Banana research and production in China

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Banana is one of the major fruits in China. In 2004, the total planted area for banana was 244 793. Some commercial plantations obtain 60 t/ha\(^{-1}\) yr\(^{-1}\). However, due to typhoon and chilling, the average yield is only at 22.7 t/ha (Table 1). The main consumption market is located in north China, amounting to 6 t/yr. Effective 18 June 2003, China is in Free Trade Area Agreement with the Association of Southeast Asian Nations (ASEAN). This opened up more opportunities for the country’s thriving banana export industry.

Table 1. Area planted and volume of production of banana and their occupation rate.

<table>
<thead>
<tr>
<th>Province</th>
<th>Area (1000 ha)</th>
<th>Area (%)</th>
<th>Production (t)</th>
<th>Production (%)</th>
<th>Productivity (t/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangdong</td>
<td>110.7</td>
<td>44.65</td>
<td>2 717 700</td>
<td>48.90</td>
<td>24.55</td>
</tr>
<tr>
<td>Guanxi</td>
<td>54.5</td>
<td>21.99</td>
<td>1 073 400</td>
<td>19.32</td>
<td>19.70</td>
</tr>
<tr>
<td>Hainan</td>
<td>34.1</td>
<td>13.76</td>
<td>853 700</td>
<td>15.36</td>
<td>25.01</td>
</tr>
<tr>
<td>Fujian</td>
<td>29.3</td>
<td>11.82</td>
<td>765 000</td>
<td>13.77</td>
<td>26.11</td>
</tr>
<tr>
<td>Yunnan</td>
<td>16.0</td>
<td>6.45</td>
<td>126 000</td>
<td>2.27</td>
<td>7.88</td>
</tr>
<tr>
<td>Guizhou</td>
<td>2.0</td>
<td>0.81</td>
<td>8 400</td>
<td>0.15</td>
<td>4.20</td>
</tr>
<tr>
<td>Sichuan</td>
<td>1.1</td>
<td>0.44</td>
<td>11 800</td>
<td>0.21</td>
<td>10.73</td>
</tr>
<tr>
<td>Chongqing</td>
<td>0.2</td>
<td>0.08</td>
<td>1 300</td>
<td>0.02</td>
<td>6.50</td>
</tr>
<tr>
<td>Total</td>
<td>244.8</td>
<td>100.00</td>
<td>5 557 300</td>
<td>100.00</td>
<td>22.70</td>
</tr>
</tbody>
</table>

Banana industry promotion

A project for the promotion of the banana industry was carried out by the China Agriculture Ministry, South Sub-tropical Crop Development Center (CAM-SSCDC) in 2002. Last November, a demonstration meeting was held in Hot Farm, Nanning, Guangxi. Hot Farm is one of the biggest banana plantations in China. It started with a plantation area of 67 ha in 1997 and later expanded to 1000 ha in 2004. To improve the productivity of Hot Farm, irrigation system, mechanization, cable way transport system and a packing house were set up. These all contributed to better price and quality of bananas. Hot Farm is now becoming a famous brand in China.

In order to extend the new technology to all banana plantations, CAM-SSCDC will launch a China Banana Network in Xuwen County,

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Guangdong on 20 December 2004. There is a bumper harvest this year, with some farms having more than $20 000/ha average income. A China Fruit Marketing Association Banana Branch in Haikou, Hainan province was set up in June 2004 (Xu Linbing 2004a). This will improve the banana marketing system, build up the banana selling network, help the farmers sell bananas easier and earn more profit. Hot Farm, Jianfeng, Datang, Tianbao, Tongtian, Baiguo, Shanding, Fu Min, etc. are some of the most recognized brands (Yang Peisheng 2003).

Hainan Banana Association (HBA) was founded in April 2002. During the last 2 years, HBA helps the government develop the local banana industry. The first magazine in China, BANANA, is edited for extending new technology and information. HBA also put up a joint export base covering 2000 ha in cooperation with Fresh System Company, the biggest banana dealer in Japan. HBA has helped Lingao farmers to join a Banana Community (BC). The BC can obtain a loan from the bank to avail of the technology and marketing directed by HBA. For the first year, BC has covered 100 ha, and earned a $900 000 interest. It is estimated that the earnings of BC would double this year. HBA has also assisted the farmers to avail of insurance for the plantation in case of calamities like typhoons.

