YIELD CAPACITY AND QUALITY INDICATORS OF WINTER WHEAT DEPENDING ON SYSTEMS OF BASIC TREATMENT OF SOIL AND FERTILIZER

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The production of high quality winter wheat grain in the context of Ukraine's entry into international grain markets is of urgent importance. Foreign and domestic experience shows that it is possible to produce competitive grain only on the basis of scientific and technological progress, which consists of the development, implementation and application of resource-saving technologies for growing crops. Therefore, there is a need to find and implement scientifically grounded new, innovative technologies taking into account the natural and climatic features of the region, the experience of domestic and foreign scientific research and increase the competitiveness of agricultural production.

We investigated winter wheat crop (Polissya 90 variety). The precursor was corn for silage. Repetition of the experiment is three times, placement of options is randomized in repetitions. Agrotechnics are common in the area. The soil of the experimental site –is a medium loam typical chernozem on the loess. The crop yield was recorded manually with each repetition of variants from test plots with a total area of 15 m^2, followed by weighing. Protein and crude gluten content in winter wheat samples were determined using an Infratec 1225 analyzer. Influence of application of different systems of primary tillage (plowing, shallow tillage without overturning, deep tillage without overturning) and fertilizer levels (Control, Manure + NPK, Manure + straw + NPK, Straw + NPK, Straw + siderates + NPK) on wheat yield and quality indicators of winter wheat grain.

Studies have shown that in the conditions of the Right-Bank Forest Steppe of Ukraine systematic tillage without overturning improves the yield and quality of winter wheat grain at all levels of fertilizer, compared with the traditional plowing.

Regardless of the soil cultivation, the highest yields were available on that variants: Manure + NPK and Manure + straw + NPK (3.74–4.72 t / ha). In general, application of mineral and organic fertilizers on typical chornozem increased the yield of winter wheat compared to the control by 0.28-0.84 t / ha for plowing, by 0.36-1.26 t / ha for deep tillage without overturning, and by 0.4–1.55 t / ha – for shallow tillage without overturning. The efficiency of fertilizer doses is better under tillage without overturning than under plowing. Among the tillage of the soil, the shallow tillage on the depth 10–12 cm without overturning with the use of manure with mineral fertilizers had a slight advantage. In this variant the highest yield was observed – 4.72 t / ha. With various deep tillage without overturning, this figure was only 3% lower. Among other variants with fertilizers, various deep tillage without overturning was somewhat outweighed.

Polissya-90 is one of the strong and valuable varieties of soft wheat, which demonstrates the genetically laid high protein and gluten content, and good baking properties. In our case, the yield and quality of winter wheat were influenced by soil cultivation, fertilizers, and favorable weather conditions during the growing season. Quality of winter wheat were most influenced by the fertilizers. Much less – tillage. It is known, that providing plants with nutrients throughout the growing season can produce a greater yield with good technological performance of the grain.

The best quality indicators were in the variant with traditional organic-mineral fertilizer and with the use of manure, straw on the background of NPK. In general, protein and gluten content were in accordance with the quality standards of valuable and strong wheat: protein content in the fertilized variants was in the range of 14.3–15.5% (strong wheat), on the control – 13.3–13.6 (valuable). Gluten content, respectively, is 29.4–31.9% (strong) and 27.3–27.9 (valuable). There is a dependence, that the higher the yield of winter wheat, the higher the protein content, what was confirmed by our indicators. The variant with the highest protein content was Manure + NPK with shallow tillage, accounting for 15.5%. Gluten content was also highest in this variant – 31.9%.