Summary

The results of the presented research on winter triticale were obtained from field experiments carried out at fifteen experimental points of the Research Center for Cultivar Testing (COBORU). The research was conducted in five growing seasons: 2018/2019, 2019/2020, 2020/2021, 2021/2022, 2022/2023. The experiments were planned as two-factor: in terms of variety and agrotechnical experiments in a split-block design. The experimental factors were winter triticale varieties ('Avokado', 'Belcanto', 'Carmelo', 'Kasyno', 'Lombardo', 'Meloman', 'Orinoco', 'Porto', 'Sekret', 'Tadeus', 'Temuco' , 'Toro' and 'Trapero'), and the levels of agrotechnics which differed in the fungicide plant protection program and the level of nitrogen fertilization (level a_1 - average, level a_2 - high). In the experiments carried out, the yield of individual varieties was determined depending on the technology used and the impact of meteorological conditions on the growth and development of plants, taking into account susceptibility to infection by pathogens or tendency to lodging. For each tested feature, the variety with the best parameters was selected. An assessment of the yield stability of individual varieties and a risk assessment was carried out. In addition, an energy efficiency analysis and an economic assessment were performed based on research results from the 2018/2019 growing season.

The results of the conducted research indicate the influence of weather conditions on the course of individual development phases of winter triticale. The longest growing season lasted 291 days from plant emergence to full maturity and concerned the 2020/2021 season. Using the Selyanina hydrothermal coefficient (K), this growing season was determined to be quite humid due to high precipitation and low average daily temperatures. The shortest growing season, counting from the emergence of plants to full maturity, was characterized by the 2018/2019 growing season (280 days), where the average daily temperature was the highest of all the growing seasons examined, and the sum of precipitation was one of the lowest. The 'Carmelo' and 'Sekret' varieties were most resistant to lodging at an average level of agrotechnics, while at a high level all varieties were susceptible to lodging. Based on the analyzes performed, it can be assumed that this is a reaction to the use of an increased dose of nitrogen fertilization. The tallest and most stable variety in this respect was the 'Avokado' variety, which, despite its height, was not most susceptible to lodging. The varieties which were most resistant to infection by Blumeria graminis are 'Avokado', 'Orinoko', 'Tadeus', 'Toro', to Puccinia striiformis 'Avokado', 'Lombardo', 'Orinoko', 'Temuco', 'Toro', to Puccina recondita 'Avokado', 'Belcanto', 'Kasyno', 'Meloman', 'Porto' and 'Trapero'. The least resistant to infection by fungi of the Fusarium genus were the 'Toro' and 'Temuco' cultivars, which were resistant to other fungal diseases tested. The source of yield variability was the influence of environments (location and year). The highest average grain yield from all years of experiments was obtained at the Radostowo experimental site (108.9 dt/ha) located in the north of the country, while the lowest - in the south-east in Dukla (59.7 dt/ha). The highest yield and thousand-grain weight of the plants were achieved in the 2022/2023 growing season. The energy index at a high level of agrotechnics was unfavorable. Higher income from production was achieved by using low-cost technology (average level of technology intensity).

Key words: winter triticale, yield stability, production efficiency.

Karolina Madajska