SOIL SAMPLING TUBE

Soil moisture studies of the tillage zone necessitate sampling small increments of soil at frequent intervals. Open sided tubes such as the Oakfield and Hoffer soil samplers do not work well in sampling this zone. For sampling the tillage zone, the tube must be designed a) to expose the soil core for sectioning with minimum contamination, b) to permit rapid sampling, and c) to minimize soil core compression.

Figure 1 is a drawing of a sampling tube constructed to fulfill the above requirements. The tube is 1 1/2-inch rigid, galvanized steel conduit and the handle is 1-inch conduit. The tube was enlarged to an outside diameter of 1-13/16 inches at a distance of 1 inch above the cutting edge. The enlarged portion provides easier pulling in wet soil. The cutting edge was shrunk to a diameter of 1-7/16 inches and sharpened. Since the diameter of the cutting edge is smaller than the inside diameter of the tube, the soil does not stick to the inside of the tube after it clears the cutting edge.

Sampling depth marks can be placed on the outside of the enclosed part of the tube above the cutting edge. At a distance of 7 1/2 inches above the cutting edge, half of the tube was cut away so that soil cores could be sectioned and removed from the side. A narrow strip of masking tape was placed along each side of the cutaway section. Marks were placed on the strips to serve as guides for sectioning the soil core. A wooden dowel, slightly smaller than the diameter of the cutting edge and 18 inches long is used to push the soil core to the slotted area of the tube for sectioning. A lightweight wooden rack was constructed to hold the tube in a horizontal position at a convenient working height.

After taking the sample, the tube is placed on the rack and the dowel used to push the core to the slotted area. Using a sharp knife or spatula, the soil core is sectioned according to sampling depth marks on the masking tape.

The sampling tube has been used successfully to obtain small soil increments for laboratory analyses and bulk density measurements. Cost of construction was $15 per tube at a local machine shop.—PAUL L. BROWN, Research Soil Scientist, USDA, ARS, SWC, Bozeman, Mont.

2 Oakfield Apparatus Company, Oakfield, Wisconsin.
3 Elano Corporation, Xenia, Ohio.
4 Trade names and company names are included for the benefit of the reader, and do not imply any endorsement by the USDA.