

IMPACT OF TILLAGE ON ACOUSTICAL SIGNATURES DURING RAPID HYDRATION OF AIR-DRIED SOIL AGGREGATES

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- Introduction
- Methods
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- Conclusions

Movies

- Hoytville Conventional Tillage

Mov00001.mpg

- Wooster Forest

Mov00002.mpg

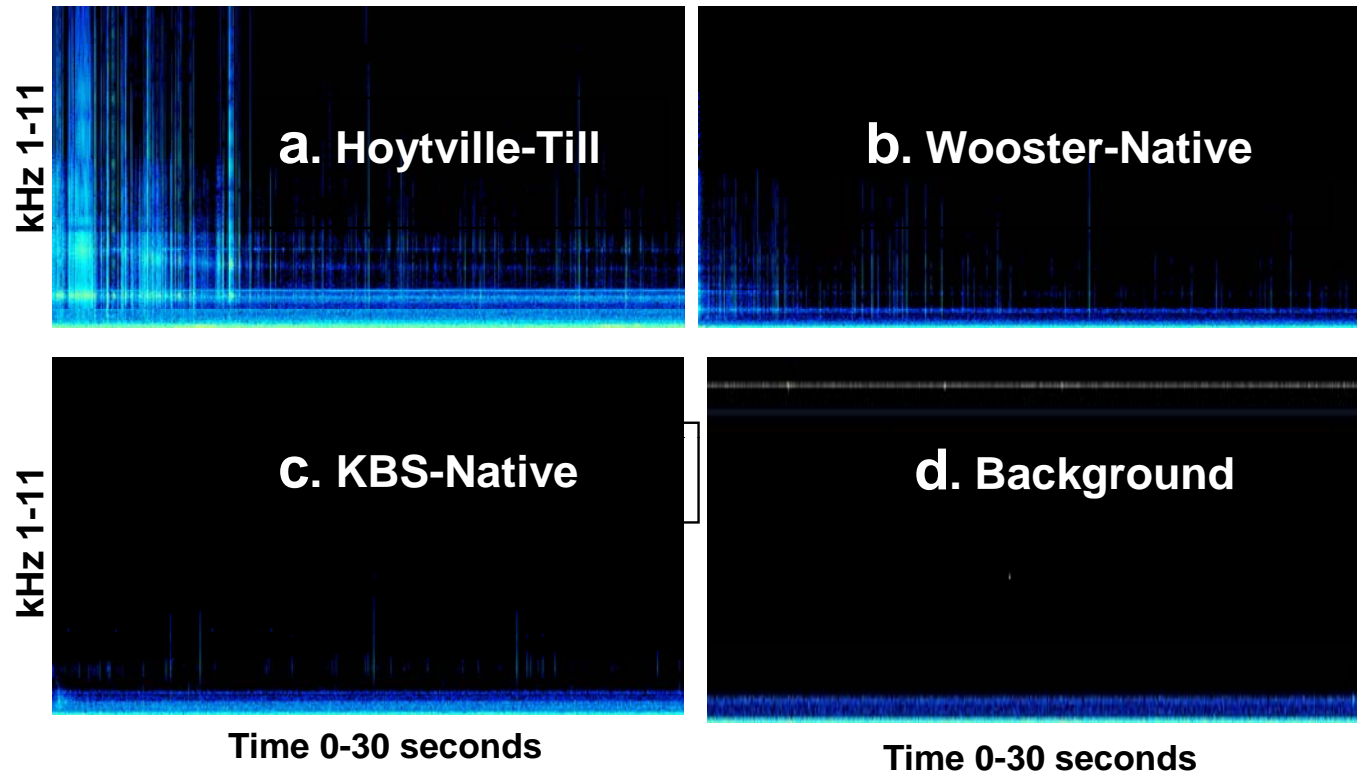


Fig. 1 a-d: Spectrograms of rapid water hydration of soil aggregates from three different soils: a) Hoytville, Ohio continuous till, b) Wooster, Ohio native forest, c) KBS, Hickory Corners, Michigan native soil and d) background sound with no soil aggregates. The color intensity and brightness indicates sound intensity. Black indicates no sound. Lighter color means higher sound intensity.

