Goldfinger in Australia: a banana variety with potential

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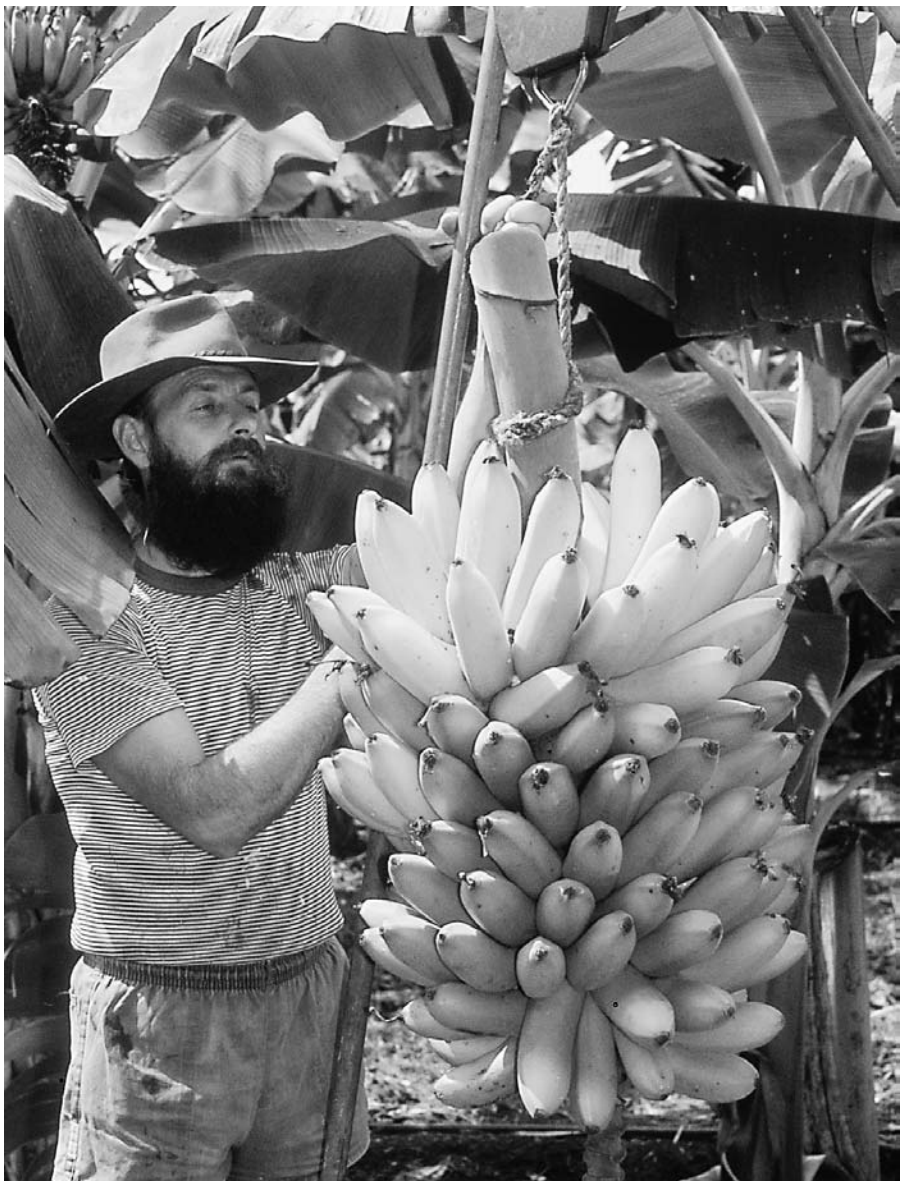
The banana variety SH-3481 (FHIA-01) was introduced from the FHIA breeding program in Honduras in 1989. It is now popularly known as Goldfinger. It was produced by a cross of a dwarf Lady Finger type (Dwarf Prata = Santa Catarina Prata AAB 'Pome') with SH-3142 which has some resistance to burrowing nematodes, Sigatoka leaf diseases and Fusarium wilt. Goldfinger has generated a lot of interest recently with the discovery that it is resistant to Fusarium wilt race 1 and 4 which are a major problem in southern Queensland and northern New South Wales. This article details the current status of its evaluation.

Plant and bunch characteristics

Some plant crop information is presented in Table 1. Goldfinger plants were 55-83 cm taller than Williams, but were 53 cm shorter than Lady Finger. Goldfinger bunches were heavier than Williams, but were harvested later. Overall yield in the plant crop was comparable to Williams. The plant has slightly droopy leaves and the broad high shoulders of the bell (male bud) are very distinctive. In southern Queensland bunched plants of Goldfinger have withstood wind better than many other varieties. The leaves remain quite green in southern Queensland during winter which is a characteristic of some cultivars with tolerance to Fusarium wilt.



A typical bunch of Goldfinger

Pest and disease status

Goldfinger is remarkably resistant to pests and diseases. As mentioned earlier it is resistant to Fusarium wilt race 1 and 4 which would make it a potential replacement for susceptible varieties. From preliminary observations, it is apparently resistant to burrowing nematodes probably inherited from its resistant parent SH-3142. It has high level of resistance to black Sigatoka in the Americas and Africa. It has also been shown to be resistant to crown rot overseas. On the downside, it is susceptible to leaf speckle (*Mycosphaerella musae*), but in north Queensland this may be contained by regular deleafing. As well, it has a similar susceptibility to banana weevil borer as the Cavendish types. Goldfinger has also been prone to the physiological disorder, maturity bronzing, in one trial at Mission Beach. Goldfinger is also highly susceptible to bunchy top disease, but this is a useful characteristic because the variety cannot be a hidden carrier of the disease.

