

OUR SOIL EROSION MENACE

BY

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When we read of a flood and its damages our thoughts are always at the wrong end of the story. We begin to wonder how to protect that flooded area by dikes, levees, dredging and straightening channels. It is a rare occasion if anyone ever thinks of it from how to stop the flood at its source. Maybe this spring we should turn the picture around and think of dust storms. Either one has the same general treatment. Why not reverse the engineer's ideas and go back up the stream to the source of this water and plan by reforestation and revegetation to hold these rains where they fall and let more of the water down through our subsoil and have clear trickling streams feeding the rivers the year around in place of a flood of muddy water every time it rains?

The daily papers always tell us of the damages done by these floods, the crops destroyed, the livestock drowned, the bridges washed out, and the buildings floated away. They never tell of the farmers' loss at the source of the floods in the millions of dollars worth of plant food and soils eroded away. They never tell of how we are rapidly making of our people a nation of subsoil farmers; how unrestrained soil erosion is rapidly building a new public domain in America, an empire of impoverished worn-out soil; land stripped of its rich surface and gullied beyond redemption. You have seen the national erosion toll figures quoted in dozens of magazines, but let me requote so we can readily get the picture before us.

1) An area in the United States the size of the State of Illinois—35,000,000 acres is already so badly gullied and eroded it is doubtful if it can ever be reclaimed.

2) One hundred twenty-five million acres or one third of our remaining good soil in the United States is being sheet eroded so rapidly it will soon be to the subsoil farmer stage. Then gullying starts readily. You can see thousands of such acres here in central Illinois—those yellow gravelly spots appearing on the slopes and tops of the little knolls in our good black soil fields.

3) We lose annually by water run-off 21 times the plant food taken out in crops.

4) Fully 75 per cent of the cultivated land in the United States is subject to some degree of impoverishing erosion when used for clean cultivated crops. One half of this is subject to serious erosion.

5) Our state as shown by the state soil survey map, shows approximately 50 per cent of our soils subject to some degree of harmful erosion. Fifteen per cent of this is now at the serious gullying stage.

6) On the first 1200 acres surveyed in our erosion area, 45 per cent of it showed the surface 6 to 12 inches already washed off, and on 10 per cent the top loessial deposit of 40 inches gone completely. Remember this has happened in a new country where the first plow was used in 1825.

7) The Mississippi River dumps annually 428,715,000 tons of soil at its mouth. This is the equivalent of $2\frac{1}{2}$ townships of soil to a depth of four feet, or the annual destruction of 360 quarter section farms. Farmers operating these farms stripped of their fertility have but the slimmest opportunity to make a satisfactory living, whether prices go up or down.

We have been preaching and worrying about wearing our soils out by continuous cropping and putting nothing back. Hundreds of textbooks have been written on this subject. If I am informed rightly to date no textbooks have been written on soil erosion and only a very few definite erosion study stations set up. I believe we have eleven such fields under the supervision of the United States Department of Agriculture, and I doubt if many here ever heard of them.

America's original wealth, her natural resources, were so vast it is little wonder we started in to be wasteful, destroying some of the world's greatest hardwood forests and celebrating by community log-rollings, burning up these logs to get rid of them. We let lumber companies cut off timbers and not replace them, making \$5,000,000 profits while as a result of this, \$50,000,000 damages was done to the property down stream due to flood waters from above. Our land seemed to be limitless so as one field was cleared and it washed away, we abandoned it, and cleared another. That policy has come to an end, and we find ourselves today facing the opposite direction in trying to teach our farm people the value of conservation in place of devastation. Our farm people have gone too much on the theory that erosion is a natural process that cannot be avoided.

May I here give you a few brief illustrations of our lax national policy on land utilization. First take the Navajo Indian reservation, with an area of sixteen million acres; fifty years ago we had about 8,000 Indians on the reservation, with only a small amount of livestock. Today we have 45,000 Indians with over one million sheep and goats. Their

animal population has grown so rapidly that the grasses and shrubs are kept eaten into the ground and we have no natural cover to hold the soils in place following rain or wind. The Indians are seeing this problem and giving up a large per cent of their livestock.

Along the Rio Grande area is a small canyon 40 miles long through which flows the Puerco River; the soil was mapped a few years ago as a good alluvial soil. After a heavy flood last year almost the entire valley was covered by 1 to 3 feet of sand and sandy loam. Lives were lost, millions of dollars of damage done to personal property. Mr. H. H. Bennett, Director of Soil Erosion Service, investigated the watershed and found the grasses and undergrowth had been so completely eaten off that erosion was easily started and it was impossible to find an area where the original topsoil remained. We people reading that story missed the main point. We saw the property destroyed but never gave a minute's thought to the land destroyed in the two locations: first, the surface in the upland washed away and secondly, the good alluvial bottom-land covered with sand, the fine rich soil being carried out into the larger streams.

