'FHIA-01' is a synthetic hybrid dessert banana that was released by FHIA in 1988. It was developed from a Dwarf Pome and another synthetic hybrid. 'FHIA-01' plants are cold- and wind-tolerant and produce higher quality fruits in sub-tropical, than tropical, conditions. 'FHIA-01' is tolerant/resistant to Fusarium wilt and black leaf streak (black Sigatoka) and susceptible to Sigatoka leaf spot (yellow Sigatoka) and nematodes. 'FHIA-01' has been widely distributed for subsistence and commercial cultivation. In Australia, 'FHIA-01' has been marketed under the name 'Goldfinger'.

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### Local names

'Goldfinger' (Australia). 'Maravilha' (Brazil)\(^1\)

### History of cultivation and current distribution

'FHIA-01' was released by FHIA in 1988 as part of their programme to breed bananas with increased tolerance/resistance to major pests and diseases.\(^2\)\(^3\) The female parent was a 'Dwarf Brazilian/Dwarf Apple' type (AAB, Pome subgroup) and the male parent was 'SH-3142', an advanced cultivar (genome group AA) also produced by

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### 'FHIA-01' at a glance

- **Ploidy level**: 4x
- **Genome group**: AAAB
- **Status**: Synthetic hybrid
- **Breeding institute**: FHIA
- **Breeder's code**: SH-3481
- **Pedigree**: 'Santa Catarina Prata' (AAB, Pome) x SH-3142
- **ITC code**: ITC0504

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[1] Local names: 'Goldfinger' (Australia). 'Maravilha' (Brazil)

[2] History of cultivation and current distribution: 'FHIA-01' was released by FHIA in 1988 as part of their programme to breed bananas with increased tolerance/resistance to major pests and diseases. The female parent was a 'Dwarf Brazilian/Dwarf Apple' type (AAB, Pome subgroup) and the male parent was 'SH-3142', an advanced cultivar (genome group AA) also produced by

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'FHIA-01' was one of the first synthetic hybrids to be widely distributed to more than 50 tropical and subtropical countries for subsistence and commercial cultivation after it demonstrated tolerance to Fusarium wilt and high agronomic performance during the International Musa Testing Programme phase 1\textsuperscript{[6][7][8]}. 'FHIA-01' was released for commercial cultivation in Australia in 1995 under the name of 'Goldfinger'\textsuperscript{[9]}.

**Morphological characteristics**

'FHIA-01' plants grow to around 2.5 m tall and the pseudostem is shiny and green to light-green with many dark brown blotches\textsuperscript{[10]}. The leaves are slightly drooping\textsuperscript{[9][10]} and unblemished\textsuperscript{[5]}. The leaves remain quite green during the winter in southern Queensland, Australia, and this is a characteristic of some cultivars that are tolerant to Fusarium wilt\textsuperscript{[9]}. The bunch hangs at a slight angle and is asymmetric\textsuperscript{[10]}. The rachis is bare\textsuperscript{[5]}. The male bud is short and heart-shaped with distinctive wide shoulders and revolute (rolling) bracts that lift one at a time\textsuperscript{[10][9]}.

**Agronomic characteristics**

'FHIA-01' plants are cold-tolerant and produce better quality fruit in sub-tropical than tropical conditions\textsuperscript{[6][11]}. Because of their small stature they are considered to be wind-tolerant\textsuperscript{[5]}. The finger length is considered to be extra large by Cavendish standards\textsuperscript{[9]}.