Guangdong Horticulture Academy Banana Science and Technology branch is another active group founded in 2001, which works on the banana industry.

**Market price analysis**

Good market price is a good motivating factor for the farmers to plant bananas. Data on this was collected from www.pyagri.gov.cn.

It can be seen from Figure 1 that in some months, the highest price appears to be twice more than the average price. Too many fruits competing with banana during summer lowers the banana rice. On the other hand, during winter, most of the plants die of chilling. The price gets higher than $0.5/kg following the next spring, of which the farmer can earn $20 000/ha profit in Hainan. Although there has been a recorded increase in production (Table 1), Figure 1 shows that the price did not change so much in the last 4 years.

Economic development increased the market demand for bananas. Postharvest technology made the shelf life of banana longer. The marketing network of banana is also extended to small towns. Overall, more people eat banana than before, with the consumption volume becoming bigger. It is estimated that the production will reach 7M t in the next 3 years.
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Banana production and research

**Major pests and diseases**

- **Sigatoka** is the most common disease in the undeveloped region (i.e. Hainan, Yunnan) during spring and fall. Four to five types of chemicals are sprayed yearly to control it. In 2004, Xie Yixian had studied the nucleic acid of banana sigatoka leaf spot disease pathogens in Hainan. Eleven isolates of banana sigatoka leaf spot disease pathogens from Hainan were identified using the polymerase chain reaction (PCR) species-specific primers. The result showed that 10 of the 11 isolates from Danzhou, Ledong, Wenchang, Dongfang, Chenmai, Lingao, Qunhai, Changjiang, Qunsan and Sanya in Hainan were *Mycosphaerella fijiensis*, while the isolate from Baisha was neither *M. fijiensis* nor *M. musicola*. Further studies should be done to identify this isolate. Random amplified polymorphic DNA (RAPD) analysis showed that the isolates were in two groups, which supported the result of the PCR identification. The results of this study can be used as a reference guide for the integrated management of banana Sigatoka leaf spot disease in Hainan (Xie Yixian 2004).

However, in developed regions such as Pearl River delta, leaf spot disease is no longer a problem for banana plantation. Leaf margin necrosis, where the the margin of the leaf turn light greyish brown and then dries up, is more common.

- **Leaf marginal necrosis**. Ten years ago, leaf marginal necrosis was found only in Machong town, Dongguan city (30 km from Guangzhou). However, at present, it is very common in Pearl River delta A possible reason for this are the influx of power stations, factories and vehicles which cause severe air pollution. According to 2003 report of Guangdong Environmental Protection Bureau, SO$_2$ is the main air pollution source. SO$_2$ contain 0.025 mg/m$^3$ and goes up to 13.5%. The
rate of provincial de-sulfurization is only 13.30%. This then causes acid rain of more than 50% and the average pH of precipitation to be 4.92 (http://www.gdepb.gov.cn. 2004). The relationship of acid rain and banana leaf marginal necrosis is yet to be studied.

- **Banana Bunchy Top Virus (BBTV).** Wei Hongyan (2004) studied the promoter activity of BBTV Zhongzhou isolate (BBTV-ZZ) DNA4 non-coding region. BBTV-ZZ DNA4 non-coding region (Po1), and its 5’ end deletion of CR-M (Po2), and deletion of CR-M and CR-SL (Po3) were subcloned by PCR and inserted into the upstream of GFP::GUS plant expression vector pCAMBIA 1304 to construct the recombinant plasmid pTA2, pC26 and pC45, respectively. Agrobacterium tumefaciens harbouring pTA2, pC26 and pC45, were respectively injected into leaves of the tobacco (Nicotiana tabacum l. cv. Xanthi NC) via agroinfiltration. Transient expressions of GUS and GFP determined in injected leaves were 1.007, 0.852, 0.939, 2.069 and 0.021 pmol·MU/(g·min), respectively. Values of absorbance of GFP in 1mg total protein from pTA2, pC26, pC45, pCAMBIA 1304 injected leaves and non-injected at 490 nm by indirect ELISA were 89.577, 65.184, 72.096, 100.440 and 3.287, respectively. The results suggest that Po1, Po2 and Po3 all have strong promoter activity. In transgenic tobacco plants, activities of Po1, Po2 and Po3 were restricted to the vascular associated tissue by the detection of GUS.

