



INFLUENCE OF THE USE OF COMPOSTS OF DIFFERENT COMPOSITIONS ON THE GROWTH AND YIELD OF COTTON

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ANNOTATION

The article describes the impact of the use of composts of various compositions on the growth and development and yield of cotton. This is the growth and development of cotton with the use of compost -2 at rates of 10 and 20 t/ha, these indicators, respectively, amounting to 99.8–105.9 cm, the yield of raw cotton averaged 37.1 c/ha and, comparing to control, 6.7 c/ha additional crop.

KEY WORDS: *compost, composition, cotton growth and development, productivity, fertility, soil, phosphogypsum, rice and sawdust, manure, poultry manures.*

INTRODUCTION

Recently, in the cotton growing of the republic, large-scale measures have been taken to apply the optimal norms and terms for the joint use of organic and mineral fertilizers, the use of organomineral composts for plant nutrition. The use of organic fertilizers on gray soils, desert-sandy, gray-brown, taky and other soils makes it possible to obtain high and stable yields of raw cotton.

In this regard, the preparation of composts from phosphogypsum and various organic substances in optimal ratios and carrying out research to improve soil fertility and nutrient uptake by the plant, as well as determining their effect and aftereffect on cotton yields, is relevant.

According to R.K. Kuziev [3; 51-60-p.] in order to preserve, increase soil fertility and regulate the balanced mineral nutrition of plants, it is necessary to revise the system of applying fertilizers for various crops, taking into account the use of new forms of organic fertilizers (lignin, composts, organomineral mixtures, biofertilizers, etc.) and local mineral raw materials. For these purposes, it is necessary to introduce in all natural and economic zones of the republic, for all farms, the practice of collecting, evaluating, composting and applying local organic and mineral fertilizers to the soil.

The data of M. Sorokin, S.G. Okhotnik and T. Yakhina [4, 11-12-p] show that the use of organic fertilizers for cotton contributes to the formation of high-quality raw cotton with good technological indicators of fiber and seeds. At the same time, there is no growth of the tissue of the base of the outer integument of the peel and the chalazal part in the form of loose layered thickenings, leading to a decrease in the mechanical strength of the seed peel and the formation of a skin defect with fiber during ginning.

The results of studies by A.Zh.Bairov, D.Kh.Khamdamov and A.A. Zhuraev [1; 170-173-p; 2; 66-67-p.], showed that organomineral composts obtained from fresh poultry manures with the addition of straw, ammophos (at the rate of 1.5-2.0% of the total mass of compost) and phosphogypsum (5-7% of the total mass compost) are rich in organic matter (37.9-43.7%) and the content of total nitrogen was in the range of 1.55-2.56%. The highest content of organic matter and total nitrogen was observed in option I (poultry manure+straw+soil+ammophos) and in option 4 (poultry manure+straw+soil+phosphogypsum).

Compost was applied on the soil (KR manure + sawdust). Under the influence of long-term use of compost, the physical properties of the soil have significantly improved. The water-retaining capacity increased, incl. moisture available to plants and matrix potential. The parameters of soil porosity have noticeably improved. The biological properties of the soil have improved. As a result, these changes contributed to an increase in crop yields [5; 535-539-p, 6; 7].

MATERIAL AND METHODOLOGY OF THE RESEARCH

Field experiments were carried out in conditions of typical gray soils in the educational and experimental farm of the Tashkent State Agrarian University. We used the methods of UzSRIA in our research.

The experiments were carried out in nine variants, in four repetitions. In the following schemes: 1) N₂₀₀; P₁₄₀; K₁₀₀ (control); 2) NPK + 10 t/ha of manure; 3) NPK + 20 t/ha manure; 4) NPK + 10 t/ha compost - 1; 5) NPK + 20 t/ha compost-1; 6) NPK + 10 t/ha compost - 2; 7) NPK + 20 t/ha compost - 2; 8) NPK + 10 t/ha compost - 3; 9) NPK + 20 t/ha compost - 3 (note:



compost - 1 - (rice and sawdust - 25%, manure - 25%, poultry manures - 45%, phosphogypsum - 5%); compost - 2 - (rice and sawdust - 25%, manure - 25%, poultry manures - 35%, phosphogypsum - 15%); compost - 3 - (rice and sawdust - 25%, manure - 25%, poultry manures - 25%, phosphogypsum - 25%); cattle manure).

