

WIND Erosion Can be Controlled by Proper Tillage Operations

Soil erosion by wind has been more destructive throughout the Great Plains area during 1933 and 1934 than for any other similar period since the native sod was broken for crop production. Millions of acres are subject to wind erosion, and from hundreds of thousands of acres of level to slightly rolling land the soil was blown as deep as the fields had been tilled the previous year (fig. 74). Fences, Russian-thistles, weeds, shrubs, farm machinery in the fields, farmsteads, windbreaks, roads, or any obstruction that might retard the wind velocity and permit the soil to settle were filled or covered with wind-blown soil.

The principal causes of the disastrous soil blowing in 1933 and 1934 were continuous high winds, intensive cultivation, the practice of burning stubble, low rainfall, and lack of organic matter to hold the



FIGURE 74.—The tilled soil in this field has been nearly all blown away and the subsoil shows the marks of the tillage implements.

soil in place. The loam and light sandy soils are most subject to blowing. Under the same conditions the light sandy soils will usually blow before the heavier loams.

One of the best methods to control soil blowing on continuous-wheat land is to begin immediately after harvest with a lister, one-way disk plow, or duckfoot cultivator. The duckfoot can be used provided the stubble is not too heavy or the soil too dry and hard. These implements cover some of the stubble but leave some uncovered and some only partially covered. The land then will not blow badly and is in good condition to retain sudden heavy rains. The next operation should preferably be made after a few rains have occurred and weed growth has started. The field may be relisted by splitting the ridges, or the ridges may be worked down with a ridge buster, weeder, or other implement capable of leveling the ridges and furrows. This second operation further mixes the soil and stubble.

The land should be kept free of weeds from the time the lister ridges are worked or after the first one-way disk plow, tandem disk, or duckfoot operation until seeding for wheat. The amount of rainfall received usually determines the number of times the soil must be worked to destroy the weed growth. Whatever implement is used, the surface soil should not be worked to a fine dust mulch. A cloddy surface is desired for rainfall absorption and for control of blowing. Such implements as the duckfoot cultivator, spring-tooth harrow, subsoil packer, and rod weeder are much preferred to the one-way disk plow, tandem disk harrow, peg-tooth harrow, clod crusher, or surface roller, for prevention of soil blowing. For seed-bed preparation the proper use of the lister, ridge buster, one-way disk plow, duckfoot, or subsoil packer will usually be found sufficient for small-grain and sorghum crops.

The methods of tillage described above for continuous wheat may be used in the fallow system. Fallow tillage begins early in the

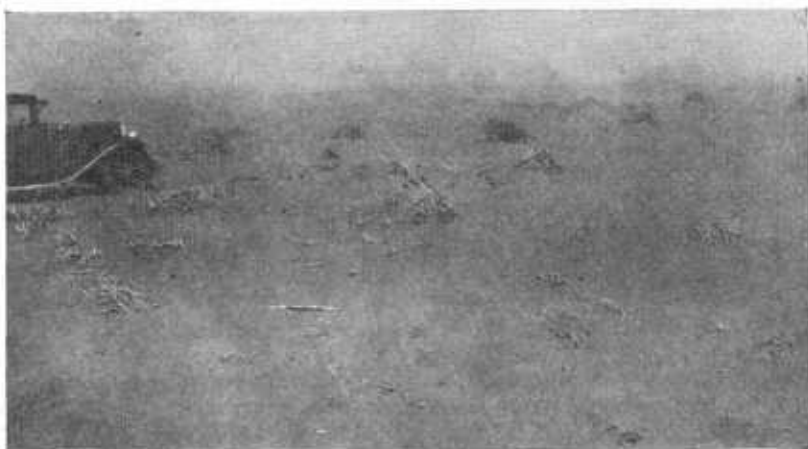


FIGURE 75.—The surface soil is being rapidly blown off this field.

spring, before weed growth starts. The implements and the order of their use are similar to the continuous-wheat methods. The land must be kept in a roughened condition and free of weeds. A roughened cloddy soil surface is more difficult to maintain due to the lack of new stubble and to more tillage operations which tend to pulverize the soil to a fine dust. Listing and relisting by splitting the ridges is one of the best methods to maintain a rough cloddy soil surface and to thoroughly mix the old stubble in the soil. In the winter-wheat area of the Central Plains the field should be allowed to remain in a rough condition until 45 to 60 days before seeding. Then the lister ridges must be worked down, subsoil packed, and field rendered free of weeds, but care must be taken not to produce a fine surface soil by the use of disk or drags.

The greatest danger of soil blowing is during the winter and spring months. Three factors are responsible for this; (1) the weathering of the soil during the winter, (2) high winds, and (3) lack of sufficient plant growth to protect the weathered surface soil. Wind erosion should be checked as soon as it starts. Usually the first sign of soil

blowing is a little dust rising from a small portion of the field. Later the dust will come from a larger area and if control measures are not begun promptly all the field will eventually be blowing (fig. 75).

The best method of checking soil blowing is by roughening the surface in strips at right angles to the prevailing winds (fig. 76). A cultivator or spring-tooth harrow may be used for this purpose. A lister is preferable in light sand or loose, dry loam soils. One to three lister furrows made every 10 rods usually are sufficient but the entire



FIGURE 76.—A field listed in parallel strips to check wind erosion.

field may require listing to stop the soil movement. If the soil is dry and very loose, even listing does not always check the soil movement.

In a clean-tilled field enough clods must be brought to the surface and remain there to prevent the shifting of fine silt and sands. Dry dusty loam and light sandy soils do not have clods near the surface. Rainfall is needed to pack the surface or the lister must penetrate to the moist hard subsoil and lift the clods to the surface.

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