertilization norms on different soil climatic conditions on the development of the winter wheat

№ Var.	Irrigation regime, (%)	Mineral fertilizernorms, kg/ha	Variety names	Shakhrisabz district, (typical gray soils)				Karshi district, (light gray soils)			
				1*	2*	3*	4*	1*	2*	3*	4*
1.	LFMC (70-70-60)	Control (fertilizer free)	“Alekseevich”	48	144	188	195	54	137	178	186
			“Bunyodkor”	50	141	184	191	56	134	174	181
			“Shams”	49	142	185	192	55	135	175	183
2.		N ₁₂₀ P ₈₀ K ₆₀	“Alekseevich”	45	145	190	197	49	138	178	186
			“Bunyodkor”	48	142	185	192	52	135	175	183
			“Shams”	47	143	187	194	53	136	177	185
3.		N ₁₈₀ P ₁₂₀ K ₉₀	“Alekseevich”	43	146	191	198	48	140	179	187
			“Bunyodkor”	46	143	187	194	50	136	177	185
			“Shams”	45	144	188	195	52	138	178	186
4.		N ₂₄₀ P ₁₆₀ K ₁₂₀	“Alekseevich”	40	148	194	201	47	142	182	190
			“Bunyodkor”	42	145	190	197	49	139	178	186
			“Shams”	41	146	191	198	50	140	179	187
5.	LFMC (75-80-70)	Control (fertilizer free)	“Alekseevich”	46	141	184	191	52	134	174	181
			“Bunyodkor”	48	138	180	187	54	131	170	177
			“Shams”	46	139	182	189	53	132	172	179
6.		N ₁₂₀ P ₈₀ K ₆₀	“Alekseevich”	43	142	185	192	49	135	175	183
			“Bunyodkor”	46	139	182	189	51	133	172	179
			“Shams”	45	140	183	190	52	134	173	180
7.		N ₁₈₀ P ₁₂₀ K ₉₀	“Alekseevich”	42	143	187	194	48	137	177	185
			“Bunyodkor”	44	140	183	190	51	134	173	180
			“Shams”	43	141	184	191	52	135	174	181
8.		N ₂₄₀ P ₁₆₀ K ₁₂₀	“Alekseevich”	41	145	190	197	48	139	178	186
			“Bunyodkor”	43	142	185	192	50	136	175	183
			“Shams”	42	143	187	194	51	137	177	185

Notex: Periodsof winterwheat 1* “Yield accumulation”, 2* “Shooting”, 3* “Spiking stage”, 4* “Floering pase”.

Winter wheat begins to grow strongly from the transition to shooting period.

Therefore, winter wheat should be adequately supplied with water and nutrients during this period.

This period in plant life is the most responsible, i.e. the “critical period”

The yield of wheat depends to some extent on the physiological processes during the shooting period, the level of nutrient and moisture supply. [3; 28-29 p., 4; 183-187 p.].

Besides, during the period from shooting stage of winter wheat to spiking period, intensive formation of reproductive organs, rapid yield accumulation of vegetative mass has been also observed.

The acceleration of the growth process depends to some extent on the external medium, primarily on temperature and humidity.

Studies have shown that the winter wheat variety “Alekseevich” was grown in the condition of high typical gray soils (Shakhrisabz distict), the yield accumulation was 44 days, shooting stage was 146 days, spiking stage was 191 days and flowering period equaled to 198 days in proportion to the irrigation regime of LFMC (70-70-60); while these indicators in the irrigation regime of LFMC (75-80-70) the figures showed 43; 143; 187 and 194 days respectively, when planted in the low light gray soils (Karshi district), the indicators constituted 50; 139; 179; 187 days and 49; 136; 176 and 184 days (Fig. 1).

