SOIL AND EROSION CHANGES ON THE DALHART SAND DUNE AREA

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In the past few years, certain areas in the southern Great Plains have suffered from extreme wind erosion with the subsequent formation of sand dunes. In 1936, an experimental area was established in Dallam County, Texas, which is known as the Dalhart Sand Dune Area. This site, consisting of 2,000 acres, was selected as being typical of a large number of similarly wind-eroded areas. The results of studies dealing with the methods of stabilization and utilization of this sand dune area have been reported by Whitfield. In April 1936, a Soil Conservation Service survey was made on this experimental area prior to treatment. In August 1939, another survey was made on a portion of the area (925 acres) to obtain information of a specific nature as to the changes in soil and erosion that had occurred in the interval of about 3½ years.

Before examining these two surveys, it might be well to note in a general way the nature of the soils occurring on the area and to suggest the nature and probable causes of this particular type of wind erosion.

DESCRIPTION OF SOILS

The soils occurring on the area are characterized by a light brown to brown, sandy surface soil and a reddish brown sandy loam to sandy clay subsoil. In structure the surface soils are single grained and the subsoils are massive with a slight tendency to form columns. Of particular importance is the property of these subsoils to become very compact when dry. When they are exposed by erosion, they form an extremely hard, smooth surface. These soils are of a medium depth to deep, varying in the depth to calcareous material from about 2 to 5 feet. Small areas with lime at or near the surface are common. The areas, if large enough, are mapped as a shallow phase or as another series. Another variation is the occurrence of buried lake beds. These old lake beds are generally 2 feet or more below the surface and consist of a very dark, heavy, plastic clay. Such areas are for the most part quite small and are not delineated in ordinary Soil Conservation Service surveys, but are of importance in the present detailed study.

Two soil types, a fine sandy loam and a loamy fine sand, were mapped on 55% of the area. The remainder of the area, due to severe

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1 Contribution from the Soil Conservation Service, U. S. Dept. of Agriculture, Amarillo, Texas. Received for publication February 6, 1940.
2 Junior Soil Technologist and Senior Soil Conservationist, respectively.
5 Original survey by Dave R. Cawlfield and Claude L. Fly, Soil Conservation Service.
6 The two soil types would probably be correlated as Dalhart fine sandy loam and Springer loamy fine sand. These two series are differentiated entirely on subsoil texture. The Dalhart series has a sandy clay loam to sandy clay subsoil and the Springer series has a sandy loam to a sandy clay loam subsoil.