

More plant-available water from soil carbon

May 3, 2022



First author Dianna Bagnall (center) talks about soil structure with a field supervisor and plant scientist. Photo by Bill Stutz.

Healthy soil soaks up rainfall and stores it for crops. While farmers have known this for a long time, it has been hard for scientists to predict how much extra water farmers can expect soil to provide to their crops when they use practices that improve carbon in the soil. Past experiments have found mixed results.

New equations published in the *Soil Science Society of America Journal*, developed as part of the **North American Project to Evaluate Soil Health Measurements**, show that enhancing soil carbon results in an increase of plant-available water as much as three times higher than earlier estimates. Important reasons for the larger amount of water were that data were more comprehensive than past studies, covering many soil management practices at 124 replicated experiments across North America; and measurements of field capacity preserved soil structure.

Being able to predict how increases in carbon improve plant-available water is important because many farmers consider water management a reason to adopt soil health management practices like no-till or cover crops. The equations are open source and can be used to model how increasing soil carbon can make agriculture more drought resilient.

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Bagnall, D. K., Morgan, C. L.S., Cope, M., Bean, G. M., Cappellazzi, S., Greub, K., ... & Honeycutt, C. W. (2022). Carbon-sensitive pedotransfer functions for plant available water. *Soil Science Society of America Journal*.

<https://doi.org/10.1002/saj2.20395>

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