

Wpływ uprawy współrzędnej pszenicy na poziom aktywności wybranych enzymów glebowych w różnych systemach uprawy

The effect of wheat intercropping on the activity level of selected soil enzymes in different cultivation systems

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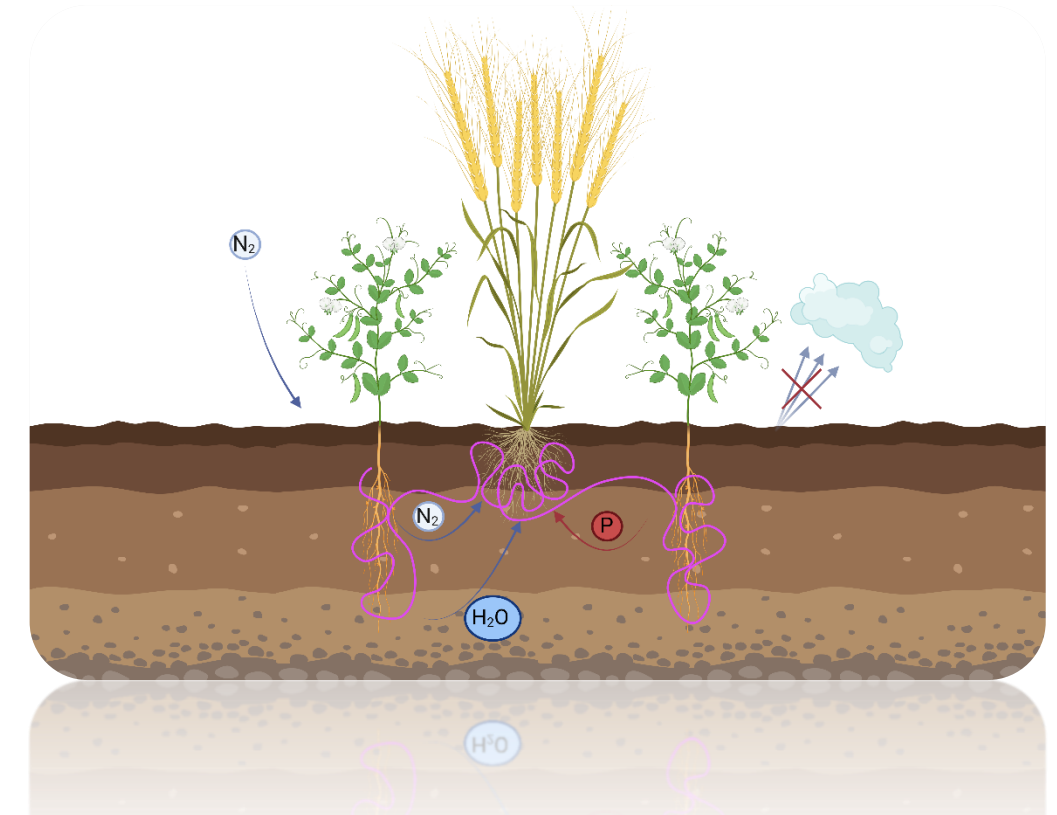


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The LEGUMINOSE project aims to explore the benefits of intercropping beyond yield and nitrogen cycling and promote sustainable cropping systems by identifying opportunities for environmental, economic, and social gains. The target group in this project are farmers focused on horticulture and animal husbandry, considering that all farmers can benefit from intercropping in some way. 40.6% of Polish farmers are concentrated in crop output, especially cereals—16.5%. Furthermore, farmers focused on animal production often grow their fodder to lower the cost of production.

The application of intercropping strategies in Poland is already present; however, it still might be much more known and widely used. Typical intercrop mixes in Poland are cereals such as maize, barley, oats, and wheat with the intersown of peas, fava beans, or clover. Those mixes can be used together as fodder without the need to separate the grains or as silage when collected at the right moment and if needed, the grains can be separated and sold separately.

