

## BENEFITS OF TOPDRESSING

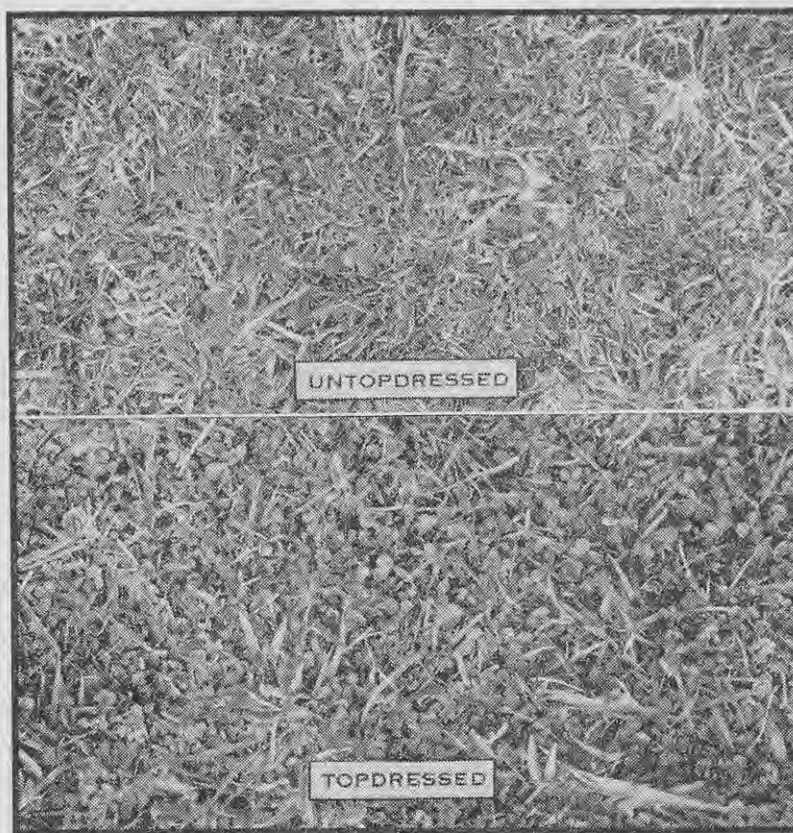
Settled communities have had to devise methods which maintain fertility. The basis of medieval European farming was the restorative fallow (the summer fallow for nitrogen, the winter fallow for potash and phosphates), assisted by hardly-adequate supplies of dung. Backed by sanctions of custom and local authority, the general adherence to a rigid system of crop, pasture, and livestock management did produce a constant but low level of fertility maintenance on arable land throughout the Middle Ages.

The next stage (exemplified particularly in British farming) was the development of modern mixed farming in the eighteenth, nineteenth, and twentieth centuries. Fertility was raised through the inclusion of clovers and turnips in crop rotations, the introduction of fertilisers, and the intimate combination of livestock and crop production. With security of land tenure and freedom of action no sanctions were necessary to enable occupiers to improve land. Each new practice gave tangible results: Improved rotations and fertilisers gave higher crop yields, heavier crops enabled more livestock to be reared and fattened, and the increased number of livestock produced larger quantities of manure, which benefited succeeding crops. Crop and livestock production were increased and farming was made more profitable.

However, these advances did not cover the real scope of land-fertility maintenance, for even at present most highly-developed mixed-farming areas draw on the fertility of extensive pastoral areas where the livestock for fattening are bred and reared. No community can flourish indefinitely on a fixed area of land unless fertility maintenance is reasonably complete on all areas devoted to the production of food. The exhaustion of extensive pastoral areas for the benefit of arable and intensive pastoral areas must in the end contract production.

The extensive pastoral areas of the New World now contribute largely to the meat (through the rearing of store and breeding stock) and wool supplies of the crowded dependent populations of industry, and these pastures in general are not increasing in productivity. The extensive grazier, commonly merely leasing natural grassland, has done little or nothing to increase fertility; rather the general experience has been that he has repeatedly burnt and over-grazed and depleted fertility. This depletion of fertility usually has not been deliberate, but has been forced by economic conditions. Many of the normal methods suggested or enforced for conservation—for example, spelling and cessation of burning—give no immediate tangible results and have to be enforced by coercion.

Commonwealth countries have a fairly common story of depletion and erosion of soils. "In Canada there was evidence of a general decline in soil fertility. Yields were falling, trace-element deficiency diseases were increasing; the present widespread tendency to soil drifting had not been foreseen when the land was first cultivated. . . . In Australia . . . much depletion of soil fertility had resulted from over-cultivation and over-grazing. . . . The increase in population in India was producing a very serious



Experience has proved that in the higher-rainfall areas topdressing accompanied by the oversowing of clovers will improve the carrying capacity and fattening qualities of large areas of surface-sown grassland.

situation with regard to depletion of soil resources. Nobody had a clear picture of how much damage had been done by erosion. . . . South Africa was mainly pastoral and most of the pastures were natural. It was essential to discover conservative systems of intensive farming. Legislation had been enacted putting the responsibility for proper land use on the farmers. The State assisted with subsidies and only intervened by expropriating the land in the last resort. . . . In parts of Kenya large areas of fertile forest land had reverted to desert conditions within living memory. . . ." (1)

In New Zealand settlers burnt and over-grazed (or allowed rabbits to over-graze) the natural pastures, exploited the fertility of the forest lands, and started on the path of fertility building only when it was necessary to take in hand land of low virgin fertility, and the practice of topdressing grassland was developed. Topdressing is one of those practices that adequately fills the requirements for land improvement; it can be done by the occupiers of the land; it gives immediate tangible results; its development requires no coercion; and from it flow other desirable farm practices and improvements.

1. From a summary of discussions on problems of land utilisation and conservation, the Royal Society Empire Scientific Conference, 1946, Volume II, pages 217 and 218.

So far topdressing has been confined mainly to 4 to 5 million acres of flat and undulating land, and this land has provided the great increase in supplies of meat, wool, and dairy produce in the past 25 years. Very little has been done to mitigate the depletion of fertility on the 10 million acres of surface-sown grassland and 13 million acres of native tussock grassland. Experience has proved that in the higher-rainfall areas topdressing accompanied by the oversowing of clovers will improve the carrying capacity and fattening ability of large areas of surface-sown grassland. On such areas topdressing obviously should be the primary step in fertility building and conservation. From it will flow other necessary conservation methods in the control of erosion, but without the primary practice to give tangible results the secondary practices will be undertaken only with the aid of heavy subsidies and coercion. For the 13 million acres of native pasture the best that can be hoped for at the moment is conservation through rabbit destruction, regulated grazing and burning, and spelling. None of these will start the upward spiral of fertility building and they can secure only conservation. The path to improvement may be found later in suitable pasture species which will conserve or increase fertility and offer increased carrying capacity as the reward for their introduction.