

Influence of the aftereffect of mineral fertilizers applied at different rates and ratios on the fields of winter wheat on the structure of the millet crop

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Abstract. The article presents the aftereffect of the norms and ratios of mineral fertilizers used in the cultivation of winter wheat on the structure of the yield of millet grown as a re-crop in the stubble. As a result of an increase in the norms and ratio of mineral fertilizers and an increase in the number of residues in the soil, an increase in the productive millet eating from 0.4 to 0.9 pieces was noted, and an increase in the length of the panicle from 1 cm to 3 cm, the number of grains in the panicle increased from 20 to 99 grains, The grain mass of the panicle increased from 5.2 to 6.3 g, the mass of the grain of the panicle increased from 0.7 g to 1.8 g, the mass of 1000 grains increased compared to the control variant by 0.5 g - 1.8 g. , the nature of millet grain increased from 2 g/l to 11 g/l compared with the control variant.

Keywords: millet, stubble, re-sowing, experiment, variant, top dressing, mineral fertilizer, soil residues, nitrogen, phosphorus, potassium, panicle, productive tillering, natural grain.

Introduction

According to its biological characteristics, millet is resistant to high temperature and drought, drought, and high air temperature, it is considered a very favorable crop for increasing the efficiency of irrigated lands in the conditions of the southern regions of our country [1].

According to the results of our research, it was found that when growing millet in the second half of summer on the stubble of winter wheat, you can get a plentiful and high-quality crop even in conditions of high air temperature and limited water supply [2]

In arid conditions, the cultivation of winter wheat and millet as secondary crops sharply reduces the consumption of phosphorus fertilizers. Nevertheless, in such conditions, obtaining abundant and high-quality crops of millet grown in the southern regions can serve as a way to identify new effective ways to save mineral fertilizers.

The object of study and methodology

Field experiments were carried out from 2012-2014 on the farm "Kulmanov Umar" in the Kosonsky district. The area of the field experiment was 90 m², the calculated area was 50 m², and they were carried out in four repetitions [1].

Mineral fertilizers in the field of winter wheat in 7 variants: control variant without applying NPK, reduced (N₁₅₀P₇₅K₅₀), recommended (N₁₈₀P₉₀K₆₀), increased (N₂₁₀P₁₀₅K₇₀) norms, and phosphorus fertilizers in increased proportions (N₂₁₀P₁₂₀K₈₀), (N₂₁₀P₁₃₅K₁₀₀), (N₂₁₀P₁₅₀K₁₀₀) were carried out in the field experiences. The aftereffect of mineral fertilizers was studied when growing millet as a secondary crop on winter wheat stubble [2].

Research results and discussion

The main indicators that determine the yield of millet grain are determined by productive tillering, the length of the panicle, the number of grains in the panicle, the mass of grain in one panicle, the weight of 1000 grains, and the nature of the grain.

Table 1 shows the aftereffect of mineral fertilizers used to feed winter wheat on the structure of the millet crop.

In the stubble, it was noted that the effect of mineral fertilizer residues on the yield of millet grown as a secondary crop varies depending on the norms and proportions of mineral fertilizer application for winter wheat grown as the main crop.

Productive tillering of millet, grown as a re-crop in the control without mineral fertilizers, was 2.1 pieces. Its increase by 0.2 pieces was noted at a reduced rate of mineral fertilizers (N₁₅₀P₇₀K₅₀) and by 0.3 pieces at the recommended rate and ratio.

As a result of an increase in the norms and ratio of mineral fertilizers and an increase in the number of residues in the soil, an increase in the productive eating of millet from 0.4 to 0.9 pieces was noted. The same pattern was repeated in an increase in the length of the panicle and the number of grains in the panicle.

Table 1

Aftereffects of mineral fertilizers used to feed winter wheat on the structure of the millet crop (2012-2014)

№	Experience options	Productive tillering		Panicle length		The number of grains in a panicle	
		amount	Difference ±	cm	Difference ±	things	Difference ±
1	Without fertilizer (st)	2,1	0	20	0	510	0
2	N ₁₅₀ P ₇₀ K ₅₀	2,3	+0,2	21	+1	530	+20
3	N ₁₈₀ P ₉₀ K ₆₀ (st)	2,4	+0,3	21	+1	549	+39
4	N ₂₁₀ P ₁₀₅ K ₇₀	2,5	+0,4	22	+2	568	+58
5	N ₂₁₀ P ₁₂₀ K ₈₀	2,7	+0,6	22	+2	573	+63
6	N ₂₁₀ P ₁₃₅ K ₉₀	2,8	+0,7	23	+3	592	+82
7	N ₂₁₀ P ₁₅₀ K ₁₀₀	3,0	+0,9	23	+3	609	+99

As a result of the aftereffect of the influence of the norms and ratios used in the cultivation of winter wheat, the amount of panicle in millet was observed to increase in proportion to the norms and ratios of fertilizers.

