CARIBBEAN FOOD CROPS SOCIETY

22

Twenty Second Annual Meeting 1986

St. Lucia

Vol. XXII

PRESENCE OF THE YAM NEMATODE **Scutellonema bradys** IN GUADELOUPE AND MARTINIQUE

Alain Kermarreck, G. Anais and Lucien Degras

Institut National de la Recherche Agronomique
Centre des Antilles et de la Guyane
BP 1232 - F 97184, Pointe-A-Pitre, Guadeloupe FWI

ABSTRACT

The "root-lesion nematode" **(Pratylenchus coffeae)** has been, until 1985, the major soil-borne pest of yam crops in the French West Indies. Since early this year, the actual "yam-nematode" has been found regularly in tubers sampled in Guadeloupe and Martinique. Research strategies for an integrated control of nematode pests of yams are presented.

RESUME

Le nématode des lésions racinaires **(Pratylenchus coffeae)** était, jusqu'à cette année, le principal parasite racinaire des ignames aux Antilles Françaises. En 1986, **Scutellonema bradys**, grave parasite des Dioscorées dans l'ensemble des tropiques est retrouvé regulièrement dans les tubercules de Guadeloupe et de Martinique. Les principes d'une stratégie de recherche pour un controle intégré de ces helminthes sont présentés.

INTRODUCTION

The main purpose of this paper is to provide important information concerning the outbreak of a new nematological problem in the French West-Indies.

The presence of nematodes in yams often reduces yields and the quality parameters of tubers. In Guadeloupe and Martinique the phytophagous nematode popualtion living on **Dioscorea** spp. is commonly composed of one or two species, among which **Pratylenchus coffeae** generally remains highly dominant.

The so-called yam nematode **(Scutellonema bradys)** was not detected until 1984 in our surveys and appears now to be the most frequent in occurence. However, the fact that it was generally distributed throughout continental America and the whole of the Caribbean with the exception of certain islands of the Lesser Antilles (Kermarrec et al., 1981), posed a continuing threat towards those islands.

METHODS

More than 250 tubers were sampled in the main production areas of the Guadeloupe archipelago and in Martinique. The nematodes in the outer skin layers are extracted by the classical blender-centrifuge method. The specific determination was approached using biometrical methods and the **S. bradys** status was confirmed by specialists of this group in France.

RESULTS

The easily-recognized yam nematode appears to be already generally distributed on both islands.

a- Martinique: The central lowlands (Figure 1) support almost 75% of the tuber production of this island. The yam nematode has been found in the four districts of this area: St. Joseph, Trinité, Lamentin and St. Esprit. Some tubers sold in the central market in Fort-de-France have also been found carrying the nematode.

b- Guadeloupe: The northern islands of the archipelago (Fig. 2), St. Martin and St. Barthelemy, are situated close to the Virgin Islands. St. Barthelemy does not have any yam plantations but imported tubers bought on the local market were positively contaminated. Yams sampled in plantations at St. Martin also showed the presence of **S. bradys.**

Closer to Guadeloupe there are four islands, from east to south west: Désirade, Marie-Galante, les Saintes (Terre de haut, Terre de bas). Only the two islands of les Saintes appear to be free of the nematode and this, basically, is related to the lack of local yam plantations. On the other hand, Marie Galante, and to a lesser extent, Desirade, are severely contaminated by **S. bradys.**

As far as Guadeloupe itself is concerned, a survey of Grand Terre, east of the Salt River, shows a general distribution of the yam nematode in each district, with the exception of Gosier. The latter case is certainly due more to a low number of samples taken rather than to an actual absence of parasites in that particular area. Everywhere else in Grand Terre, as in the central market of Point-a-Pitre, **S. bradys** was easily detected.

The west part of Guadeloupe, called Basse Terre, consists of 16 districts surrounding a montane rain forest dominated by the Soufrière volcano. Only four of these districts have been sampled until now, and three of them already show the presence of **S. bradys** in yams: Lamentin, Petit-Bourg and Capesterre. The fourth, Goyave, is situated between Petit-Bourg to the north, and Capesterre to the south. It seems very unlikely that this district is actually uninfected. The twelve remaining districts will be sampled as soon as possible.

