New test assesses gas drilling effects on soils

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This installation of a pipeline right-of-way for gas shows how construction related to gas drilling can impact soil health. The Cornell Soil Health Test assesses such effects.

(PhysOrg.com) -- Researchers have developed the Cornell Soil Health Test to evaluate soil response to management on different types of land. It's intended to assess changes due to gas drilling work.

The construction necessary to extract natural gas from the Marcellus Shale in southern New York could affect the soil around drilling sites and pipeline right-of-ways, says a Cornell soil expert who has helped develop a new soil health test to assess such impacts.

"Soil is sensitive to heavy construction, and while there are a lot of construction standards and practices, there isn't really a standardized way to measure construction impacts on soil behavior," said Robert

Schindelbeck, a Cornell extension associate in crop and soil sciences and member of the Cornell Soil Health Team.

To fill in that information gap, Schindelbeck and his team have developed the Cornell Soil Health Test (CSHT), a set of tests designed to evaluate soil response to management on different types of land.

Prior to the CSHT, soil tests typically only measured the chemical composition of the land, which essentially indicates which nutrients are available in the soil sample. However, those traditional measurements gave no indication of the overall "life" of the soil, and how well it could sustain proper functioning after being disturbed by construction, farming or other activities.

With the CSHT, testers can compare soil measurements from a construction site with those from adjacent, undisturbed areas to evaluate whether chemical, biological and physical attributes of the soil have been affected by construction.

These issues are taking on particular importance now as the state, landowners and environmental groups debate whether and how wetlands, fallow and agricultural lands could be adversely affected by drilling, road and pipeline construction associated with extracting natural gas from the Marcellus Shale. Healthy soil is necessary for filtering and storing water, protecting the land surface and for supporting plant growth.

"When drilling companies are constructing any sort of right-of-way, it can affect the land and the area around it," said Schindelbeck. "The state already has established different construction and reclamation standards for varying land use types, with more sensitive land uses having stricter soil protection standards for construction activity. Developers must document how they will meet these standards."

Schindelbeck's research on pipeline construction suggests soil quality can be restored using widely accepted practices in the wake of typical drilling activity on some types of land.

"On agricultural land use areas where the contractors follow the state-mandated practices of removing topsoil during construction, replacing it and then decompacting the soil, we found the soil quality is almost the same as it was before construction," said Schindelbeck.

However, fallow lands, which do not have as stringent construction and reclamation requirements, were found to have marked negative effects from pipeline construction. With the new CSHT tools, disturbances to especially vulnerable wetland and agricultural lands could be properly assessed. The team also identified soil parameters and suggested remediation practices to return the soil to its full potential. The team will use the CSHT again next spring on construction sites to assess how certain projects might affect land use in the future.

"We wanted to develop a test that helps ensure that state standards do indeed protect the environment, so somebody downstream of pipeline construction does not end up with a problem," said Schindelbeck. "With a test that actually measures the performance of the soil, we can confirm or refute issues concerning reclamation of the affected land."

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