INFLUENCE OF LONG-TERM TILLAGE, CROP ROTATION AND FERTILISATION COMBINATIONS ON SOIL ENZYME ACTIVITIES

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SUMMARY

Soil enzyme activities (actual and potential dehydrogenase, catalase, acid and alkaline phosphatase) were determined in the 0–20–, 20–40– and 40–60–cm layers of a brown luvisol soil submitted to a complex tillage (no-till and conventional tillage), crop rotation (2– and 6–crop rotations) and fertilisation [mineral (NP) fertilisation and farmyard-manuring] experiment.

Each activity in both non-tilled and conventionally tilled soil under all crops of both rotations decreased with increasing sampling depth. No-till – in comparison with conventional tillage – resulted in significantly higher soil enzymatic activities in the 0–20– and in significantly lower activities in the deeper layers. The soil under maize or wheat was more enzyme-active in the 6– than in the 2–crop rotation. In the 2–crop rotation, higher enzymatic activities were recorded under wheat than under maize. In the 6–crop rotation, the enzymatic indicators of soil quality decreased, depending on the nature of crops and kind of fertilisers (mineral NP or farmyard manure), in the following order: mineralily fertilised (m.f.) wheat > m.f. oats-clover > farmyard-manured maize > m.f. soybean > m.f. clover > m.f. maize. This order means that by determination of enzymatic activities valuable information can be obtained regarding fertility status of soils.

It should be emphasised that farmyard-manuring of maize - in comparison with its mineral (NP) fertilisation – led to a significant increase in each of the five enzymatic activities determined.

BIBLIOGRAPHY