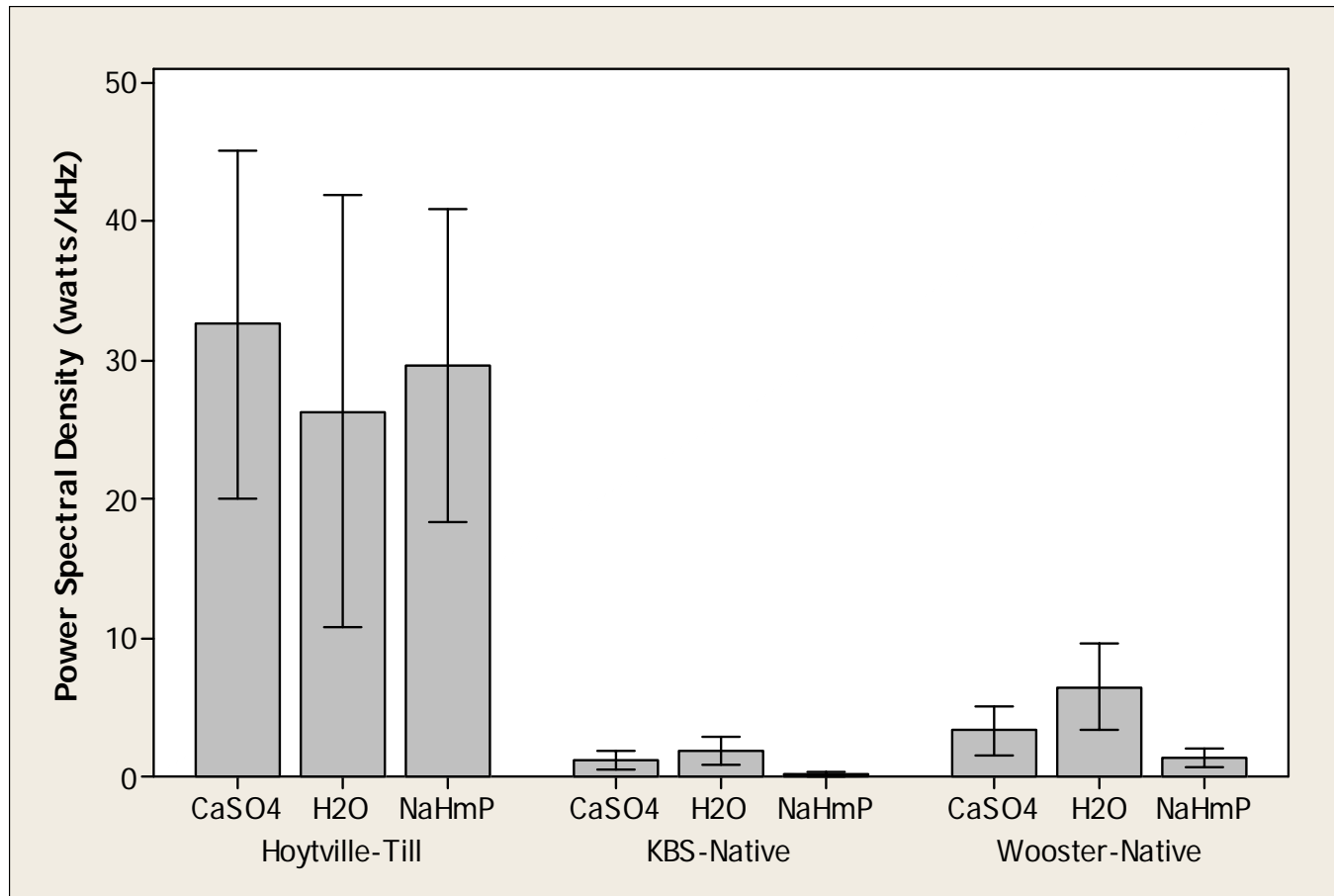


Fig. 2. Relationship among Power Spectral Density (acoustical intensity, sum of kHz frequency levels 3-11) of soil aggregates from three soil/management systems: a native succession at the Kellogg Biological Station (KBS), Hickory Corners; Michigan, a conventionally-tilled soil from Hoytville, Ohio; and a native forest soil from Wooster, Ohio. Samples were immersed in water (H₂O), 50 g/L Na-Hexametaphosphate (NaHmP), or 5mM CaSO₄. Error bars indicate standard error of the mean of four replicate aggregates.

