

INVESTIGATION ON ROOT-KNOT NEMATODES IN SRILANKA UNDER INTERNATIONAL MELOIDOGYNE PROJECT

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There are two major growing seasons in Sri Lanka. The Yala season, which is from April to September; and the Maha season, which is from October to March. The latter is the wet season for most parts of the island receiving the north-east monsoonal rains. On the other hand, Yala is the dry season for most parts of the island, excepting the south-west quarter, which receives the south-west monsoonal rains as well. On the basis of rainfall distribution and the duration of periods of dry weather, the island is broadly classified into wet, intermediate and dry zones. These regions are in turn sub-divided in accordance with elevation, major soil groups and related climatic features, as shown in Figs. 1 and 2.

Wet zone : this zone is again sub-divided on the basis of elevation into up-country (c. 1,000 m. and above); mid-country (c. 300-900 m.) and low-country (below 300 m.). This zone receives a mean annual precipitation ranging from 130 to 320 cm. (Figs. 2 A₁, A₂ and A₃).

Intermediate zone: this zone is again sub-divided into up-country, mid-country and low-country as above. This zone receives a mean annual precipitation ranging from 90 to 215 cm. (Figs. 2 B₁, B₂ and B₃).

Dry Zone: this zone is mainly flat and gently undulating and is sub-divided into 3 main regions on the basis of rainfall pattern. This zone receives a mean annual precipitation ranging from 50 to 75 cm. (Fig. 2 C).

There are 3 main categories of agricultural land in Sri Lanka. These include the traditional rice lands, "highland" (lands not suited for rice cultivation) and chenas, which are jungle clearings, cleared by burning. The latter is a form of shifting peasant farming.

About 2/3 of the rice lands in Sri Lanka are irrigated, whilst about 1/3 is rainfed. All these rice lands are under rice cultivation during the wet Maha season, whilst during the Yala season, about half the irrigated rice

lands are once again under rice cultivation and the remaining is generally left fallow.

The bulk of the field and vegetable crop cultivation is concentrated in the dry zone and the lowlands of the intermediate zones. In the wet zone, on the other hand, rice is the dominant crop during both growing seasons along with some vegetable cultivation. Field crop cultivation in the wet zone is relatively low, whilst in the midlands of the intermediate zone limited amounts of field crop cultivation is carried out together with vegetables. In the highlands of the wet and intermediate zones, vegetable cultivation dominates.

The greatest diversity of cropping systems is encountered mainly in the dry zone and to a lesser extent in the low and midlands of the intermediate zone. Root-knot nematode surveys in these regions have revealed that both *Meloidogyne incognita* and *M. javanica* predominate. On the other hand, the cropping systems in the wet zone are markedly less diverse and less intense and the only dominant root-knot nematode species is *M. incognita*, with comparatively fewer recordings of other species (Fig. 3).

In the survey carried out in various crops, including field, vegetable, fruit and miscellaneous crops together with weeds, 49 hosts were recorded for *M. incognita*, and 26 for *M. javanica*. On the other hand, only 8 hosts were recorded for *M. arenaria* and 3 for *M. hapla* and these two latter species were encountered mainly in the highlands of the wet and intermediate zones (Fig. 3).

DISCUSSION

Sasser: Is it possible that as in the case of the coffee root-knot nematode, *Meloidogyne cofficola*, that only the very old trees are infested and in which case too no alternate hosts have yet been found?

