STUDIES OF FRENCHING OF TOBACCO WITH PARTICULAR REFERENCE TO THALLIUM TOXICITY

C. E. Bortner and P. E. Karraker

STUDIES at the Kentucky Agricultural Experiment Station have been reported showing that frenching of tobacco is related to the reaction or lime content of the soil and to the soil nutrient supply (2, 8). Later observations agree for the most part with these findings. There was considerable frenching in Burley tobacco on various plots of the Greenville soil experiment field in 1938, the extent depending on the plot treatment. The extent in various plots was determined on July 30. None was present on five unlimed plots, one of which had received no commercial fertilizer and the others varying nitrogen, phosphorus, and potassium treatments. The frenching on the plots which had received ground limestone and different commercial fertilizer treatments was as follows: Superphosphate, 40% (of the plants) severely frenched; superphosphate and nitrate of soda, 13% frenched to a medium degree; superphosphate and sulfate of potash, 6% frenched to a medium degree; superphosphate, nitrate of soda and sulfate of potash, 0.7% frenched to a medium degree; and superphosphate, nitrate of soda, and double the standard application of sulfate of potash, no frenching.

In one of the publications of this Station on frenching (2), it was stated that on the Campbellsville soil experiment field frenching occurred nearly every year on the limed plots and not on the unlimed plots, and that usually the frenching was much less severe where sulfate of potash was applied. Frenching still is entirely confined to the limed plots at this field and in many years is severe on these plots receiving only limestone and phosphate but much less severe on plots where potash has been applied in addition to limestone and phosphate.

Dr. E. M. Johnson, in field studies in western Kentucky in 1938 and 1939, observed frenching in 12 farm fields. In all but two, the pH of the soil in the frenched areas was 6.0 or above, that of the two exceptions being 5.53 and 5.58. Rapid soil tests showed a low supply of available phosphorus or potassium or both in all but one of the areas and the pH of the soil of this was 6.59. Potash deficiency symptoms were present at the time of frenching in over half the instances. The tobacco was Dark Fired, or One Sucker, except Burley tobacco in one field.

However, one clear instance has come to our attention of frenching where the soil was moderately to strongly acid. This was on a plot on the Experiment Station farm to which sulfur is added as necessary...