THE MELOIDOGYNE PROBLEM IN SOUTH AFRICA

BY

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At the last Nematological Conference there was mixed feeling as to the validity of CHITWOOD's splitting the old species, *Heterodera marioni*, into a number of different species. I think the nematological world owes Dr. CHITWOOD a vote of thanks for having taken the initiative. Those workers who today are studying root-knot nematodes realise the necessity for the creation of the different species of *Meloidogyne*.

In the past it was most difficult to prescribe any crop rotation for the control of nematodes, for none of the prescribed systems were ever really effective. Today the picture is somewhat different, for although not by any means an easy task, we at least understand the problem a good deal better. We can at any rate make a survey of any particular cultivated area and establish what species are present in that area; should crop rotation prove to be the only means of combating the nematode in such an area, an attempt can be made with some certainty to prescribe the crops that should be grown in such a rotation.

In Southern Africa or Africa as a whole these nematodes are indigenous. They can be found in certain localities living on plants in the veld, but never becoming a pest of these plants; they only show up when an economic crop is grown.

Some of the species described are very distinct and relatively easy to distinguish morphologically and by host reactions. We in South Africa however experience great difficulty with certain geographical forms of *Meloidogyne* which differ relatively little on morphology and host reactions.

In our preliminary survey of the distribution of the different species of *Meloidogyne*, a number of forms were found in different localities which morphologically resemble *M. incognita* and *M. incognita* var. *acrita*.

The nematodes collected at Vaalhartz and Roodeplaat experimental stations, appeared to be *M. incognita*, but on applying the host reaction...
test (SASSER, 1954), these parasitized *Lycopersicon peruvianum*. Thus according to these tests they must be *M. incognita* var. *acrítica*.

The nematodes collected at Elandskop, Oribi and Underberg in Natal and Ceres and Berlin in the Cape, Kitwe in N. Rhodesia and Odendaalrust in the O.F.S., all somewhat resemble *M. incognita* var. *acrítica* morphologically, but it is difficult to establish their identity definitely. They however all parasitize *L. peruvianum* and they are thus regarded to be closely related to, though not necessarily identical with, var. *acrítica*. All these forms which morphologically resemble *M. incognita* var. *acrítica* do not however show much penetration and very little, if any, reproduction when tested against *Gossypium hirsutum*. Their actual identity is therefore uncertain.

A number of host susceptibility tests were then carried out to study the reactions of some of these forms towards host plants and to compare them with other well identified species, viz. *M. hapla*, *M. arenaria* subsp. *thamesi* and *M. javanica*.

Unfortunately some of the forms were only discovered recently and it was not possible to include them in all of the tests. When these forms were originally found, a single egg-sac from each female was inoculated in sterilized soil on the roots of a bean plant; but many females from the original plant material were examined to establish whether only one species was present. From the single egg-sac a large population was built up to carry out these tests.

The tests were carried out in a greenhouse, there were five replicates for each nematode species or geographical form. Each replicate was inoculated with 25 egg-sacs and the experiment continued over ninety days, to insure development and reproduction.

All forms were tried against peanuts, to ascertain whether this crop was susceptible to all these races, but the only infestation was obtained from the nematode collected on strawberries and identified as *M. hapla*. This was verified by the susceptibility of *Zea mays* to the other forms, but not to *M. hapla*.

We believe that we will be able to differentiate between these apparent *acrítica* populations by means of host susceptibility. For example, the population from Elandskop was tested together with the populations from Vaalhartz, Underberg and Ceres against the grass *Panicum maximum*, Olifantsriver strain (Northern Transvaal) and it was the only one which reproduced in its roots. Again the population from Elandskop was tested with those from Vaalhartz and Underberg against *Pennisetum glaucum* and only they reproduced in its roots.