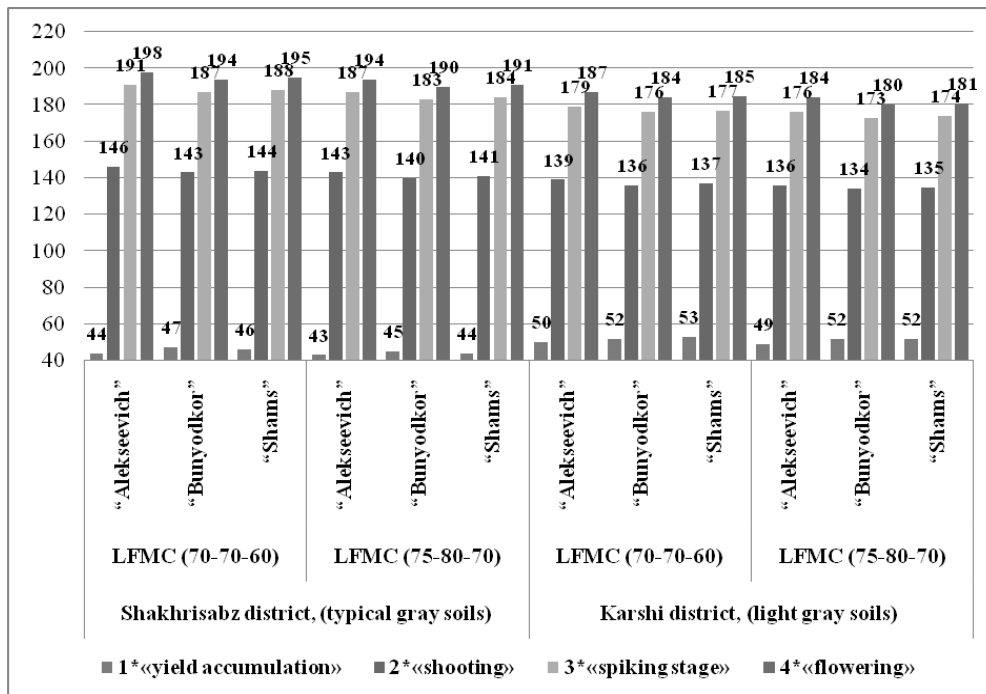


Fig. 1. The influence of irrigation regimes on the duration of the growing season of winter wheat varieties (days)

“Bunyodkor” variety was grown high typical gray soils (Shakhrisabz district), the average yield accumulation of LFMC (70-70-60) in irrigation regime was 47 days, shooting period was 143 days, spiking stage period was 187 days and flowering period was 194 days, these indicators were 45; 140; 183 and 190 days in irrigation regime of LFMC (75-80-70) respectively, in accordance with the above, the study was conducted on the conditions of irrigation regime of low light gray soils (Karshi district) the indicators were noted to be 52;136;176;184 days and 52;134;173; and 180 days.

“Shams” variety was planted in the condition of high typical gray soils (Shakhrisabz district) the average yield accumulation of LFMC (70-70-60) in the irrigation regime was 46 days, shooting period was 144 days, spiking period was 188 days and flowering period showed 195 days, these figures were in the irrigation regime of LFMC (75-80-70) 44; 141;184 and 191 days, in the accordance with the above, the study was conducted on the conditions of irrigation of low light gray soils (Karshi district) was 53; 137; 177; 185 days and 52;135;174 and found to be equal to 181 days.

This means that when winter wheat is not adequately supplied with moisture, the growth process slows down significantly and the plant development accelerates.

This condition adversely affects the yield accumulation in the plant. It was found that in the deficiency of moisture during this period, the plant 4-5 days earlier than usual and in a very intensive state.

The analysis of the experimental results showed that the optimal growth and development of the winter wheat varieties was significantly affected by the increase in the norms of mineral fertilizers (Table 2).

In the study, winter wheat varieties were planted in the conditions of typical gray soils (Shakhrisabz district) and in the controlled (fertilizer free) variant, the average plant yield accumulation, shooting, spiking stage as well as flowering period indicators of “Alekseevich” variety made 47;143;186 and 193 days, “Bunyodkor” variety made 49;140;182 and 189 days, these indicators for “Shams” variety were 48;141;184 and 191 days respectively, when applied $N_{120}P_{80}K_{60}$ kg/ha these indicators were for “Alekseevich” variety 44;144;188 and 195, for “Bunyodkor” variety the indices were 47,141;184 and “Shams” variety showed 46;142;185 and 192 days, when applied $N_{180}P_{120}K_{90}$ kg/ha fertilizer 43;145;189 and 196 days for “Alekseevich” variety, 45; 142;185 and 192 for “Bunyodkor” variety, 44;143;186 and 193 for “Shams” variety, and when applied $N_{240}P_{160}K_{120}$ kg/ha fertilizer for “Alekseevich” variety showed 41;147;192 and 199 days, for “Bunyodkor” variety the figures were 43;144; 188 and 195 days, for “Shams” variety the figures were noted to be 42; 145;189 and 196 days.

