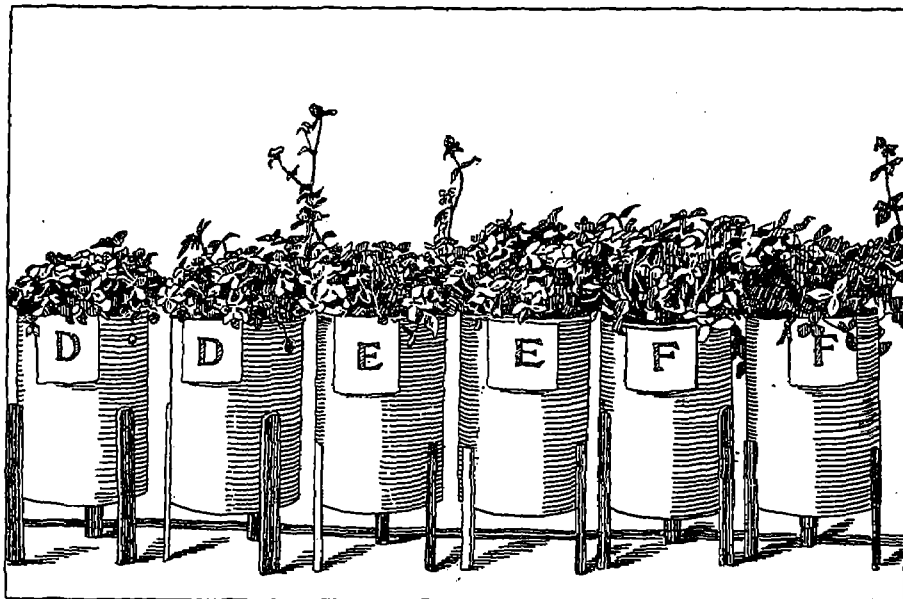


it evenly over the field to be inoculated, which is then deeply harrowed.

Following these methods, experiments have been made in Germany, England, and on this continent. The results so far obtained, as gathered from the reports of these investigations, scarcely admit of any more emphatic statement than that the indication are that on soils that have not previously grown legumes, or for other reasons do not contain the nitrogen-assimilating bacteria, the practice of inoculation will be attended with profit. Some soils contain such an abundance of these microbes that a further supply is unnecessary. European field experiments seem to show that, even when the growth of the foliage is not increased by *Nitragin*, there is frequently a greater

culture, or *Nitragin*, for, it seems, the legumes are exclusively dainty, and refuse to thrive on any other than their own private culture. The experiments were conducted, in duplicate, check-pots, uninoculated, being sown at the same time. Somehow or other, the lucerne and the vetches did not take kindly to the treatment, for their growth was feeble, and it was not considered worth while to weigh and analyse their crop.

The horse-beans did not show any marked difference in foliage, though the plants in the pots containing inoculated soil were decidedly larger and healthier than the others. In the untreated pots, however, the roots of the beans were meagre and had only very few nodules, showing clearly that the *nitragin* had had some effect. When the seed



Inoculation experiments with *Nitragin* for Mammoth Red Clover, Sept. 17th, 1897. Pots D. D., not inoculated; Pots E. E., soil-inoculated; Pots F. F., seed-inoculated.

root development and a larger number of nodules. No great difference could be noted, in these reports, between the results of soil inoculation and seed inoculation, though such differences as there are appear to be in favour of the former.

Mr. Shutt's experiments were carried on in galvanised iron-pots, filled with an artificial soil composed of clay, sand, and swamp-muck, to resemble an ordinary loam of medium fertility. Lucerne, clover, horse-beans, and vetches were the legumes chosen for these experiments, and each plant-pot was treated with its own special bacterial

had been inoculated, the root systems were not so well developed.

The following are the deductions Mr. Shutt makes from the results of the experiments, taken as a whole. We should like to see the use of this novel plan of treatment at work on an extended, practical scale; for instance, on the land of some English or Scotch farmer, and made part of his regular system of cultivation.

"Deductions.—(A.) The largest yield of crop was obtained from the soil-inoculated pots H. H., chiefly due to the greater weight of roots.