NOTES

FAILURE OF VETCH TO EXCRETE NITROGEN FROM THE NODULES
WHEN GROWN IN ASSOCIATION WITH NITROGEN-DEFICIENT
CITRUS SEEDLINGS

In connection with studies of nitrogen gains and losses in California soils, an experiment was set up in pot culture to determine whether nitrogen-starved citrus seedlings would show any benefit when grown in association with vetch. The thought was to determine whether nitrogen excretion from root nodules might occur under the climatic conditions prevailing in this region. Though the original findings by Virtanen, et al., have been substantiated by Wilson, the latter has concluded that nitrogen excretion by legume nodules probably depends on climatic conditions which favor nitrogen fixation rate, on the one hand, but limit photosynthetic rate on the other. Under such conditions fixed nitrogen is not utilized in growth as rapidly as it is formed and thence may accumulate in and be excreted by the nodule.

Sweet orange seedlings were transplanted into a series of 18 2-gallon pots filled with a uniformly mixed loam soil of low nitrogen content, on August 23, 1937. The plants were allowed to grow in the greenhouse until February 9, 1938, by which time all plants had ceased growing and were very yellow owing to extreme nitrogen deficiency. Sweet orange seedlings in such a state will become green and resume growth within 10 days if given nitrogen but without nitrogen will remain essentially dormant for months.

On the aforementioned date, inoculated purple vetch was planted in 8 of the 18 plots. The vetch germinated well and the cultures were kept in the greenhouse until April 15, 1938, by which time the vetch had made substantial growth. There was no sign of greening or growth of the citrus seedlings in the vetch pots, however.

In order to alter the climatic conditions, all of the pots were taken out of doors on April 15. At the end of 1½ months of further growth out of doors there was no change in the appearance of the citrus seedlings in the vetch pots as compared with the controls, hence the experiment was discontinued.

Pictures were taken of the tops and roots of representative pots and the dry weights (Table 1) of the tops of all plant material in each pot obtained. Pictures showing the appearance of the tops of the seedlings with and without vetch, the nodulation of the vetch roots, and the intertwining of the vetch and citrus roots are presented in Fig. 1.

1Paper No. 486, University of California Citrus Experiment Station, Riverside, Calif.