THE main purpose of liming soils is to increase crop yields. Generally, the use of lime on acid soils has increased the yields of crops and hence was a desirable practice, but in some instances decreased yields have been observed (6, 7). It is important, therefore, to know the optimum amount of lime to use for a definite cropping system on a given soil.

The composition of plants is important from the standpoint of quality or the nutritional value for animals. Under some soil conditions actual mineral deficiencies occur in feeds grown on certain soils (1, 3), and excessive liming may bring about similar conditions. Numerous investigations have been reported to show that liming influenced the mineral and protein content of crops (4, 8, 9), but further information is needed for a clearer understanding of the effect of lime on the chemical composition of plants.

In a previous paper (5), it was shown that lime effected certain chemical changes in soils, and it is the purpose of this paper to present the results on another phase of the same investigation in which a study was made on the influence of lime on yields and the composition of plants.

PLAN OF INVESTIGATION

Details of the soils used and the method of liming the soils in the greenhouse are given in the preceding paper (5). Briefly, this consisted of liming soils from eight different locations in Alabama in increments of 25% of the Ca-sorption capacities over the range from native saturation to 125%. Greenhouse studies were also included on soils limed in the field. The sources of lime were C. P. CaCO_3 and a mixture of C. P. CaCO_3 and MgCO_3 in chemically equivalent amounts. Six successive crops, consisting of Austrian winter peas, rape, sorghum, hairy vetch, sorghum, and early Crotalaria spectabilis were grown in the greenhouse in the order named.

When a majority of plants had made their maximum growth, each crop was harvested and the dry weight obtained. The third successive crop, which was sorghum, was ground in a Wiley mill and analyzed for ash, N, Ca, Mg, K, Mn, P, and Fe.

Since over-liming injury is somewhat temporary (6), the response of each successive crop to lime is discussed separately to bring out the effect of time on the growth response.