BEEF FROM ERODED LAND[1]

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Proper combinations of lime fertilizer, mineral fertilizers, legumes and grasses will do wonders for inherently poor, eroded soils. They pave the way to permanent and stable pastures and livestock production on this type of land. Sound development and use of such land on the Red Plains Conservation Experiment Station, Guthrie, Oklahoma, controlled erosion and provided an opportunity for greater production. Through this type of conservation much of the shallow, eroded, land can be converted into profitable pastures and meadows, and satisfactory returns obtained. (Figure 1).

METHOD OF ESTABLISHING GRASS. Under natural conditions, grass re-established itself slowly on eroded land. The problems common to this type of land, therefore, must be overcome for accelerating the re-grassing of exposed subsoil and unweathered parent materials. Low fertility, poor physical condition of the soil, and lack of moisture and organic matter, are perhaps the most serious.

Low fertility can be corrected by the addition of commercial fertilizers and lime. By growing sweet clover and other legumes the organic matter supply in the soil is built up and available nitrogen is increased. Soil organisms can then thrive. Their activity improves the physical condition of the soil, which is extremely important in obtaining good seedings of native grass.

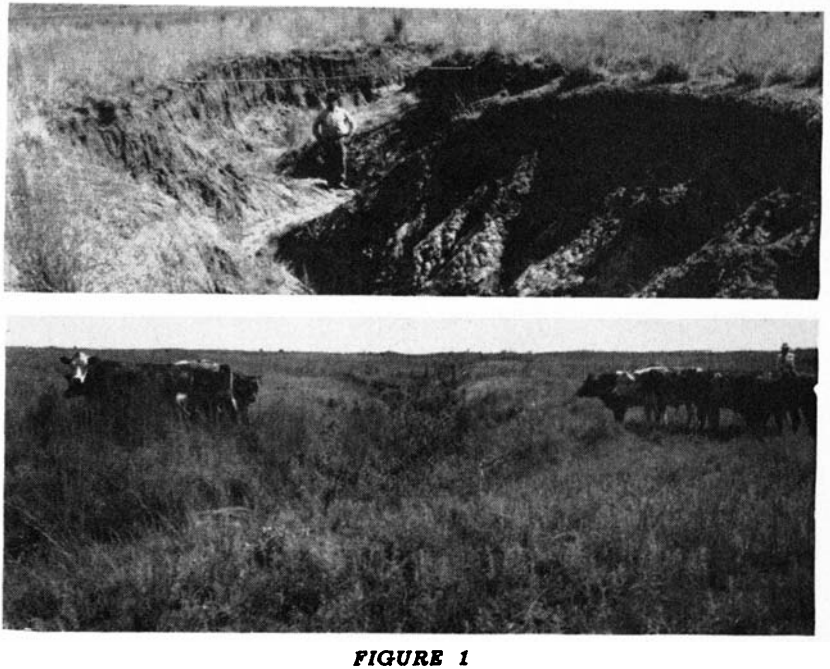

FIGURE 1

[1] Contribution from Oklahoma Agricultural Experiment Station and U. S. Soil Conservation Service.

In regrassing gullied or sheet-eroded land, special treatment is necessary. The first step is to reduce further erosion and stabilize the seedbed. In some areas it may be necessary to divert the runoff water from the original channels by installing contour furrows or small ridges between gullies and above the heads of gullies. Another part of this process is the installing of vegetative barriers of brush and crop residue, and the plowing and grading down of the gully banks. Then the seedbed is ready for fertilizer and lime as needed and the planting of legumes. After the legumes are established, native grasses may be seeded by applying mulches of native hay containing seed. Usually this seed-hay method requires 1500 to 2000 pounds per acre to produce satisfactory results.

RESULTS OF REVEGETATION. Where this procedure has been followed, the density of the vegetation in the treated gullies was three times more than in the untreated gullies. Legumes condition the soil for the growth of grass. Sweet clover, during periods of fall and spring grazing, produced about 50 pounds of beef per acre, and then 200 pounds of seed per acre. Vetch is also being used to improve soils for grass culture.

KR bluestem *(Andropogon ischaemum)* has been grown on a formerly abandoned and gullied area on the Red Plains Station (Fig. 2). The gullies

FIGURE 2

were plowed and leveled in 1946, treated with 200 pounds of superphosphate per acre, and seeded to sweet clover in the spring of 1947. The sweet clover produced 244 pounds of seed per acre.

In the spring of 1949 this area was plowed, then 300 pounds of superphosphate and 100 pounds of ammonium nitrate per acre was applied. After this treatment it was planted to spring oats in 16-inch rows and seeded to KR bluestem. The yield of oats is given in Table I. They were a nurse crop and protected the land from erosion while the grass was becoming established.

Superphosphate was applied at the rate of 300 pounds per acre in 1947 to several other species of grass on this Station. This treatment was repeated

TABLE I

Yield of Oats Used for Nurse Crop of KR Bluestem Grass on Fertilized, Shallow, Eroded Land, Guthrie, Oklahoma, in 1949.

TREATMENT[1]	YIELD—PER ACRE	
	GRAIN BUSHELS	STRAW POUNDS
Fertilized	40.5	1852
Fertilized gully area, and 2 years sweet clover[2]	44.0	2248
Check	4.0	151

[1]Superphosphate, 300 lbs. per acre, and ammonium nitrate, 100 lbs. per acre, applied in spring 1949.

[2]Gullies in this area were plowed, bulldozed and leveled. Then in the spring of 1947 they were seeded to sweet clover and 200 pounds per acre of superphosphate added.

again in 1950. One hundred pounds of ammonium nitrate per acre was applied annually. The hay yields of switchgrass *(Panicum virgatum)* and weeping lovegrass *(Eragrostis curvula)* were about doubled by fertilization. The fertilized plots of switchgrass also produced 2.5 times more seed than the unfertilized. The same fertilizer, and light disking, increased the hay yield of Bermuda grass 4.2 times, and little bluestem *(Andropogon scoparius)* 1.6 times.

BEEF PRODUCTION AFTER REVEGETATION. During the past seven years of summer grazing, yearling steers on severely eroded, unfertilized land produced an average of 40 pounds of beef per acre. But beef gains on regrassed, eroded land can be increased by fertilization. When phosphorus and nitrogen fertilizers were applied to regrassed land in the spring, beef production the following summers was doubled.

The KR bluestem was grazed during the grazing season of 1950. Although there was some weeping lovegrass in the pasture, it produced 88 pounds of beef per acre. An adjacent pasture of native grass on virgin soil produced 69 pounds, and fertilized grass on eroded land, an average of 81 pounds per acre during the same grazing period the last four years.