The application of the intercropping strategies might have numerous impacts on the environment and the socioeconomic factors of the farmers themselves. It can lower the application rates of mineral nitrogen, reduce the carbon footprint of farming, reduce soil degradation, increase biodiversity, and increase water use efficiency. Because of that, this agricultural practice can reduce farmers' dependence on fertilizer use and thus reduce the cost of farming.

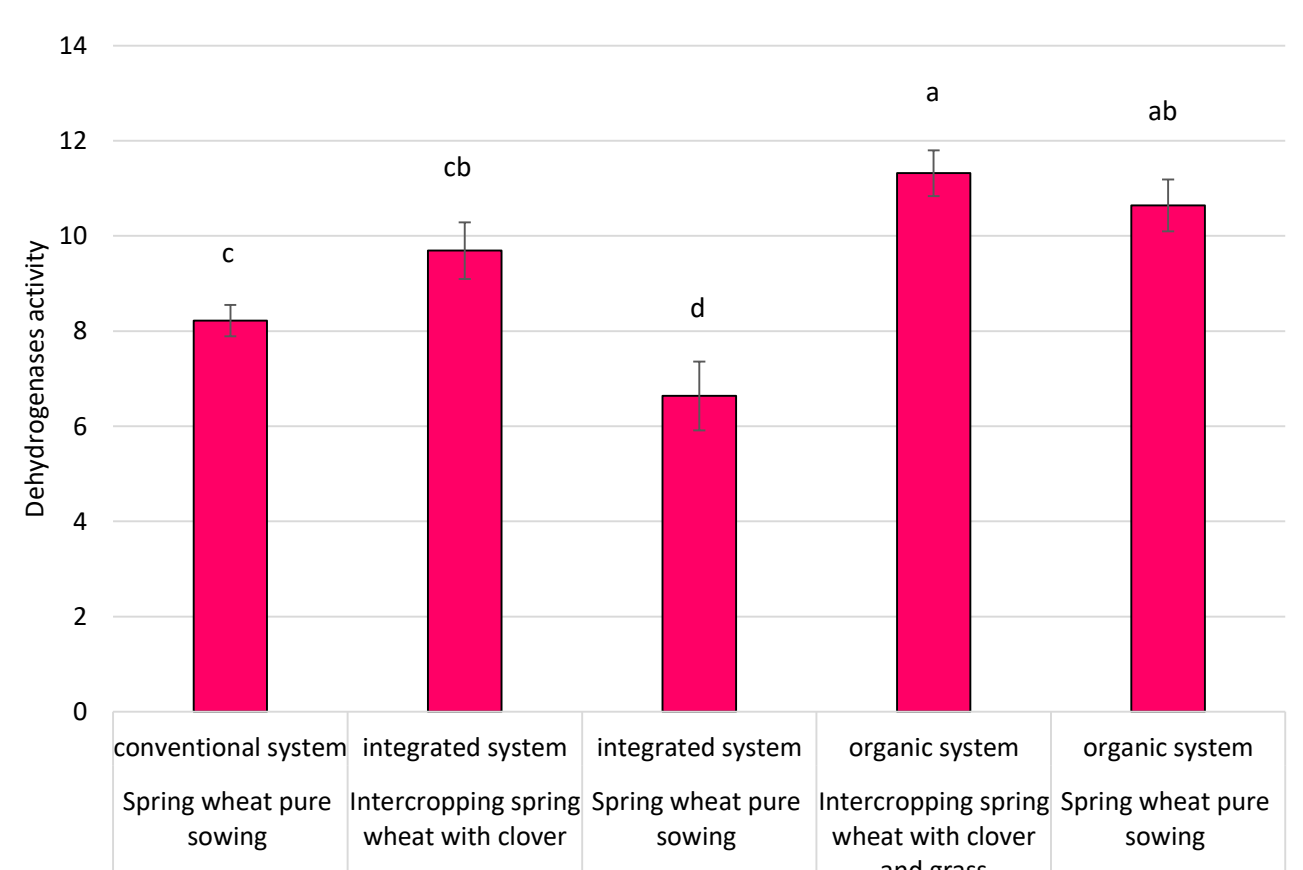
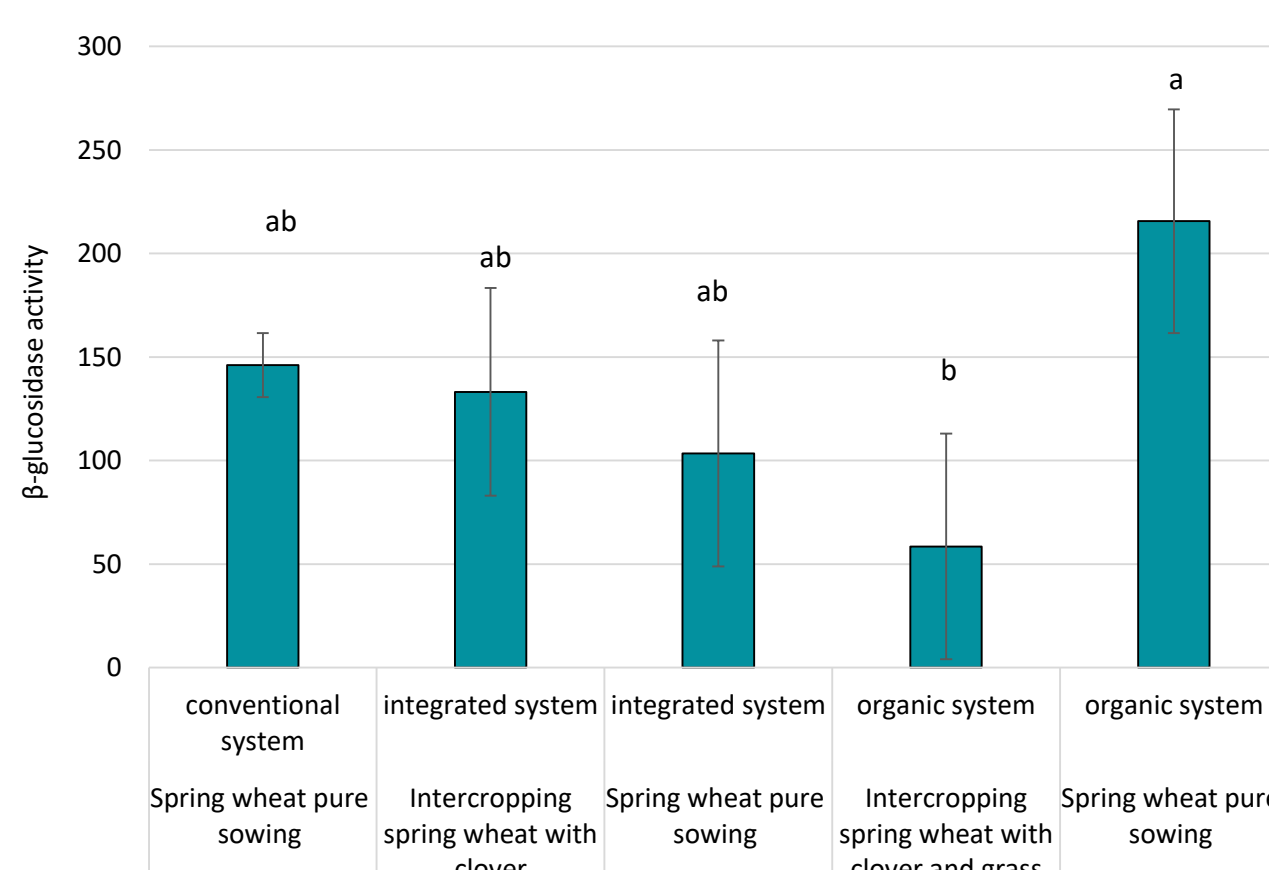
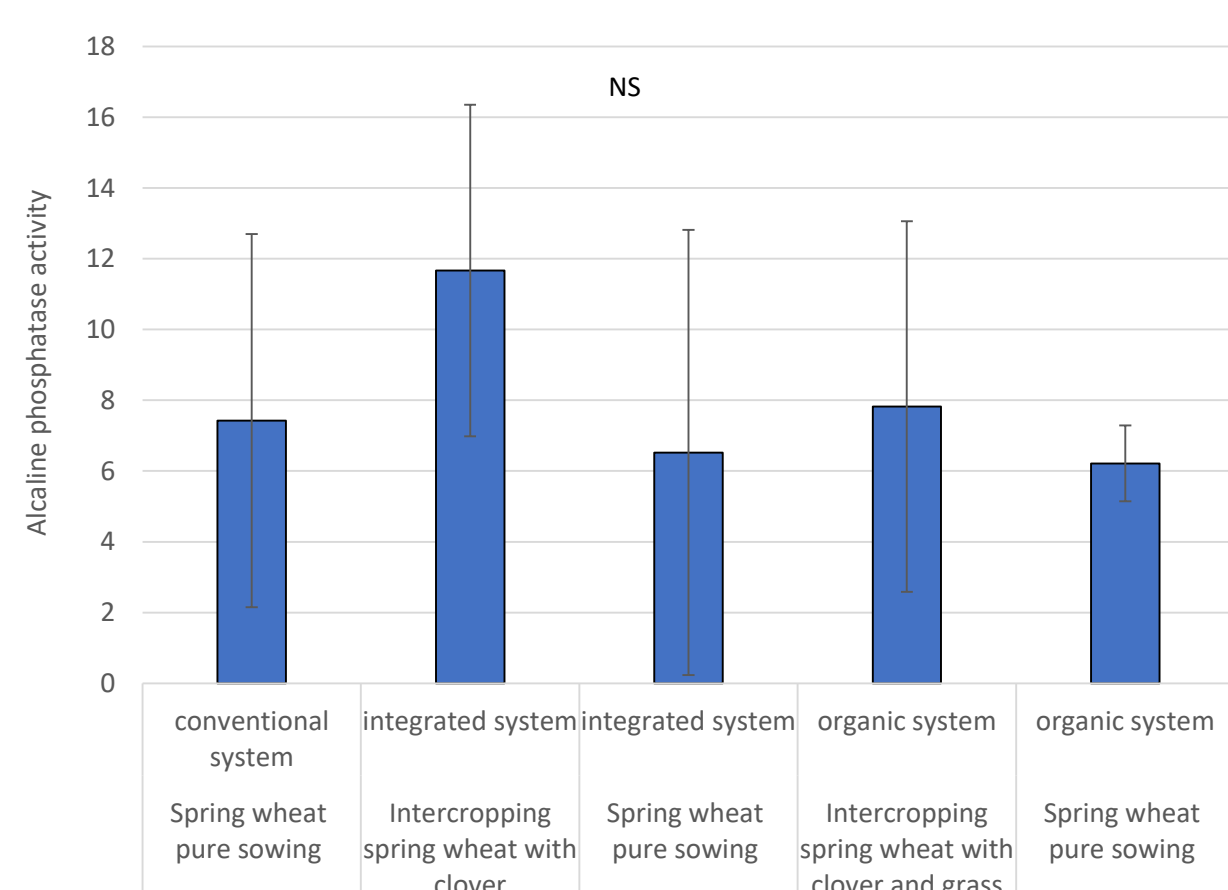
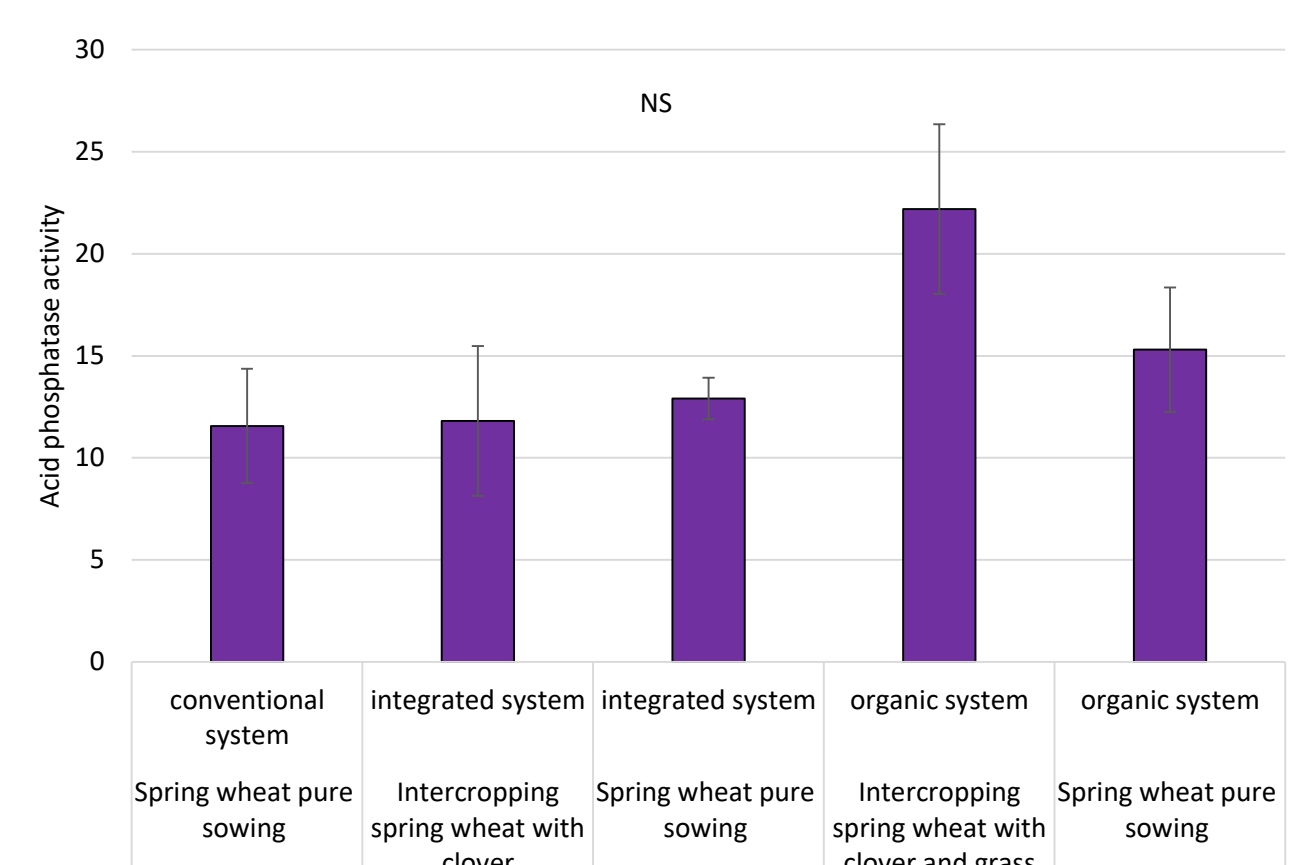
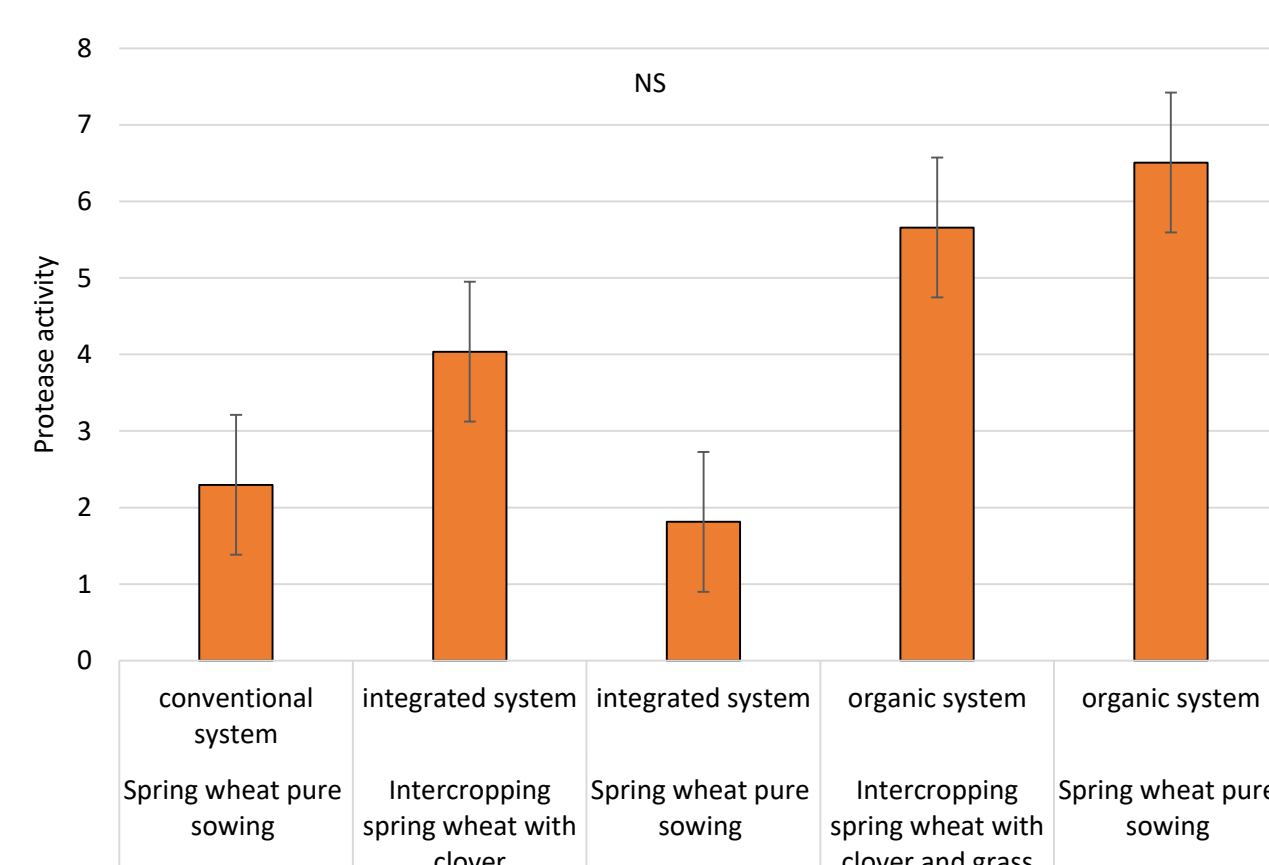
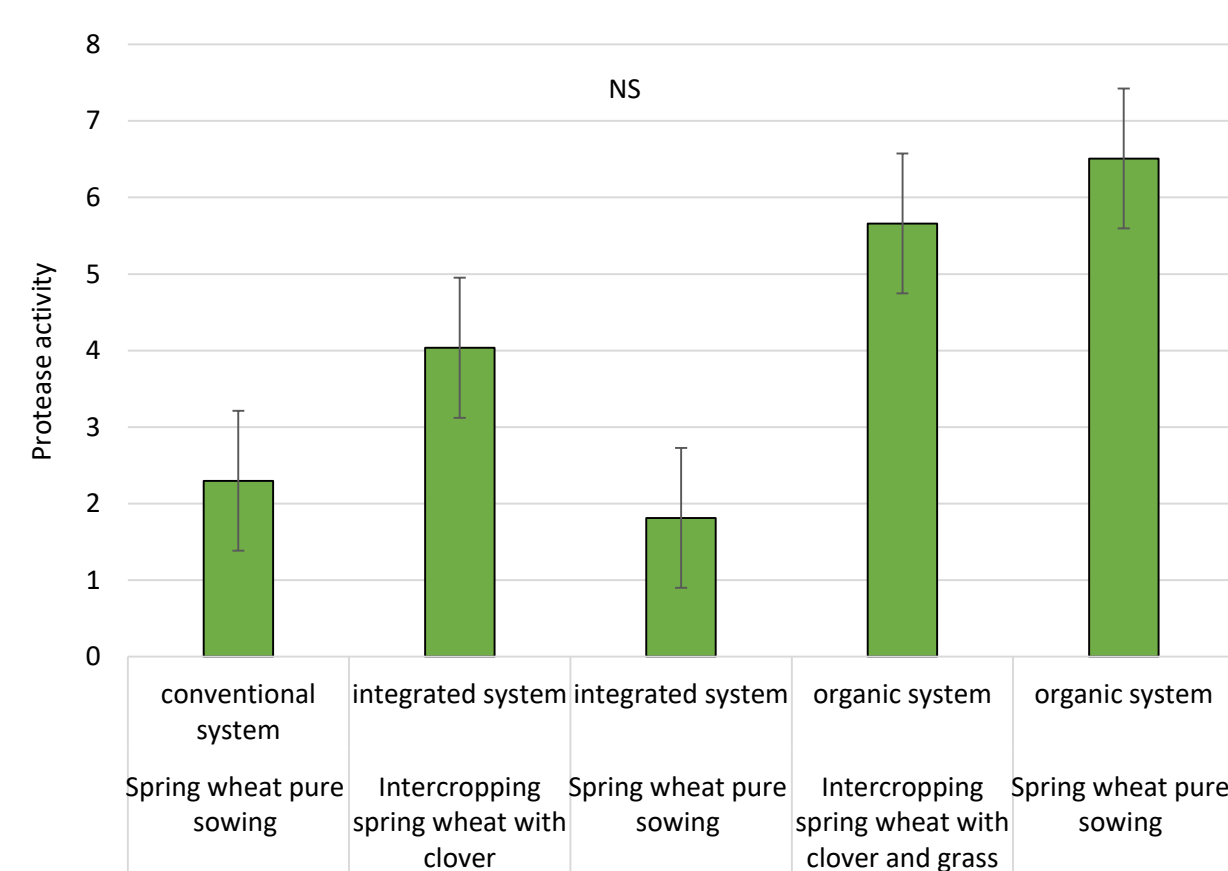
The challenges of the introduction of intercropping often include changes that need to be made in the agricultural equipment, finding a new market for mixed grain yield, or separating the grains. The solution to this might be to create a new