STRESZCZENIE ROZPRAWY DOKTORSKIEJ W JĘZYKUANGIELSKIM

Influence of post-harvest tillage extent on growth, development and yield of selected winter wheat cultivars sown by strip-till method

Keywords: winter wheat, variety, strip-till, strip tillage, grain yield, grain quality, biomass, growth, flag leaf

The aim of the research was to determine the effect of the extent of post-harvest tillage on the growth, development and yield of selected winter wheat cultivars grown using the striptill method. Field experiments set up in three growing seasons formed the basis for the research leading to this objective: 2018/2019, 2019/2020, 2020/2021 at IUNG-PIB Kepa-Osiny Agricultural Experimental Stations, on black soil proper, classified as good wheat complex. The forecrop was winter wheat. The experiment was set up in a split-block arrangement with mirror image, in 4 repetitions. The first factor of the experiment were different ranges of tillage before sowing: ploughing (medium deep sowing ploughing, strip tillage combined with sowing wheat), simplified tillage (pulverised stubble with a disc aggregate, strip tillage combined with sowing wheat), zero-tillage (strip tillage of mulched stubble, combined with sowing wheat). The second factor were wheat cultivars differing considerably in origin (different breedings): Formacja, Metronom, Desamo. The results obtained were processed statistically. The effect of tillage method on the yield of the aboveground weight of wheat plants was unequal in the successive growth phases. In the initial growth period (tillering), the lowest value of this canopy trait was found in the treatment with ploughing. In later growth phases, it was the treatment with the highest aboveground weight. The genetic factor had a significant influence on plant growth rate. In each growth phase, the cultivar Metronom had the highest aboveground biomass yield. There was no interaction between cultivar and cultivation method in shaping the growth and development parameters of wheat plants. Flag leaf area and plant height did not depend on tillage and cultivar. The extent of tillage used and the cultivar did not affect the tillering of wheat plants, and the number of plants and ears per area unit. Significantly higher grain yield was obtained from the ploughed treatment. The cultivars responded unevenly to the extent of tillage applied. The Formacja and Desamo cultivars had a greater yield decrease due to reduced tillage intensity. The variability in yield depending on the experimental factors and weather conditions varying over the years was mainly determined by grain yield per ear. The extent of

post-harvest tillage significantly influenced the sedimentation index, while it had no effect on gluten amount, gluten index, or falling number.

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