We were all startled by the story of the flood in California last December at which time 60 people were killed and millions of dollars worth of property was damaged, roads destroyed, bridges washed out, etc. But very few of us ever heard why this happened, so let me tell the story. Thanksgiving Day in one valley a fire destroyed 5,000 acres of timber with its ground cover. When the December rains came with a waterfall of 12 to 18 inches in thirty-six hours there was no undergrowth or ground cover to hold this moisture—only a hard soil that absorbed water slowly so off went millions of tons of soil and caused the damage. The truth then, is that it was the fire that caused the flood because adjoining valleys where there had been no fire, but which received the same rainfall had no floods. The forestry service in California burned over a small area to note the effect of rains. A 12-inch rain fell and on the burned over area the run-off amounted to 300 buckets of water, on the unburned area of the same size, only eight buckets. I could go on giving these illustrations and not have to go West. We have it here in Illinois. Our greed for crops has forced the breaking up of rolling timbers and pastures and after two or three good crops the soil washes off rapidly and we see through Illinois these gravelly surface soils all gullied and now so poor they can hardly be put back into grasses.

The business man is interested in this program, for he wants to build lakes on our small streams for city water supplies and pleasure resorts. These once constructed at a large expense are filling up rapidly by the careless farming methods at the headwater of all the branches of these streams. Lake Decatur is an example of this rapid silting in. The Government has asked Mr. Bennett, the Director of Soil Erosion Service

in the Department of the Interior, to help them develop a revegetation program to keep all this soil from washing into the large lake back of Boulder Dam. The engineers underestimated the silting in rate. Please remember this, don't think of it only as a lake saver, but a soil conservation program.

I mentioned earlier in this paper that through the United States we have eleven Soil Erosion Control stations. I want to quote a little from the Missouri Station, so you will know better what these stations are teaching us about the soil losses we have been talking about.

We have been told that it takes Mother Nature at least 400 years to build an inch of this good, black soil, or about 3,000 years to build our top 7 inches. At the Missouri station the plots with an average slope of 4 per cent are located on a good, black soil. They are arranged so they catch all the run-off of water and soil from these plots. Plot No. 1 is cultivated each season but no crop planted. Under these conditions the water run-off and soil erosion is so great that in 24 years the surface 7 inches of soil would be washed off.

Plot No. 2 is planted to continuous corn. With this plan it would take only 50 years to lose the top 7 inches. This is just the lifetime of the average farmer.

On Plot No. 3 is planted a rotation of corn, wheat and clover; here it would take 350 years to lose the surface 7 inches.

Plot No. 4 in continuous bluegrass, lost soil at the rate of 3500 years for the top 7 inches. In other words, man's methods of farming speeds up rapidly Nature's power to erode soils.

At these fields soil losses are being checked by applying different soil treatments and the growing of legumes. They are also studying checking of soil losses by different methods of farming as strip cropping, contour farming, and terracing.

With a National President who is interested in this great problem of conserving our National resources, soil erosion has come to the front. People are reading about its effects, applying it to land values, and above all asking for help to stop this menace. With this in mind, appropriations were made from P. W. A. funds to develop throughout the United States demonstrational areas on Soil Erosion. Illinois was given one of these projects. The first thought was that maybe it should be in extreme southern Illinois where the menace no doubt is greater. The representatives from Washington, though, disapproved of this plan, saying they were not interested here in Illinois in a reclamation project of poor lands but wanted to go up into the higher-valued lands of the corn belt and put on a conservation project. In this they are right, for it is more important to conserve what good soils we have left than to try to reclaim soils that will cost more to reclaim than their probable production worth.

The area selected for Illinois is located on the Bloomington Moraine in McLean County between Bloomington and Gibson City. The south and east sides of the area are the lower edge of the moraine. The area comprises about 140,000 acres with approximately 700 farm operating units. Our program, built up hurriedly and without the guiding experience of former work, had to take shape as we went along and we have had to make many changes as we progressed.

The first step was a series of educational meetings among the farmers as to just what we were planning to do. As a demonstration we have asked the farmer to furnish the land and we will furnish the other materials necessary for the project. The farmer signs an agreement to go along with us for five years. We have divided our program into four parts.

1) A farm management survey to get information on the cropping system practiced on that farm, and to use as a guide in building a cropping system that will put life back into the soil and using farming practices to conserve soil.

2) A soil survey based on original soil type as nature left the soil and the degree of erosion that has taken place to date.

3) A gully control program to put in erosion control structures such as brush dams, wire check dams, grass bag dams, basket dams, tree plantings and sod strips.

4) A terracing program on slopes averaging from 3 to 7 per cent gradient. This later being done only on farms where the land owner lives or a tenant who has been there for some time and is likely to stay several more years.

You are not interested in the details of this program but what we hope to do is to apply all practical known methods to farms in this area to check our soils from washing away. After all, what can be more important to the future of our nation than the conserving of our soils? May I close with the following little verse, author unknown.

EROSION

Hordes of gullies now remind us
We should build our lands to stay,
And, departing, leave behind us
Fields that have not washed away;
When our boys assume the mortgage
On the land that's had our toil,
They'll not have to ask the question
"Here's the farm, but WHERE'S the SOIL?"