Results and Discussion

The results of the baiting treatments are given in Table 1. In all cases, after 4 weeks post-treatment, control was achieved. It is very probable that the bait was attractive due to the use of soy oil as the toxicant carrier.

The utilization of the sediments of locally produced toxic baits for controlling these and other noxious ants enhances the economic considerations of toxic baits for small growers. These small growers can thus cheaply control colonies of leaf-cutting ants, and at the same time either use bait sediments to control other noxious ants, or to collect these sediments and sell these to other growers with noxious ant problems.

Abstract

Sediments of toxic baits developed for leaf-cutting ant control proved effective in controlling *Crematogaster quadriformis, Solenopsis invicta* and *Solenopsis wasmanni* colonies in Paraguay. These baits are effective controls for some species of noxious ants and increases the economic feasibility of their utilization by small growers.

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MERISTEM CULTURE OF BANANAS

Sumario. Se desarrolló un método rápido de propagación de plantas de banano por medio del cultivo del tejido meristemático. Los meristemas apicales, asépticamente removidos del rizoma, fueron cortados con 7 a 12 incisiones verticales y colocados en un medio de Murashige y Skoog modificado. Al mes, el grupo de vástagos formados fue separado y los vástagos individuales fueron transferidos a un medio de crecimiento fresco. Después de dos meses adicionales, las plántulas tenían sistemas foliares y radicales bien desarrollados y se transplantaron en el suelo

Banana ('Musa AAA') plants are normally propagated by detaching suckers from the parent rhizome. When large numbers of plants are available, sucker propagation can provide sufficient material for new plantings. However, when there is a limited number of plants available or when small plants are needed for experimental purposes, meristem propagation can provide the quantity and type of plants required.

Propagation of axillary buds from banana rhizomes, produced by injuring the central and lateral growing points, produced up to 150 plantlets in five to seven months (2). Berg and Bustamante (1) utilized heat-treated rhizomes to produce virus-free meristems from lateral buds (1). These meristems produced normal banana plants when grown on modified Knudson's medium. This communication reports a method of meristem propagation suitable for the rapid multiplication of disease-free banana plants.

Materials and methods

Rhizomes were dug up in the field, washed and the roots and outer layer of tissue removed. The central growing point and the lateral shoots were excised with their surrounding tissue. In the laboratory, tissue was cut away with a sterile knife until only the apical meristem and closely adjacent tissue were left. The pieces of tissue (ca. 2 mm^2) were surface sterilized in a 0.25% solution of NaOCl and cut vertically seven to twelve times with a sterile scalpel. Incised meristems were placed on a growth medium containing the major and minor salts of Murashige and Skoog's revised medium (3); glycine, 2 mg/l; thiamine hydrochloride, 0.5 mg/l; nicotinic acid, 0.5 mg/l; piridoxine hydrocloride, 0.5 mg/l; indole-3 acetic acid, 1.0 mg/l; 6-benzyladenine, 0.5 g/l; sucrose, 30 g/l; agar, 6 g/l. The medium was adjusted to pH 5.6 prior to dispensing 20 ml into 200 x 25 mm test tubes. Tubes were capped with aluminium foil and autoclaved at 1.05 kg/cm^2 for fifteen minutes.

Meristem cultures were incubated at ca. 29°C with a daily twelve-hour period of light provided by 40 W incandescent lights (150 lux). Shoots developing from the incised meristems were separated and transferred

to fresh tubes of medium. When root development was sufficient, plantlets were planted in soil and grown under shade in a high humidity atmosphere until established.

Results and Discussion

Single banana rhizomes grown in the field yielded 10 to 25 meristems which, after incision and incubation on culture medium for about 30 days, produced 15 to 20 shoots each. A further 50 days were required for the separated shoots to develop roots and grow sufficiently to be transferred to soil. Further increases in the number of plantlets produced from each rhizome were possible using the shoots produced from the incised meristems as sources of additional meristems. Meristem culture methods were used successfully on bananas in the Cavendish and Gros Michel groups, plantains ('Musa AAB'), as well as diploid and tetraploid hybrids from a breeding program. Plants produced appeared to be morphologically identical to the parent.

Meristem-cultured plants have been utilized in small scale laboratory and greenhouse trials for nematode and insect feeding studies where small plant size and freedom from bacteria, fungi and nematodes are an advantage. Multiplication of clones from a banana breeding program can be accelerated using meristem culture rather than the standard procedure of sucker propagation. Developing plantlets are readily transported in sterilized, closed tubes containing medium and allow the establishment of desirable banana and plantain varieties in new areas without the risk of introducing pathogens. In addition, detectable viruses can be eliminated from rhizomes by heat treatment before meristems are excised (1). Seed beds in new production areas could advantageously be planted with meristem-cultured plants to produce planting material free of parasitic nematodes.

Summary

A rapid method of propagating banana plants by meristem culture was developed. Apical meristems, aseptically removed from rhizomes, were cut with 7 to 12 vertical incisions and placed on a modifed Murashige and Skoog medium. Within one month, the cluster of shoots formed was separated and individual shoots transferred to fresh medium. After an additional two months, plantlets had weel-developed shoot and root systems and were transplanted into soil.

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