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Spectroscopy and water sorption can estimate soil specific surface area

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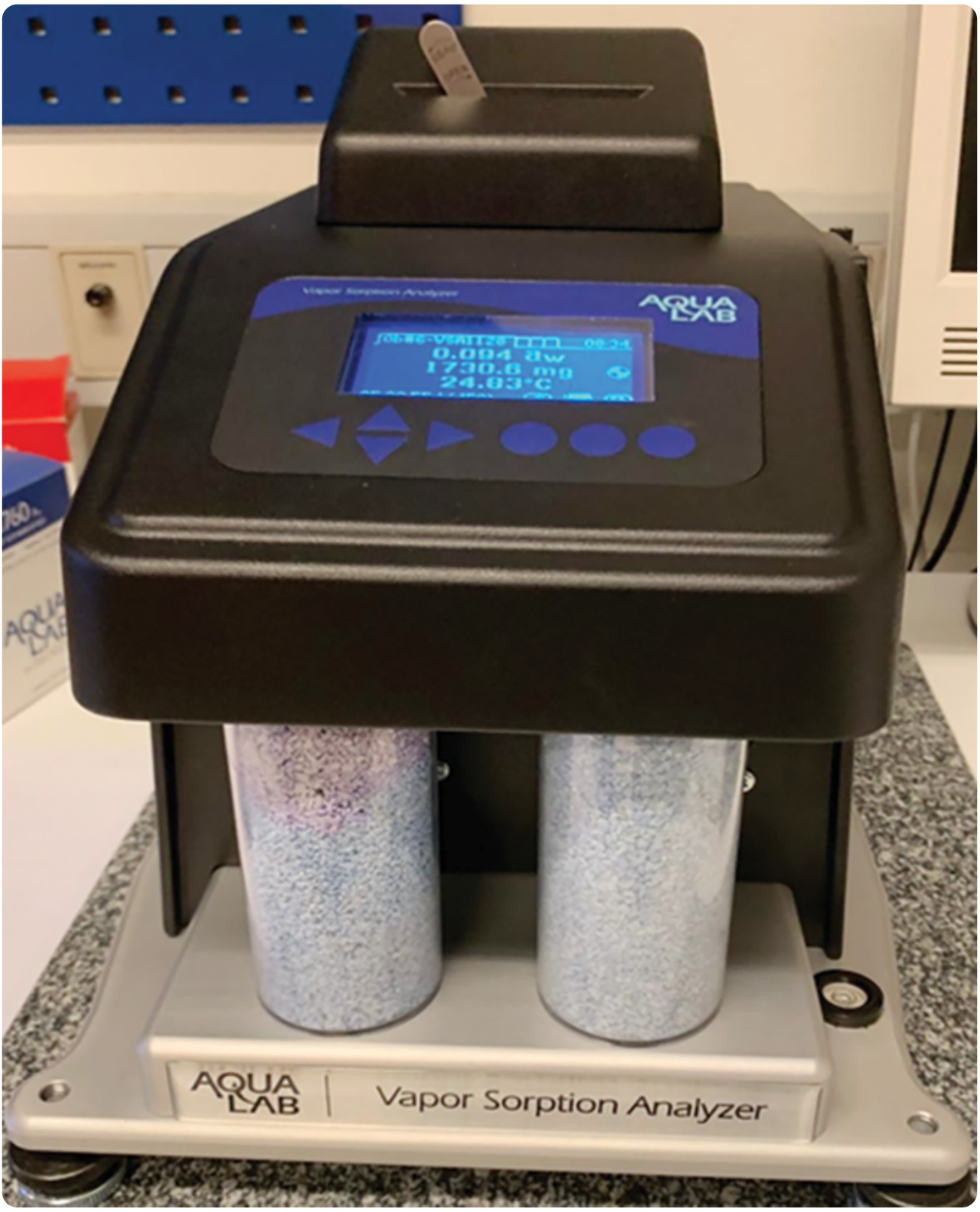

The vapor sorption analyzer provides sorption isotherm measurements by automatically wetting and drying the sample while recording the change in the sample mass. Photo by

Hafeez Ur Rehman.

There is worldwide interest in the accurate estimation of specific surface area (SSA), which governs numerous soil process and behaviors. Although it is measured routinely by scientists, agronomists, and engineers around the world, there is no standard method available. Moreover, there are many limitations and disadvantages associated with the usage of the existing techniques, such as long measurement times, complicated measurement protocols, and environmental concerns about the chemical disposal.

A new study, recently published in *Vadose Zone Journal*, reports on the use of an alternative approach for SSA estimation for samples originating from different parts of the world and covering a wide range of soil types and mineralogies. Capitalizing on the excellent reproducibility and rapidity of visible near-infrared spectroscopic and vapor sorption isotherm measurements, the authors proposed a method for SSA estimation based on a combination of the two techniques.

Given the elevated interest in SSA, a rapid, more accurate, and repeatable alternative method for its determination is crucial. The published study suggests that the use of vapor sorption as a reference technique for training spectroscopy models can provide such an alternative, generating SSA estimates akin to the common chemical method and avoiding the use of chemicals.

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Knadel, M., de Jonge, L.W., Tuller, M., Rehman, H.U., Jensen, P.W., Moldrup, P., Greve, M.H., Arthur, E. (2020). Combining visible near-infrared spectroscopy and water vapor sorption for soil specific surface area estimation. *Vadose Zone Journal*, *19*, e20007. **https://doi.org/10.1002/vzj2.20007**

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