The growth conditions and yielding of spring barley under different tillige systems

Abstract

The objective of the research was to assess the influence of incorporating white mustard stubble catach crop into the soil on the changes in the field habitat and spring barley productivity.

The field trials were conducted between 2009 and 2012 in RZD Swojec (Research and Training Station in Swojczyce), part of Wroclaw University of Environmental and Life Sciences, and involved a two-factor field experiment. The first order factor were four cultivation systems, including pre-winter tillage, spring pre-sowing tillage and a catch crop. The second order factor was N fertilisation in three different variants.

The cultivation systems and catch crop presence had a varying effect on spring barley yield. The direct sowing of barley into mulch and incorporating the catch crop into the soil using a cultivator resulted in crop reduction by 37.9% and 11.5% respectively, compared to the traditional cultivation system with no catch crop. Spring barley's response to the different cultivation systems adopted in the trials varied significantly in different years, depending on the changes in weather conditions.

The use of white mustard catch crop did not facilitate the reduction of nitrogen fertilisation.

The soil physical properties parameters analysed in this study varied depending on the cultivation system used and the direct sowing of barley into white mustard mulch resulted in reduced respiratory activity of the soil.

Economic analysis indicated that the use of catch crop and simplified cultivation resulted in a reduced gross margin and agricultural income.

Key words: spring barley, stubble catch crop, cultivation, N fertilisation, soil properties, weed infestation, yielding, economic effect.