

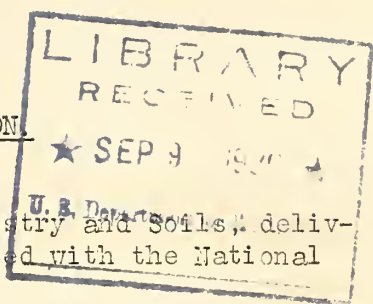
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THE COST AND CONTROL OF SOIL EROSION



A radio talk by H. H. Bennett, Bureau of Chemistry and Soils, delivered through WRC and 37 other radio stations associated with the National Broadcasting Company, September 3, 1930.

The Department of Agriculture, cooperating with the States, has recently begun a nation-wide effort to protect our farm and grazing lands from the costly wastage of soil erosion. This attack against the most vicious enemy to land fertility will be directed along the following lines: First, measurement of the extent of damage and rate of progress of erosion throughout the more vulnerable parts of the country; second, determination of the chemical and physical principles underlying the process as it varies from place to place; and third, working out of practical methods of control. Experiment stations are being established in those localities where soil wastage and water losses are most costly. There are some twenty major regions in which the process is exceedingly devastating. Appropriations already have provided for seven of these stations, all of which are in operation now or will be in a month or two. As soon as practical measures of control have been worked out they will be carried directly to the farmers and ranchers by county agricultural agents and all other effective agencies for disseminating farm knowledge. Though the work is in its infancy, valuable information already has been obtained. Moreover, educational work recently carried on in regard to soil and water losses by rapid run-off of rainwater has aroused much interest in the problem. This year soil and water-saving field terraces are being built in localities where a short time ago this method of conservation was unknown. Cropping schemes and tillage methods designed to reduce erosion are now being tried in many parts of the country.

Excessive washing of farm and grazing lands, induced by man's violent disturbance of Nature's stabilizing agencies, chiefly vegetation and ground structure, is rapidly impoverishing vast areas of soil throughout the Nation. Our best estimates indicate that 75 per cent of all land in cultivation is being seriously affected. Every year the extent of land abandoned because of gullying and sheet washing is being added to. The process is taking from our fields at least 126 billion pounds of plant food annually. This is twenty times the amount removed by crops. The fertility taken by crops can be restored, but that stolen by erosion can not, because the whole body of the soil is washed off, plant food and all. Wherever it rains enough for water to run down hill costly washing goes on. You may fail to observe the damage, because only a thin surface layer is removed by each rain. Finally, when clay spots and yawning gullies appear, it is often too late to remedy the situation, because at this stage of decline all or most of the topsoil, the most valuable part of the land, has floated away toward the oceans, or has been washed down over fertile valley lands and over roadways or has passed on to choke and fill stream channels, reservoirs, irrigation and drainage ditches, culverts and harbors.

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Every year the Mississippi alone pours into the Gulf of Mexico more than 400 million tons of mud, most of which comes from cultivated land within the Mississippi Valley. This is but a small part of the loss. Vastly more material is swept down from upper slopes than actually reaches tidewater. No one knows precisely what this annual wastage amounts to. Probably it exceeds by a hundred times the quantity of water-transported soil actually entering the sea. At the erosion experiment station in the Texas Black Belt, a region known as one of the best cotton areas of the world, a single rain on the morning of May 10, this year, washed away soil from average slopes of the region at the measured rate of 17 tons per acre. This rain fell over millions of acres and did tremendous damage. The mind can not possibly conceive the enormous amount of soil removed by erosion. A flood in the Rio Grande of New Mexico last year deposited approximately 100 million tons of sediments over a 40-mile strip of the alluvial plain, enough to build a monument eight miles high and covering an acre at the base. Immediately above the head of water in Elephant Butte, our greatest irrigation reservoir, the deposits were seven feet deep in places, indicating that a huge volume of silt was dropped in the lake, which was built to hold water, not silt. This material came largely from the over-grazed drainage basin of the Puerco River, where the world is on the move because of the erosion following excessive removal of the native vegetation. Even the bottom lands, on which the cliff-dwellers and Pueblo Indians farmed before the coming of the white man with his livestock, is rapidly washing away.

Oklahoma recently found that 13 million acres of the 16 million devoted to crops in that State are suffering seriously from erosion. Half of this already has reached the stage of gullying. Only about three decades ago home seekers went rushing across Oklahoma's virgin prairies to stake out farms on Government land. Oklahoma has no monopoly on erosion. The problem is equally bad in numerous other localities, as in the middle-Missouri River country, throughout the Valley of East Tennessee, the Ohio Valley and southwestern Wisconsin. I have just returned from the Palouse wheat belt of the Northwest, where a soil-erosion experiment station is to be established in order to find ways to save the splendid grain lands of that fertile region before they have washed too deeply.

The evil effects of erosion are cumulative. Destructive washing speeds up as the soil is cut into deeper and deeper. Already over 17 million acres of formerly tilled land have been destroyed in this country or so badly washed that farmers can not afford to reclaim it. Ninety thousand acres of such land were found in a single county. The damage of this more destructive type of washing is insignificant in comparison with the insidious wastage of unceasing sheet erosion. No nation or race has mistreated its agricultural lands as have we of America; yet nations and even civilizations have disappeared because of the evil. Until recently, we scarcely gave a passing thought to the cost of erosion. We looked on it as a necessary evil, a natural process, impossible of control. Furthermore, with our abundance of land we have looked on this form of wastage as a matter of small importance. But, the kind of erosion we are now discussing is not a natural process, and let's not forget, please, that the soil of our uplands is usually only about 6 to 12 inches deep. Below this vital layer is subsoil, which is

much more difficult to till, is vastly less productive, washes faster than the spongelike topsoil and sheds rain water quicker to add volume to destructive floods. Recent measurements have shown that under continued corn growing over large areas in the Middle West one inch of topsoil is lost by erosion every seven years. To build this precious inch of soil, Nature took not less than 300 years.

We are not on the verge of a land shortage, but we are getting much closer to a shortage of good farm land than has been generally supposed. Today tens of thousands of hard-working farmers are eking out a meager living on erosion-enfeebled land, where there is no hope for success even when prices are good. In the interest of a sound policy of national economy we should as speedily as possible get under way a far-reaching soil-saving program, never forgetting that the soil, our most precious resource, is easily destructible. Our farm and grazing lands are vital to our national existence. When we come down to the pitiable level of subsoil farming, the sun will rapidly decline upon the agriculture of America, which was built on what once seemed limitless acres of indestructible soil.

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