Sivapalan: *Meloidogyne brevicauda* has been

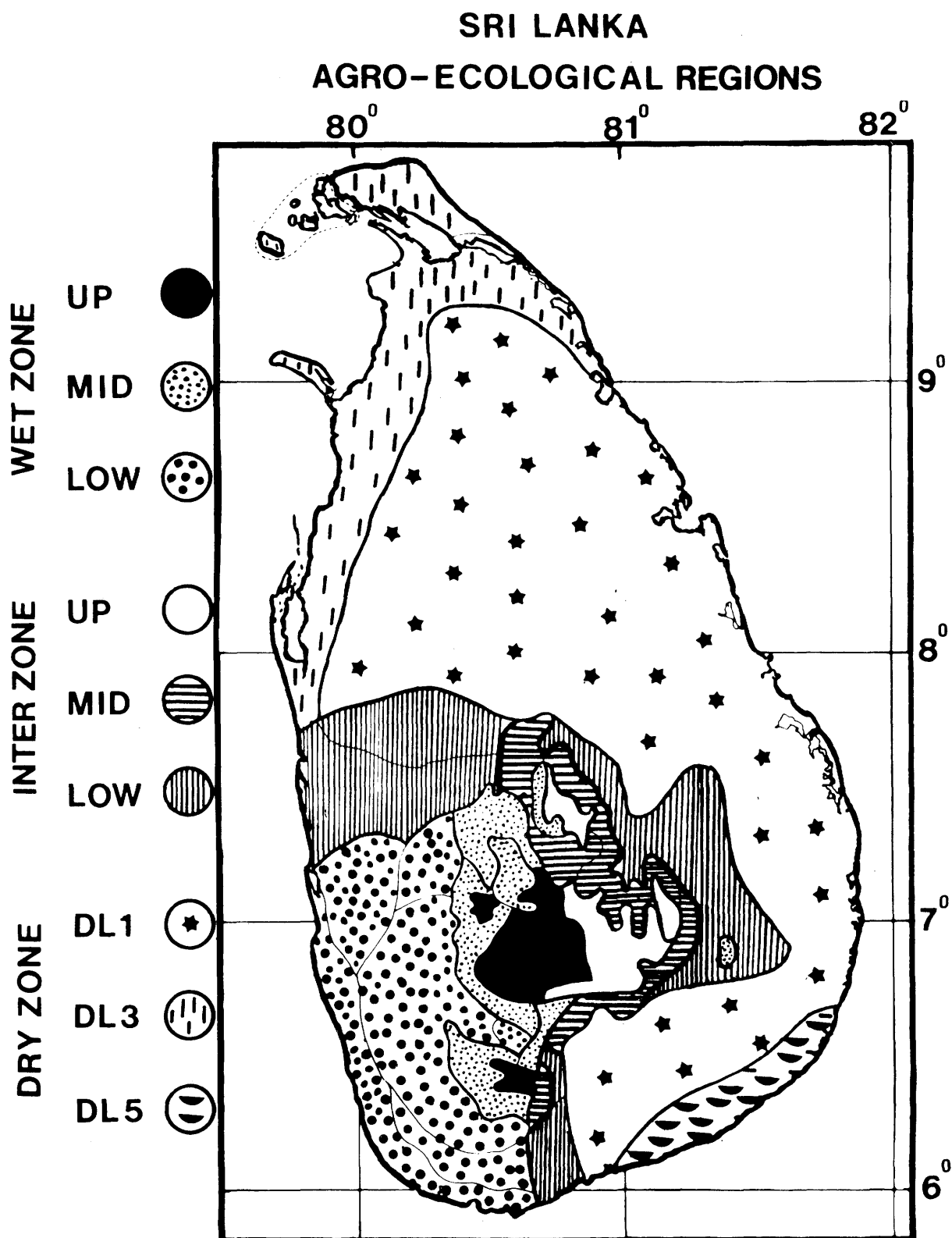


