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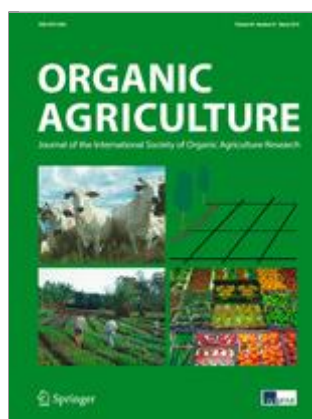
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## Wheat yield and quality as influenced by reduced tillage in organic farming

### Abstract

Organic farmers are interested in soil conservation by reduced tillage, techniques well known in conventional agriculture to protect soil quality and limit labor time and energy costs. However, organic farming and reduced tillage can modify weeds, soil structure, and thus soil nitrogen (N) mineralization which strongly influences wheat yield and quality. The main objectives of this study were to analyze how reduced tillage applied to organic wheat influenced (1) grain yield, protein concentration, and weed infestation; (2) deoxynivalenol (DON) contamination on grain; (3) technological quality parameters such as dry gluten, zeleny index, falling number, and gluten index; (4) protein composition (F1, F2, F3, F4, and F5 fractions, and UPP, gliadin/glutenin ratio); and (5) baking test. For this purpose, we analyzed five site-years of data from winter wheat crops where mouldboard ploughing and reduced tillage were compared in three experimental trials (two in France and one in Switzerland). Main results concern wheat yields: the effect of reduced tillage on wheat yield was influenced by several factors such as weed competition. No significant increase in mycotoxin content (DON) due to reduced tillage was detected. Contamination with DON was always below the European threshold for human consumption. The technological quality parameters were less affected by the tillage treatments than grain yield: protein content, gluten index, zeleny index, and falling number showed on average no significant difference between treatments although the protein composition was slightly different. The main results of this study are that the effect of reduced tillage on grain yield depends very much on soil type, weather conditions, and time after conversion, whereas there is only minor impact on wheat quality. This is in contrast to the hypothesis that reduced tillage under organic farming will cause problems in baking quality.



## Citations

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