RESULTS OF THE RESEARCH

When using various composts, in the first year, an increase under their influence in the 0–30 cm soil layer of the bulk density by 0.05–0.07 g/cm³ and porosity by 2.2–2.6% was revealed, along with this, preservation of their impact in subsequent years in the variants in which composts were introduced.

The optimal effect of the applied composts was observed at a rate of 20 tons/ha of compost-2. At the same time, an increase in the amount of humus in 0–30 and 30–50 cm soil layers relative to the control by 0.115–0.024%, nitrogen by 0.010–0.002% and phosphorus by 0.014–0.003% was also observed.

It is stated that the influence of composts was clearly reflected in the growth and development of cotton in subsequent years. Under the influence of 10 and 20 t/ha of compost -1, the height of the main cotton stem was (1.08) 100–105.2 cm, the number of sympodial branches, as well as the total number of open buds was 13.5–14.9; 10.9–12.7 and 3.43–4.14 pieces, and the weight of cotton in one bud was 4.55–4.72 and, accordingly, relative to the control was higher by 12.0–17.2 cm, 2.0–3.4; 1.5–3.3 and 0.73–1.44 pieces, as well as by 0.35–0.5 grams, and regarding the options in which manure was used, by 2.0–0.5 cm, 0.3–0.5; 0.2–0.2 and 0.23–0.38 pieces, as well as 0.1–0.07 grams. When using compost -2 at rates of 10 and 20 t/ha, these figures, respectively, amounting to 99.8–105.9 cm, 13.7–15.2; 11.0–12.9 and 3.5–4.3 pieces, as well as 4.6–4.75 grams, relative to the control were higher by 11.8–17.9 cm, 2.2–3.7; 1.6–3.5 and 0.8–1.6 pieces, as well as by 0.4–0.55 grams, relative to options 2 and 3, where 10 and 20 tons of manure per hectare were applied, were higher by 1.8–1.2 cm, 0.5–0.8; 0.3–0.4 and 0.3–0.47 pieces, as well as 0.15–0.1 grams. And when using compost -3 in the norms of 10 and 20 t/ha, making respectively the above 98.8–104.6 cm, 13.4–14.7; 10.8–12.5 and 3.35–4.1 pieces, as well as 4.5–4.7 grams, were higher than the control by 10.8–16.6 cm, 1.9–3.2; 1.4–3.1 and 0.65–1.4 pieces, as well as 0.3–0.5 grams and relative to the options where manure was applied, there were no significant differences.

Judging by these indicators, the most optimal among the structural ratios and norms of composts is compost -2 at a rate of 20 t/ha, with the use of which more accumulated productive elements of cotton are compared to other options, where other composts and manure were introduced.

And according to subsequent influences in 2011–2012 the norms of the applied composts, the information corresponding to the above regularities was obtained.

In the control variant, where mineral fertilizers (NPK) were used, the yield of raw cotton, according to the years of research, was 30.8; 30.4 and 29.9 c/ha, and on average for 3 years - 30.4 c/ha (1-fig.).

This means that in this variant, there is a decrease in the cotton yield to 0.9 c/ha from 2010 to 2012. Note that, as noted in the previous sections, the weather conditions in the years of research were almost similar, and therefore such a decrease can only be explained by a decrease in soil fertility.

