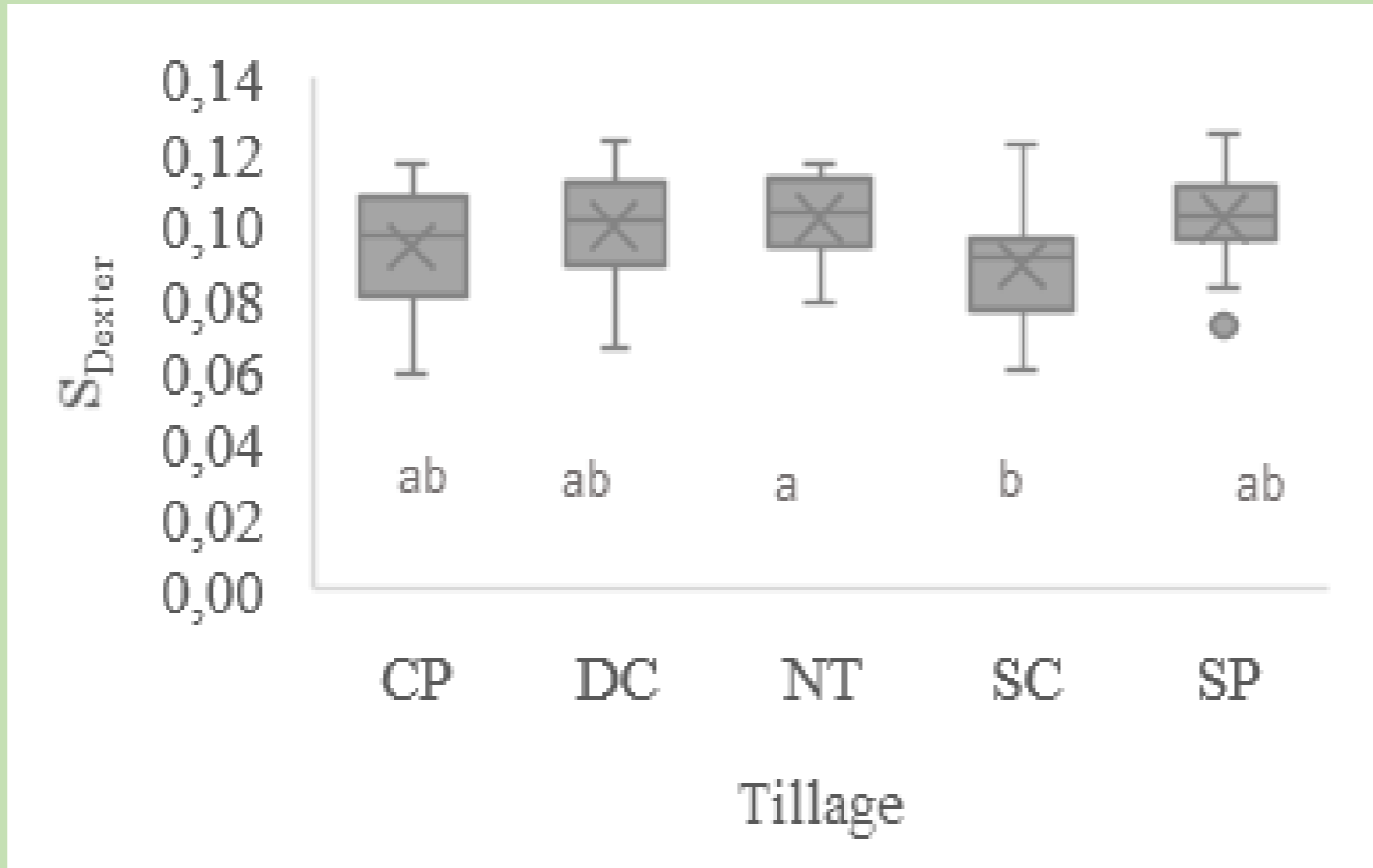
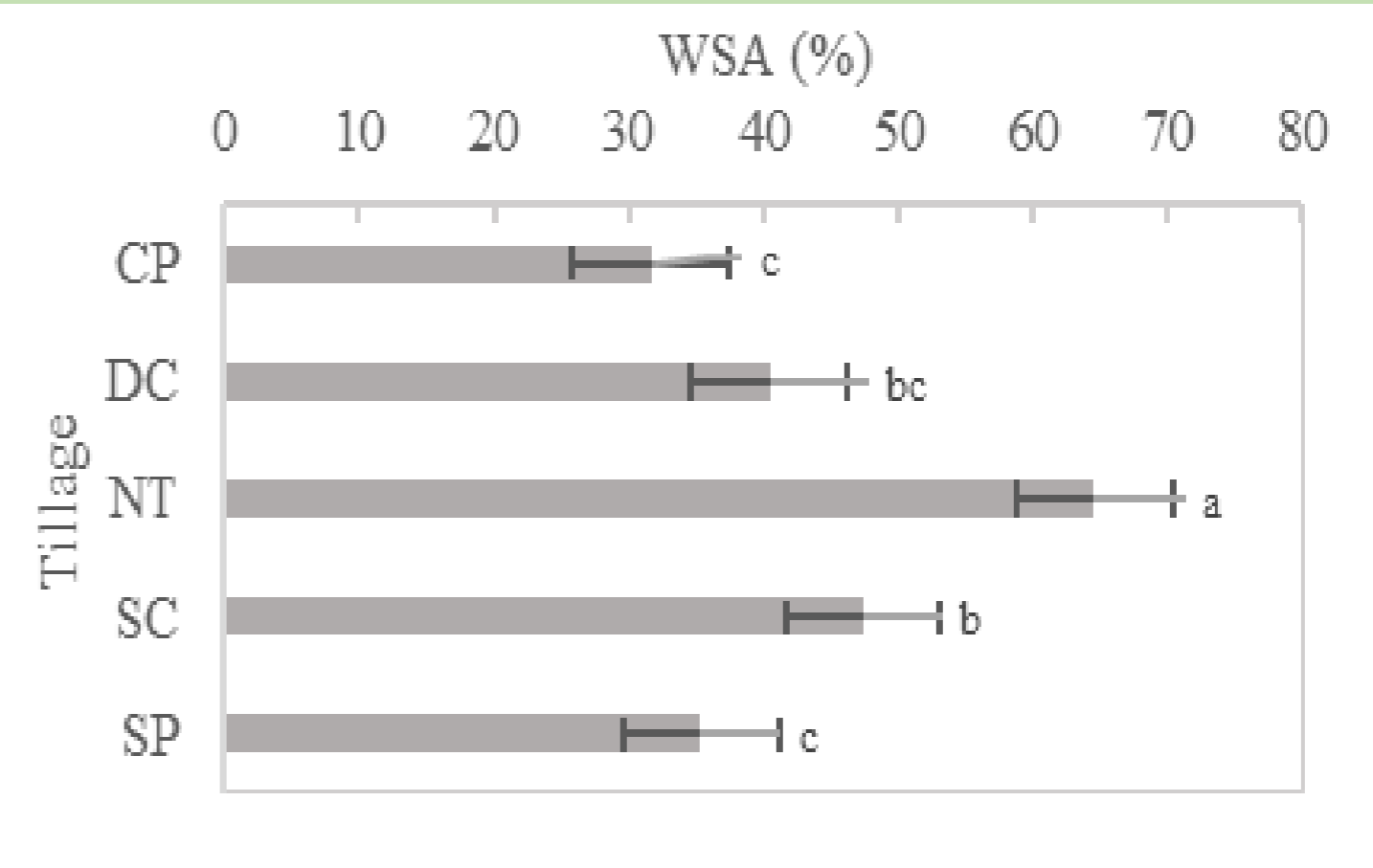
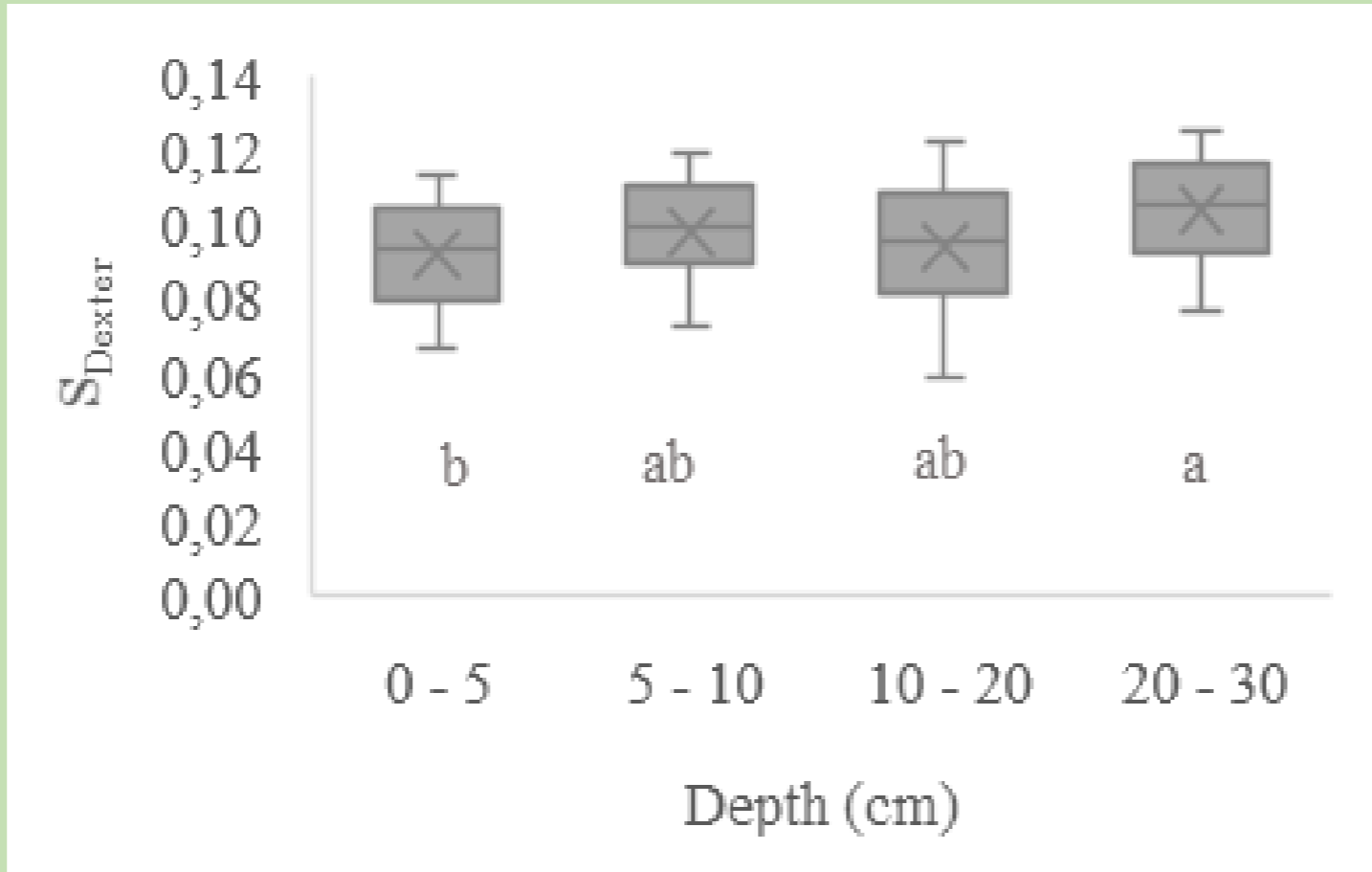
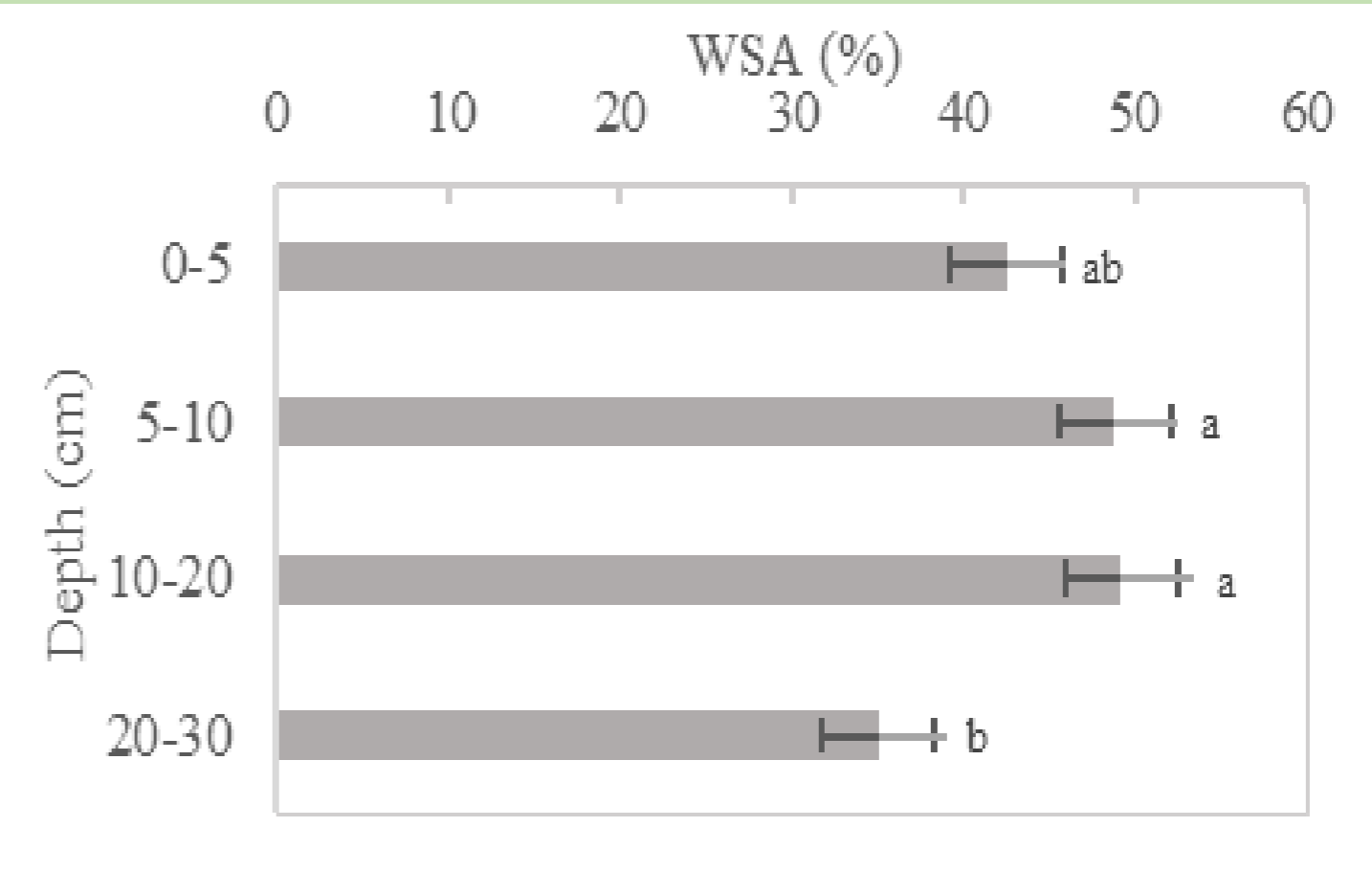


IMPACT OF TILLAGE INTENSITY WITH VERTICAL SOIL STRATIFICATION ON SOIL PHYSICAL QUALITY INDEXES

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Rationale	In many cases, the impact of tillage and vertical stratification on S_{Dexter} (soil physical quality) and WSA (stability of soil aggregates) indexes have been studied nevertheless, there is a lack of investigations through these indexes in a semi-humid subarctic climate of the Baltic States.
