

# Nematodes Killed; Tomatoes Survive

**Robert B. Marlatt**

**Ross M. Allen**

Plant Pathology Department

Limited commercial plantings of fresh market tomatoes have been grown on the sandy Yuma Mesa during the cool season. These have shown that the winter and spring crop can be profitable if the hazards of frost and root knot can be avoided. Root knot is caused by nematodes which live in the soil.

Because root-knot resistant varieties adapted for Arizona have not yet been proven, attempts are being made to control the nematode problem by soil fumigation. To be satisfactory for the Yuma Mesa, a fumigant must control nematodes in almost pure sand at exceptionally high temperatures for about nine months. For this reason higher than average rates of fumigants are being used.

## Fumigants Injected In Alfalfa

The site of the 1955 experiment had contained Ranger alfalfa. The crop showed a moderate amount of nematode infection. Dr. Harold W. Reynolds, nematologist at the University of Arizona's Cotton Research Center, has shown that Ranger is more susceptible to root knot than the African variety.

Planting tomatoes following Ranger alfalfa was more likely to result in a root-knot problem than if the field had contained African. Dr. Reynolds generously helped with these experiments.

The alfalfa was plowed and allowed to decay before fumigation. This permitted the fumigant to kill nematodes that might be inside large roots. Each fumigant was injected 8 inches into the sand behind shanks which were 12 inches apart.

## Different Applications Used

Materials used were ethylene dibromide (EDB)—7.3 and 14.6 gallons per

acre (gpa) of the 83 per cent concentration and dibromochloropropane (DBCP)—1.5, 2.1, and 4.4 gpa of the 97 per cent strength. A wider selection of fumigants was used in 1957: EDB—10.3 gpa of 83 per cent, "Dorlone"—10 gpa, "Telone"—33 gpa, "D-D"—31 gpa and DBCP—10 gpa. Control plots were not fumigated.

Clean tomato plants were transplanted to the fumigated plots 17 days after the fumigants had been injected. None of the transplants seemed to be hurt by chemical residues.

Fruits were harvested as they ripened from late December to May. The tomatoes were graded to three sizes, 5x6, 6x7 and 7x8, which refer to the number of fruits in each of two layers of a 30-pound lug. All of the soil treatments increased yields above those of the controls. No one fumigant increased the yields more than the rest. However, there were differences in the amounts of root knot in the plots.

## EDB Proves Best

In the 1955 experiment, tomatoes growing in sand fumigated with EDB had less nematode injury than vines in the DBCP-treated plots. EDB also performed best in the 1957 experiment. Tomatoes in EDB, Telone and D-D plots had less root knot than the controls. EDB controlled nematodes better than DBCP or Dorlone and Telone was more effective than Dorlone. More experiments are going to be made on the Yuma Mesa. It now looks like 7 to 10 gallons of 83 per cent EDB will control nematodes in sandy soil sufficiently to provide a satisfactory yield of tomatoes.

**ALL TOMATOES** were killed by nematodes in a plot which received no fumigant (top arrow), while tomato plants were living in fumigated plot (bottom arrow).