Fruit quality

Finger length for Goldfinger is exceptionally good with most fruit on the bunch being extra large by Cavendish standards. Overseas results indicate that fruit greenlife is good being comparable to Cavendish. Goldfinger ripens to an attractive golden yellow which can be achieved without controlled ripening conditions. The fruit taste is closer to Pome than Cavendish. The fruit pulp is softer and more mucilaginous than either of these varieties.

Marketing potential

Because of Goldfinger's high level of resistance to pests and diseases it will require fewer pesticides. With consumers becoming more and more conscious of chemicals this could be an important marketing approach. Lower pesticide inputs will also lead to reduced costs of production and reduced chemical handling risks. In some si-

Table 1. Plant crop characteristics of Goldfinger (FHIA-01) in north Queensland

	Planting to bunch harvest (months)	Bunch weight (kg)	Finger) length (cm	Pseudostem Ht (m)	Yield t/ha/yr*
Mission Beach					
Goldfinger	13.6	36.9	26.4	2.75	49.6
Williams	11.8	28.7	23.8	2.20	44.3
					** Plant density approximately 1500 plants/ha*
South Johnstone					
Goldfinger	14.4	34.3	25.5	2.74	38.6
Williams	12.4	30.5	29.0	1.91	39.8
Lady Finger	14.1	20.2	19.4	3.27	23.2
					** Plant density approximately 1333 plants/ha*

tuations it could be possible to produce Goldfinger without the use of any pesticides or totally organically. An organic/pesticide free market could be developed.

Because Goldfinger is different to other varieties it needs to be sold as a totally new product. This brings with it the problems/opportunities of market development.

Goldfinger was officially released to the banana industry in Australia on May 1995.

Further varieties from overseas breeding programs will soon be evaluated in the field as part of INIBAP's International *Musa* Testing Program. Hopefully they will include varieties with similar pest/disease resistance to Goldfinger to help curb the use of pesticides in banana production. ■

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Table 2. The severity of Sigatoka/yellow Sigatoka on banana varieties at South Johnstone*

Variety	Youngest leaf spotted+	33% Necrosis #
Williams	4.7	7.3
Goldfinger	6.1	12.0
SH-3142	5.4	8.2
Santa Catarina Prata	5.9	8.8
Ducasse	ND	ND

** Averages of monthly ratings in March, April and May 1994*

+ Youngest leaf spotted = numerical leaf position from top of plant with 10 mature lesions

 # 33% necrosis = numerical leaf position from top of plant with more than one third of the leaf area killed by the leaf spot fungus

ND *No disease symptoms, more than 12 green leaves were present.*

The male parent of Goldfinger - SH-3142 is highly susceptible to yellow Sigatoka

Goldfinger: Not as resistant to Sigatoka/yellow Sigatoka as first thought

Jeff Daniells, Bob Davis, Ron Peterson and Ken Pegg

Goldfinger (FHIA-01), a hybrid developed from Prata in Honduras, has been considered to have potential for the production of bananas without pesticides including fungicides for leaf spot control. However, recent trial results indicate the level of Sigatoka/yellow Sigatoka leaf spot (*Mycosphaerella musicola*) and leaf speckle (*Mycosphaerella musae*) damage to Goldfinger could be sufficient to reduce yield/quality under some circumstances if fungicides are not applied.

Table 2 shows leaf spot data from a recently completed trial at South Johnstone Research Station. The Cavendish variety, Williams, was the most severely damaged by leaf spot - the youngest leaf spotted being 4.7 on average. Santa Catarina Prata (Dwarf Lady Finger) and SH-3142 the respective female and male parents of Goldfinger were also severely damaged by leaf spot, but not quite as badly as Williams. The youngest leaf spotted for Goldfinger was 6.1, which is only slightly less severe from those already mentioned. However, the speed by which the spot stage progressed to major leaf necrosis (death) for Goldfinger was much slower than the other varieties thus indicating a degree of resistance. Ducasse (ABB 'Pisang Awak') was immune to leaf spot in the trial.

Leaf spot disease pressure was very high and less damage would be expected under normal circumstances. The effect of disease levels on yield and quality of Goldfinger is unknown. It is our experience from elsewhere that Goldfinger usually has sufficient resistance to leaf spot to avoid yield/quality problems especially if regular deleafing of diseased lower leaves is practiced. This strategy is also particularly effective against leaf speckle on Goldfinger - a disease to which it is also susceptible. A mid-autumn assessment of speckle damage (based on presence or absence) in a mixed unsprayed planting at Pimpama (Southern Queensland) this year revealed that in unbunched plants of Goldfinger, the youngest leaf affected by the disease was 5.8, similar to 5.3 for Santa Catarina Prata, but more than a whole leaf better than 4.1 for the Cavendish variety Giant Parfitt. However, a speckle disease index (see below) designed to score overall severity indicated a large difference between Giant Parfitt (12.8) Goldfinger (3.3) and Santa Catarina Prata (4.3).

Speckle disease index:

$$\frac{\text{number of leaves diseased} \times \%\ \text{leaf area affected} \times 100}{\text{total number of leaves}}$$

The response of Goldfinger to these leaf diseases highlights some of the serious shortcoming of relying solely upon overseas breeding programs for disease resistant varieties. Goldfinger was developed in Honduras in the absence of Sigatoka/yellow Sigatoka and leaf speckle. Thus breeding material used in such programs cannot be screened for the important diseases affecting banana production in Queensland. ■