The complete range of cultivated **Dioscorea** species were parasitized, but, at least for the French islands, **D. alata** appeared obviously more frequently infested than **D. cayenensis, D. trifida, D. transversa, D. bulbifera** and **D. esculenta.**

Another important point to underline is related to its well-known very large host range: besides yams, we found **S. bradys** in sweet potatoes **(Ipomoea batatas),** dasheen **(Colocasia esculenta),** tannia **(Xanthosoma sagittifolium)** and wild ornamental **Xanthosoma.** It would certainly appear even more widley distributed after more extensive sampling on weeds and natural vegetation.

In Dominica, the so called "Ladies yam" **(D. cayenensis)** seemed the most frequent host from our two first surveys organized with the aid of

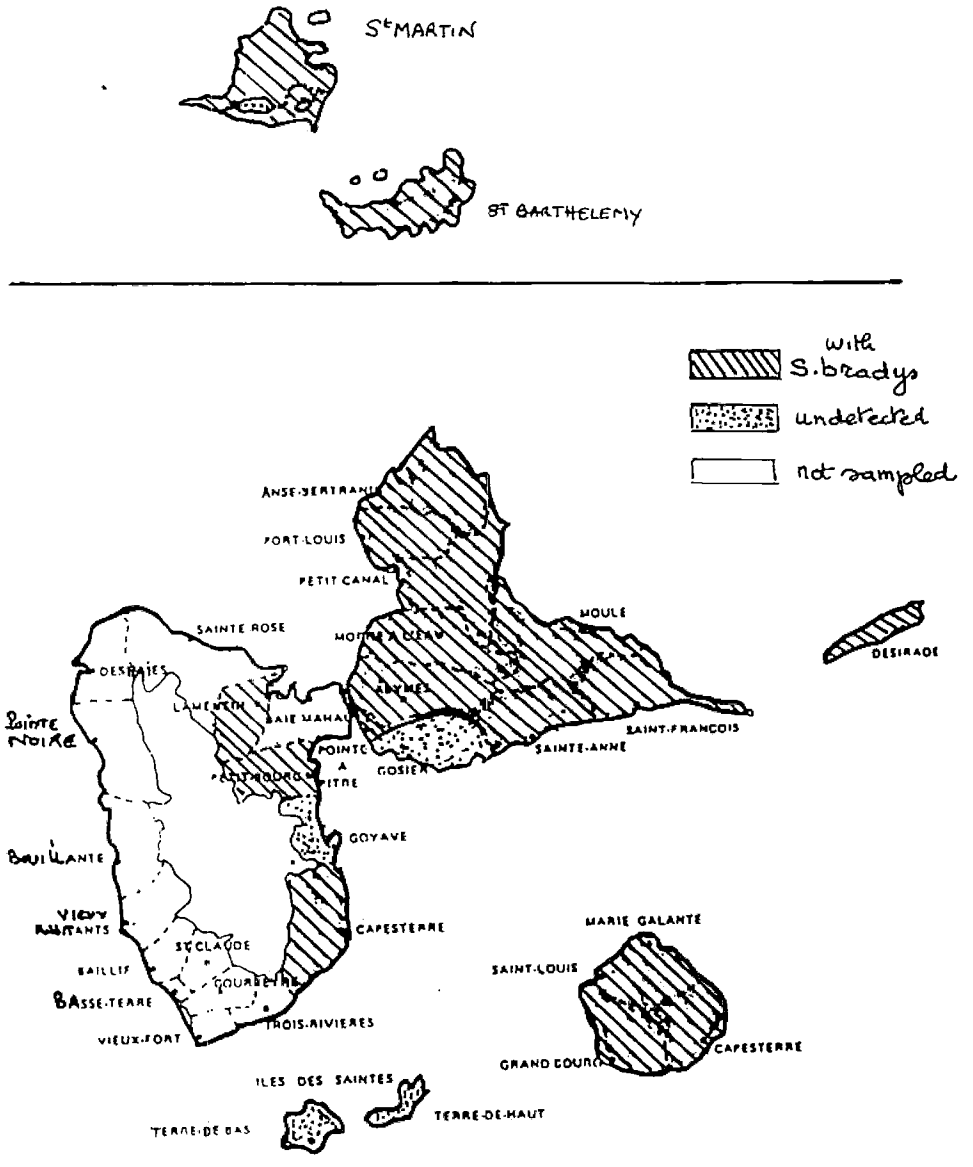

Fig. 1. Guadaloupean archipelago: the presence of **S. bradys** was verified for the hachurated areas.