FIG. 1

WET ZONE - LOW

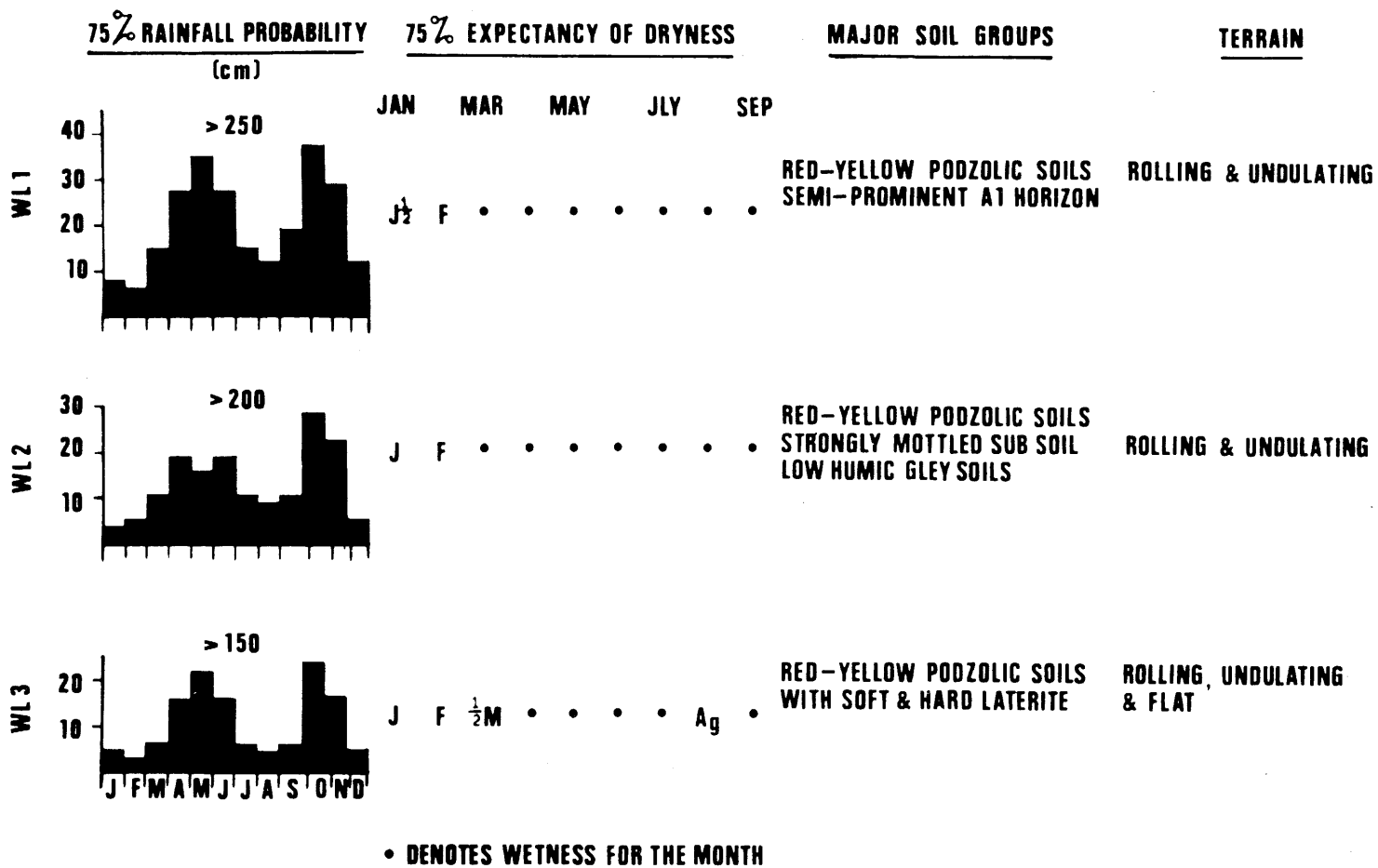