Objective	A long-term field experiment was performed at the Experimental Station of Vytautas Magnus University since 1988. The aim was to investigate the impact of different tillage intensity on the upper layers S_{Dexter} and WSA indexes.
Methods	The plots of spring barley (<i>Hordeum vulgare</i> L.) were divided in five subplots: conventional ploughing (CP) at a depth of 23–25 cm, shallow ploughing (SP) at a depth of 12–15 cm, deep cultivation with chisel (DC) at a depth of 23–25 cm, shallow cultivation with discs (SC) at a depth of 12–15 cm and no-tillage (NT). WSA index was obtained using dry aggregates samples. S_{Dexter} index was calculated using water content data. Soil samples were collected in 2018.
Results	<p>a)  c) </p> <p>b)  d) </p> <p>Figure. Soil physical quality indexes S_{Dexter} (a, b) and WSA (c, d) under different tillage (CP, DC, NT, SC, SP) and at 0–5, 5–10, 10–20, 20–30 cm soil layers. Values with different letters represented a significant difference ($P > 0.05$) according to Fisher LSD test. There was no interaction between factors.</p>
Conclusion	<ul style="list-style-type: none"> The significantly highest value of S_{Dexter} index was obtained under NT along with the lowest value under SC tillage, 0.102 and 0.089, respectively. The index was significantly higher in 20 - 30 cm soil depth than in the upper soil depth (0 - 5 cm), 0.104 and 0.092, respectively. Different intensity tillage with vertical soil stratification had a significant effect on the stability of soil aggregates. The significantly highest values of WSA index were determined under NT, however, the lowest value was under SP and CP tillage, 64.53 % with 35.33 % and 31.62 %, respectively. The index was significantly lower in 20 - 30 cm of soil depth than in 5 - 10 cm soil depth, 35.01% and 48.80 % and 49.18 %, respectively. The results showed that NT increases soil physical quality also soil aggregate stability.
Keywords	Keywords: soil physical quality, stability of soil aggregates, tillage, soil depth.