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Pecio A., Jarosz Z. 2016 Long-term effects of soil management practices on selected indicators of chemical soil quality [Wpływ wieloletniego stosowania zabiegów agrotechnicznych na wybrane właściwości chemiczne gleb] Acta Agrobotanica 69, 2 10.5586/aa.1662

Background and objective

The study was conducted in scope of Catch-C project "Compatibility of agricultural management practices and types of farming in the EU to enhance climate change mitigation and soil health" (7FP), realized in 2012–2014 by the consortium of partners from 10 European countries (<http://www.catch-c.eu>). This work reports the effects of soil management practices – under different soil and climatic conditions – on the selected soil chemical quality indicators, based on the analysis of data extracted from literature on long term experiments (LTEs) in Europe, as well as from LTEs held by the Catch-C consortium partners. Catch-C ("Compatibility of agricultural management practices and types of farming in the EU to enhance climate change mitigation and soil health") project was conducted to verify the hypotheses that "best management practices" are not only effective in maintaining high yields, in reducing cultivation costs, and in mitigating climate change, but also contribute in improving chemical, physical and biological crop quality. In this paper we analyze the effects of soil management practices on selected soil chemical quality indicators.

Search strategy and selection criteria

not specified Long term experiments (LTEs) in Europe, as well as from LTEs held by the Catch-C consortium partners from 10 European countries.

Data and analysis

All statistical analyses were performed with the help of the package Statgraphics Centurion v. XVI. RR frequency distributions were tested for normality and their descriptive statistics were calculated. A one-sample Student t-test (2-tails) was used to identify which RR means were significantly different from 1 ($p < 0.05$). Next, a multiple linear model with climate, soil type, sampling depth and duration of practice as a single nominal factor (without interactions) was used to evaluate if any of these factors affected the relative RR to a given management practice, and by how much. For this purpose, climate, soil texture and duration of practice were divided into four classes ("levels") each, while three different depths of soil sampling were considered. A type III Wald statistics for maximum likelihood estimate of regression was chosen. Then, a t-test was used to separate means of single factors different at $p < 0.05$.

Number of papers	Population	Intervention	Comparator	Outcome	Quality score
8	Not specified	Catch and cover crops	No cover crop	Metric: Soil total nitrogen stock; Effect size: Ratio of the considered metrics in the intervention to the considered metrics in the control	25

Results

- Overall, the effect of catch and cover crops did not significantly influence soil total nitrogen stock. However, the longer time of the practice significantly increased total nitrogen stock, comparing to short time.
- NULL
- NULL
- NULL
- NULL

Factors influencing effect sizes

- Duration : The effect of catch and cover crops was significantly affected by the duration of practice. The longer time of the practice significantly increased total nitrogen stock, comparing short time.

Conclusion

Overall, the effect of catch and cover crops did not significantly influence soil total nitrogen stock. However, the longer time of the practice significantly increased total nitrogen stock, comparing to short time.