It was noted with different norms and ratios of mineral fertilizers applied when feeding winter wheat due to the aftereffect of mineral fertilizer residues, an increase in panicle length from 1 cm to 3 cm was observed.

It is noted that the increase in the number of grains in the panicle of millet is due to the aftereffect of mineral fertilizers used in the cultivation of winter wheat.

Because the higher the norms and proportions of mineral fertilizers applied to the top dressing of winter wheat grown as the main crop, the higher the amount of mineral in the soil. For this reason, it was found that the number of grains of the panicle grown against the background of the control variant without mineral fertilizers was 510 grains, and against the background of norms and ratios of mineral fertilizers, it increased from 20 to 99 grains.

The higher the norm and ratio of mineral fertilizers applied to winter wheat as the main crop in the system of cultivation of grain crops grown twice a year, the higher the number of their residues in the soil, and the higher the subsequent impact on the structure and quality of the crop. cultures. As the mass increases, the panicles become longer, and the number of grains in the panicles increases.

It was noted that the structure of the millet yield, along with the length of the panicle and the number of grains in the panicle, increased the weight of grains in one panicle, the weight of 1000 grains, and grain sizes (Table-2).

Table 2

Aftereffects of mineral fertilizers used for feeding winter wheat on the formation of millet grain (2012-2014)

№	Experience options	panicle grain mass		Masses of 1000 grains		Grain nature	
		g	difference, ±	g	difference, ±	g	difference, ±
1	Without fertilizer (st)	4,5	0	6,5	0	731	0
2	N ₁₅₀ P ₇₀ K ₅₀	5,2	+0,7	7,0	+0,5	733	+2
3	N ₁₈₀ P ₉₀ K ₆₀ (st)	5,4	+0,9	7,3	+0,8	735	+4
4	N ₂₁₀ P ₁₀₅ K ₇₀	5,5	+1,0	7,4	+0,9	736	+5
5	N ₂₁₀ P ₁₂₀ K ₈₀	5,7	+1,2	7,6	+1,1	738	+7
6	N ₂₁₀ P ₁₃₅ K ₉₀	5,9	+1,4	7,8	+1,3	740	+9
7	N ₂₁₀ P ₁₅₀ K ₁₀₀	6,3	+1,8	8,3	+1,8	742	+11

It was noted that the grain mass of panicle grown in the second half of summer as a re-crop against the background of winter wheat fed with mineral fertilizers in different doses and ratios increased from 5.2 to 6.3 g.

If we compare this indicator with experimental options, we will see the following. The mass of grain in the panicle grown against the background of the control variant of the experiment without the use of mineral fertilizers was 4.5 g, and against the background of increased norms and ratios of mineral fertilizers, it increased from 5.2 g to 6.3 g. Or increased from 0.7 g up to 1.8 g compared with the control variant.

There was also an increase in the weight of 1000 grains and the weight of the variety according to the variants of the experiment as a result of the aftereffect of the influence of the norms and proportions of mineral fertilizers used in feeding winter wheat.

If the mass of 1000 grains of millet in the control variant without mineral fertilizers was 6.5 g, then with further exposure to the norms and ratios of mineral fertilizers, it increased from 7.0 g to 8.3 g compared to the control variant, and an increase of 0.5 was observed. g - 1.8 g.

It is noted that the natural mass of millet grain grown against the background of the norms and ratios of mineral fertilizers used in the cultivation of winter wheat increases in accordance with the number of mineral fertilizer residues in the soil. That is, it was observed that the nature of millet grain in the control variant was 731 g/l, and the nature of millet grain against the background with mineral fertilizers increased from 733 g/l to 742 g/l. That is, it increased from 2 g/l to 11 g/l compared to the control variant without mineral fertilizer.

Conclusions

When winter wheat is fed with the norms and ratios of mineral fertilizers, due to the residues in the soil, the amount of grain in the mass of 1000 grains and the nature of millet grain increase.

As a result of an increase in the norms and ratio of mineral fertilizers and an increase in the number of residues in the soil, an increase in the productive eating of millet was noted from 0.4 to 0.9 pieces, an increase in the length of the panicle from 1 cm to 3 cm, the number of grains in the panicle increased from 20 to 99 grains. The grain mass of the panicle against the background of winter wheat, fed with mineral fertilizers in different doses and ratios increased from 5.2 to 6.3 g, the mass of grain in the panicle increased from 0.7 g to 1.8 g, and the weight of 1000 grains increased from 7, 0 g to 8.3 g compared with the control variant, an increase of 0.5 g - 1.8 g was observed, the nature of millet grain increased from 2 g/l to 11 g/l compared with the control variant without mineral fertilizer.

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