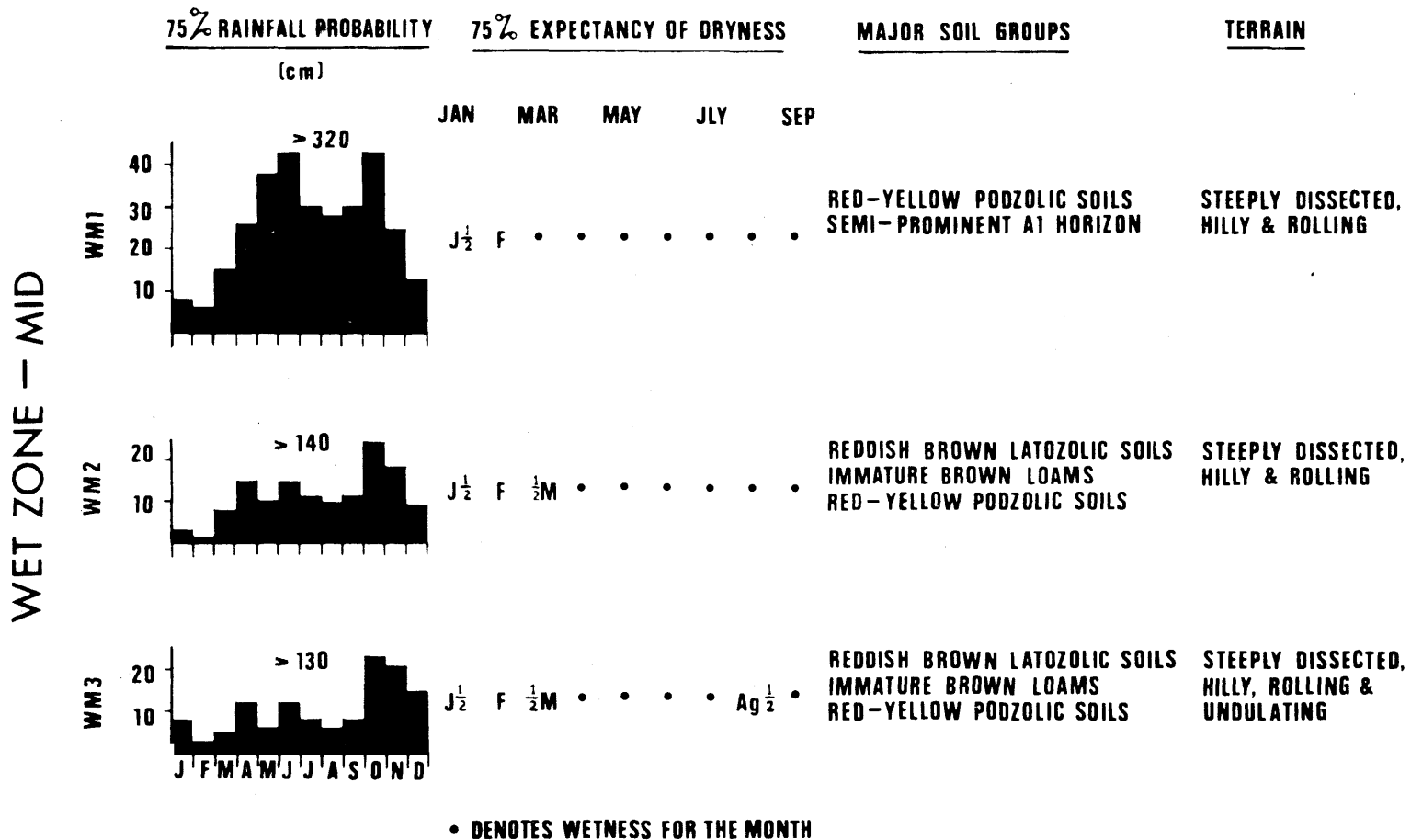
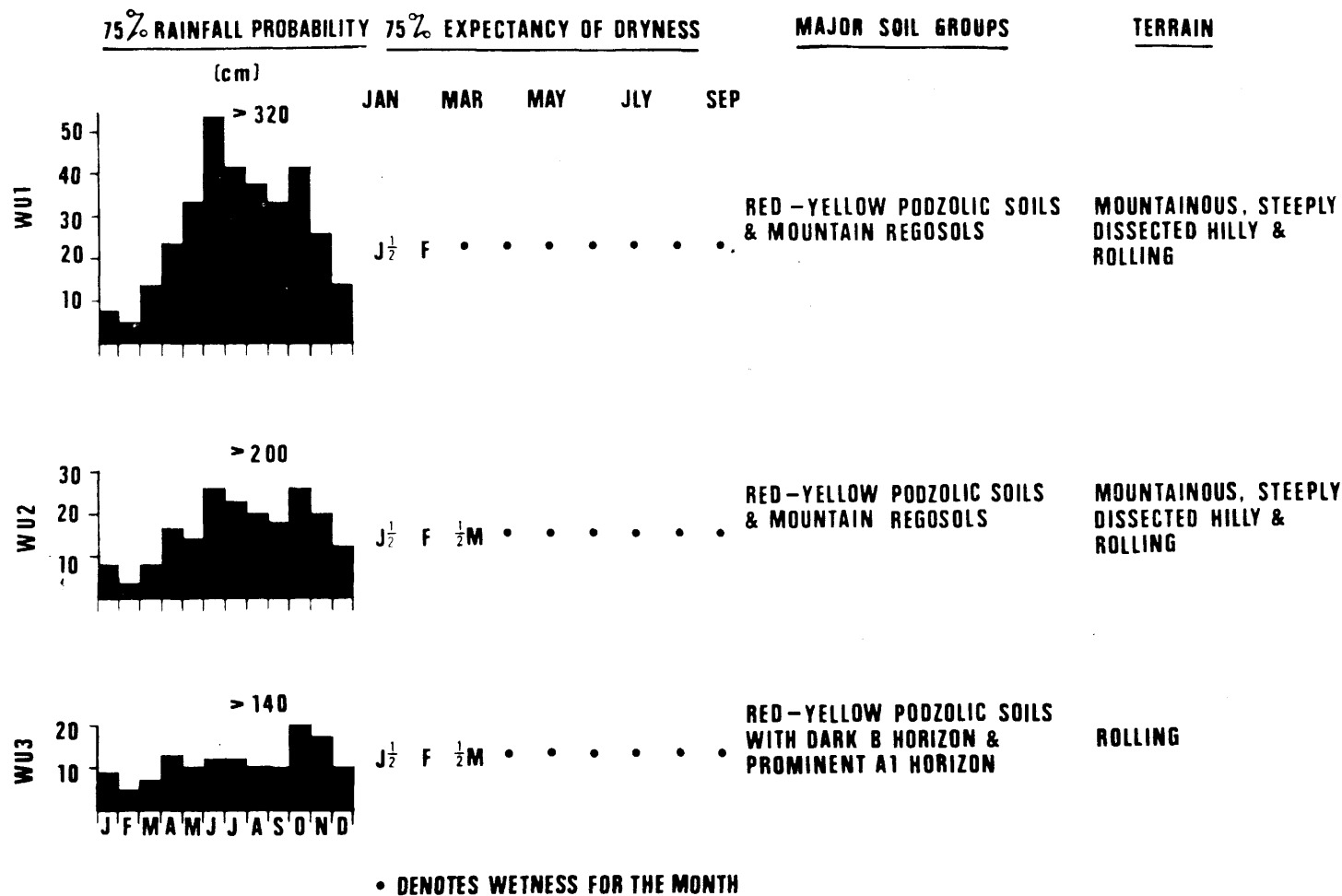