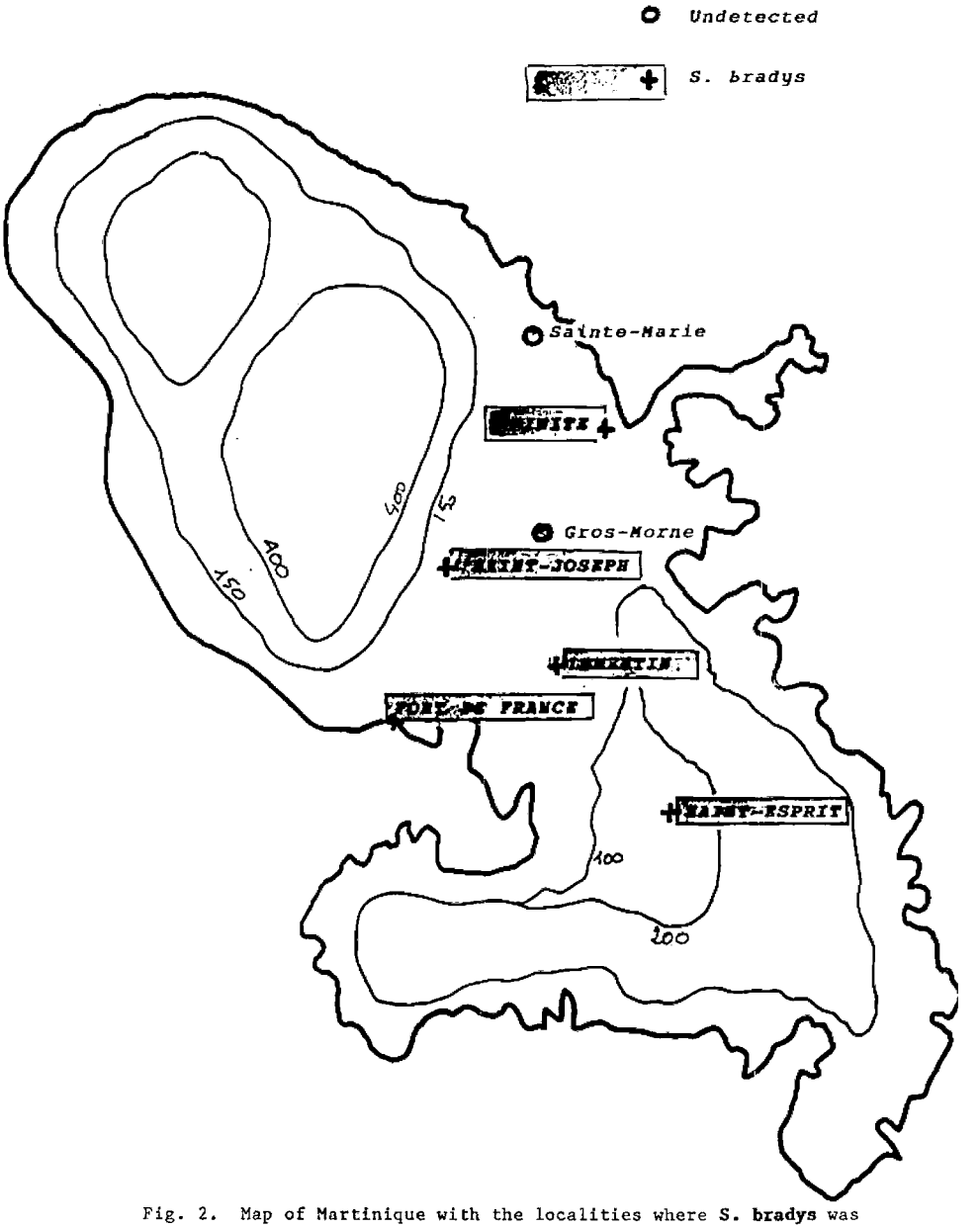

Fig. 2. Map of Martinique with the localities where **S. bradys** was detected.

the French Technical Cooperation (FTC) and Dominican agriculture officers.