market for mixed cereal, e.g., for novel food products, or plan the intercropping so that it can be harvested separately.

Uprawa współrzędna zbóż i roślin bobowatych przynosi liczne korzyści w aspektach agronomicznym i ekologicznym. Celem przeprowadzonych badań była ocena wpływu uprawy współrzędnej pszenicy i koniczyny oraz pszenicy i koniczyny z trawą w różnych systemach uprawy: konwencjonalnym, integrowanym oraz ekologicznym na aktywność takich enzymów glebowych jak dehydrogenazy, β -glukozydaza, proteaza, ureaza, fosfataza kwaśna i zasadowa.

Doświadczenie poltowe przeprowadzono na polach doświadczalnych Instytutu Uprawy Nawożenia i Gleboznawstwa PIB w Osinach. Próbkę gleby ryzosferowej zostały pobrane z głębokości 0-15 cm. Najwyższe wartości badanych enzymów zanotowano dla uprawy współrzędnej pszenicy z koniczyną i trawą w systemie ekologicznym. W glebie pozaryzosferowej taki efekt zaobserwowano dla β -glukozydazy, ureazy i proteazy. Natomiast w glebie ryzosferowej dla fosfatazy kwaśnej.

Intercropping of cereals and legumes brings benefits in agronomic and ecological aspects. The aim of the study was to assess the effect of wheat intercropping with clover and the use of clover with grass in various cultivation methods: conventional, integrated and organic on the activities of soil enzymes such as dehydrogenases, β -glucosidase, protease, urease, acid and alkaline phosphatase.

The experiment was conducted on the fields of the Institute of Soil Science and Plant Cultivation in Osiny. Samples of rhizosphere soil were taken from a depth of 0-15 cm. The highest values of enzyme parameters were found for intercropping with clover and grass in the organic system. In non-rhizosphere soil such an effect was noted for β -glucosidase, urease and protease. Conversely, in rhizosphere soil it was found for acid phosphatase.



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