- **Cucumber Mosaic Virus (CMV)** is the main disease in farms planted with tissue-cultured seedlings. Aphid control in the nursery and young plant is very important.

- **Fusarium wilt** (*Fusarium oxysporum* f. sp. *cubense*) (Foc) has become the main disease for some banana plantations in Southern China. Guangdong has set up a project to control it. The involved institutions include South China Agricultural University, Guangdong Academy of Agricultural Sciences (GDAAS), Chinese Academy of Tropical Agricultural Sciences (CATAS), Fujian Agricultural and Forestry University, Hainan Academy of Agricultural Sciences and Guangzhou Institute Agricultural Sciences. Xu Wenyao studied the pathogenic reaction of banana pseudostem cells to different races of vascular wilt fungus and their crude toxins. It describes the pathogenic reaction of the banana cells upon the inoculation of spore suspension and crude toxins of Foc. The detached pseudostems and pseudostem cells of banana plantlets were treated with pathogen spore or crude toxins solutions. The pathogenic reactions were observed by using tissue sectioning. The results showed the same reactions, such as browning reaction, upon the inoculation of crude toxins produced by different fungal races. This suggests that the virulence differentiation of Foc was
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determined by some unknown factors rather than the toxins specificity. It was also proven that the toxins produced by Foc are non-selective for banana (Xu Wen-yao 2004). The Foc was found to have not only destroyed Fenjiao (ABB, Pisang Awak), but also Baxi (AAA, Cavendish) in Qiongshan and Sanya, Hainan province. The disease area covered 43.33 ha and 6.67 ha respectively. This is a big potential problem for the banana industry in Hainan (Zhou Chuan Bo 2003).

Fengjiao (ABB, Pisang Awak) is the popular variety in China. The price is usually higher than Cavendish. It is very susceptible to Foc in commercial plantations. The ratoon harvest, which is 60-80% in virgin land, may fall to 0%. But in some backyards, Fengjiao can harvest many crop, and last for many years.

Integrated pest management may cause no harm to the roots and sucker since no chemicals/pesticides will be used. Further studies are needed on this IPM programme.

Twenty-three accessions from the International Musa Testing Programme (IMTP) were propagated, rooted and planted in Wangqingsha IMTP station on 31 March 2004. These accessions were investigated for the presence of Foc. Based on the last assessment conducted on 14 October 2004, FHIA-01 (AAAB), FHIA-02 (AAAB), FHIA-18 (AAAB), FHIA-25 (AAAA) are resistant. Meanwhile, 10% of FHIA-03 (AABB) and GCTCV 119 (AAA) and 12.5% of CRBP39 (AAAB) are affected. More detailed studies will still be done.

• Banana Anthracnose. Zhu Sijiang (2004) investigated the induction of disease tolerance of postharvest banana by using crude extract from peels of green banana. Dipping postharvest banana in crude extract from peels of unheated green banana (UHGB) significantly controlled the occurrence of banana anthracnose, while dipping in crude extract from peels of heated green banana (HGB) had little effect on fruit rotting. This is the first report on the induction of disease tolerance of postharvest fruits by direct application of crude extract from fruit of the same species. UHGB-treated anthracnose (Colletotrichum musae) spores were found to be less virulent than HGB-treated ones. While HGB affected spore germination, more than UHGB, lesser anthracnose was observed on UHGB treated fruits. These results imply that the mechanism of anti-disease substances extracted from green banana peel to enhance the disease tolerance of post harvest banana by exogenous application lies in the fact that the anti-disease substance help strengthen the defensive system of the fruit itself instead of affecting the pathogens (Zhu Si-jiang 2004).

Genetic divergence among 38 strains belonging to the falcate-spore
species of Colletotrichum was assessed by RFLP analysis on the basis of rDNA ITS region. The PCR amplified ITS region (ITS-ITS5) was about 650 bp in length in all the tested strains. RFLP patterns of ITS products digested with different endonucleases (Alu I, BsuR, Hin6 I, Hpa II and Taq I) were not distinguishable within the same species, but clearly different at the interspecies level. UPGMA analysis of co-migrate band in restriction patterns showed that 38 isolates could be divided into six distinct groups. Some strains previously in the different species, such as C. truncatum, C. circinans and C. capsici, were closely grouped together in a cluster dendrogram, indicating that they possibly belong to the same species (Zeng Daxing 2004).