PROSPECTS

Although certain published data (Adesiyian, 1976; Bridge, 1978) indicate the occurrence of levels of varietal susceptibility towards **S. bradys**, these same authors differ on the ranking of the varieties. Currently, with the possible exception of **D. dumetorum**, which apepars to be attacked by few nematodes in West Africa, all species can be ranked as susceptible. This is one aspect of the work undertaken by INRA in Guadeloupe. More generally, the researches are focussed upon an integrated control strategy for these two **Hoplolaimidae (Pratylenchus coffeae** and **Scutellonema bradys)**. The experimental approaches, conducted in close collaboration with plant geneticists, involve, on the one hand, essentially classical control by heat treatment of seed tubers (hot water dippings) and chemical treatment of soils before planting or even later with non-phytotoxic nematicides (ethoprofos...). On the other hand, genetical studies are being undertaken to define a simple practical method for detecting, as soon as possible, any kind of resistance or tolerance towards **Pratylenchus coffeae** and **Scutellonema bradys** in cultivated species of Dioscorea.

It is noticeable that, in recent decades, there has been a real hindrance to yam production in some areas due to the population explosion of **Pratylenchus coffeea** (Kermarrec et al., 1986). Both the nematodes thus appear capable of considerable damage in Guadeloupe and Martinique. How will the synergistic population dynamics develop in the field in the future? Will we eventually see, as has already been reported form Puerto-Rico (Acosta and Ayala, 1975) the ultimate dominance of **P. coffeae** or the converse?

CONCLUSIONS

The yam nematode is certainly the major pest of tropical tubers. Its recent detection is Guadeloupe, Martinique, and Dominica (Singh, Cardi, pers. comm. 1981, and INRA-FTC 1985-86 surveys) shows that it can no longer be regarded as restricted in distribution to the Greater Antilles (Kermarrec et al., 1981).

There is, as yet, no rational explanation for the origin of this recent introduction, in spite of the existence of a long-standing inter-caribbean circulation network of people and living plants. It seems likely that the large increase in numbers of immigrants from the Caribbean into the French West Indies, and the related increase in transport of people and materials in the Caribbean Region during the past 10 years have resulted in a distribution pattern which could have been foreseen long ago. It may be also that the reduction of yam production in the F.W.I. in relation to anthracnose disease of **D. alata** and virus diseases of **D. trifida** has led ot more yams being imported from other Caribbean countries and even from South American countries.

REFERENCES

Acosta, N. and Ayala, A. 1975. Pathogenicity of **Pratylenchus coffeae, Scutellonema bradys, Meloidogyne incognita** and **Rotylenchulus reniformis** on **Dioscorea rotundata**. J. Nematol. 7: 1-6.

Adesiyian, S.O. 1976. Host range studies of the yam nematode **Scutellonema bradys**. Nematropica 6(2): 60-63.

Bridge, J. 1978. Yams nematodes. Seminaire International sur l'igname. Buce, FIS, pp. 305-324 and Yams (Miege, Lyonga, Ed.), 1982, Clarendon Press, London, pp. 253-264.

Kermarrec, A., Degras, L. et Anais, A. 1981. Le nenamtode de l'igname **Scutellonema bradys** dans la Caraibe: distribution et quarantine internationale. Agronomie Tropicale 3(5): 364-369.

Kermarrec, A., Anais, A., et Degras, L. 1986. Une grave maladie parasitaire de l'igname grosse-caille **(Dioscorea cayenensis rotundata)** due au Nématode des lésions racinaires **(Pratylenchus coffeae)**. Bull. Agron. INRAAG, 7 (en preparation).

ACKNOWLEDGEMENTS

Dr. Scotto La Massese (INRA-Antibes, France) confirmed the specific determination of the nematode. The Regional Plant Protection Service helped, in Martinique, with sampling. Technical aid: Gouffran, Harry, Nolar, Guy-Emile and Beramis, Evy. Helpful cooperation in the field Ibalot, Robert of Marie-Galante. Dr. Howse reviewed the English and the manuscript.