Banana bunchy top virus confirmed in Pakistan

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Banana is one of the most important fruit crops in Pakistan. In 1988, plantings totalled 23,500 ha with an annual production of around 210,000 tonnes (Anon, 1991). Approximately 87 per cent of the land under banana is in the Sindh province and most lies on the left bank of the River Indus. However, these figures do not include the untaxable kachcha (Indus flood basin) lands where banana is thought to be grown on another 25,000 ha. About 90 per cent of the bananas grown in Pakistan are Dwarf Cavendish, locally called "Basrai".

In 1988, an unknown disease was observed in epidemic form. The disease devastated banana plots, causing losses up to 100 per cent in some areas (Soomro, *et al.*, 1992). This was the first time that the Pakistan banana crop had been attacked by serious disease since it was established in 1913. The disease was first thought to be caused by nematodes and fungi. However, the application of nematicides and fungicides did not lead to a recovery.

The disease symptoms included bunching, shortening and excessive brittleness of leaves. Dot-dash, dark green streaking on leaves, petioles and stalk of the pseudostems was also observed on infected plants. The disease was finally identified as banana bunchy top disease (BBTD), caused by banana bunchy top virus (BBTV), on the basis of symptoms, virus particle morphology and serology (DAS-ELISA), (Khalid *et al.*, 1993). It should be noted that some damage to the crop in Pakistan is also being caused by nematodes, including *Meloidogyne*, *Helicotylenchus* and *Hoplolaimus* species.

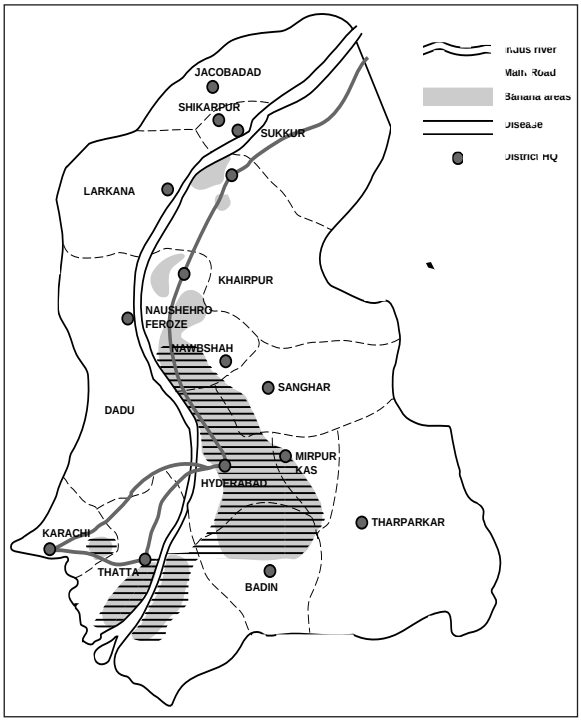
Prevalence and incidence of BBTD was assessed in July and October 1991 (Soomro, *et al*., 1992), and again in July 1992. In October 1991, the disease was found to be common in all southern banana-growing districts of Sindh province (these include Karachi, Thatta, Badin, Hyderabad, Mirpur Khas and Sanghar), whereas the northern districts (Nawabshah, Naushehro Feroze and Khairpur) were disease-free. By July 1992, banana had disappeared from Badin and Hyberabad districts and had been replaced with sugarcane. The disease was also found to have spread to Nawabshah district. According to the Agriculture Extension Department of Sindh, banana plantings were reduced to 8,000 ha, excluding *kachcha* lands, by the end of 1992. This represents a 60 per cent loss in the taxable area of production in the Sindh province since 1987. In monetary terms, the income loss for the year 1992, based on local market prices, amounts to 915 million rupees.

Up until April 1993, the known insect vector of the virus, the banana aphid *Pentalonia nigronervosa* Coquerel, had not been seen. Thus the spread of the disease had been thought to be mainly through infected suckers (the normal practice in Pakistan is that corms of harvested mother plants are used for new plantations). However, during a survey in April 1993, colonies of insects resembling the banana aphid were observed on plants with and without BBTD symptoms. These insects were also seen on apparently healthy plants in Khairpur district which has been considered outside the affected area. Specimens of these insects have been sent to the United Kingdom for identification and the plant material from Khairpur district is being tested for virus.

Because of shortages, very high prices are being paid for bananas in local markets. This has led to an increase in speculative banana cultivation and crops are being planted in previously "non-banana-growing" areas. Unfortunately, planting material is taken from wherever it is available, including affected areas and this has led to disease spread. Certified, virus-tested material is not yet commercially available in the country.

The Pakistan Agricultural Research Council is making efforts to rehabilitate the banana industry. Some virus-tested banana germplasm has already been acquired through INIBAP and is being multiplied through tissue culture. However, only a few plants are in the field so far. Our institute has trained some of the government agriculture extension staff in field diagnosis of the disease and distributed leaflets suggesting precautions. Farmers are being encouraged to form an association of banana growers.

Formation of a "Banana Bunchy Top Management Bureau/Board" has also been initiated. This will be responsible for the coordination and supervision of all the activities needed for rehabilitation of the crop. However, it is going to be some time before the virus-tested planting material is available on a commercial basis. Growers will also have to be persuaded to eradicate old plantations and buy plantlets from BBTV-tested sources in relatively high numbers. Meanwhile, regular monitoring of the banana crop for BBTV will be continued and growers will be advised to take the necessary precautions to minimize losses.



Major banana areas and BBT disease prevalence in the Sindh province (Pakistan)

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