

Pasture Improvement Pays Big Dividends



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GOOD pasture is the foundation of a profitable livestock industry. It is well known among livestockmen that the cost of gains produced on grain is several times higher than the cost of gains produced on pasture. For that reason much of the profit on livestock farms is made while the animals are on pasture.

In spite of its importance, no farm crop has been more neglected than pastures. It does not seem to be realized that pastures, like any other crop, can produce only in proportion to the quality or fertility of the soil. It is a mistaken notion that pastures are sufficiently enriched by the droppings of cattle, and due to the fact that often no treatment is ever given to the soil to return some of the fertility that has been removed in the milk or animals sold, many pastures are rapidly being depleted of fertility and are getting poorer and poorer.

While in general, farmers have not given much thought to the pasture problem, many farmers in the last few years have noticed that their pastures are not supporting the number of cattle they formerly did. In a survey of pasture conditions in West Virginia in 1935 more than half the farmers in one area stated that their pastures were considerably poorer than they were five to ten years ago.

Bluegrass Disappears

A careful study of the kind of pasture on forty farms in this area showed that the bluegrass which was once considered the pride of the stock farmers of the area had largely disappeared. Less than 20 per cent of the vegetation in the pastures was bluegrass, and an average of 4.8 acres was required to pasture a 1,000-pound animal.

It is evident that the livestock industry cannot long remain profitable in such an area, unless steps are taken to improve the pastures. As the soil gets poorer, the bluegrass disappears and weeds and poor native grasses come in. Not only do these

poor native grasses, such as poverty grass and broomsedge, produce less feed, and feed of poor quality, but the sod in many cases gets so thin the soil washes badly and the loss in fertility increases rapidly.

Unfortunately, in many cases, pastures get so poor due to the loss of fertility and top soil by erosion before anything is done that improvement may no longer be practicable. If our pastures are to remain our greatest agricultural asset, improvement must be undertaken before it is too late.

Experiments Point Way

For more than 12 years the West Virginia Agricultural Experiment Station has been conducting experiments to find out how pastures can be economically improved. These studies have been made on different kinds of soil in different parts of the state. Near Wardensville in Hardy county, at the Reynmann Memorial Farms, a large field of 40 acres was divided and fenced into eight pastures which received different lime and fertilizer treatments in 1931 and 1933. These pastures were stocked with dairy cows the first year and with dairy heifers since that time. A careful record has been kept of the milk produced, the gains in weight of the animals, and the number of pasture days furnished by each pasture.

Two of the eight plots were untreated to serve as checks on results. All of the other plots were limed as shown to be



It's tough to be a sheep on a pasture like this, where shade trees along with the grass are scarce. A badly overgrazed condition is evident and the top soil is thinning.

needed by a soil test, and 500 pounds of 20 per cent superphosphate applied per acre in 1931 and 1933. In addition, four plots had 100 pounds of muriate of potash per acre at both treatments. Two of these four plots also had 200 pounds of nitrate of soda applied each year—half in April and half in July.

The area receiving lime and superphosphate only furnished 131 days of pasture per acre as compared to 80 days for the check plots, and the animals gained 204 pounds on an acre basis as compared to 140 1-2 pounds on the untreated area. The pasture on the area receiving this treatment produced an average of 1,331 pounds of digestible nutrients per acre as compared to 854 pounds for the untreated land. On two plots receiving lime, phosphorus, and potash, the number of days of pasture provided was increased to 142 1-2, the average animal gain per acre to 257 1-2 pounds, and the average number of pounds of digestible nutrients per acre to 1,521 pounds. The addition of nitrogen to the lime, phosphorus, and potash, on the other two plots further increased the number of days of pasture provided to 169, the average gain of the animals to 267 pounds, and the average amount of digestible nutrients produced per acre to 1,743 pounds.

These results together with similar results obtained in other pasture experiments point the way to a sound pasture improvement program.

Phosphorus, Lime Needed

Phosphorus has been found to be the greatest need of pasture soils in West Virginia with lime a close second. This condition is not surprising, because there has been a large loss of lime and phosphorus from pasture soil through the sale of milk animals. Since in most cases lime and phosphorus are both necessary, application of one without the other does not give nearly as great or as economical returns as when both are applied together. The application of one or the other by itself may be of little value.

In experiments, the use of lime alone on pastures gave only relatively small benefits, but the combination of lime and superphosphate increased yields from 38 per cent on one of the better soils to more than 100 per cent (more than doubling the yield) on a less fertile soil.

Manure is very beneficial in improving pastures. Unfortunately, manure produced on the farm is usually all needed for the crop land. Since manure is low in phosphorus it should be supplemented with about 40 pounds of superphosphate per ton when applied to pastures.

Benefits Last Years

Increased yield is only one benefit that results from pasture fertilization and liming. If applications of superphosphate and lime merely increased the growth, little would be gained. The main benefit from applying lime and phosphorus to pasture land is that the fertility of the soil is increased so that bluegrass and clover can come back into the sod, fill up the bare spaces, and crowd out weeds and poor native grasses.

The second year after an experiment was started on poor Dekalb soil at Morgantown it was found that the plots which received lime and superphosphate contained 67 per cent of bluegrass and clover in the pasture sod as compared to four per cent in the untreated plots. Not only does bluegrass and clover produce more growth than weeds and poor native grasses but the quality of the herbage is far superior.

Saving In Barn Feeding

The average content of protein in the herbage from the untreated pasture plots in 1932 and 1933 was 12.3 per cent, while herbage from plots on which lime and superphosphate were applied contained 18.8 per cent protein. The total protein produced in the herbage was 66 pounds per acre on untreated plots and 321 pounds on treated plots.

Bluegrass makes an earlier growth in the Spring than poor native grasses, so improving pastures by applying lime and superphosphate provides earlier grazing. In many cases cattle can be turned on improved pastures ten days to two weeks earlier in the Spring and kept on later in the Fall than on untreated pastures. Pasture improvement not only increases carrying capacity and provides better quality grass, but it is also a means to a longer grazing season and a large saving in barn feeding.

Improvement Is Practical

There is little doubt that pasture improvement is practical. It is not practical or economical to attempt to improve all pasture land. Some is too steep for improvement to be economical. Some is too droughty or has lost so much of its surface by erosion it is now too late to attempt improvement.

Such areas should be protected from further washing and gullying by fencing them off from the rest of the pasture and putting them back in trees. It is a conservative estimate, that on at least half of the pasture land in West Virginia and nearby states the judicious use of lime and superphosphate would be economical wherever the additional grass produced can be utilized. In many cases such treatment will mean an investment of from \$4 to \$8 an acre, but it is an investment that will bring high returns.

Some farmers feel they cannot afford to spend this money on their pastures. Many farmers, however, do not hesitate to spend money for high-priced feed or for renting of additional pasture. If part of this money were spent for superphosphate and lime, the feed bill would be greatly reduced and within two or three years it would no longer be necessary to rent additional pasture land. At the same time, the money spent by the farmer in this manner would be adding to the value of his land and would keep his pastures from getting so poor they could no longer be improved economically.

It should be remembered that the effect of treatment often shows up for many years. Once a good bluegrass and clover sod is established, it can be kept in good condition at a very low cost.



The dairy herd, above, and the Herefords, below, are provided with pasturage which results from the experiments described in Dr. Pierre's article. The beef cattle were photographed on the farm of J. D. McReynolds, Harrison County, W. Va.

