textured soils. At Akron, concave slopes concentrate more than the normal flow of water across an area, generally had soils with lime zones deeper than those soils developing on convex surfaces where greater runoff and surface soil erosion was expected (figure 5). Microrelief appeared to be connected, also, with other soil-forming processes such as organic matter accumulation, clay migration, and structural development. A direct comparison of depth to lime zone was made with unadjusted plot yields (figure 6A) and it was noted that the scatter, perhaps caused by treatment variations and miscellaneous factors, with an $r^2$ value of 0.52 for the regression equation

$$Y \text{ [yield]} = 60 \ (0.11 D_L + 4.40)$$

When yields are adjusted for treatment and miscellaneous factors (such as hail or insect damage), the values fit rather closely the regression line

$$Y = 60 \ (.18 D_L + 3.44)$$

with an $r^2$ value of 0.988 (figure 6B). Thus, the justification in using a single, easily measurable soil property to quickly assess relative productivity of soils which are derived from similar parent materials and are developing under the same general influences of climate and vegetation. Such technique might not apply to recent alluvium or other undeveloped soils or to soils differently irrigated and fertilized.

LITERATURE CITED


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NOTES

A RECORDING BALANCE FOR MEASURING UNSATURATED MOISTURE FLOW IN SOIL

The transient outflow method for making unsaturated conductivity measurements, described by Kunze and Kirkham, requires accurate measurements of the initial flow rate out of a soil sample. Green found that the method also was applicable for transient flow into a soil sample. Both methods were adequate for most conductivity experiments, but apparently were unsatisfactory for some experiments in the near saturation range. In the investigations cited above, the flow rates were obtained by measuring the movement of an air bubble in a pipette. The air bubble technique has several limitations: (1) more force is required to move a column of water containing an air bubble than without it; (2) with fast outflow the bubble movement is too rapid to be recorded accurately with the eye; and (3) the initial surge effect is difficult to quantify. An alternative method involves the use of a recording balance to measure the movement of the soil sample in response to a known force.