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# CONTROL OF PHYTOPHTORA CINNAMOMI CAUSING ROOT ROT OF AVOCADOS

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Between 1977 and 1979 over 30 trials were initiated to determine the efficacy of metalaxyl in controlling *Phytophthora cinnamomi* avocado orchards. The responses of the organism were measured by means of bio-assay studies and that of the trees by visual observation and rating according to a standard (0—10) scale.

The initial results, which lead to the registration of Ridomil 5G for use on avocados, were reported on by P Margot in Bangkok during October, 1980 at the 2nd S.E.A. Symposium of Plant Diseases in the Tropics.

This briefly summarized showed:

(i) The EC90 for inhibition of mycelial growth was 2,5 ppm.

The EC90 for inhibition of sporangium formation was 0,2 ppm.

The EC90 for inhibition of chlamydospore formation was 0,2 ppm.

(ii) Metalaxyl applied twice per season at 1,25g ai/$m^2$ gave protection from zoospore infection for 12 weeks after the second application. Metalaxyl applied twice per season at 2,5g ai/$m^2$ gave protection all year.

(iii) Chlamydospore levels monitored during the autumn, winter and spring following a summer application, showed:

a). 1,25g ai did not reduce the numbers at autumn peak, but resulted in reduced levels the following spring.

b). 2,5g ai resulted in low or undetectable levels in autumn and zero at the on set of the rainy period the following spring.

Aerial responses of avocado trees showed:

a). Treated trees maintained their status quo or showed slight improvement after the first seasons applications.

b). Untreated trees usually deteriorated.

c). Treated trees had an abundance of new feeder roots that usually resulted in a marked improvement of aerial symptoms during the second season.

Five of these trials have been maintained for long term bio-assay studies and visual observations. Where treatments continued for a third and fourth season, *Phytophthora* zoospores were recovered sooner than expected and some trees started to show a

decline in vigour.

Laboratory studies carried out on soil samples taken from these sites showed that the fungus was fully sensitive to metalaxyl at the usual low rates and that no resistance could be detected.

At one site in the Tzaneen area where metalaxyl was applied 4 times during the first season and twice per season during the second and third seasons at a rate of 2,5 g ai/$m^2$ per treatment, soil samples were taken from under treated and untreated trees. The half-life of metalaxyl on those soils was determined in the laboratory. Metalaxyl was broken down much faster in the treated than untreated soil. This seems to indicate that micro-organisms which utilize metalaxyl as a food source, may be present in some soils. Continuous exposure to metalaxyl may therefore lead to an increase in these organisms and subsequent shortening of the active life of metalaxyl in the soil. This phenomenon is not uncommon, and has been shown in the case of herbicides, insecticides and even fungicides, where bacteria make use of such chemical substances as a source of carbon. This aspect should be further investigated.

Studies will be undertaken at this and other sites in an attempt to identify the responsible organism and to determine whether this phenomenon could be associated with certain soil types, climatic conditions etc.

In the meantime, however, it is of the utmost importance that every effort be made to maintain the balance of microbial activity in the soil. In an attempt to achieve this, metalaxyl should not be used for more than two consecutive seasons. This would be sufficient to restore diseased trees to normal health and result in an abundance of new feeder roots. In the third season it is recommended to use fosetyl-al and thereafter to alternate fosetyl-AI and metalaxyl on a seasonal basis. In addition, sound cultural practices, which would ensure optimum tree growth and minimize *Phytophthora* development, should be practiced.