

CONSERVATION AND LAND-USE PRACTICES FOR FLOOD CONTROL AND FOOD PRODUCTION¹

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As soil is depleted by wasteful farming and erosion, there is an increased demand for more intensive use of the better land on which crop farming can be maintained. The first step toward soil improvement and conservation is an understanding of land capability and nature's methods of protecting and developing soil. Conservation farming requires the classifying of our farm land (Hackensmith and Steele 1943), whereby each acre is put to the use for which it is best fitted, and the selecting and applying of soil-saving and soil-using practices for maximum production, protection, and profit. It has been found difficult, if not impossible, to control erosion on the shallow soils of the rolling slopes (Daniel, Elwell and Cox 1943a), when they are utilized for the production of cultivated crops. In the eastern part of Oklahoma, where the rainfall is highest, some of this land may be reforested, while in the central and western parts, regrassing is more feasible. Cultivated crops should be restricted to the nearly level areas with deep soils and protected from erosion by adequate conservation practices.

LAND-USE PRACTICES FOR SHALLOW, ERODED, AND UNUSED SOILS

Grasses reestablish themselves slowly on shallow eroded land (Daniel, Elwell, and Murphy 1942), but this process can be greatly accelerated by the use of legumes and light applications of lime and mineral fertilizer. After the legumes are established, mixtures of native grasses may be introduced. There are several methods of establishing such grasses, but satisfactory results (Daniel, Elwell, and Cox 1943b) have been obtained by applying mulches of mature hay containing seed. Land devoted to this type of revegetation under favorable conditions may be moderately utilized about the second or third season.

Another important land-use practice is the converting of formerly unused scrubby oak woodland into meadows and pastures for livestock production (Elwell 1942). This has been accomplished as trees and other woody competition were removed by clearing and mowing. Where such land was used as a meadow, protected from fire, and the sprout growth controlled by mowing, it developed into good pasturage in three years.

Much of the establishment and improvement of pastures on idle, eroded, or unused scrubby woodland is practicable for the average landowner or occupier. Such pastures may be maintained by keeping out fires (Elwell, Daniel, and Fenton 1941), conservative use, and eliminating undesirable species with the mowing machine—procedures which will assist in the development of a mulch cover for erosion and flood control. During the last five years (Daniel, Elwell, and Cox 1943b and Elwell 1942) summer grazing experiments with yearling steers at Guthrie, Oklahoma, produced from 25 to 50 pounds of beef per acre on badly eroded, abandoned, and formerly unused scrubby oak land.

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LAND-USE PRACTICES FOR CULTIVATABLE SOILS

The deep soils are best suited for cultivated crops. Their productivity must be maintained through careful conservation and thrifty management. Some soil-conservation practices for such land are easily installed, whereas others require technical assistance. The main point is that each of the better farming practices started is one step nearer the ultimate objective of a complete conservation program.

Present information (Cox 1942; Daniel, Elwell, and Murphy 1942; and, Daniel, Elwell, and Cox 1943a) indicates that a well-planned system of terraces, designed to reduce the amount and velocity of runoff from fields which are being *crop-rotated*, is probably the most desirable erosion- and flood-control practice for the deeper lands suitable for arable farming in central Oklahoma and the more humid areas. It is also advisable for all cultivation to be conducted on the contour and the cropping system should include as many close-growing sod-like crops of legumes and better grasses as possible. In addition, the conservation of crop residue and manure is essential and the use of lime and mineral fertilizers is recommended when needed.

Maintenance of soil fertility is important in the wind-eroded area, but not nearly so immediately important as the conservation of soil and water (Daniel and Finnell 1939). In the arid section, the cultivation and cropping system should be so arranged as to uniformly distribute and economically use the rainfall for maximum production of crops and the maintenance of a protective cover. In such areas, raw organic matter, particularly in the form of crop residue, is often a helpful factor in maintaining successful crop production and soil conservation. In addition, terraces are necessary for controlling erosion on many of the deep, fertile, sloping soils of the western part of the state (Daniel 1935), but they may also be used for moisture conservation.

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