FARM: In Our Field: Root-knot nematode on bell peppers a problem in Coachella Valley

By OLI BACCHIE, JOSE LUIS AGUIAR and ANTOON PLOEG Special to this Newspaper | Posted: Thursday, May 15, 2014 12:20 am

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The Coachella Valley is the most important bell pepper production region in California. It has about 5,000 acres in spring and fall productions.

There are two main fruit colors grown; green and red peppers. The red types, called "Lamuyo," are elongated, have thick walls, are bell-shaped and have three to four lobes. Some representatives of the "Lamuyo" type are "Maccabi," "Red Madonna," and "Massada," to list a few. The "blocky" type of bell pepper would be the green type that are square-shaped and shorter in fruit size. A yellow-colored bell pepper is also grown to a lesser degree but these can be very sensitive to sunlight.

The Southern root-knot nematode (Meloidogyne incognita) is a major problem in Coachella Valley and in general on bell pepper production. Growers have observed a bleaching of newer leaf growth on the plants and assumed that the crop was deficient in nitrogen. Because their fields are drip irrigated, they believed that the nitrogen was leaching away below the root zone. However, the bleaching appearance never disappeared regardless of an N fertilizer N adjustment.

Experts responded to the growers complaints and found out that a nematode known as root-knot nematode (RKN) is responsible for the bleachy look of the plants. The second-stage juveniles of this nematode (J2), which are worm-shaped, move through the soil, enter the plant roots, parasitize on the crop sap and finally develop into females, while the root system responds to infection with the formation of galls.

Females produce up to 400 eggs, contained in clusters in a gelatinous material and "glued' to the outside of the roots. From these eggs, second-stage juveniles can emerge and repeat the cycle, or eggs can remain in the soil during a fallow period to serve as inoculum for the next crop cycle. The duration of the nematode life cycle depends primarily on the species of root-knot nematode and soil temperature.

Meloidogyne incognita, the most important species infecting bell-pepper, can complete its life cycle in fewer than four weeks under an optimum soil temperature of 90 degrees Fahrenheit, and become inactive when the soil temperature drops below 62 degrees Fahrenheit.

In most host crops, root-knot nematode infestation can easily be diagnosed because of obvious galling on the affected roots. Above-ground symptoms are however not specific, but can include chlorosis, wilting under sufficient soil moisture, stunting, and increased susceptibility of plants to fungal or bacterial root pathogens. Sandy soils (widespread in the low desert), over irrigation with drip irrigation and mono-culturing bell peppers year after year exacerbates RKN problem.

If fields are suspected to have nematode problems soil samples should be collected at different crop growth stages for analysis of root knot nematode.

IN SUMMARY

Rotate crops and avoid mono-cropping bell peppers or any crop for that matter. This helps reduce nematode population, although some RKN eggs can survive in soils for some years

Avoid over irrigating the crop and fix leaking lines. Nematodes can move in water and in saturated fields can spread in all directions.

Plant cover crops such as nematode-resistant cowpea variety during the fallow period to reduce the number of nematodes.

Check for root galls on plants. Sample the soil early-mid-late season to track the nematode population.

Clean farm equipment between fields to prevent carrying nematode contaminated soils.

Disc all crops after harvest; disking deprives the nematodes of food reserves.

Keep the fields clean from weeds as weeds may serve as alternate hosts.

The preceding was extracted from an article by Jose Luis Aguiar, Oli Bacchie and Antoon Ploeg to be published in the Agbrief. They are farm advisers and associate nematology specialist, respectively, with the University of California Cooperative Extension. Oli Bacchie works in Imperial County at the Desert Research and Extension Center near Holtville.