GROWING CONDITIONS ON ROADSIDE BANKS AND METHODS OF IMPROVING THEM

By
D. W. Levandowsky,
Shenandoah National Park

Agronomy as it is applied in soil conservation will furnish the necessary information to the roadside man as long as he is working in situations where growing conditions are comparable to those of cultivated fields. However, when cuts are deep and fills are high, the roadside man is on his own. There is no ready-made information for his various and peculiar growing conditions. Also, it is up to him to develop methods to improve the above conditions.

Growing Conditions

The soil classification as used by agronomists helps very little in understanding soil conditions of cuts and fills. More often it is confusing. The variations in soil series and types are based on changes in horizons. The soil horizons are very much disturbed in our case.

A very simple classification of soils based mainly on physical structure and quartz content will be sufficient for practical purposes of the roadside man.

The climatic conditions are best demonstrated by distribution of plant indicators. The distribution of hardy roadside species shows, first, that their climatic provinces are larger than the provinces of plants of well-developed soils; second, that there is a great deal of very minute micro-climatic variations within a province (exposure of slopes to sunshine or to northern winds as compared to protected or moist locations). The plant associations of well-developed soils are more uniform in this respect. Also, the acute competition for moisture in dry situations results in more mixed stands and less pure stands.

Methods of Improvement of Growing Conditions

The tendency has been (and still prevails) to create on roadside banks a habitat similar to that of a garden or of a field. However, topsoiling has never furnished a satisfactory solution for moisture regulation problems in dry situations. As to fertility improvement, topsoiling often creates a temporary condition quite unnatural for the situation. The resultant artificially forced vegetation faces an eventual set back in dry months. It is far better to evaluate existent growing conditions and to improve the deficiencies in a manner which will meet the natural laws of plant life development of a roadside habitat.

The development of the art of mulching will help to replace the old-fashioned horticultural methods by more economical and efficient ones. The meaning of the word mulching should not be limited to deposition of a certain material on the surface of a treated area. It ought to comprise also the introduction of the above materials into the soil and the creation thus of a layer of material composed of the mixture of existing soil and introduced ingredients.

Recent work with mulches in Shenandoah National Park demonstrates the promising possibilities of mulches mixed into soil. The digging under of herbaceous mulch in heavy clay with part of the mulch showing above the surface resulted in better growth of plant cover, promoted by more porous, better aerated and moisture-absorbing soil. Root penetration was also improved. When herbaceous material was other than of grass origin there were noted effects of extra nitrification.

In soils with a high percentage of quartz the above method was not as beneficial. This type of soil has already a rather pervious structure. The following treatment brought better results in sands. Materials high in raw and well-decomposed humus, introduced into the upper three or four inches of soil, compensated for the lack of mineral colloids and helped to retain the moisture and plant-food elements. A herbaceous surface mulch was added to shade and to protect from erosion the surface of slopes. A thin layer of lumpy soil was spread over the herbaceous mulch to make it more compact and less susceptible to fire hazard.

Work with various types of chemical fertilizers demonstrates the fact that fertilizer mixtures with high nitrogen content, although beneficial in meadows, are not efficacious in the droughty conditions of roadside banks. The resultant vegetation had small root per tap ratio and plant tissues were tender. A 2-12-4 fertilizer produced vegetation not quite as luxriant as 6-12-4, but a great deal more drought-resistant. In sandy soils chemical fertilizers should be mixed with humus materials used in mulching. Direct application in sandy soils will result in loss of fertilizer and also in high concentration of salt solutions, unabsorbed by soil lacking in colloids.