STRIP CROPPING TO PREVENT EROSION

LEAFLET NO. 85

U.S. DEPARTMENT OF AGRICULTURE

STRIP cropping consists of planting strips of densely growing or fibrous-rooted crops between strips of clean-tilled crops, along the contours of erosive slopes.

At present strip cropping is being practiced largely on slopes where it is proposed to carry on summer terracing following the removal of grain or other midseason crops grown on the strips.

Strip crops preserve terrace lines previously surveyed until such time as it may be found possible to construct the terraces.

Strip crops reduce run-off and erosion, and they increase the penetration of rain water into the soil. They also reduce losses due to wind erosion.

Strip cropping is easily done at slight expense.

Under certain conditions, especially where the land is gently sloping or where the rainfall is light, strip cropping may be substituted for terracing.

Washington, D. C. Issued November, 1931

STRIP CROPPING TO PREVENT EROSION

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Introduction

Wherever land has sufficient slope for rain water to flow over its unprotected surface, soil is being washed away and the land impoverished. It has been estimated that not less than 126,000,000,000 pounds of plant-food material, and the soil that contains it, are being removed every year by erosion from the fields and pastures of the United States. While this loss is enormous, it is by no means the only damage being done by run-off rain water. Over large areas sheet erosion is gradually removing the surface soil, leaving exposed the relatively infertile subsoil which is often of such a stiff and compact nature that it is very difficult to cultivate, and which absorbs water more slowly and loses it more quickly in dry weather than the mellow topsoil now gone. Gullies rapidly form, making the use of farm machinery difficult and rendering much land practically worthless. The enormous cost of soil erosion is discussed in detail in United States Department of Agriculture Circular No. 33.

Specific information obtained by erosion surveys in different parts of the country has given concrete evidence of the extent to which erosion has progressed. The reconnaissance erosion survey of the Brazos River watershed of Texas has revealed the fact that in the part of this region not included in the high plains and embracing an area totaling more than 22,500,000 acres, about 27 per cent of all the land in cultivation is already gullied to a degree varying from shallow washes to deep gullies. An additional 60 per cent is suffering from sheet erosion. In that part of the Brazos River watershed known as the west Cross Timbers region, 41 per cent of the cultivated land is gullied, and 44 per cent more is being desurfaced by sheet washing. In the fertile black prairie region (or black belt) of central Texas 38 per cent of the cultivated land has, according to this survey, reached the stage of gullying, and sheet erosion is showing its effect on the 60 per cent of the remaining area under cultivation. (Fig. 1.) A recent erosion survey of Oklahoma has shown even greater erosional damage, and investigations carried on in different parts of the country reveal that the menace to our agricultural lands from this source is nation-wide.

Methods of Preventing Erosion Are Available

Fortunately there are practical methods available to every farmer for checking, to a large extent at least, the damage being done by the run-off of rain water. The most generally used method of pre-

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venting these losses is by the use of terraces. The construction and maintenance of such terraces has been described in Farmers' Bulletins 1386 and 1669, United States Department of Agriculture. Many farmers have already taken advantage of this method of protecting their land, and the practice is spreading rapidly. For various reasons, however, thousands of farmers are indefinitely postponing the terracing of their land, and erosional devastation is proceeding at a much more rapid pace than are measures for its prevention. It has been estimated that at the present rate of progress it would require more than 80 years to run terrace lines on all the cultivated land now being seriously damaged by erosion. Furthermore, county agricultural agents and others who are running these lines state that many of the terraces for which lines are run are never constructed. It seems evident, therefore, that all practical means should be employed to stimulate terracing and that additional methods for

FIGURE 1.—View of "black lands" near Temple, Tex., taken from an airplane, showing light-colored areas which have lost their topsoil through erosion

preventing erosion are highly desirable. It is the purpose of this leaflet to call attention to a practice that promises to greatly increase the opportunity and stimulation to terrace, that provides partial protection from erosion until the terracing system is complete, and, under certain conditions, may serve as a satisfactory substitute for terracing.

Planting Strip Crops

Recently a practice known as strip cropping has been tried out by a number of farmers in scattered localities, with highly satisfactory results. This practice consists in running the terrace lines, plowing along these contour lines, and then, where the terraces would otherwise be constructed, planting strips of certain densely growing feed or grain crops, which tend to arrest losses of soil and water.

Cotton and other row crops are planted on the contours, parallel to the strips. Thus each row serves as a miniature terrace to check the flow of rain water, causing more of it to sink into the soil. As soon as the crop on the strips is harvested, the land so employed is

available for terrace construction. (Fig. 2.) It will thus be possible to terrace during the late summer and fall when there is usually ample time for such work. Where cotton or corn is planted over the entire field, summer terracing can not be done without destroying a large amount of the crop. Under these conditions terracing must be done during the winter. The winter season is not well suited to terracing, since the weather is often unfavorable and the ground too wet to be disturbed much of the time. For these reasons the amount of land terraced during the winter months is entirely too restricted.