• Bacterial corm rot was found in Hainan. It is caused by Erwinia carotovora. It occurred on poorly drained fields during the rainy season, 3%-7% plants were harmed (Zhou Chuanbo 2004).

Environmental factors

• Chilling in winter is one of the main restraining factors of banana production. Compared with apple, pear and citrus, the area planted to banana is very limited in China. However, the quality of Chinese bananas is better than tropical bananas, thereby attracting Japanese buyers to come to China. HBA is pushing a big company to join together to supply the Japanese market but typhoons and summer made banana production unstable. Some farmers moved their business to Xisuanbanna, Yunnan province. The province has the best environmental condition in China, without typhoon, with a tropical climate which lies 400 m above sea level. The banana is sweet all year round because even during summer, the temperature is remains at 20°C at night and 37°C in the afternoon. The road condition, however, is not that good but will be improved with the opening of the Kunming-Bangkok express way in 2007. This will also benefit Thailand and Laos. It is expected that they will bring their tropical fruits to the Chinese market.

• In 2004, Chen Jiahao has studied how the defense effect of smoke screen on low temperature injures banana. The results showed that smoke screen prevented radiation of low temperature. The lower the air temperature was, the better the heat preservation effect was. The heat preservation effect was stronger at the densest height than at any other heights in the banana plantation. The heat preservation effect of smoke screen was not significantly affected by sky conditions (sunny or overcast) and air humidity.

• Typhoon is another major limiting factor in banana production. In 2003, more than six typhoons devastated the banana regions. On 17
November 2003, Typhoon Nibert wiped out half of Hainan’s banana plantation, causing an estimated loss of 1 billion yuan ($120M). Fortunately, in 2004, no typhoons landed on Guangdong, Hainan and Fujian provinces. The production in 2004 therefore increased by 20%. To minimize production loss due to typhoons, most plantations use timber and bamboo props to minimize the effect of strong winds. Approximately 100 M of timber and bamboo are used yearly. This is a great loss for the forests in China. In order to save timber, a timber preservation research project was carried out by the Guangdong Forest Research Institute. This project was sponsored by the International Tropical Timber Organization (ITTO). The vacuum-pressure system in the pilot workshop was set up to treat timber. They developed a new formulation for mold control, which showed good efficacy after being tested. The treated timber for banana standing pole is one of the demonstration programmes. Four-year tracking analysis results indicated that the timbers are still in good condition. It is estimated that the timber can last 15-20 years, about 3-4 times longer than the untreated ones. If the project is extended to 50% of the banana plantations, more than 70% of timber will be saved.

- Xuwen County is situated in the cape of Leizhou Peninsula, west Guangdong. It is a tropical region, afflicted by drought which causes a stress to banana plantations. Some farmers usually dig deep wells (200-400 m deep) and pump water for irrigation. The 2-3 hours/8 days irrigation belt system is adapted. In Hainan, irrigation is for 1 hour/6 days, while in Pearl River delta, it is 20 minutes/3 days. The optimal plot for irrigation should be tested respectively. At present, this irrigation belt system has been extended to up to more than 30 000 ha in China. However, over excavation of underground water will cause the water table fall. It is said that the water table dropped to up to more than 100 m in Ledong, Hainan during the last 2-3 years. The use of underground water should be studied further.

**Standardization**

The Chinese government is setting up standards to promote banana production. This includes environment management, plantlet care and production, field management, postharvest processing and fruit quality.

**Germplasm**

Of the collections held in GDAAS, about 50% accessions were characterized and entered into the MGIS database. Chen Houbin has
evaluated fruit characteristics of 28 Cavendish subgroup banana cultivars. The result showed that the bunches of ‘Gaojiao Dundilei’, ‘Williams’ and ‘Baxijiao’ were more cylindrical while those of dwarf Cavendish were more conical. Yields of the planting crop and the first ratoon were 20-30 kg and 30-35 kg per stem, respectively. ‘Aijiao Dundilei’ had the highest yield of 33.8 kg per stem in two crops, 21% higher than the introduced cultivars like ‘Baxijiao’ and ‘Williams’. Number of hands varied between 7 and 9, with the total fingers 140 to 170. The first hand consisted of 25 to 30 fingers and weighed 4 to 7 kg in a bunch, which was double to triple that of the last hand. Finger length of the first hand was 20 to 22 cm whereas finger diameter was bigger than the normal standard (around 40 mm). A few local cultivars like ‘Aijiao Dundilei’ and Gaojiao Dundilei’ were comparable with the introduced cultivars in terms of yield, bunch shape, finger length and shape.

