PRELIMINARY OBSERVATIONS ON REACTION OF LEGUMINOUS COVER CROPS TO ROOT-KNOT NEMATODE

Legumes constitute an important group of plants in agriculture. In rubber plantations, they help to improve the physical properties as well as the nutrient status of the soil, in addition to conserving soil moisture, preventing soil erosion and keeping down the soil temperature during the summer months. The cover crop most popular in rubber plantations is *Pueraria phaseoloides*. *Mucuna bracteata* has gained importance during the recent years. *Calapagonium mucunoides*, *Centrosema pubescens* and *Mimosa invisa* var *inermis* have also been recommended in rubber plantations. These cover crops are found attacked by a number of pests, many of them being leaf feeders such as caterpillars, beetles, bugs, grasshoppers, snails and slugs. The root system is attacked by cockchafer grubs and root-knot nematodes. Field observations for the past three years indicated that root-knot nematode is almost absent in areas where *M. bracteata* is grown. *Mucuna* sp. was found to reduce the presence of parasitic nematodes in the soil in Brazil (Anon, 1983).

Root-knot infection is brought about by the second stage larvae causing hyperplasia and hypertrophy and results in the formation of galls or knots on roots. Consequently many morphological, anatomical and physio-chemical abnormalities occur in the host (Ahmad Jamal, 1976) resulting in the reduction of conducting efficiency of the host plant. Srivastava *et al* (1974) reported the effect of root-knot nematode, *Meloidogyne javanica* on gram. The attack of *Meloidogyne incognita* in cover crops of rubber was reported by Mammen (1973). Rajendran and Jayarathnam (1977) reported the occurrence and infestation of nematodes in rubber plantations. However, no information is available on the comparative resistance of rubber plantation-based cover crops to root-knot nematodes. In order to evaluate the comparative resistance, it was planned to screen different legume covers against the root-knot nematode, *Meloidogyne incognita*.

Pueraria phaseoloides Benth., *Calapagonium mucunoides* Desv., *Centrosema pubescens* Benth., *Mimosa invisa* var *inermis* and *Mucuna bracteata* D. C. were screened for resistance against the root-knot nematode *Meloidogyne incognita*. Ten seeds each were sown in 23 x 18 cm polythene bags, each containing 3 kg sterilized nematode free laterite soil. Each variety was grown in five bags as five replications. After germination, five plants were maintained in every bag. Ten days after germination, the seedlings were inoculated with 1000 freshly hatched second stage juveniles per bag. The juveniles were obtained by crushing the root galls of *Abelmoschus esculentus* Wt & Arn. For inoculating the larvae, the roots were exposed by removing the upper layer of the soil and 20 ml of water containing the larvae was poured on to the exposed roots. The roots were then covered with a layer of soil. Only adequate water for just sustaining the life of the plant was given. After 35 days, the plants were uprooted and observations based on gall index were recorded on a 0–5 scale (Mohanty and Das, 1988) and the averages of five replications were calculated.

The results (Table 1) revealed that *Mucuna*

bracteata exhibited high resistance. *Centrosema pubescens* and *Mimosa invisa* showed moderate resistance while, *Calapagonium mucunoides* and *Pueraria phaseoloides* reacted with high susceptibility. *Pueraria phaseoloides* had the maximum root-knot index. This indicates that the most popular cover crop *Pueraria phaseoloides* encourages the growth in population of root - knot nematodes.

Table 1. **Susceptibility of leguminous cover crops to root-knot nematode,** *Meloidogyne incognita*

Sl. No.	Species	Range of infestation	Root-knot Index	Reaction
1.	*Mucuna bracteata*	0.0—1.0	0.0	HR
2.	*Centrosema pubescens*	1.0—2.0	1.76	MR
3.	*Mimosa invisa*	3.1—4.0	3.20	MS
4.	*Calapagonium mucunoides*	4.1—5.0	4.84	HS
5.	*Pueraria phaseoloides*	4.1—5.0	5.00	HS

HR — Highly resistant; MR — Moderately resistant; MS — Moderately susceptible ; HS — Highly susceptible.

O — Disease free 5 — Maximum disease intensity.

Further long term studies are in progress to confirm this finding. In rubber attack of root-knot nematode has been reported on a very low scale in Malaysia and Indonesia. Recently the attack of nematode was also noticed in nursery seedlings in India. In case this pest is on the increase, one possible method of reducing its population is by replacing *Pueraria phaseoloides* by *Mucuna bracteata* as associated cover crop.

ACKNOWLEDGEMENT

The authors are grateful to Dr. M. R. Sethuraj, Director, Rubber Research Institute of India for providing necessary facilities during the course of this investigation.

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