The increasing importance of livestock production in Virginia and the southeastern states had been recognized before the present emergency demands focused attention on problems incident to an enormously expanded national livestock program. Hence, some of the problems connected with pasture improvement in this region have been under rather intensive study for several years. The increasing use of phosphates and limestone for pasture improvement in this area has raised the question of the best time of year for application of these materials. Thus far there appears to be little experimental evidence showing any one time of year is much better than another for applying superphosphate and ground limestone to permanent pastures in a long-time improvement program. If there is any danger of appreciable losses of fertilizing and liming materials through surface runoff, obviously, these materials should be applied during seasons when heavy runoffs are less likely to occur.

Measurement of surface runoff from permanent pastures in Virginia (2) has shown that considerable amounts of water are lost from such areas annually. The monthly distribution of this runoff showed most of the water losses were concentrated in June, July, and August. It was further pointed out that this concentration of runoff during the summer months was to be expected from the predicted monthly distribution of excessive short storms in this region. Fig. 1 shows the predicted (9) seasonal distribution of excessive storms of 2 hours or less duration for the Blacksburg, Va., area. It is evident that most of the intense storms can be expected during June, July, and August with a few in May and September. This area is remarkably free of such storms during the remainder of the year.

This information on amounts of runoff occurring from permanent pastures and the seasonal concentration of runoff-producing storms, combined with the observation (2) that surface water from phosphated pastures contained consistently more phosphorus than similar flows from untreated sods, suggested the present study of losses of surface materials. The objectives of this investigation were (a) to determine the loss of broadcast applications of phosphates and limestone from rains of different intensities; (b) to measure the losses of materials from successive rains, thereby showing rapidity of "fixation", or conversely penetration of surface-applied phosphate in the soil; and (c) to study the effect of soil moisture, slope of land, soil type, kind and degree of vegetative cover, grazing practices, form of phosphate, and applying superphosphate with or without limestone on the magnitude of phosphate losses.

PREVIOUS RELATED INVESTIGATIONS

No report was found of an attempt to determine the losses of freshly applied fertilizer or...