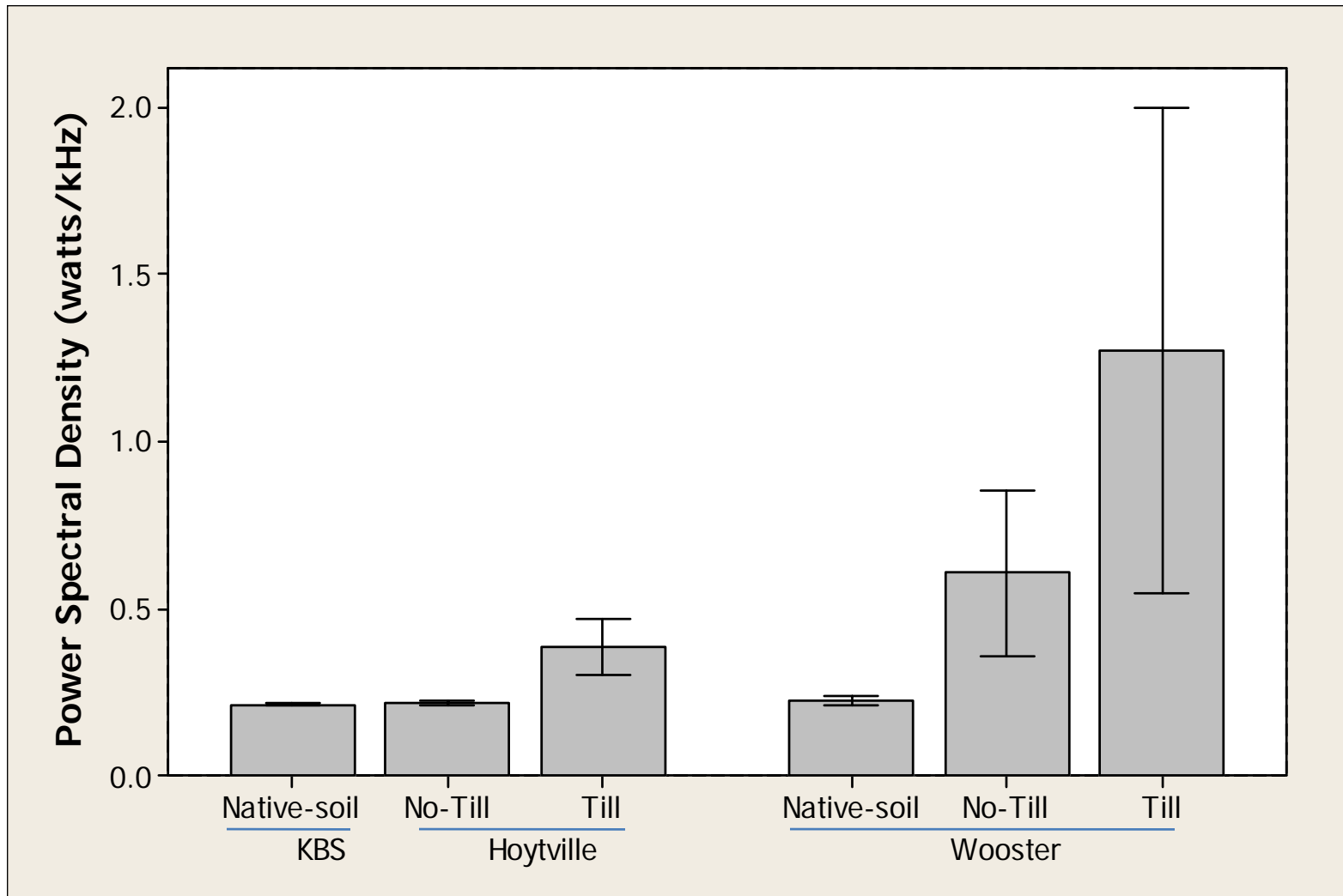


Fig. 3. Relationship between Power Spectral Density Mean (acoustical intensity, sum of kHz 2-11 frequency levels) of rapidly hydrated (immersed in water) soil aggregates and six soil/management systems: native succession at KBS (Hickory Corners, Michigan); conventionally tilled and no tilled soil from Hoytville (Ohio); and native forest, no-till and conventionally tilled soil from Wooster (Ohio). Error bars indicate 95% confidence intervals from the mean of 30 replicates.

