

the anion in sodium chloride had any effect on yield. The fact, that in the case of potassium the form of potassium salt was immaterial in cereals was referred to in this connection.

Peculiar observation that a lower dose (250 lb. sodium chloride) produced high yields in laterite soil, while a high dose (1000 lb.) was effective in neutral soil was then discussed. The difference in the amount of exchangeable ions displaced by sodium ion was suggested as a possible explanation.

In view of the regularity of increase of dry matter yield and grain yield it was suggested that a correlation might be worked out for this relationship.

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V. ENTOMOLOGY AND NEMATOLOGY

1. A PRELIMINARY REPORT ON THE OCCURRENCE OF ROOT-KNOT NEMATODES (*Meloidogyne* spp.) ON SOME IMPORTANT CROP PLANTS IN MADRAS STATE

by

A. R. SESHADRI and T. KUMARASWAMI

Root-knot is one of the oldest and most widely known nematode diseases of plants and occurs on the roots of numerous plants belonging to all families. Root-knot nematodes belonging to three species and one subspecies viz., *Meloidogyne javanica*, *M. incognita*, *M. incognita acrita* and *M. arenaria* have been recorded from different parts of India so far on a number of cultivated crops. The present paper summarizes the result of one year's preliminary survey on the occurrence and distribution of different species of root-knot nematodes on some important crop plants in Madras State. Five different species of *Meloidogyne* and one subspecies viz., *M. incognita incognita*, *M. incognita acrita*, *M. javanica*, *M. arenaria*, *M. hapla* and *M. brevicauda* are recorded from various cultivated crops. *M. arenaria* is reported for the first time in South India and *M. hapla* and *M. brevicauda* are new records in India. The survey has given clear indication that the root-knot nematodes constitute one of the most common nematode problems in Madras State.

* During the discussion that followed the presentation of the paper there were a number of questions from the members which elicited information on the following points:

(i) The authority for identification of the two new records *M. hapla* and *M. brevicauda*; (ii) The differences between the genera *Meloidogyne* and *Heterodera* and whether the allied genus *Meloidodera* is known from India; (iii) The toxic mechanism by which galls are produced; (iv) Whether the root-knot nematode is known to transmit any virus disease and (v) What happens to the nematode after the death of the host plant.

The Senior author explained that the identity of the two species *M. hapla* and *M. brevicauda* was determined by him at Coimbatore itself based on detailed studies of the perineal pattern. *M. hapla* is characterised by a low dorsal arch with a distinctly punctate area near the anal region and *M. brevicauda* has a very tall arch with a strikingly rectangular perineal pattern. These characters along with other morphological features are distinct and cannot be confused with other species.

The differences between *Meloidogyne* and *Heterodera* consisted in the fact that the root-knot nematode forms galls on the roots, is internal when mature, rarely exposed to the outside and does not form cysts whereas the members of the genus *Heterodera* are cyst forming nematodes, where the female body protrudes outside the root tissue when mature which eventually turn into the cysts. *Meloidodera* which is intermediate between the above two genera is not known from India so far, and is at present confined to the U. S. A.

As regards the toxic mechanism causing the galls, it was explained that the nematode while feeding, injects small quantities of the secretion of the esophageal glands into the host tissue. This secretion contains some unidentified enzymes which induces the formation of the giant cells, renders the contents of the cells more fluid making it easier to ingest and assimilate and causes such reactions on the plant tissue as hypertrophy and hyperplasia of the cells, leading to distortion of the roots. One possible explanation on the physiology of gall formation has been that it is due to excess production of the amino acid tryptophane which is a precursor of IAA in the gall tissue. The plant protein is perhaps broken down into several amino acids including tryptophane which later gets converted into IAA.

Regarding the question on virus transmission, the questioner was informed that root-knot nematode is not known to transmit any virus disease so far.

When the nematode becomes mature, eggs are laid inside a mucilaginous secretion extruded out of the vulva. The II stage larvae hatch out and move about in the soil and a good percentage of them are able to survive, till the next crop is available.

At the plenary session, questions were raised regarding the influence of rainfall and soil types on root-knot nematodes. It was explained that root-knot nematodes are well known to tolerate varied soil types and soil moisture conditions and these factors are found to be of minor importance, though light soils are very conducive to their multiplication. Studies on these aspects will be taken up in due course.

1. STUDIES ON THE CONTROL OF *Sitophilus oryzae* L. AND
Tribolium castaneum H. IN STORED *Cholam* WITH
MODERN SYNTHETIC INSECTICIDES

by

C. RAMAKRISHNAN and P. S. NARAYANASWAMY

Investigations were carried out at Coimbatore during 1957-'58 to evaluate the efficacy of treating *cholam* seeds with modern synthetic insecticides as a prophylactic measure against *Sitophilus oryzae* L. and *Tribolium castaneum* H., as this would provide a cheap and effective means of storing seed *cholam*. Two sets of experiments with ten treatments and four replications were conducted separately for each pest over a period of one year with Co. 18 *cholam* seeds in a suitably randomised layout. Well cleaned *cholam* seeds were taken in one lb.