TABLE 93

TUNG OIL—ADAPTATION TEST
Average Yield for Years 1927 to 1938, Inclusive
Yield Expressed in Pounds per Tree*

	YEAR												Av. Annual Yield
	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	
Lbs. Dry Wt	.92	14.93	20.33	8.50	19.62	3.21	1.56	73.22	0	110.04	38.91	101.97	32.77
Age of Trees	4	5	6	7	8	9	10	11	12	13	14	15	
Crop Years	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	

*Air dried weight in pod.

Cherries: With the exception of Capulin, all varieties of cherries in the trial grounds have died, and it not only is making indifferent growth but its fruit is of poor quality. Therefore, it is concluded that the varieties of cherries now available are not adapted to the Coastal Plain of Georgia.

Persimmons: Japanese persimmons are becoming increasingly susceptible to both fruit and plant diseases, with the result that many trees have died and those remaining mature only a small portion of their fruit.

Walnuts: Walnuts growing in the trial grounds since 1922 lack vigor and, with the exception of Japanese, have matured only a few fruits.

Quince: This fruit is highly susceptible to blight and as a result holds little promise of successful culture in South Georgia, particularly in the lower Coastal Plain area.

Chestnuts: Only blight resistant varieties of chestnuts are surviving in the trial grounds. They, however, appear vigorous and well adapted to this area.

Other fruits: Among the fruits that have shown the least evidence of adaptability in the trial grounds are: Apricots, hazlenuts, prunes and raspberries.

NEMATOLOGY

In cooperation with the Division of Nematology, Bureau of Plant Industry, United States Department of Agriculture, experiments have been conducted on various phases of nematode control, with special reference to our most common nematode parasite of plants—the root-knot nematode.

CHEMICAL CONTROL OF THE ROOT-KNOT NEMATODE

In former years, numbers of chemicals for root-knot nematode control have been tested, but good results have been obtained with only two—chlorpicrin (tear gas) and carbon bisulphide. All other chemicals

tested, including some extensively advertised for use against this pest, have been found to be entirely ineffective.

Carbon bisulphide injected into the soil at the rate of 500 to 1000 pounds per acre reduced root-knot more than 90 per cent. However, this chemical is extremely disagreeable and dangerous to handle, having a bad odor and being highly inflammable and even explosive. Under some conditions, chlorpicrin at the rate of 150 to 200 pounds per acre has given excellent control of root-knot, but has failed entirely under other conditions with similar amounts applied. Work of the past year has been directed toward a study of the conditioning factors assuring the highest effectiveness of this chemical and toward the design of machines for applying it.

The method of application of both carbon bisulphide and chlorpicrin is essentially the same. Measured quantities of the chemical are placed in holes 8 to 10 inches deep punched in the soil at regular intervals. The holes are then filled in and a cover placed over the soil to prevent escape of the gas formed by the evaporation of the chemical.

Experiments this year have indicated that the soil should be fairly moist—neither dry nor water-soaked—and that the chemical application should be made when the soil temperature is about 70° F. However, the past season's experiments were not entirely conclusive and are being continued.

Both carbon bisulphide and chlorpicrin are too expensive for use on a large scale, but will have considerable value for treatment of seed-beds, greenhouses, and similar small areas of infestation, particularly if the soil is valuable.

In view of the above, unqualified recommendations cannot yet be made for chemical control of nematodes in the soil. Prospective users are requested to write to this Station for detailed instructions for the application of chemicals for this purpose and are cautioned that such applications must be considered experimental, which means that the possibility of complete failure must be taken into account.

A hand applicator has been developed for applying these chemicals, and a description and drawings of it can be furnished to those interested.

It has been definitely established that ammonium thiocyanate, used either dry or in solution in infested soil, has no appreciable control effect on root-knot nematodes.

ACTIVE MIGRATION OF THE ROOT-KNOT NEMATODE

Experiments have shown that the root-knot nematode can move through sandy soil at the rate of about one centimeter a day (approximately one foot in 30 days) and that it can travel at least two feet from its starting point during its active larval life. These figures are for active migration of the nematode and do not take into account such transporting agencies as running water, soil carried on farming implements, the feet of men and animals, infested nursery stock, etc. These latter agencies seem to be far more important in the spread of nematode infestation than movement of the nematode itself.

SPREAD OF NEMATODES FROM AN INFESTED AREA

By placing root-knot nematodes in a carefully defined area and planting various crops in continuous rows across the area, it was shown that

the infestation spread at the rate of 7.5 mm (3/10 inch) per day along rows of squash and at the rate of about 3.5 mm (1/7 inch) per day on cowpeas and lima beans. No explanation of the varying rates of travel on the three crops was found. Again it is apparent that cultivation along the rows and water running along the rows is far more responsible for enlarging a nematode infested area than the multiplication and movements of the nematodes themselves.

TUNG TREES AND ROOT-KNOT

An experiment to determine the effect of root-knot on the growth and yield of the tung tree has been set up. Several years must elapse before any worthwhile data will be available.

CONTROL OF ROOT-KNOT IN THE FIELD

As the root-knot nematode attacks and weakens to some extent all of the principal crops grown in the Coastal Plain, and as most of our soils are very favorable to the pest, farmers should give careful consideration to the planning of their crop rotations.

Tobacco, watermelons, squash, cucumbers, tomatoes, and truck crops in general are severely damaged by root-knot and should never be planted on soil known to be infested. Nor should one of these crops follow any of the others if it can be avoided, for, while the first crop may escape noticeable damage, the nematode population may be increased to the danger point and subsequent crops badly damaged. Corn, peanuts, velvet beans, oats, and other grains are generally not badly damaged by nematodes and have a tendency to decrease the nematode population, so these crops can be planted on infested soil. After two or three seasons of the less susceptible crops, the soil again may be used for the more susceptible ones for a season with a degree of safety. Even then, caution must be used, for the nematodes will not be eliminated entirely and one or two susceptible crops will again build up the population to the danger point.

Cotton can be classed as a semi-susceptible crop. While it is attacked by the nematodes and sometimes damaged, the damage is generally not severe. But cotton will increase the nematode population and should never be followed the next season by one of the highly susceptible crops.

Crops which definitely decrease the nematode population are few. The best one is peanuts where the nuts are harvested. Either the Spanish peanut or the runner peanut may be used. Crotalaria, particularly **Crotalaria spectabilis,** will also reduce the nematode population. It has the advantage of adding nitrogen to the soil. Oats and rye may also be used. Some of our native weeds, such as Florida pursley (**Richardia scabra**), coffeeweed (**Cassia tora**) and beggarweed (**Desmodium tortuosum**), are highly resistant to root-knot and where these weeds have predominated for several years, the soil should be fairly safe for nematode susceptible crops. Bare fallow also decreases the nematode population, but is not generally practical. Velvet beans may also be used. (See also section on tobacco diseases in this report.) In any case, the nematode resistant crops must be grown for at least two successive years before noticeable reductions of the nematode are obtained.