

HOW NEMATODES ENTER AND DISPERSE IN FLORIDA NURSERIES VIA VEHICLES

R. P. Esser¹

INTRODUCTION: A very small amount of soil and roots can harbor a very large number of phytoparasitic nematodes, bacteria, fungi, and other microflora and fauna. When infested soil or roots become embedded in the tire tread of a vehicle, or adhere to fenders, chassis, or other vehicle parts, the nematodes and/or associated microflora and fauna may enter and infest new agricultural sites.



Fig. 1. A small tractor wheel caked with mud and mud that has been thrown on the tractor chassis.

A study in Florida revealed 16 genera of plant-destructive nematodes in soil adhering to 63 bulldozers operating in 23 different groves in Lake, Orange and Polk counties (3). Twelve of the 63 vehicles had more than 151 nematodes per sample. None of the bulldozers were free of plant parasitic nematodes. Seed gall nematodes have been dispersed by harvesting machinery, trucks, and burlap bags (2). In one test, a threshing machine was found to have carried nematode-infected seeds 300 feet (1). Cyst nematodes are commonly found in soil adhering to the undersides of cars imported from foreign countries.

VEHICLE CONTAMINATION: Passive movement of nematodes to new sites occurs by external or internal transportation. External transportation includes passenger cars and trucks visiting the nursery for various reasons and then leaving. Internal transportation includes vehicles used in the nursery operation, such as cars, trucks, tractors, carts and wheelbarrows.

¹Nematologist, Bureau of Nematology, P. O. Box 1269, Gainesville, FL 32602.

NEMATODE POPULATION: Normally, the greater part of the nematode population will be found 6-8" below the soil surface. In nurseries where soil is moist most of the time, the nematode population may be closer to the surface. When vehicles move through mud, tires may dig into the mud and spin out the normally inaccessible nematode population.

PREDISPOSING FACTORS: As a result of irrigation or rainfall and subsequent water runoff within the nursery, mud may form. Mud may adhere within tire treads or may stick to various parts of the vehicle body as the mud is thrown by spinning wheels (Fig. 1). Moist soil will also adhere to vehicles and inside tire treads but not as tenaciously as mud. Adherent soil containing nematodes and other microflora and fauna can infest a new site when soil dries and drops off or is jarred off by vehicular movement.

Vehicular operation is also a factor in nematode dissemination. Fast starts and high speeds throw more mud on the vehicle than slow starts and normal speeds. Vehicles, such as fertilizer trucks and other types of agricultural supply vehicles, may visit many agricultural sites in the course of a day. If such a vehicle passes through a site which is heavily infested with regulatory nematode pests on a rainy day, it could transport the pests to a noninfested site thereafter. The noninfested site is particularly subject to infestation if the delivery truck drives deeply into the nursery operation or close to stored soil mix mounds. One of the principal predisposing factors for pest infestation is the location in heavy traffic areas of mounds of soil mix intended for pots, flats, and benches. Unfortunately, many nurseries store soil mix next to busy traffic thoroughways. In many nurseries, less than 10 feet separates the soil mix from the thoroughway. In one nursery, a contaminated compost pile was close (20-30 ft) to the soil mix storage site with a thoroughway between the pile and the nursery.

PREVENTIVE MEASURES: Vehicular traffic from outside the nursery should be restricted to designated thoroughways and parking areas. Loading and unloading sites should be located in areas separated from the nursery operation. On rainy days when an excess of mud is evident, traffic from muddy, contaminated areas should be prohibited from areas where pest-free plants are maintained.

Owners of nurseries in a planning or expansion stage should consider locating new soil mix storage sites in pest-free areas away from heavy traffic thoroughways in the nursery. Many fumigated or steamed soil mix mounds or concrete slabs have been noted with nursery vehicle tracks leading from the thoroughway directly into the soil mix. If possible, pest-free soil mixes should be stored off the ground, or a baffle should be provided to prevent the intrusion of vehicle wheels into the soil mix pile.

Some growers have geographically separated sites which are cultivated and maintained with one common set of vehicles. If one site is infested with a serious nematode pest and the other is not, separate vehicular arrangements should be made for the two sites, or vehicles should be thoroughly hosed down between sites.

LITERATURE CITED:

1. Courtney, W. D., and H. B. Howell. 1952. Investigations on the bent grass nematode, Anguina agrostis (Steinbuch, 1799) Filipjev, 1936. Plant Dis. Reprtr. 36:75-83.
2. Jensen, H. J., H. B. Howell and W. B. Courtney. 1958. Grass seed nematode and production of bentgrass seed. Oregon State College Sta. Bull. 565. 8 pp.
3. Tarjan, A. C. 1956. The possibility of mechanical transmission of nematodes in citrus groves. Proc. Fla. State Hort. Soc. 69:34-37.