

# Soil Conservation Necessary for Nation's Security

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**Strip cropping.** Strip cropping is one of the vegetative methods for the control of erosion. This concerns with the planting on the land in alternate strips of close-growing cultivated crops. Thick-growing fibrous rooted-crops, such as corn, tobacco, cotton, etc. are planted around the slope. The planting should be done in such a manner as to follow the contour of the land as closely as possible. The contoured rows of soil-building crops, which are mainly for the protective cover of the soil, serve as miniature terraces. These crops may either be plowed under at an appropriate time or harvested for seed or feed.

The practice of strip cropping is best suited to land areas of rolling topography with more or less uniform slopes. One thing necessary in putting strip cropping into reality is courage to change the layout of the farm and to a certain extent, the cropping system. Strip cropping is one of the simplest, but most effective, and inexpensive methods in controlling soil erosion.

**Farm terracing to reduce erosion.** Steep as well as rolling lands that wash badly should be terraced in order to prevent large amounts of surface water running straight down the hill at a high velocity. The reduction of runoff is a means of controlling erosion and it gives the soil an ample time to absorb more water for the growing crops. Terraces are important in protecting gullied areas by diverting surface runoff from them. They are not difficult to maintain and are more useful especially on moderately sloping areas. Lands with a 12 to 15 per cent slope are, in most cases, considered as steepest and can be terraced and cultivated on practical basis. Areas of steeper slopes should be left alone in pasture.

**Contour plowing.** The purpose of contour plowing is to break the ground at regular intervals along the lines around the slopes in order to collect runoff and prevent soil washing. The water-holding furrows should be from 15 to 20 meters apart or closer depending on the angle of slope and condition of the land. When crops of the same level are planted, lines are to be followed in order to form shallow trough above each row which not only controls erosion but holds surface runoff also. Thus, the danger of runoff is reduced. The fact that erosion can be controlled is impor-

tant and the correct solution to the problem of erosion is simple and practical. However, a complete, coordinated program, and sustained efforts are necessary if a maximum benefit is to be desired.

**Microbiological conservation of soil.** One may inquire, "What part do micro-organisms play in the conserving of soil fertility and of preventing the losses of the soil itself? It may be emphasized that these losses are brought about in the following ways, (a) the gaseous losses, especially the soil nitrogen, (b) losses in a liquid state through the constant dissolution of some nutrient materials by the movement of soil water, and (c) losses in a solid state, or true soil erosion. It has been shown that the problems of water and wind erosion, as well as that of soil deterioration owing to improper system of tillage operation, are closely associated with the problem of soil organic matter. A decrease in the amount of organic matter in the soil accompanies soil deterioration and in itself a cause for further deterioration. An increase in organic matter and nitrogen is a symbol of soil improvement. The soil microbes are closely associated with the formation and destruction of organic matter, and with an increase or a decrease of the available nitrogen and mineral nutrients. In most cases an improvement in the microbiological condition of the soil, or proper aeration of poorly-drained soils, etc., results in improvement of the physical and chemical soil conditions.

In addition to preventing soil losses, micro-organisms can be made, with careful and scientific crop rotation and soil management, to increase the fertility of the soil. They are believed to be capable of replacing, at least, some of the nutrient materials lost from the soil. It has been generally recognized that micro-organisms serve several distinct functions in the soil; namely, (a) they prevent the plant nutrients from being leached out, (b) they convert the essential plant nutritive elements in the soil into forms in which they can again be utilized by the following crops, (c) they reduce the waste of plant and animal life and transform these residues into organic matter, which becomes an important constituent of the soil system and exerts highly favorable influence upon the growth of crops, and (d) they increase the supply of nitrogen in

the soil through judicious utilization of leguminous plants.

The soil microbes are important agents in the conservation of the tremendous wealth that nature has in store in the soil. It is, therefore, necessary to take into consideration the influence of soil treatment upon the activities of the autochthonous soil micro-flora, as well as the methods of utilizing their activities in order to make possible a permanent system of agriculture.

**Program of soil conservation.** It may be stated that it has been only recently that the soil has received the attention of scientists, which it should have had long ago. Philippine soils as are soils elsewhere are not inexhaustible. The results of studies conducted in the College of Agriculture on soil samples collected from typical areas of the Philippines showed that unless our methods of farming systems are modified or changed sooner or later the production of crops will be limited owing to exhaustion of plant-food materials due primarily to excessive erosion.

We should not wait until our soils are exhausted before we adopt a system of farming operations which will insure their continuous fertility. The farmer, himself, needs to adopt newer and wiser farming methods and to cherish his soil as his only capital. The farmer who puts into operation the suggestions for conserving the soil and improving its fertility will not only secure benefit but also maintain the fertility of the land for many years to come.

Any program of permanent soil improvement or soil conservation should take into consideration the detailed treatment of every aspect of the subject of land loss, the results, and the necessary methods for the prevention and control of accelerated erosion. There is a need for a careful study of the problems of maintaining high soil productivity, the production and propagation of farm and range plants for the control of erosion. The use of pasture grasses, small grain-crops and legumes as protective covers of the soil, and shrubs and trees is of vital importance in the control of soil erosion both by wind and by water. Seeding all crops on the contour and practicing contour strip cropping and terracing on sloping land areas are among the methods used for controlling erosion. The microorganic population of the soil must