Identification and characterization guide for FHIA banana and plantain hybrids

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Contents

Presentation

The present guide is the outcome of several years of work, presented for the first time at the ACORBAT 2004 meeting in México. It is mainly directed to personnel in charge of introducing, evaluating and disseminating banana and plantain hybrids from the Fundación Hondureña de Investigación Agrícola (FHIA), in their respective countries. The objective of this document is to provide a tool that will allow the field identification of all hybrids released by FHIA in a simple and precise manner. It is written in a concise and easy-to-use way, illustrated with photographs of the most distinctive characteristics, or descriptors, of these otherwise very similar hybrids.

The work of selecting the descriptors used here was mainly carried out by Ing. Jose Manuel Alvarez, Leader of Cuba's Plantain Programme, who since the introduction of the hybrids to the island (in 1992), has untiringly studied and promoted their utilization in Cuba. Currently, this country has one of the most complete collections of FHIA hybrids.

We want to acknowledge the valuable support of the Red de Investigación y Desarrollo de Plátano y Banano para América Latina y el Caribe (MUSALAC) in providing the necessary funds to develop, design, publish and distribute this document and also in promoting and introducing these hybrids through its partners in Latin America and the Caribbean.

A special and well deserved recognition is also due to Bioversity International (formerly the International Network for the Improvement of Banana and Plantain – INIBAP) for its unconditional support to FHIA's genetic improvement programme as well as for promoting and disseminating these hybrids worldwide, coordinating systematic evaluations of these materials and for its contribution to the present document through its Regional Office for Latin America and the Caribbean.

We trust that this guide will serve the purpose for which it was produced: a correct identification of FHIA banana and plantain hybrids at field level.

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Introduction

Use of resistant or tolerant cultivars has always been considered the optimum solution or part of the technological or strategic alternatives to manage pests and diseases of banana and plantain production. Its use has depended traditionally on the collection and introduction of genetic material from their centre of origin or dispersal; in this case the Southeast Asia and Pacific region. Most collected materials are kept in special sites for their use in genetic improvement programmes and a very small portion can be used directly in production systems in different areas around the world.

Banana and plantain hybrids produced by the Fundación Hondureña de Investigación Agrícola (FHIA), key topic of the present publication, are the outcome of a worldwide genetic improvement effort initiated during the first quarter of the 20th Century jointly in Trinidad (1922) and in Jamaica (1924) at the Imperial College of Tropical Agriculture (ICTA). In 1960, this programme was transferred to Jamaica. By that time, the United Fruit Company – UFCo, which had access to material collected in the early 1920s, had also launched, in 1959, a banana improvement initiative in Honduras following the apparition of Fusarium wilt (Panama disease) in Latin American and Caribbean plantations. As a result, "Gros Michel" is no longer grown commercially and has been replaced by various types of "Cavendish" clones.

The programme initiated by UFCo was donated to FHIA in 1984 and initially supported with international funds from the United Nations Food and Agriculture Organization (FAO), thus extending the scope of its objectives to make them more global and diversified. Although improvement initially targeted resistance to "Panama disease", other objectives such as resistance to Sigatoka diseases and plant nematodes were included. By the mid 80s, the International Development Research Centre (IDRC) from Canada started to support FHIA's programme and continued doing so for almost 10 years during which cooking bananas and plantains were also improved. Recognizing the value of testing and distributing to farmers worldwide the most promising banana and plantain hybrids, the International Network for the Improvement of Banana and Plantain (now part of Bioversity International) was instrumental in securing this support. Currently the hybrids described in this document are disseminated in more than 50 countries around the world. This would have not been possible without the patient, meticulous and persistent work of Dr. Phil R. Rowe, who dedicated more than 30 years of his life to this cause. Our everlasting gratitude goes to Dr. Phil Rowe.

Main differences between bananas and plantains

A. BANANAS

- Plants with vigorous pseudostem.
- Low to medium height in the first crop cycle.
- Long, wide leaves.
- Short internodes.
- Leaf arrangement from normal to pendular.

B. PLANTAINS

- Plants with thin and not very robust pseudostem.
- Tall stature in the first crop cycle.
- Short, narrow leaves.
- Long internodes.
- Leaf arrangement from normal to erect.

Main differences among bananas (FHIA-01, FHIA-02, FHIA-03, FHIA-17, FHIA-18, FHIA-23, FHIA-25, SH-3436 and SH-3640)

BEFORE FLOWERING

Only hybrids from Groups **A.1.1** and **A.1.2** can be distinguished before flowering. All characteristics mentioned in the "After flowering" section will help to identify hybrids within Group **A.1.3**.

A.1 - By pseudostem colour

A.1.1 - Reddish, no blotches or very few blotches (**FHIA-02** and **FHIA-18**).

A.1.2 - Bright light green, no blotches or very few (**FHIA-03**). It is the only one with these characteristics.

A.1.3 - Green to light green with more or less abundant dark brown blotches (**FHIA- 01**, **FHIA-17**, **FHIA-23**, **FHIA-25**, **SH-3436** and **SH-3640**).

A.1.1.1 - By petiole channel of third leaf: FHIA-18

The wings of the **FHIA-18** petiole have a fine purple line absent in **FHIA-02**, and if present, will neither be continuous nor defined.

The petiole channel is semi-closed. In **FHIA-02** it is fully-open.

