



THE EFFECT OF NATURAL ADSORBENTS USED IN WINTER WHEAT ON THE CHANGES IN NUTRIENT ELEMENTS IN ROOTS AND STRAW

<https://doi.org/10.5281/zenodo.17859781>

Meliyeva Farog'at Shavkat qizi

PhD Applicant, Termez State University of Engineering and Agrotechnologies

Boltayev Saydullo Maxsudovich

Doctor of Agricultural Sciences, Professor, Termez State University of Engineering and Agrotechnologies

ANNOTATION *This article highlights the effects of natural adsorbents applied to winter wheat on the nutrient content in the roots and straw.*

KEYWORDS: *Winter wheat, bentonite, root, straw, nutrient elements, natural adsorbent.*

ABSTRACT (RUSSIAN) *В данной статье освещено влияние природных адсорбентов, применяемых при возделывании озимой пшеницы, на содержание питательных элементов в корнях и в соломе.*

КЛЮЧЕВЫЕ СЛОВА: *Озимая пшеница, бентонит, корень, солома, питательные элементы, природный адсорбент.*

INTRODUCTION

Today, wheat is cultivated on 220.4 million hectares worldwide, with an average grain yield of 3.0–3.5 t/ha. According to the Food and Agriculture Organization (FAO), world wheat production was projected to reach 751 million tons in 2022. Over the next decade, due to global population growth and increasing demand for grain and flour products, wheat production must increase by 6.6% or 59.7 million tons.

At present, grain and grain-based products constitute the major part of the global food ration. Grain products account for 50% of food trade, which indicates that the demand for wheat on the world market remains consistently high.

Therefore, conducting research aimed at developing and applying modern technologies in wheat cultivation is of crucial importance.

Research Methods As the research object, the winter wheat variety *Bunyodkor* was selected. As a natural adsorbent, bentonite slurry was applied at different rates under the conditions of meadow–takas (meadow–desert) soils. The efficiency of bentonite slurry applied in various doses during the cultivation of winter wheat was investigated.

Discussion and Results It is well known that agricultural crops remove significant amounts of nutrients from the soil during the growing season. After harvest, part of these nutrients returns to the soil through root residues and straw.



According to F. Namozov (2011), both perennial and annual crops leave considerable amounts of root and straw residues in the soil, which serve as a source of nutrients.

Our research was conducted at the experimental field of the Scientific Research Institute of Fine-Fiber Cotton in Surkhandarya region, where winter wheat was grown on meadow-takas soils. During the growing season, wheat was additionally nourished with bentonite slurry. After harvest, the amount of root and straw residues left in the soil and their nutrient content were determined.

The quantity of root and straw residues was measured in the 0–50 cm soil layer. Nutrient contents were determined by agrochemical analysis of 100 g of dried plant material.

According to the obtained data, in the 5th optimal variant, 100 g of dried wheat roots contained 0.31% nitrogen,

0.16% phosphorus, and 0.19% potassium, while straw contained 0.20%, 0.13%, and 0.17% respectively. Compared to the control variant, nitrogen increased by 0.07%, phosphorus by 0.05%, and potassium by 0.04% in both roots and straw.

The highest amount of root and straw residues (3.19 t/ha) was observed in variant 5, where before plowing, mineral fertilizers (150-105-75 kg/ha NPK) plus 9.0 t/ha of bentonite slurry were applied.

In this variant, the nutrient content in 100 g of dry matter was: 0.31% N, 0.16% P, and 0.19% K in roots.

The results indicate that applying bentonite slurry as an additional nutrient source along with reduced mineral fertilizers significantly improved the growth and productivity of winter wheat, and also increased the amount of root and straw biomass and their nutrient content (Table 1).

Table 1. Effect of Natural Adsorbents on the Accumulation of Winter Wheat Roots and Straw and Their Nutrient Content

Variant	Root and straw residues, t/ha	Nutrient elements in 100 g of plant material, %					
		Winter wheat					
		Roots			Straw		
	wheat	N	P	K	N	P	K
1	2,77	0,24	0,11	0,15	0,16	0,12	0,13
2	3,16	0,30	0,14	0,16	0,18	0,11	0,15
3	3,19	0,31	0,16	0,19	0,20	0,13	0,17



REFERENCES:

1. Abduraxmonov S.O., Abdullaev I.I. Bentonit loyqasi va kuzgi bug‘doy ko‘chat qalinligi. //O‘zbekiston qishloq xo‘jaligi jurnalining Agro ilm ilmiy ilovasi. Toshkent, 2018. №2 (52)–son. B.25–26.

2. Iminov A.A. Ekish me'yorlari va takroriy ekinlarni kuzgi bug‘doyning o‘sishi, rivojlanishi va hosildorligiga ta'siri. Q.x.f.n. dis. avtoreferati. -Toshkent, 2006. B. 20.

3. Ochildiev N., Boltaev S., Abduraximov N. Turli mahalliy o‘g‘itlar va xovdak bentoniti asosida tayyorlangan kompostlarning tuproq unumdorligi hamda g‘alla hosildorligiga ta'siri. //O‘zbekiston Paxtachilik ilmiy–tadqiqot institutining “G‘o‘za va g‘o‘za majmuidagi ekinlarni parvarishlash agrotexnologiyalarini takomillashtirish” mavzusidagi respublika ilmiy–amaliy anjumani ma'ruzalari asosidagi maqolalar to‘plami. Toshkent, 2013. B. 42–44