Many farmers, though realizing the urgent need of protecting their land from erosion, do not find the opportunity for timely construction of the needed terraces, or they postpone the matter for various reasons. The planting of soil-saving strip crops is a very

FIGURE 2.—Strip cropping on a farm in Bell County, Tex. The sorghum has been harvested, and the strips are now available for terrace construction

simple operation and involves practically no additional farm expense. The strips give considerable protection to the land and preserve the terrace lines, so that, if desired, terraces may be built at some later date, as conditions allow. It is essential that the strips be made sufficiently wide so that when the crop is harvested there will be ample space for the construction of efficient terraces. Naturally, the wider the strips, the more efficient they will be in checking run-off and erosion. A factor which will be important in determining their width will be the amount of feed and grain it is practical to grow on the particular farm in question. In most Southern States it seems desirable at present to decrease the acreage planted to cotton. With such reduction a greater percentage of feed crops will undoubtedly be grown. Generally speaking, all feed and grain crops grown on erosive soils, where entire fields are not devoted to such crops, should be seeded in strips along the contours, thus giving protection to the land.

Strip-Cropping Observations

In the spring of 1931, with the cooperation of the county agent, fields on several farms in Bell County, Tex., were laid off according to the strip-cropping plan. One of these, comprising about 35 acres, has been under almost constant observation. The slope on this field ranges from less than 2 per cent to about 4 per cent. The terrace lines were given a fall of 2 inches to every hundred feet. Sumac (Red Top), a grain sorghum, was planted on the strips, part of which was seeded in close drills and the remainder planted in rows. Following a heavy rain about the middle of July, this field was studied in detail. On every hand it was clearly evident that the strips of feed crops had greatly retarded the flow of water across the

FIGURE 3.—Contoured rows holding a 2-inch rain

field, and accordingly, greatly lessened the erosive action of the water. Even where well-formed waterways existed (fig. 3) the feed strips served as semipermeable dams, checking the flow of water to such an extent that much of the heavier soil material was deposited, and the tendency toward gully washing was practically eliminated. There was considerable evidence that no soil was carried from the field except a comparatively small amount of fine material which remained in suspension in the water.

On a farm near Itasca in Hill County, Tex. (fig. 4), a system somewhat similar to the strip cropping described has been practiced for a number of years. On this farm the common practice is to plant such part of a field in feed crops as may be terraced during the following summer. The object is to build terraces during that year along the boundaries of the areas devoted to soil-saving crops. This practice affords opportunity to terrace a larger acreage, and the land is meanwhile protected to a very considerable degree.

Numerous variations of strip cropping may be profitably employed, under suitable conditions. A great variety of crops may be

Possible Adaptations

satisfactorily grown on the strips. In the Texas black lands, sorghum, Sudan grass, oats, and similar crops are very suitable for strip cropping. In other regions and on different soils other crops may prove more desirable. Winter crops are especially useful because they protect the land during the winter and early spring.

Figure 5 is an illustration of land unprotected from erosion. The cotton rows run up and down hill, and row gullies are forming.

A very satisfactory arrangement is possible when the acreage of crops suitable for the strips is equal to that of cotton. Under such

FIGURE 4.—Method of strip cropping in Texas. The junction of the oats and sorghum marks the line of the proposed terrace

conditions the protective strips may be the same width as the strips of cotton, so that, if it is not desirable to terrace for several years, the strips may be interchanged each year, bringing about a rotation of crops on the land.

In case the acreage of cotton may be reduced to such an extent that cotton will occupy only one-third or one-fourth of the land, and it may not prove desirable to terrace, a variation from the above procedure may prove effective. This consists in reversing the order by planting cotton along the terrace lines, or where the feed strips would otherwise come, and using the space between strips for feed, grain, or other soil-conserving crops. The strips of cotton may be made as wide as desired, half the rows being above the proposed terrace line and half below. This system would have the advantage of largely avoiding short rows of cotton, thus removing one of the objections some farmers have to terracing and contouring of the crop rows. If a drilled crop is sown between the cotton strips, slight irregularities in the shape of the area are not especially objectionable.

While it is possible that strip cropping may be substituted for terracing where the land is only gently sloping and not gullied, especially in regions of comparatively light rainfall, it is probable that terracing, or terracing plus strip cropping, will always be the most effective means of protection on more rolling or more eroded land. In such locations strip cropping will have its greatest value as a supplementary measure in connection with terracing, and as an inducement to proceed with terrace construction.

FIGURE 5.—Land unprotected from erosion, showing row gullies forming

Further Benefits From Strip Cropping

In addition to minimizing losses of soil and water, other benefits will, under some conditions, result from the growing of strip crops. In regions where the soil blows badly, the strip-planted crops, besides affording direct protection from wind disturbances of the soil, cause the deposition of much wind-borne material. In some instances enough material is likely to be deposited in this manner to build an effective terracelike embankment.

The growing of strip crops to prevent soils from blowing has been practiced for years in western Oklahoma, western Texas, and other regions where this evil is serious. It might be added that crop barriers, which essentially constitute a type of strip cropping, have been used to some extent in Texas in connection with root-rot control. Strip cropping is practiced to some extent in the Gulf coast prairie of Texas, to protect cotton from wind action. In this connection, a sorghum of some kind is used to protect the cotton, as it has been found that the cotton plants grow better (taller) when thus protected from wind.

No doubt, as the practice of strip cropping becomes more general and other variations are introduced, possibilities of further adaptations will be recognized, and greater benefits will result. Unquestionably, grass, alfalfa, sweetclover, Lespedeza, and other soil-conserving crops can be as effectively used as the crops mentioned.

U. S. GOVERNMENT PRINTING OFFICE: 1931

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