

three soil depths. The periods between samplings which had high total rainfall, had a low nitrate content in the three soil depths at the end of each period. Conversely, drought periods brought about a rapid accumulation of relatively large quantities of nitrates in the three soil depths. Only traces of nitrates were found in all depths of the soil investigated on dates of sampling following periods of excessive and leaching rainfall.

In addition, evidence of the leaching of nitrates from the upper to the lower depths of soil was obtained. For instance, there are four dates of sampling in 1927 and six in 1928 when the nitrate content of the lower soil depth was equal to or exceeded that of the depth above it. If the daily rainfall record of the periods preceding this apparent leaching of nitrates into the lower depths is examined, such periods are found to be characterized by a number of light rains just before the date of sampling or else by one heavy rain in an otherwise dry period.

In general, the nitrate content of the 0-9 inch depth was found to be higher than that of the 21-33 inch depth for most sampling dates.

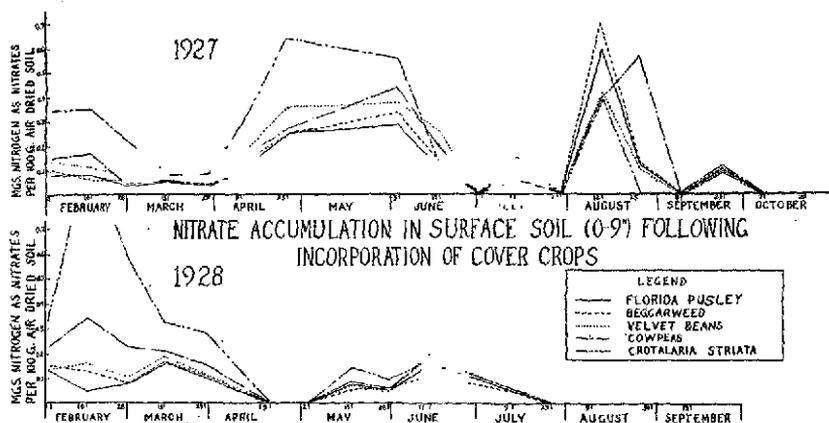


Fig. 4.—Accumulation of nitrates in the surface soil (0-9 inches) after the incorporation of different summer cover crops in 1927 and 1928.

(b) Influence of plowing under summer cover crops on accumulation of nitrates in the surface soil. The results of the nitrate determinations on the 0-9 inch depth of soil of the plots of the sweetpotato and corn rotations for each date of sampling have been averaged to make this study. The results of the averages for the sampling periods of 1927 and 1928 are given graphically in Figure 4.