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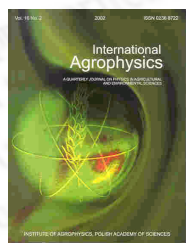
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Effects of moisture content of grain layers and their arrangement in the silo on the temperature and pressure distribution

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abstract In the present paper, results of temperature and pressure measurement of some cereals (triticale, rye, oat) along with the vertical silo wall were presented. Laminar filling of the silo with layers of various moisture content (8 and 16% w.b.) was applied. Respiration processes and differences in the moisture content caused a significant increase in temperature. During the 10-day study cycle, oat temperature increased up to 45 °C, that of triticale to 39 °C and rye to 25.5 °C. In all the cases, temperatures increased with the increase of storage time. Higher temperatures were obtained when the lower layer had 8% w.b. moisture content and the upper - 16% w.b., but lower temperatures were observed when placement was reversed. The highest temperatures were noted at the border between layers. Temperature of grain situated along the silo symmetry axis was higher than at its walls. The highest load values were obtained for triticale (3.8 kPa), the lowest for oats (1.88 kPa). For all the cases, higher load values occurred at the lowest moisture content of grain in the lower layer. Index of load increment in the lower layer amounted to 3.1 for triticale, 2.25 for rye, and 3.13 for oats.

keywords cereals, silo, temperature, pressure distribution

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