AFTER FLOWERING

Group A.1.3 - Green to light green pseudostem with more or less abundant dark blotches (**FHIA- 01**, **FHIA-17**, **FHIA-23**, **FHIA-25**, **SH-3436** and **SH-3640**)

A.1.3.1 - By bunch position in relation to pseudostem

A.1.3.1.1 - Hanging bunches
FHIA-01 and **SH-3640**

A.1.3.1.2 - Perpendicular bunches
FHIA-17, **FHIA-23**, **FHIA-25** and **SH-3436**

A.1.3.1.1.a - By male bud shape

FHIA-01
Short heart-shaped.
male bud with wide shoulders

SH-3640
Ovoid male bud with intermediate-sized shoulders.

Note: *Both hybrids show revolute bracts, but in* **FHIA-01** *they lift one at a time, while in* **SH-3640** *they lift in pairs.*

A.1.3.1.2.a - By male bud shape

FHIA-25

Male bud bracts show an intense purple-blue colour on their external faces (**no other FHIA hybrid presents this colour**). On the interior face, bracts are bright red. The bracts lift and generally do not roll (not revolute) before falling; this is another unique characteristic of this clone within the FHIA hybrid group.

A.1.3.1.2.b - By fruit colour

SH-3436

The distinctive characteristic of this clone is the light green colour of its fruits, which differentiates it from the other FHIA bananas.

A.1.3.1.2.c - By rachis characteristics

FHIA-17

- Male flowers remain adhered to bunch rachis.
- Rachis is thick with deep internodes.
- Rachis shows a slightly pronounced curvature.

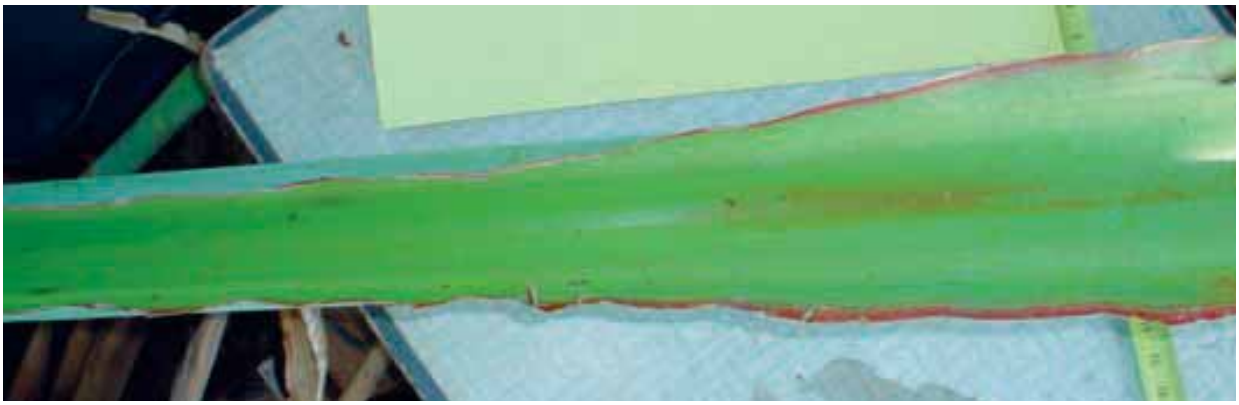
FHIA-23

- Rachis is bare (no flowers).
- Rachis internodes are fine and shallow.
- It shows an arched curvature.

A.1.3.1.2.d - By petiole channel

FHIA-17

The petiole channel is open, with erect margins and a purple line on the borders. Its internal and external sides are **reddish**.



FHIA-23

The petiole channel is open with winged margins, thick and **light green** colour on both sides.

Main differences among plantains (FHIA-04, FHIA-05, FHIA-19, FHIA-20 and FHIA-22)

BEFORE FLOWERING

B.1 - By pseudostem colour

B.1.1 - Pale green with or without reddish tones and brown blotches (**FHIA-21**). **This is considered to be the only blotched FHIA plantain**.

B.1.2 - Light green with pale yellowish tones, with no or few blotches (**FHIA-22**).

B.1.3 - Green-reddish without blotches or slightly blotched (**FHIA-04**, **FHIA-05**, **FHIA-19** and **FHIA-20**).

Note: **FHIA-21** *and* **FHIA-22** *are easily identified by their pseudostem colour. Consequently, remaining comparisons will be limited to the identification of* **B.1.3** Group plantain hybrids.

B.1.3.1 - By petiole colour

B 1.3.1.1 - **FHIA-04** and **FHIA-20**

Green to pale green on both sides.

B.1.3.1.2 - **FHIA-05** and **FHIA-19**

Green to pale green on both sides with purple tones

B.1.3.1.1.a - By petiole colour

FHIA-04

Petiole with a wide red-violet stripe.

FHIA-20

Petiole with narrow pink-mauve stripe.

B 1.3.1.2.a - By petiole colour

FHIA-05

Ventral side without central stripe.

FHIA-19

Ventral side with defined purple stripe in the centre on a green-yellow background.

Note: **FHIA-04** *and* **FHIA-20** *have the most vigorous pseudostems among FHIA plantain hybrids.* **FHIA-04** *leaves show an intense green colour which is very distinctive from the rest.*

AFTER FLOWERING

B.1.3.1.1.b - By male bud colour

FHIA-04
Red-purple

FHIA-20
Blue-purple

B.1.3.1.2.b - By male bud colour

FHIA-05
Purple

FHIA-19
Red-purple