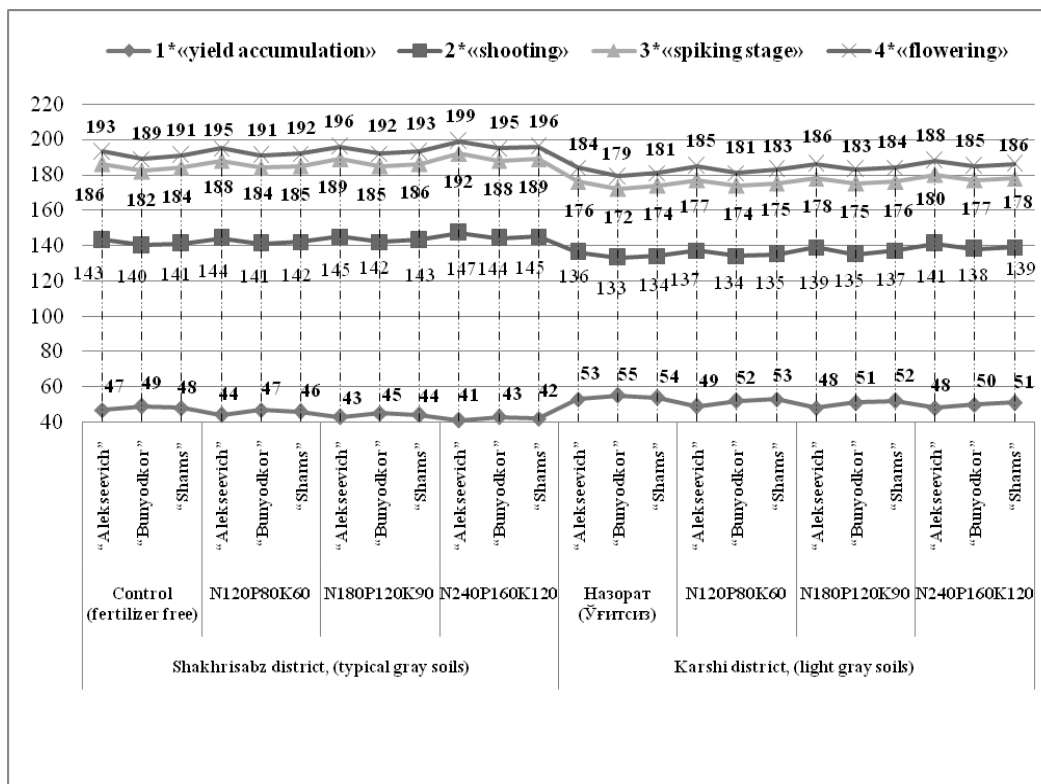


Fig. 2. The influence of mineral fertilizer norms on the duration of the growing season of the winter wheat varieties (days)

In the proportion to the above, in the conditions of light gray soils in the lower part of the Kashkadarya oasis (Karshi district) winter wheat varieties are planted and in the controlled (fertilizer-free) variant, the duration of the average plant yield accumulation, shooting, spiking and flowering period of Alekseevich variety were 53; 136; 176 and 184 days, Bunyodkor variety was 55; 133; 172 and 179, Shams variety showed 54; 134; 174 and 181 days, and these indicators were in proportion when fertilizer applied $N_{120}P_{80}K_{60}$ kg/ha 49; 137; 177; 185 days and 53; 135; 175; 183 days, when $N_{180}P_{120}K_{90}$ kg/ha fertilizer applied the figures were 48; 139; 178; 186 days and 51; 135; 175; 183 days and 52; 137; 176; 184 days, when the fertilizer norm was $N_{240}P_{160}K_{120}$ kg/ha the numbers equaled to 48; 141; 180; 188 days, 50; 138; 177; 185 days and 51; 139; 178; 186 days (Fig. 2).

CONCLUSION. So, in conclusion, it can be said that a number of factors such as soil, climate, fertilizers, water affect the growth as well as development of winter wheat.

That is under the influence of these factors there is a common integrity in the growth and development of the plant, the physiological and biological processes in the plant body, their nutrition through the roots and air, energy supply for grows, in general, the total of all processes involved in assimilation and dissimilation.

On the contrary, due to improperly used agrotechnics, the duration of the growing season of the plant is prolonged, which leads to the simultaneous immaturity of ears and the failure of the grain.

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