POWER SAMPLER FOR FROZEN SOIL¹

This paper describes a mechanical sampler for taking cores from frozen soil.

Components are shown in figure 1. The 2½-horsepower engine, drive, and transmission assemblies are available commercially, from the Haynes Manufacturing Company, Livingston, Texas. The extension shaft and sample tube were specially made at the U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. The 12-gauge sample tube has an inside diameter of 1.87 inches and is 18 inches long.

To start the sampler into the ground, the operator places his full weight on the handles, with the tube perpendicular to the surface (figure 2), and braces the handle against his thigh. If there is no ice on the surface and no stones in the soil, the tube descends at a uniform rate until it is full, the handles are rocked back and forth to break off the core. The tube is then pulled up into the core pushed out with a round wooden rod.

The machine was used to take more than 1,500 frozen soil cores from woods, pasture, and plowed land in lower Michigan. Soils were sandy loam, loam, and silt loam. When the operation went smoothly, the engine melted the frozen soil enough to permit sampling without injury to the core. In stony soils it vibrates excessively and break up the core and rotate in place, thus melting the frozen core. A slight constriction or swelling of the cutting edge might allow for swelling of the core to prevent such jamming.

The cutting edge, of rolled stainless steel, had to be withdrawn quickly, to prevent unwrapping the tube and preventing extraction of the intact frozen core. A slight constriction or swelling of the cutting edge might allow for swelling of the core to prevent such jamming.

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In an early model the extension shaft was connected to an outer cutting tube with two helical flanges. An inner tube received the sample. Two versions of the cutting tube were tried—one with flanges even with the end of the tube and one with them extended 4 inches. Both were unsuccessful, chiefly because the sampling was dangerous on the surface without entering.—ARTHUR W. KRUMBACH, JR., Research Forester, Southern Forest Exp. Sta., Forest Service, USDA, Brewton, Ala.

EFFECT OF ORGANIC ADDITIONS ON THE CHANGES IN EXCHANGEABLE POTASSIUM OBSERVED ON DRYING

Many soils release K from a nonexchangeable (NH₄OAc-extractable) form when dried samples are rewet. Consequently, there has been some uncertainty as to how these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. However, this would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values. In some cases, it would appear that undried samples of these soils should be adjusted to obtain meaningful exchangeable K values.