Days from planting to flowering: 11 months\textsuperscript{[12]}, 11.3 and 11.6 months\textsuperscript{[13]}, 268\textsuperscript{[14]}

Days from harvesting motherplant to flowering of the ratoon: 156\textsuperscript{[14]}

Days from flowering to harvest: 133\textsuperscript{[15]}

Days from planting to harvest: 390\textsuperscript{[14]}, 13.6 and 14.4 months\textsuperscript{[9]}, 14.6, 15.1 and 15.3 months\textsuperscript{[13]}

Days from harvesting motherplant to harvest of the ratoon: 265\textsuperscript{[14]}

Height at shooting (cm): 211\textsuperscript{[12]}, 239 and 245\textsuperscript{[14]}, 274 and 275\textsuperscript{[9]}

Height at harvest (cm): 239, 245 and 254\textsuperscript{[13]}

Height of tallest sucker (cm): 122 and 173\textsuperscript{[13]}

Number of suckers: 4.3, 4.8 and 5.1\textsuperscript{[13]}

Girth at shooting: 62\textsuperscript{[12]}, 73 and 77\textsuperscript{[14]}

Functional leaves at shooting: 10 and 10.7\textsuperscript{[14]}

Total leaves at shooting: 10.2 and 10.8\textsuperscript{[14]}, 13.3, 13.4 and 13.7\textsuperscript{[13]}
Mean bunch weight (kg): 26.2\(^{[12]}\), 33.9\(^{[15]}\), 34.3 and 36.9\(^{[9]}\)

Number of hands: 7.3 and 8\(^{[13]}\)

Total number of fruits: 99.3, 105.3 and 108\(^{[13]}\), 120\(^{[14]}\)

Number of fruits on hand:

Finger length (cm): 19.1\(^{[12]}\), 24\(^{[15]}\), 25.5 and 26.4\(^{[9]}\)

Finger girth (cm): 14.3\(^{[15]}\)

Finger weight (g): 121.7\(^{[15]}\)

Yield (t/ha): 20.5\(^{[16]}\), 34.9\(^{[12]}\), 33.1, 40.1 and 40.2\(^{[13]}\), 38.6 and 49.6\(^{[9]}\)

Productivity index (100 x (bunch weight (in kg)/cycling time in days)): 1.3\(^{[17]}\)

Peel (total waste from a whole finger, %): 44\(^{[15]}\)

Shelf life (days): 7.6\(^{[15]}\)

**Reaction to diseases and pests**

**Fungal diseases**

*Fusarium wilt (Fusarium oxysporum f. sp. cubense)*

'FHIA-01' has been classified as susceptible but highly tolerant\(^{[18]}\) and as resistant\(^{[19][4][12][20][2][5][21]}\) to *Fusarium oxysporum f. sp. cubense* races 1, 2 and 4.

*Black leaf streak / black Sigatoka (Mycosphaerella fijiensis)*

'FHIA-01' has been classified as resistant to *Mycosphaerella fijiensis*\(^{[14][3]}\). However, breakdown of resistance was observed in Samoa in 2006\(^{[22]}\).

*Sigatoka leaf spot / yellow Sigatoka (Mycosphaerella musicola)*

'FHIA-01' has been classified as both resistant\(^{[16]}\) and susceptible\(^{[6]}\) to *Mycosphaerella musicola*. During field evaluation trials in Australia for Fusarium wilt, though in field unsprayed for leaf diseases, 'FHIA-01' developed very few symptoms of 'yellow Sigatoka' leaf spot\(^{[23]}\).

*Eumusae leaf spot (Mycosphaerella eumusae)*

'FHIA-01' has been classified as susceptible to *Mycosphaerella eumusae* but this can be controlled by regular de-leafing\(^{[9]}\).

*Crown rot*

'FHIA-01' has been classified as resistant to crown rot\(^{[14][5]}\).

**Bacterial diseases**

'FHIA-01' does not seem to have been evaluated for its tolerance to weevils.

**Viral diseases**

*Bunchy top (Banana bunchy top virus)*

'FHIA-01' has been classified as highly susceptible to *Banana bunchy top virus*\(^{[9]}\).
**Nematodes**

*Burrowing nematode (Radopholus similis)*

'FHIA-01' plants have demonstrated varying levels of susceptibility to the burrowing nematode *R. similis*. In one study, plantlets derived from tissue-culture material were as susceptible as the susceptible reference genotypes Grande Naine or Highgate whilst plants grown from corms were less susceptible than the susceptible reference genotypes but not as resistant as the resistant reference genotypes SH-3142 and Yangambi Km5\(^2^4\). In another study, tissue-culture plantlets inoculated after they were 28 weeks old were resistant to *R. similis*, had fewer nematodes per unit weight three weeks after inoculation than Cavendish plants and were more tolerant than Cavendish plants when supporting the same number of nematodes\(^2^5\). In a further study using tissue-culture derived plantlets planted in pots in greenhouse conditions, 'FHIA-01' plants were moderately susceptible to *R. similis*\(^2^6\).