FIG. 2A,

FIG. 2A₂

WET ZONE — HIGH

FIG. 2 A₃

INTERMEDIATE — LOW

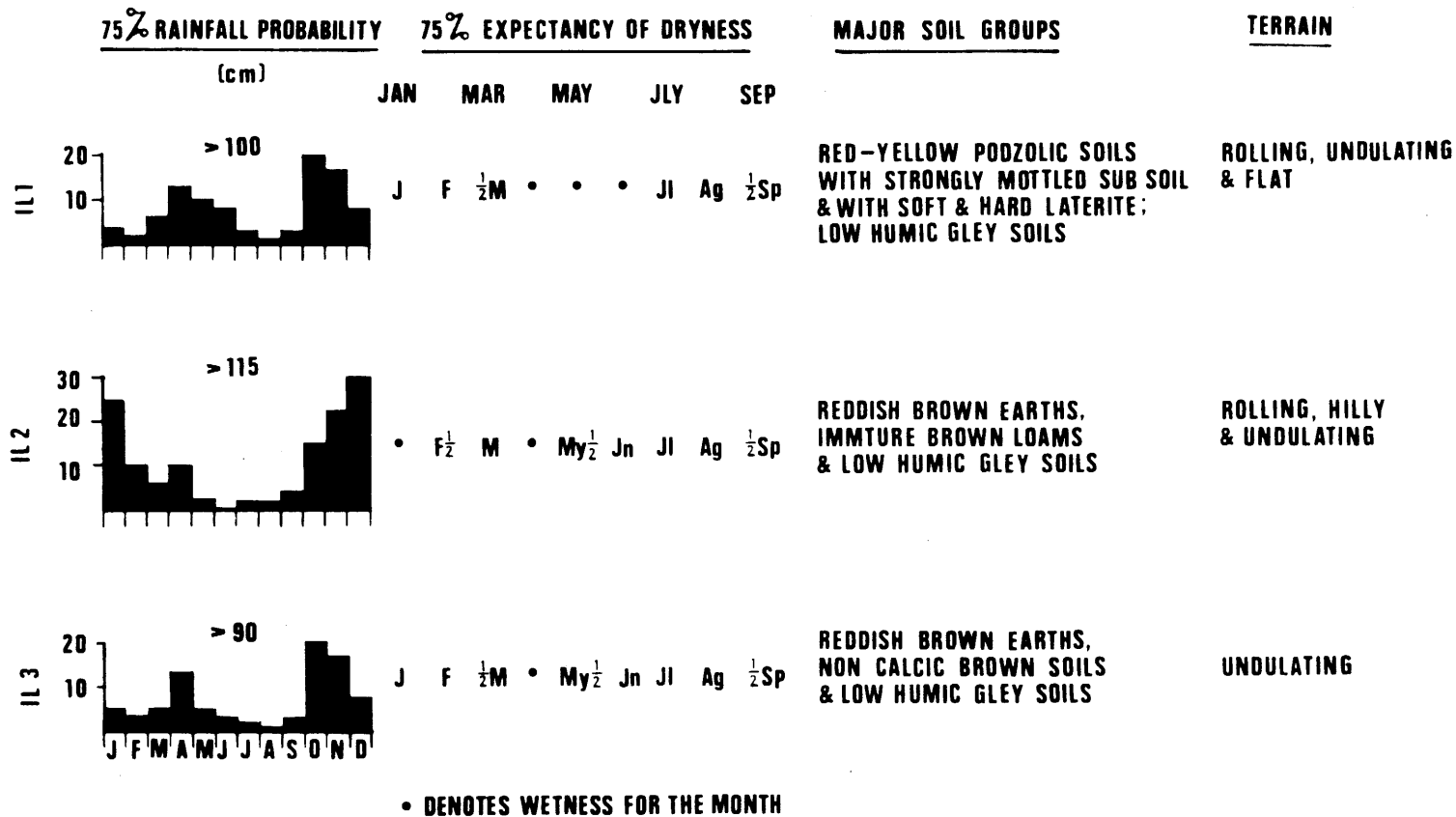


FIG. 2B,

INTERMEDIATE — MID

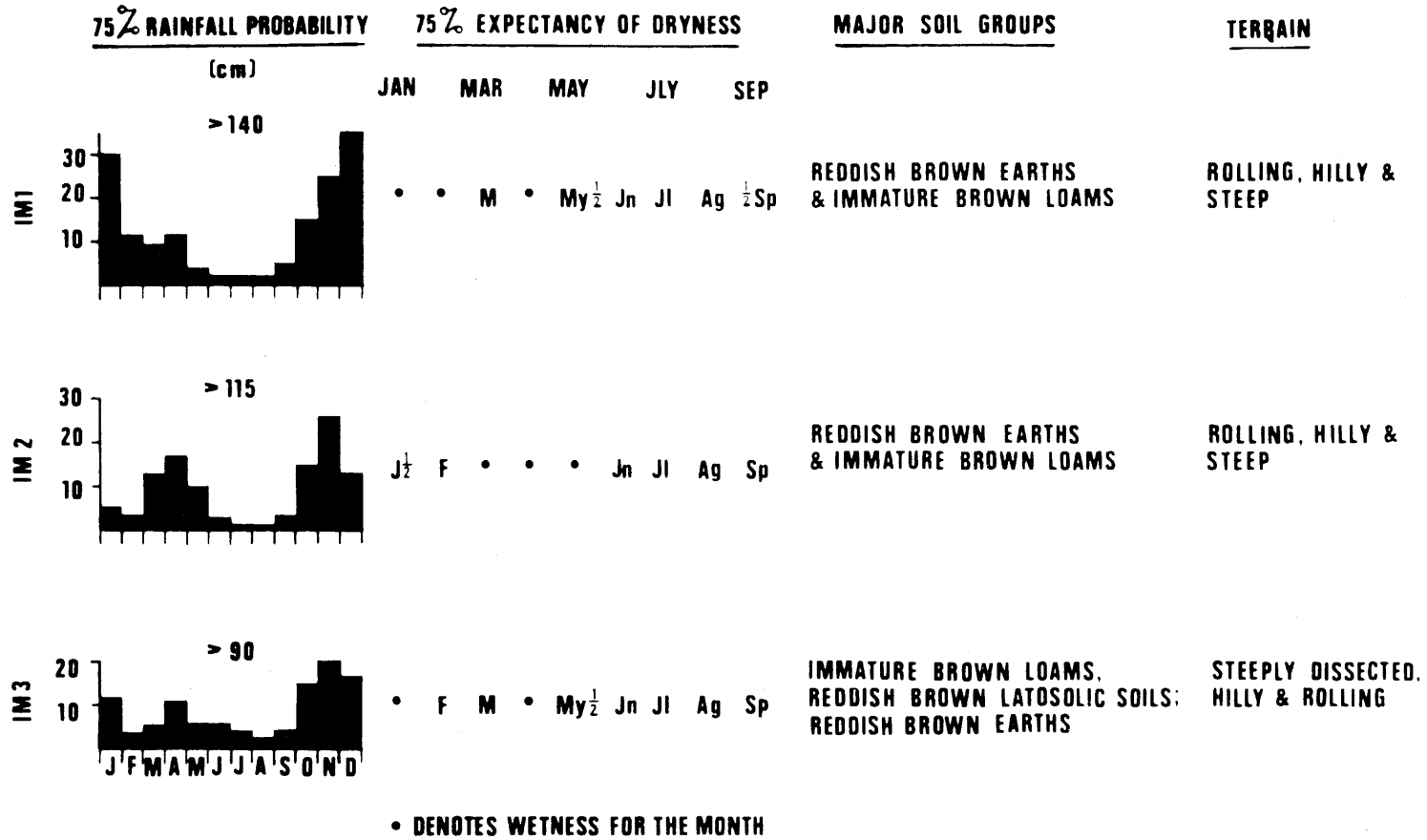


FIG. 2B₂

INTERMEDIATE - HIGH

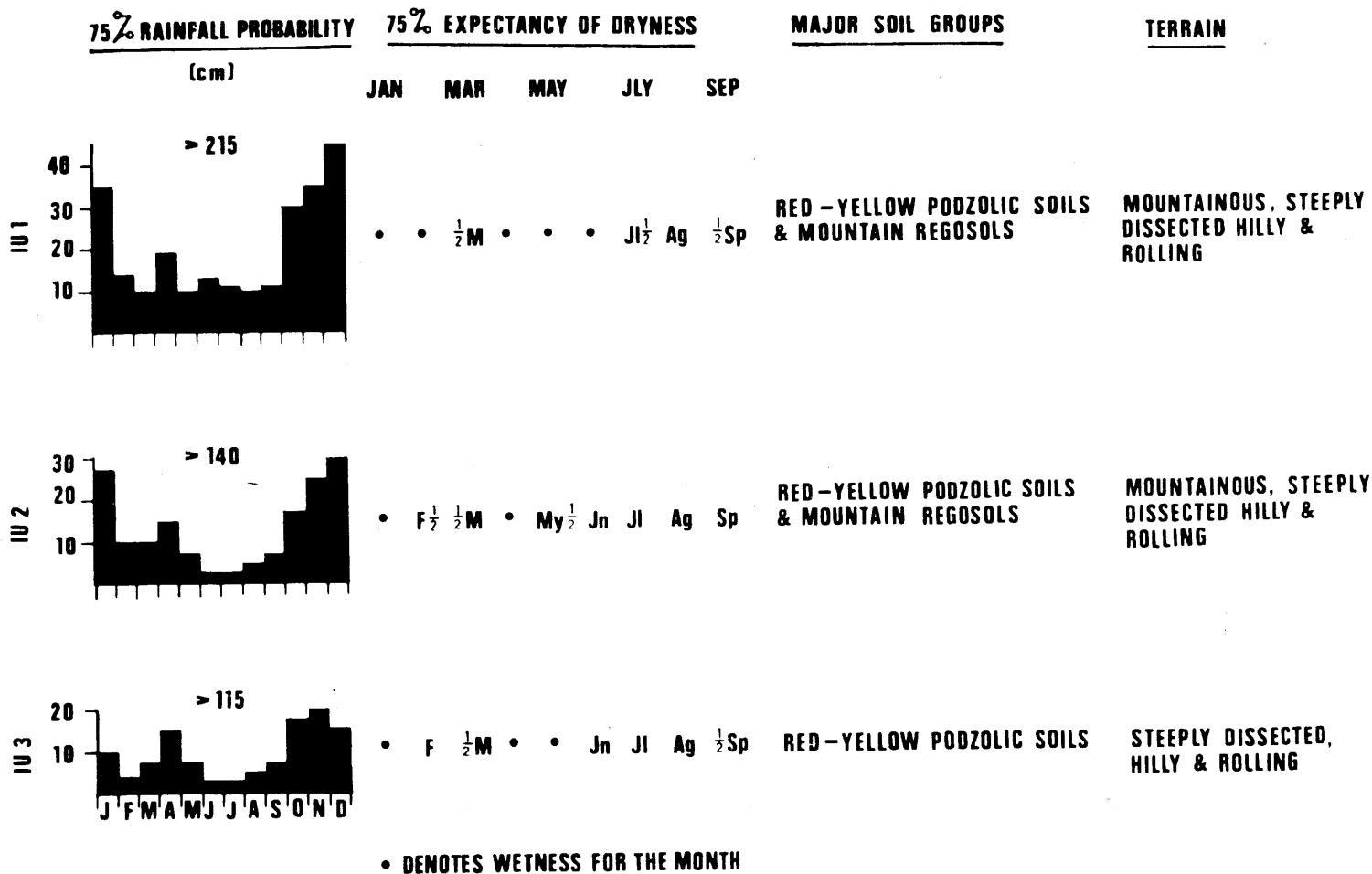


FIG. 2B₃

DRY-ZONE

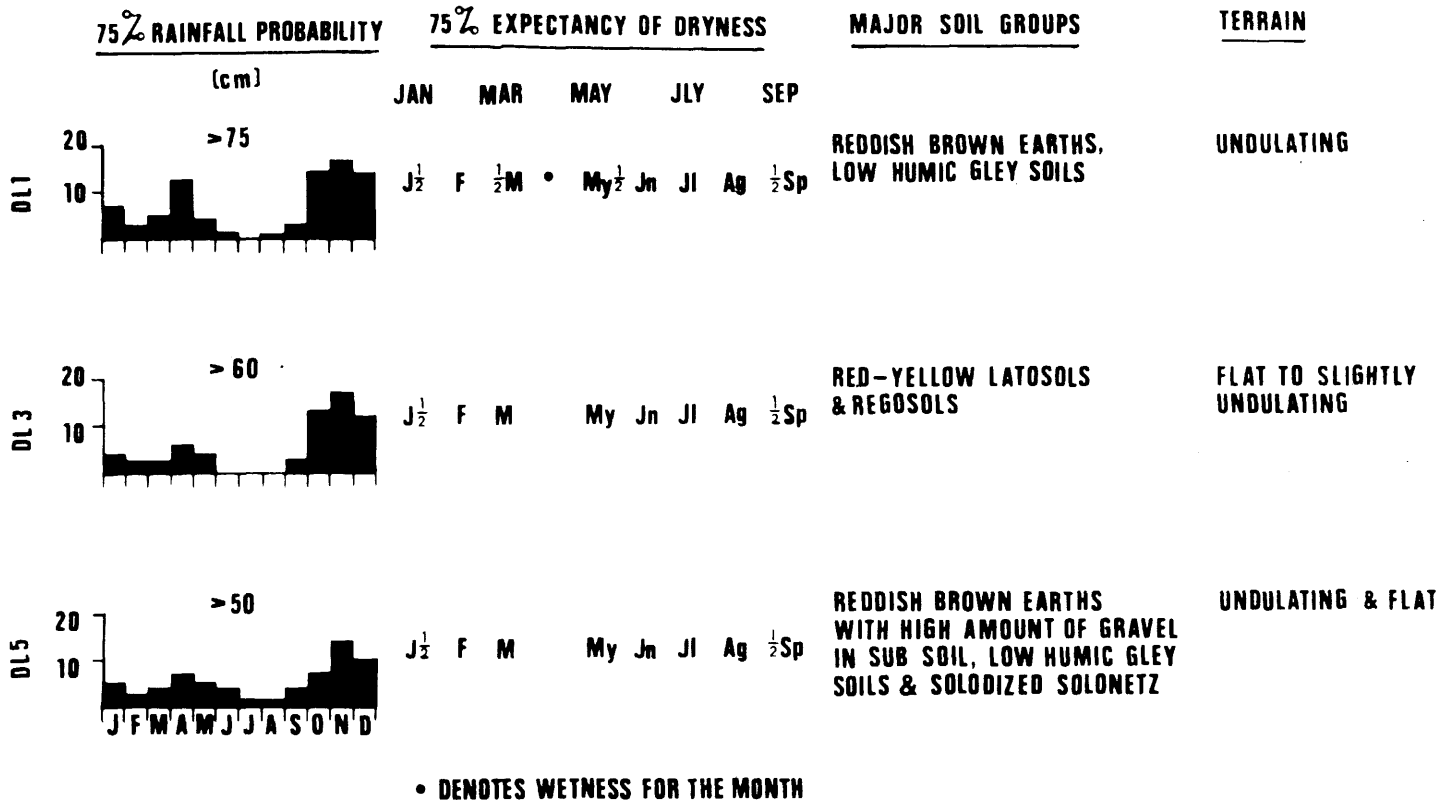


FIG. 2C

