

analysed rapidly—for example for mineral nutrients. The other is the use of radio-active “tracer elements,” which will enable accurate data to be obtained on problems presenting great difficulty by ordinary methods, such as attempting to trace the degree of utilization and the ultimate fate of a fertilizer when applied to permanent pasture.

Two factors which are hindering the full development and usefulness of the Station are lack of qualified applicants to fill vacancies and delay in erection of buildings.

Peat Development Experiments.—The experiments on peat land have been continued. Heavy dressings of lime, phosphate, and potash have changed very poor pastures dominant in either Yorkshire fog or brown-top, but with a sprinkling of clovers, into clover-dominant pastures within a year. During the second year the pastures developed into good mixed swards. Plots initially top-dressed two years ago were re-top-dressed last year to determine minimum quantities required to maintain the improvements previously effected; $1\frac{1}{4}$ cwt. of serpentine-superphosphate and $1\frac{1}{4}$ cwt. of muriate of potash per acre were sufficient.

In the development of peat land one of the most important factors is the correct regulation of the water-table, and trials are being extended to investigate methods of controlled drainage.

Spray Irrigation.—The spray irrigation trials have been continued, but the well-distributed rainfall during the summer made frequent irrigation unnecessary. Farmers are taking increasing interest in the possibilities of spray irrigation and the information gained at the Station is being made available through Instructors, field-days, and articles.

Lysimeter Studies.—The lysimeter studies continue to provide interesting information. The amount of drainage water lost during the year represents about 40 per cent. of the rainfall. The annual losses of minerals in terms of fertilizers have been as follows:—

Manure.						Pounds Per Acre.
Calcium carbonate	..	..	..	..	..	107
Magnesium carbonate	..	..	..	..	..	113
Potassium sulphate	..	..	..	..	..	4.8
Superphosphate	..	..	..	..	..	1.0
Nitrate of soda	..	..	..	..	..	48.5

During the year the loss by evaporation and transpiration from the grass surface was roughly equal to that from an open water surface.

Limestone.—Agricultural lime varies considerably in quality from one district to another according to available sources of supply. A measure of control is exercised over this variability through constant sampling and analysis and the provisions of the lime transport assistance regulations. An investigation is under way to evaluate the importance of the effectiveness of ground limestone when applied to the soil, and hence its relative value. Three principal factors are involved: carbonate of lime content or purity, fineness of grinding, and the essential nature of the stone which determines its hardness and “reactivity.” Laboratory studies and pot experiments have shown that fineness of grinding is more important than extreme purity, and that hardness and reactivity (closely-allied properties, the softer stones being more reactive) are important only when the stone is not finely ground. An attempt is being made to express the combination of these factors for any particular commercial lime product as a single numerical value. Before finality is reached it is necessary to check the laboratory findings with large-scale field trials, and these are now being established.

Microbiology Laboratory.—During the past year further soils have been plated, with particular reference to the number of samples required for statistical significance so that a survey of different soils and treatments may be adequately made. Further work was continued on the clover nodule organism in relation to peat soils and the