OVERVIEW OF ROOT-KNOT NEMATODES IN THAILAND

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Only a few species of plant parasitic nematodes were first recorded in Thailand almost 20 years ago. Root-knot nematodes were not, at that time, considered a serious pest due to the limited number of nematologists in the country who had not made extensive surveys.

Since then, especially in the last 5 years, reports from surveys conducted by many scientists from various governmental agencies revealed an interesting conclusion on root-knot nematodes. Obviously, this kind of plant parasitic nematode is commonly found throughout the country and is damaging cultivated crops to certain extent. It could be, among the nematode species found, the most dangerous pest. So far, the 6 species recorded are *Meloidogyne incognita, M. javanica, M. graminicola, M. arenaria, M. naasi* and *M. oxigua,* recovered from more than 80 species of host plants.

At present, there is no record on crop losses due to these nematodes. The surveys show that soil type is indirectly related to nematode distribution, but they are more prevalent and cause more damages in sandy soil than in clay. Disease severity ranges in general from light to heavy, depending on host plant variety, location, plant age at the time infection, and environment.

Economic loss.— It is recognized that root-knot nematodes, *Meloidogyne* spp. are becoming an important hazard for the Nation's economy. Unlike some fungus diseases, crop losses due to these nematodes has never been economically assessed. There are only isolated examples to show the disease impact on Thai agriculture as a limiting factor for crops in different regions of the country. These examples are:

Tobacco production in Chiengrai province.
Up land rice in the Northeast, Ubol Rachathani province.
Black pepper plantation in the Southeast.
Vegetables growing in the North (Lampang province) and the Northeast provinces.

Disease control.— Control of the disease is generally not practiced among Thai farmers. Chemicals are used only on tobacco in the North, since this is an economic crop in the region. Cultural practices are performed in some plantations only.

Three reasons why chemical control is not commonly practiced in the country are:

1. Cost of the chemicals—All nematicides are imported. It has been estimated that to get control, about US $ 50.00/rai must be spent for the chemicals only.
2. Method of application—Rather complicated for the farmers.
3. Uneconomical—Few crops can be economically that important in terms of cost: benefit ratio.

Nematology in Thailand.— The subject of nematology was first taught academically at Kasetsart University in 1961 to students in general Plant Pathology and to those who majored in plant nematology. This is the only institution at which nematology is taught in this country. At present Thai nematologists are scattered in various governmental agencies, as shown in Table 1.

Review of some research work on root-knot nematodes.— Some research work conducted cooperatively by the nematologists from Kasetsart University and the Office of the Under-Secretary, Ministry of Agriculture are summarized hereunder. Research work conducted by nematologists from the Department of Agriculture will be presented by Charas Chunram.

1. Population dynamics of *M. incognita* in the Northeast Thailand by sampling soil every two weeks from a heavily-infested lettuce plantation at 6 and 12 inches, it was found that the numbers of the nematodes were directly related to soil moisture but not to soil and air temperatures.
2. Crop loss by *M. incognita* — From pot experiment, it was found that Fireball tomatoes yielded 50 % less when they were inoculated at seedling stage. Application of a nematicide after the roots started galling did not improve crop growth and yields.
3. Life cycle of *M. incognita* — In sandy soils, *M. incognita* completed its life cycle

Table 1. Number of plant nematologists employed in Thailand.

Agencies	Numbers of nematologists		
	Locally trained	Trained abroad	Total
Nematology Section in Dept. of Agriculture	5*	4	9
Kasetsart University Northeast Regional	1*	2	3
Office of Agriculture	1	1	2
Thailand Tobacco Monopoly	–	1	1
Total	7	8	15

*Some of these scientists were trained to obtain Master's Degree.

in 25-28 days at 31 C. Host roots of Fireball tomatoes started galling at 48 hours. Larvae entered the roots just behind the root tip, making their bodies parallel to root stele and later on making an angle to the roots.

4. Tolerance of *M. incognita* to drought- In air-dried soil, number of nematodes decreased to zero after 4 weeks while those under flooded condition were still alive after 7 weeks but the number gradually decreased.

Discussion

Inagaki: 1. What is the unit "rai"? 2. With what kind of chemical do you need $ 50.00/ rai?

Chantanao: 1. one acre is equivalent to 2.5 rais. 2. Methyl bromide.