

YIELD AND GRAIN QUALITY OF SOFT WINTER WHEAT DEPENDING ON THE FERTILIZATION IN THE NORTHERN STEPPE OF UKRAINE

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Abstract

The results of the long-term researches on determination of the influence of mineral fertilizers on the soft winter wheat yield and grain quality after black fallow and after spring barley in the conditions of Northern Steppe of Ukraine are presented. According to the research in 2012-2014 it is established that application of spring-summer nitrogenous top-dressing at sowing after black fallow provided (according to the quality indicators set regulated by the current national standard for wheat DSTU 3768: 2019) formation of grain of the second class of quality at winter wheat varieties Lytanivka, Zamozhnist, Antonivka and Rozkishna and for the most part the first class - at variety Sonechko by the yielding capacity within 6.19-6.60; 6.25-6.74; 5.60-6.08; 5.89-6.37 and 5.38-5.71 t/ha respectively. The expediency of double top dressing of winter wheat sowings after spring barley is scientifically proved: ammonium nitrate in dose N₃₀ early in the spring on frozen-melted soil and in the end of tillering stage of plants, that provided the obtainment of yielding capacity of 4.70-5.28 t/ha with grain quality of the second and third class in the favorable moisture years. Studies conducted in 2016-2018 found that the highest yields in varieties Kokhanka, Missiya Odeska and in Pylypivka grown after black fallow were formed by plant feeding with ammonium nitrate locally in the late tillering phase, dose of 60 kg/ha, active substance. In this feeding mode increase in yield compared with the control (without feeding) was, depending on variety, 0.58-0.64 t/ha. The highest yield (7.23 t/ha) was formed by Pylypivka variety. When growing winter wheat after spring barley, the increase in grain yield, compared with the control (without feeding) in variety Kokhanka, on average for three years depending on feeding option, was 0.48-1.20 t/ha; in Missiya Odeska - 0.36-1.15; and in Pylypivka - 0.51-1.16 t/ha. The highest increase in yield was provided by the application of nitrogen fertilizer (a dose of 60 kg/ha) on frozen-melted soil and in two terms: spreading N₆₀ on frozen-melted soil and local application of N₃₀ at the end of tillering. The Kokhanka variety yield under these feeding mode was 5.31 and 5.46 t/ha, respectively, Missiya Odeska - 4.78 and 5.03 t/ha, and Pylypivka - 5.47 and 5.62 t/ha. The highest grain yield (5.62 t/ha) was formed by winter wheat variety Pylypivka with application of ammonium nitrate N₆₀ on frozen-melted soil and local application of N₃₀ at the end of tillering. Experimental data analysis and generalization showed that application of nitrogen fertilizers in spring-summer growing season after both predecessors, as a rule, facilitated improved grain quality, namely: grain nature, vitreousity, protein and crude gluten content, flour sedimentation.

Key words: winter wheat, variety, mineral fertilizers, predecessor, yield, grain quality.

INTRODUCTION

Stable demand for food in the world opens up prospects for expanding the market for Ukrainian agricultural products. Among other crops, the leading place belongs to winter wheat, the main food crop. In recent years, quantitative indicators of the yield for soft winter wheat (*Triticum aestivum* L.) fully cover domestic demand for food wheat and allow to increase its exports, which contributes to strengthening the country's economy (Kernasiuk, 2020; Procopenko, 2019).

Among the most important factors influencing the formation of winter wheat yield and quality are the weather conditions during the growing season, variety, predecessor and crops fertilizer.

Modern varieties should be characterized by adaptability to growing conditions, resistance to environmental stressors, especially in the area of insufficient and unstable moisture - conditions of Ukraine's Steppe Zone (Netis, 2008; Remeslo & Saiko, 1981; Sobolev, 1979). Winter wheat is a crop demanding to nutritional conditions.