Silt Deposition at Ardmore, Oklahoma, From Dust Storms in 1954

HORACE J. HARPER*

Several dust storms occurred in southern Oklahoma during February and March, 1954. These storms were similar to the severe dust storms that occurred in Oklahoma during March and April, 1935. Murphy (1) studied the deposition of dust in central Oklahoma during the 1935 dust storms. Distilled water was placed in shallow pans; and the quantity of dust which was caught in the water was separated by filtering, then dried and weighed. A maximum deposition of 312 pounds of dust per acre was collected on April 10 and 11, 1935. The second highest quantity of dust was 136 pounds per acre, which was collected from April 18 to 25, 1935. The organic matter content of these dust samples was 4.05%.

A severe dust storm occurred in south central Oklahoma on February 19, 1954. Dust deposited by this storm was collected from an area 4 feet square in a Burmuda grass lawn with a vacuum cleaner. The soil beneath the dense, Bermuda-grass turf was a black clay. It was moist from recent rainfall when the first dust storm occurred. Consequently, no mineral matter was picked up from the surface of the soil by the vacuum cleaner. Grass clippings picked up by the vacuum cleaner were separated from the dust with a 20-mesh screen, and smaller leaf fragments were separated with a 100-mesh screen. The total quantity of dust deposited from this storm was 116 pounds per acre. A storm occurring on February 20 deposited about 20 pounds of dust per acre. On March 12, 1954, dust equivalent to 87.6 pounds per acre was collected. The organic matter content of the dust sample collected on February 19 was 4.39%. The total phosphorus in these samples was .06%.

Very little fine silt is deposited during many dust storms because the fine particles remain in suspension until the wind speed falls below the velocity or turbulence required to lift these small mineral and organic particles from the surface of the ground. Field studies have shown that large quantities of fine silt were transported from 100 to 200 miles by wind before deposition occurred (2).

Literature Cited

1. Murphy, H. F. 1936. The deposition of dust in central Oklahoma during the 1935 dust storms. Okla. Acad. Sci. Proc. 16:74-75.

2. Ulrich, Rudolph. 1949. Some physical changes accompanying Prairie, Wiesenboden and planosol soil profile development from Peorian loess in southwestern Iowa. Soil Sci. Soc. Amer. Proc. 14:287-295.

* Agricultural Director, The Samuel Roberts Noble Foundation, Inc., Ardmore, Oklahoma.