The germplasms were collected in Xisuanbanna Botanical Garden, Menglun, Yunnan province, (101°25´ EL; 21°41´ NL, 570 m above sea level, with a yearly average temperature of 21.5°C and precipitation of 1560 mm). Seven accessions were collected, 1 Shuguo Bajiao; 2 Teai Guanye Xianagjiao(AAA); 3 Taiyin Hongyebei Guanye Xianagjiao; 4 Pinhonghua Guanye Xianagjiao; 5 Xiangmin Xiaoxianagjiao (AA); 6 Heliconia aurantiaca Ghissbr; and Xiangtui Jiao.

**Breeding and selection**

- **Biotechnology breeding.** Xu Chunxiang (2004a) had experimented on the embryogenic callus starting from immature male flowers in two out of five banana cultivars and starting from scalps in two out of three cultivars. These four cultivars belonged to *Musa* AAA group. The frequency of embryogenic cell induction depended on genotype, cultivar and incubation condition. Embryogenic cell suspensions (ECSs) were initiated successfully from the embryogenic callus of all these four cultivars. The possibility of getting ECSs from embryog was also cultivar dependent. Xu Chunxiang (2004b) also regenerated Grand Naine plant through somatic embryogenesis. Grand Naine ECSs were plated on RDI or M3 medium for the regeneration of somatic embryos, 1 to 2 weeks after last subculture. The first regenerable somatic embryos were observed approximately 3 weeks after inoculation. After 8 weeks of culture, the embryogenic mass had increased about 5 to 18 times. The number of somatic embryos that could be regenerated from 1 ml settled cell volume (SCV) of ECSs ranged from between $0.71 \times 10^5$ and $3.07 \times 10^5$, depending on pre-culture time in liquid medium before regeneration, regeneration media and incubation conditions (light/
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The frequency of plant recovery and the amount of plantlets from 1 mL SCV of ECS were indirectly affected by the somatic embryos regeneration conditions that were studied.

Different protocols for establishing embryogenic cell suspensions and plant regeneration for gene transformation were also studied. Main cultivars and important germplasm in China, such as *Musa itinerans* Cheesm., *Musa* AA Pisang Mas cv. Mas, *Musa* AAA Cavendish cv. Baxi, and *Musa* AAB Silk cv. Guoshanxiang were used as experimental materials to establish their embryogenic cell suspensions. Different explants, immature zygotic embryo of *Musa itinerans* Cheesm., immature male flower of *Musa* AA Pisang Mas cv. Mas and scalp of *Musa* AAB Silk cv. Guoshanxiang were used to induce embryogenic callus, and embryogenic cell suspensions of these cultivars were established. Histological analysis was performed and used to prove that the single-cell origin of somatic embryos was derived from immature male flower of Mas (AA). Embryogenic cell suspensions of Mas were cryopreserved successfully by vitrification, and its protoplast culture was processed (Wei Y R et al. 2004b).

- **Space radiation breeding.** Three clones (B5, B2, Guangfeng No.1) are sent to space by return satellite. Only B5 was alive when it returned. The bud tissue was then cultured in vitro. It grows faster than normal and more mutated buds, like globosity embryogenic callus and cancer buds. The first group of plants (11 normal buds’ plants, 8 cancer buds’ plants, 9 control plants) was planted in greenhouse on 9 May 2004. Now that the plants are shooting, there are no differences between them. The second and third groups were planted in Dongchong station on 7 and 30 July 2004. The cancer buds’ plants showed more off-type leaves. The agronomic traits are being observed by GDAAS.

