

DEVELOPMENT OF GRAIN FORAGE CROPS IN THE TILLERING PHASE AS ONE OF THE FACTORS OF GRAIN YIELD FORMATION AND ITS QUALITY

O. A. Yusova, P. N. Nikolaev, N. N. Shuliko, S. V. Vasyukevich, A. A. Kiseleva, Ya. O. Yurtaeva
*FSBSI «Omsk Agrarian Scientific Center», Russian Federation, 644012, St. Omsk, Pr. Koroleva, 26,
E-mail: yusova@anc55.ru, nikolaev@anc55.ru, shuliko@anc55.ru, s.vasyukevich@anc55.ru,
ya.yurtaeva@anc55.ru*

Understanding the physiology of agricultural crops allows us to effectively manage the processes of plant growth and development and, as a result, increase their productivity. The aim of the research was to assess the influence of the development of grain forage crops in the tillering phase on the formation of grain yield and its quality in the conditions of the Omsk Irtysh region. The studies were carried out in 2023-2025 in a field experiment in the southern forest-steppe of the Omsk region. In terms of moisture supply, 2023 was characterized as dry, 2024 – as wet. The object of the research was the Omskiy 101 spring barley variety (included in the State Register of the Russian Federation in 2021) and the Siberian Hercules spring oat variety (2019). In the tillering phase of spring barley and oat varieties, the leaf area, total assimilation surface and accumulation of dry aboveground plant biomass were measured; the mass fraction of protein in grain was determined. The correlations of the yield and mass fraction of protein with leaf area were calculated, total assimilation surface and accumulation of dry above-ground biomass were calculated. The research results showed that the formation of yield and grain quality largely depends on the growth and development of plants in the tillering phase. Thus, the weight of ear grain and the yield of spring barley were highly correlated with the leaf area and total assimilation surface of plants ($r=0.940-0.947$); in average – with accumulation of dry above-ground biomass in the tillering phase ($r=0.680$). Between similar pairs of traits of spring oats, medium ($r=0.455...0.570$) and strong conjugation ($r=0.925$) were noted, respectively. The mass fraction of spring barley protein is inversely proportional to the leaf area, total assimilation surface of plants, dry above-ground biomass and ear grain mass ($r=-0.680...-0.998$). The mass fraction of spring oat protein is directly proportional to the accumulation of dry above-ground biomass in the tillering phase ($r=0.930$). Obviously, grain forage crops differed in the degree of manifestation and direction of correlation relationships, but plant growth in the initial period of their development had a significant impact on the formation of qualitative and yield properties of the variety.

Key words: spring barley, spring oats, leaf area, assimilation surface, dry aboveground biomass, protein, yield, conjugation.