*Lesion nematode (Pratylenchus spp.)*

'FHIA-01' has been classified as moderately susceptible to *Pratylenchus* spp. (4,848 nematodes per 100 g root) when tissue-culture plantlets were grown in pots\(^2^6\).

*Root-knot nematode (Meloidogyne spp.)*

'FHIA-01' has been classified as susceptible to *Meloidogyne* spp. (41,352 nematodes per 100 g root) when tissue-culture plantlets were grown in pots\(^2^6\).

*Spiral nematode (Helicotylenchus multicinctus)*

'FHIA-01' has been classified as susceptible to *Helicotylenchus multicinctus* (1,577 nematodes per 100 g root) when tissue-culture plantlets were grown in pots\(^2^6\).

**Weevils**

'FHIA-01' does not seem to have been evaluated for its tolerance to weevils.

**Reaction to abiotic stress**

'FHIA-01' does not seem to have been evaluated for its tolerance to drought or other abiotic stresses.

**Recommendations for cultivation, harvest, post-harvest**

FHIA recommends that 'FHIA-01' be cultivated under the following conditions\(^2^2\):

- **Altitude**: 0 – 1400 m
- **Rainfall**: 2,000 mm/year well distributed throughout the year
- **Temperature**: optimum of 28 °C, though is cold-tolerant and able to grow at lower temperatures than the more commonly grown Cavendish varieties
- **Soil**: unflooded, well-drained
- **Planting density**: 1,600 plants/ha recommended
- **Fertilizer inputs**: in Honduras, applied 300 kg/year nitrogen (N), 250 kg/year potassium (K).

'FHIA-01' plants are able to produce high yields with minimal inputs of fertiliser (pers. comms. Jeff Daniells, 2013) and are therefore recommended for cultivation in organic or subsistence conditions.
Pesticide inputs: because ‘FHIA-01’ is tolerant/resistant to many of the pests and diseases that affect bananas (see ‘reaction to diseases and pests’ section) it can be grown without the application of pesticides.

Management advice: remove infected tips every four weeks (de-leaf). Remove young shoots every eight weeks (de-sucker).

‘FHIA-01’ hands mature sequentially and can be harvested one at a time\[^2\]. To avoid the fruits arriving to consumers in an over-ripe, soft condition the hands or the whole bunch should be harvested when they are in a hard green condition\[^27\]. The fruits have a green life of approximately 27 days when kept at 20°C. Fruits ripened at 16°C with 96 % relative humidity and 1 ppm ethylene (trickle) had good appearance and colour. The shelf life of ripe fruits is approximately 8 days when kept at 20°C. The fruits only obtain a high sugar content once the peel is a bright yellow colour\[^27\].

**Uses**

‘FHIA-01’ is a dessert banana that is mostly eaten raw when ripe. The ripe fruit has a sweet-acid, apple flavour that is similar to the mother plant\[^2\][^5]. The cut fruit does not turn black upon exposure to the air and so is good to use in salads\[^2\].

**References**

2. FHIA-01 factsheet


See also on this website

Articles on ’FHIA-01’ in Musalit
Local names for ’FHIA-01’ in the cultivar checklist
Musapedia pages on FHIA hybrids:
FHIA-01
FHIA-02
FHIA-03
FHIA-17
FHIA-18
FHIA-20
FHIA-21
FHIA-23
FHIA-25
Musapedia pages on improved materials:
BITA-2
External links

To browse accession-level information on 'FHIA-01' in MGIS
'FHIA-01' patent

Contributors to this page: Anne Vézina.
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