

tion of D-D in 1949, seemed to have disappeared by the beginning of harvest. Nevertheless, these symptoms probably were related to reduced burn.

Since the accumulation of ammonia might be expected to conserve some nitrogen frequently lost as nitrate by leaching, it seems likely that the amount of nitrogen applied to the crop might be reduced. In the light of the literature reviewed, increased amounts of potash and possibly other bases would also be indicated. These adjustments in fertilization have not been investigated.

Stable manure was applied after fumigation in all tests except those where fumigation was done in February. It is not known whether this had any effect on results.

Possible effects of the chlorine in dichloropropene-dichloropropane and of the bromine in ethylene dibromide have not been investigated. Presumably, most of the fumigant leaves the soil in vapor form, but possibly some residues remain in the form of slowly volatile materials or products of decomposition. Effects of bromine on the tobacco plant are similar to those of chlorine (24). The poor response to fourth-year fumigation may have been related to an accumulation of halogen.

Experiments are in progress on new fumigants and on the application of fumigants in the drill.

SUMMARY AND CONCLUSIONS

Fumigation studies with cigar-wrapper (shade) tobacco in the field were conducted in shades at Quincy, Florida, during the seasons of 1946 through 1949. The two fumigants used most, D-D (dichloropropene-dichloropropane) and Dowfume W-40 (ethylene dibromide), were those which have been used for fumigating a large proportion of the shade acreage beginning with the 1948 season. Observations were made on the incidence of nematode diseases and blackshank, fire-holding capacity, yield, grade index and crop index. Beginning with the 1947 season soil analyses were made for pH, ammonia nitrogen and nitrate nitrogen.

Choice of Fumigant.—D-D and Dowfume W-40 controlled root-knot equally well. Dowfume W-40 controlled coarse root significantly better than did D-D, but neither was considered satisfactory in this respect. Yield was inversely correlated with the incidence of nematode diseases in most tests. Coarse root ap-