

# NEW PARASITIC NEMATODE ON GREENHOUSE ROSES

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A new dagger nematode, *Xiphinema diversicaudatum*, has been found in a northern California rose range. This species is reported to cause severe injury to glasshouse roses in the eastern United States but has been unknown in California except in two residential rose plantings in southern California.

The *X. diversicaudatum* population in northern California is located in one section of a glasshouse range. Virtually no functional feeder roots could be found on the root systems of affected plants, hence the severe stunting of top growth.

A. F. Schindler (Maryland) demonstrated in 1957 that *X. diversicaudatum* was the cause of reduced vigor and productivity, chlorosis, and root malformation of greenhouse roses. Examination of 126 samples from rose ranges in 14 eastern states showed that dagger nematodes, along with root lesion nematodes, *Pratylenchus* spp., predominated in 60 percent of the samples. In California another species of dagger nematode, *X. americanum*, is common in rose ranges, along with root lesion nematodes and root knot nematodes, *Meloidogyne* spp.

Dagger nematodes feed on root tips and root hairs by means of long hypodermic-like spears, while their bodies remain outside the roots in the soil. Such nematodes are called ectoparasites. Growth of root tips is suppressed, and tips become swollen. The root tips also commonly curve to one side, and the result is a sickle-shaped terminal swelling or gall. Under restricted conditions, as in a container or shallow bed, galls may become large enough to be mistaken for those caused by root knot nematodes. More commonly, the severely affected root tips are killed, and new roots branch off above the dead area. The new rootlets are in turn attacked. The result is an excessively branched "hairy root" system with small, sickle-shaped terminal galls and many dead rootlets.

Eradication of plant-parasitic nematodes from greenhouse beds, especially in the presence of living plants, is not possible with chemicals and techniques now available. However, in California the nematicide DBCP (Nemagon<sup>®</sup>, Fumazone<sup>®</sup>) has been used effectively for economic control of various plant para-

sitic nematodes in greenhouse roses while plants are in place. The treatment is particularly effective when ectoparasites such as dagger nematodes are involved. The soil is drenched with a solution of 100 ppm DBCP (37.1 ml 50 percent<sup>1</sup> formulation/100 gal water), in one acre-inch of water (=0.62 gal/sq ft). At least three applications at weekly intervals should be used, and plants should not be otherwise watered between treatments.

The most effective control program in rose ranges would include a preplant treatment with soil fumigants or steam,<sup>2</sup> followed annually with a DBCP treatment, as described, to reduce developing nematode populations. In all cases soil must be permeable and well prepared. Clay soils that have not been modified by suitable amendments and tillage are difficult if not impossible to treat properly.

Any rose grower who suspects the presence of this dagger nematode should contact the University of California Cooperative Extension farm advisors office or the Agricultural Commissioner.

<sup>1</sup> Technical DBCP weighs 17.1 pounds per gallon. A 50 percent by weight formulation contains 8.6 pounds per gallon.

<sup>2</sup> Steam treatment of greenhouse beds is of limited effectiveness. Depth of control of nematodes seldom reaches 12 inches, except in the most permeable soils, and nematodes from untreated soil quickly invade treated areas.