- **Somatic mutation screening** is being used by GDAAS. Daguo No.2 (AAA Cavendish) screened from Guangdong No.2 was tested in Dongguan, Panyu. The results showed that the fingers were 1.4 cm longer, finger weight was 32 g higher and bunch weight was 4.4 kg higher than Guangdong No.2. Compared with the popular cultivar Baxi, Daguo No.2 showed a finger weight which was 22 g heavier and had a more robust pseudostem. After typhoon Dujian (2 September 2003), Daguo No.2 was damaged by 1.7% compared with Baxi which was damaged by 54.9%. Daguo No.2 however has a very poor taste. The second new clone Dafeng No.1 (AAA Cavendish) was screened from local Cavendish Dazhong Gaoba. It was shown that the finger was 1.6 cm longer, finger weight was 30.5 g heavier and bunch weight was 2.1 kg heavier than Baxi. However, its bunch shape is not very good. The third clone Changfeng Xiangjiao(AAA Cavendish) which
was screened from Williams, showed that the finger was 2 cm longer and bunch weight was 16 kg heavier, than other Williams, respectively. Compared with the popular cultivar Baxi, Changfeng Xiangjiao does not differ with Baxi in terms of plant characteristics except that its finger is 1.6 cm longer. Another Awak mutation, Ai Fenjiao (ABB Dwarf Pisang Awak) is 2-3 m in height, its shooting cycle 1 month shorter than normal one but the yield is low at 10 kg/bunch.

**Tissue culture**

Tissue-cultured plantlets are now becoming a very popular planting material. Most plantations grow tissue-cultured crops. However four problems have remained: (1) tissue-culture laboratories do not have isolated screenhouse for mother plants; (2) sample check for proliferating tissue quarantine is not sufficient and not fast enough; (3) most of the hardening nurseries do not have a net for isolation and are located near a diseased banana plantation; (4) poor nursery management of tissue-cultured plantlets made fusarium wilt spread rapidly. Huang Youbao (2004) has however introduced countermeasures for these problems encountered. These are: (1) to build up a mother plant nursery; (2) proper management of tissue culture source: location of mother plant for sucker and quarantine must be checked; (3) proper management of tissue culture nursery. Nurseries should be 50 m away from vegetable and banana field. There should be a net house and buffer space. Fields must be weeded and disinfected, clean water source should also be used.

**Nutrition**

The banana specific fertilizer becomes more popular than ordinary compound fertilizer. According to the plant growth stage, N:P:K content is adjusted, including vegetative-growth fertilizer, flower differentiation fertilizer and fruit-growth fertilizer. Bio-fertilizer (organic) is adapted in many plantation. Amino-acid leaf fertilizers are also popular this year.

**Postharvest**

Recently, many plantations have simple packing houses which are built by the local government and the farmers in Hainan province. Cartons are used to pack bananas instead of the usual bamboo baskets. There are new cable ways for banana transport built in Zhongshan and Guangxi in 2003. Hot Farm for example, has a re-fixable cable way to
transport bananas. A 4000 m length way costs $25 000, but after the harvest season the facility can be put in the warehouse to avoid any damage.

Feng Dou (2004) analyzed the ethylene receptor gene cloning and expression in banana fruit. Using a total RNA from banana fruits as template, two different lengths of cDNA fragments were specifically amplified by RT-PCR, which revealed a significant homology to the reported ethylene receptor gene (Gene bank number: AF 113748). One cDNA clone (the longer one) showed 99% of homology to the ORF (open reading frame) sequence of the ethylene receptor gene, while the shorter cDNA clone displayed 97% identity but with a missing region corresponding to nucleotide 194 to 1036. Analyses of expression profile by RT-PCR of the cloned genes demonstrated that its expression was prominent at different developmental stages of ripening banana fruit. In contrast, their expression in the roots and leaves was non-detectable. The result of southern hybridization showed that this gene sequence existed as a single copy in the banana genomic DNA. The results indicated a fruit tissue-specific expression pattern of the cloned ethylene receptor cDNA. The cDNA truncated from ethylene receptor was probably generated through alternative splicing, and therefore might represent a novel form of ethylene receptor gene in banana.

Problems encountered and proposed areas of collaboration

Single cultivar planting would be a potential risk for banana production. Cavendish occupied 89% of production. However, Cavendish is very susceptible to Sigatoka and fusarium. Breeding disease-resistant cultivars is urgent.

1. Banana processing should be emphasized. Processing technologies must be developed.
2. IPM must be developed for export bananas since use of chemicals is strictly checked in the export market. IPM would be very helpful for the export banana plantations.
3. National banana production coordinating system should be set up (Yang Pei-sheng 2003). A China Banana Network will be launched at Xuwen, Guangdong on 20 December 2004.
4. Cooperate with international banana companies regarding marketing management.
5. Banana standards should be promoted to the farmers in the banana regions. Fruit quality should be improved. The taste of Chinese bananas is good, but the appearance is not. If the fruit appearance is improved, the Chinese banana could become best in the world market.
References