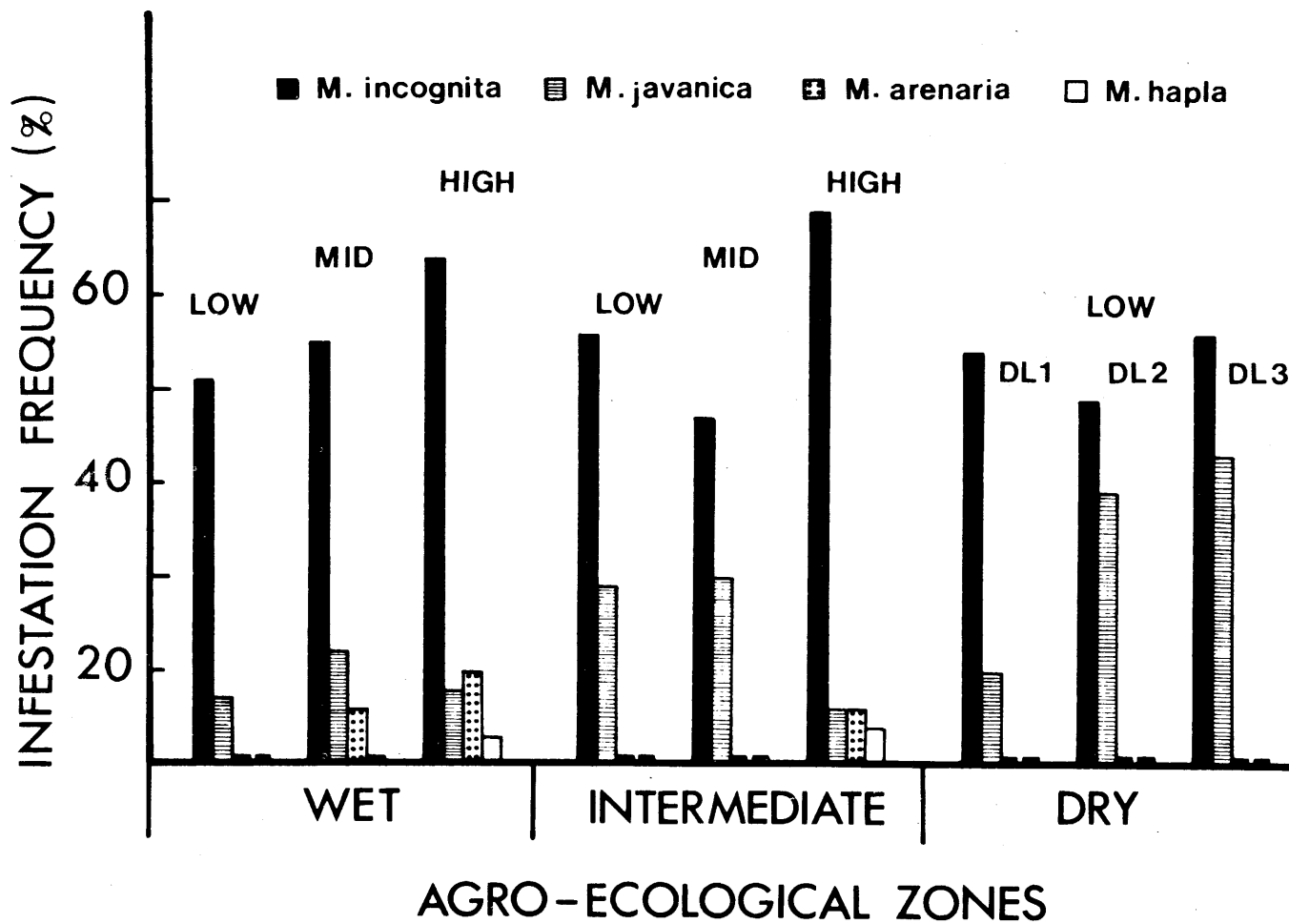


Fig. 3. Root-knot nematode species distribution in relation to agro-ecological regions and elevation.

recovered only from old tea fields, that are over 75 years old, and not from the younger fields of the same plantations. Heavily infested fields replanted with 20 different tea clones, adapted to high elevation, all failed to pick up any infestations with *M. brevicauda*. It is possible that either it is the old, weathen tea plants that are susceptible to attack, or that there is some unknown predisposing incitant that is associated with this pest, in the absence of which there is not possibility of a successful infestation. Further surveys

are being carried out in the forests surrounding these tea plantations for possible alternate tree hosts.

Wang: What are the three hosts you mentioned that are infested with *Meloidogyne hapla*?

Sivapalan: The three hosts are, (1) Pyrethrum, which is the cultivated variety, *Chrysanthemum cinaerarifolium*; (2) Red pepper, *Capsicum annuum*; and (3) a herb, *Centella asiatica*.