

Photo: Neuza Campelo



## Deposition Fungicides in Axil of the Second Leaf of Banana: New Technology for Control of Black Sigatoka

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The black sigatoka, caused by the fungus *Mycosphaerella fijiensis*, is the most important disease of banana and plantains (the name given to the bananas eaten fried, boiled or in the form of pap) in most of banana's producing regions in the world. In all world regions where occur, is the main factor of productivity drop of bananas and plantains, with reduction of until 100% of production since de first cycle of cultivation.

The black sigatoka, detected in Brazil in 1998, has expanded quickly across the country and due to its high capacity for destruction is become a importance social and economic problem.

In Amazonas State, approximately one year after discovery of the disease in plantations established with susceptible cultivars as Prata Comum, Maçã and Pacovan (in Amazonas is the name given to plantain D'Angola), losses in production reached 100%, and short time the plantations were abandoned.

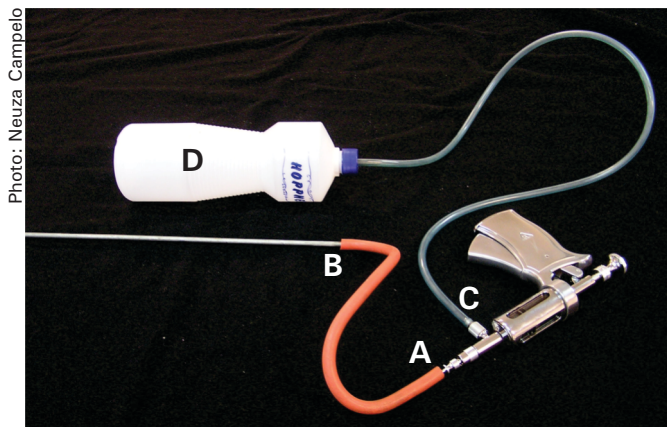
Farmers are planting resistant cultivars, such as FHIA 18, Thap Maeo and BRS Conquista, to

replace susceptible cultivars. However, some farmers continue planting susceptible cultivars with great losses.

In work carried out at Western Embrapa, it was found that for disease control with fungicides in the conditions of the State of Amazonas, there is need of 52 sprays per year with protectant fungicides or 26 with systemic. Assessing new methods of application of fungicides for the control of black sigatoka, it was found that it is possible to reduce for three the number of sprays per production cycle by means of fungicide deposition, in the commercial formulation, in the axil of the second leaf with the support of a veterinary syringe mark Höppner adapted (Figures 1 and 2). At the end of the syringe in place of the needle (Figure 1A) it's attached a transparent latex or silicon hose with about 25 cm length and 3 mm to 4 mm in diameter. At the other end of the hose it's attached a metallic tube (Figure1B), may be one conduit from a brake systems of heavy vehicles, with about 2 m in length and diameter similar to the hose, with the other end curved, similar to an umbrella cable (Figure 3). This syringe is not commonly

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found on the market, because in the location where it attaches the needle there is an entry (Figure 1C) to be coupled to a deposit (Figure 1D) where the fungicide is placed in the commercial formulation. So far, only the fungicides Flutriafol and Azoxystrobin, (Impact and Piori – commercial names, respectively) are recommended for this application form. The Impact at a dosage of 2 mL plant<sup>-1</sup> and Piori at 1 mL plant<sup>-1</sup>, should be applied by observing intervals of 60 days. The applications in plants should start from 4 months of age when the pseudostem has at least 40 cm in circumference, measured at a distance of 1.5 meters above ground. Must stopped the fungicide applications when plants flower. In tussocks clump, applications must be made in the mother plant, whose product is translocated to the first and second suckers, protecting them. When the mother plant flowers, fungicides have been applied on the first suckers, and so on.



**Figure 1.** Syringe with adaptations for the deposition of fungicide in the axil of second leaf of banana.

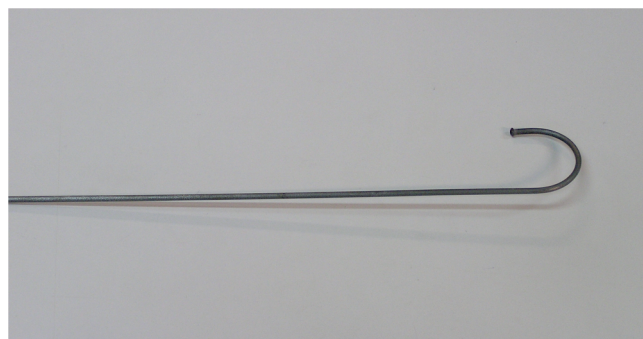
The advantages of this technique in relation to aerial application and / or terrestrial sprayers are: greater efficiency in the control of black sigatoka, a significant reduction in the number of applications; easy access to small producers; lower environmental contamination, because the fungicide is placed directly in the axil of the leaf

and there is no drift problems; no need of vehicle (oil, water); increased security of workers, since this is not exposed to the product, which dramatically reduces the problems with poisoning.

The deposition of the fungicide in the leaf axil is possible to reduce operational costs, and short-term decrease the release of agrochemicals in the environment, since the interval between applications is at least 60 days against 7-15 days in conventional spraying.



**Figure 2.** Syringe with adaptations for the deposition of fungicide in the axil of second leaf of the banana.



**Figure 3.** Conduit tube with the end curved, like an umbrella cable.

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