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*Presente e futuro delle scienze agrarie, forestali e alimentari:
sfide e prospettive per le nuove generazioni*

Cover Crops as a Climate Change Mitigation Strategy: Effects on Wheat Quality

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Abstract.

In a context of proposing agronomic strategies to limit the negative impact of climate change on agricultural production and safeguard the environment, regenerative agriculture practices can provide very interesting solutions. In this regard, an important role is played by cover crops, with the aim of safeguarding the soil, preventing erosion phenomena, ensuring carbon sequestration and maintaining biodiversity. On the other hand, limited studies focused on evaluating the impact of cover crops adoption on the quality of wheat kernels, flour and baked products obtained, which is the aim of this study.

A high protein bread wheat variety (Giorgione, protein content 15%) was grown in two seasons, 2024 and 2025, under five soil cover treatments during the intercropping period (bare soil, sorghum, niger, cowpea, and infested soil) and three fertilization rates (0, 90, 150 kg N/ha).

Agronomic (grain yield) and qualitative features of kernels (test weight and protein content) and flours (gluten aggregation properties, starch pasting properties, dough mixing and extensional properties) were investigated. Finally, small-scale baking tests were performed.

Cover crops affected yield and protein content, while fertilization rate impacted yield, test weight, and protein content. Gluten aggregation properties were influenced by both fertilization rates and cover crops, with cover crops samples presenting better gluten aggregation properties at lower fertilization rates than the control; differences were attenuated at higher fertilization rates. On the other hand, the agronomic strategies adopted did not affect starch gelatinization profiles, but impacted dough mixing properties, with cover crops mainly affecting dough stability and fertilization rates impacting dough development time. Changes in extensional properties and bread-making performance were also observed.

In conclusion, cover crops is a promising strategy for climate change mitigation, but, within a correct re-design of cereal cropping systems, require optimal fertilization to ensure effective implementation and minimize potential negative effects on wheat quality.

Keywords: Regenerative Agriculture; Cover Crops; Wheat Quality

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