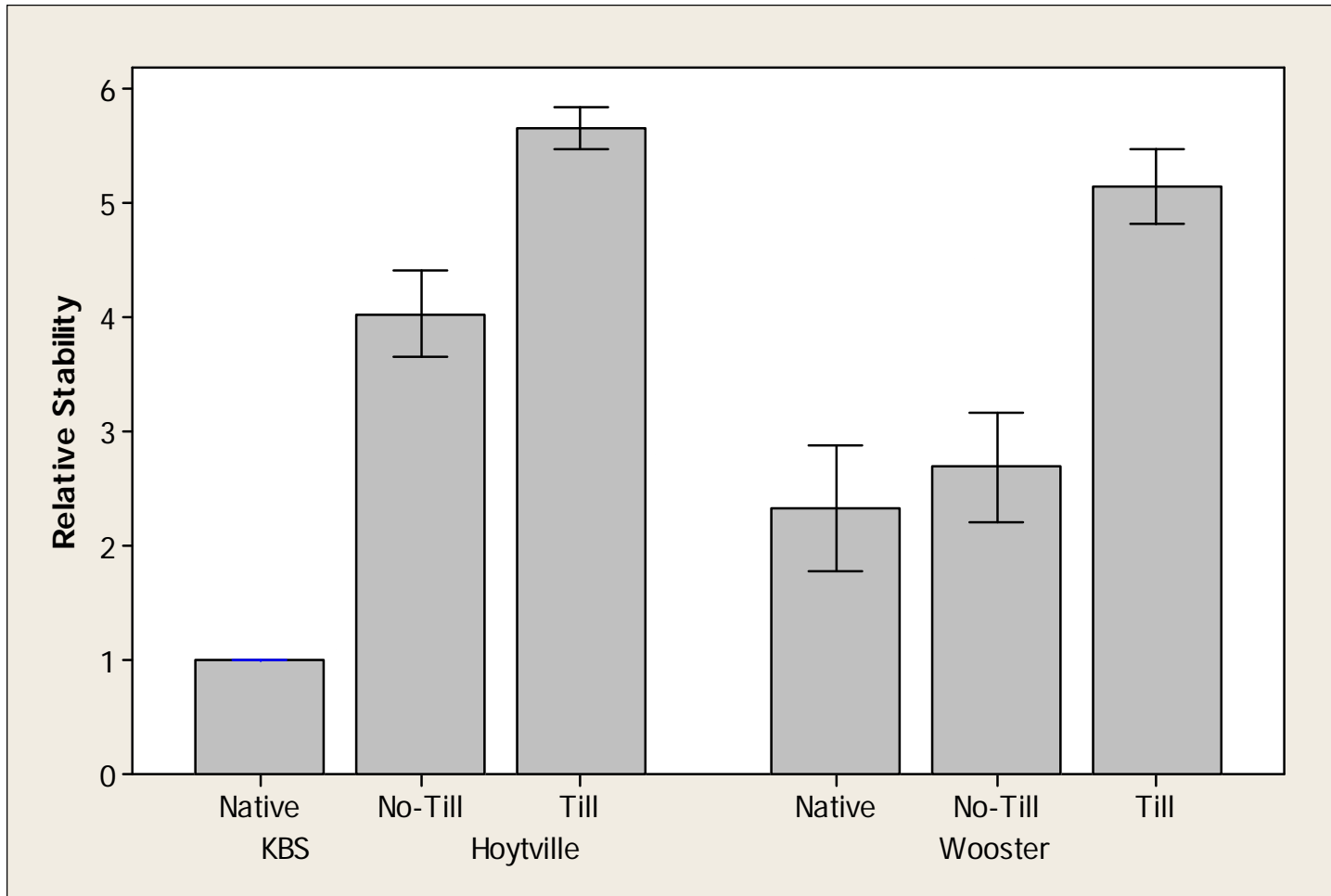


Fig 5. Relationship between visual assessment of soil aggregate slaking in water (Relative Stability: 1.0= no slaking and 6.0= complete disintegration when immersed for 30 seconds). Graphs bars represent the means (soil/management systems= 6, replications=30) and 95% confidence intervals.

Conclusions