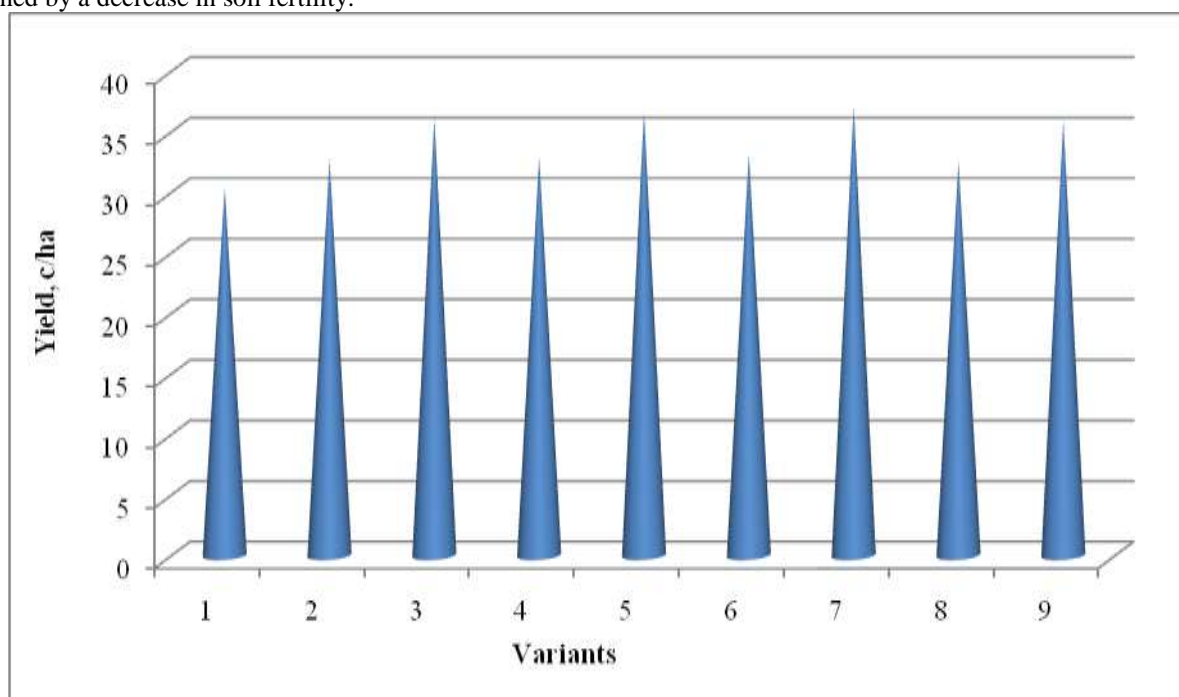


Fig. 1. Average yield for 3 years when composts are used



In variants 2 and 3, where 10 and 20 t/ha of manure were applied against the background of mineral fertilizers, under their influence, 33.0–36.5 quintals/ha of raw cotton was obtained, and under the influence of subsequent years 2011–2012 - 32.8–36.0 and 32.3–35.7 quintals/ha, and on average for 3 years - 32.7–36.1 quintals/ha or, relative to the control, the additional yield was 2.3 and 5.7 quintals / ha.

In the variants where 10 and 20 tons of compost -1 were used, the average yield of raw cotton for 3 years was 32.9 and 36.6 c/ha, and, respectively, compared to the control, 2.5 and 6.2 c/ha additional yield was obtained, and compared to options 2 and 3, where 10 and 20 tons of manure were applied, 0.2–0.5 c/ha of additional yield was obtained. When using 10 and 20 t/ha of compost -2, the yield of raw cotton averaged 33.2–37.1 q/ha and, relative to the control, 2.8–6.7 q/ha of additional yield was obtained, relative to manure norms - 0.5–1.0 c/ha, and relative to the norms of compost -1 - 0.3–0.5 c/ha of additional yield. In the variants where 10 and 20 tons of compost -3 were applied, the raw cotton yield was 32.5–35.9 quintals/ha, or 2.1–5.5 quintals/ha of an additional yield was obtained relative to the control variant.

CONCLUSION

In conclusion, we can say that when comparing the influence of various composts and their influence in subsequent years under conditions of low-fertility lands, the best result was observed when using compost-2 at a rate of 20 t/ha and a high additional yield of 6.7 c/ha was obtained.

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