there was no evidence of positive effects on the other analyzed variables. At foliar level, there were statistically significant differences ($p<0.05$) favoring B2 with a less ABCPE for ES and less IND infection percentage. However, the chemical treatment (chlorothalonil) was the most effective control. Comparing the planting material type ("seeds"), vitroplants showed the best behavior regarding severity, TL, YDL and APF. Significant differences ($p<0.05$) were observed for some interactions, standing out TL and YDL variables in the tri-factorial relationship: seeds with roots treatment and the chemical application at foliar level. In this case, seed with nematicide and fungicide interaction showed the best behavior for disease protection. Phytochemical analysis indicated a variety of secondary metabolites (polyphenols, coumarins, quinones, saponins, triterpenes, flavonoids, among other), some of which have been reported in the literature for their antifungal or resistance induction activity. This research allowed to select B2 as "highly promising" to be proposed as a candidate for banana black Sigatoka integrated management due to its protectant action. However, it is not known which molecule exerts the disease control effect. If an opportunity to continue with this research exists, it is recommended to isolate the active compound. Regarding endophytic fungi, it is necessary to conduct more studies to optimize their efficiency with subsequent reinforcement application, extending and inducing molecules liberation, which are intermediate signs of a possible systemic resistance.

Banana bunchy top disease in Mozambique and Zambia

W.T. Gondwe, B.M.L. Mwenebanda, E. Natha and P. Mutale

Banana bunchy top disease (BBTD) is considered as one of the most serious virus disease affecting bananas worldwide (Thomas *et al.* 1994). Banana bunchy top virus (BBTV) is disseminated through infected planting materials. Within the field, the virus is transmitted by a banana aphid, *Pentalonia nigronervosa*.

BBTV symptoms on cv. Williams at Vila Ulongwe government banana nursery block.

Symptoms of the disease include dark green spots along the leaf veins, midrib and petiole, upright leaves with wavy margins, stunted growth, more erect leaves giving the plant a rosetted or 'bunchy top' appearance (Jones 2000).

The disease has been reported and confirmed in several Asian and Pacific islands as well as in African countries. In Africa, it has been reported in Egypt, Gabon, Congo, Democratic Republic of Congo, Rwanda, Burundi, Central African Republic, Malawi (Tushemereirwe and Bagabe 1998, Thomas and Iskra-Caruana 2000) and more recently in Angola (Pillay *et al.* 2005.).

Recently symptoms of bunchy top disease were observed in the government banana nursery block at Vila Ulongwe (1239 masl, 14°32' S and 33°41' E) in Angonia district, Tete Province, western Mozambique and on a commercial banana farm at Chipata town (1108 masl, 13°37' S and 32°37' E) in Chipata district, eastern Zambia. The symptoms were observed in both giant and dwarf Cavendish cultivars, 'Williams' and 'Kabuthu' respectively. In Zambia,

both 'Bluggoe' and 'Pisang awak' which surrounded the Cavendish banana farm were not affected.

Cultivars of the Cavendish subgroup have been reported to be highly susceptible to BBTV (Thomas and Iskra-Caruana 2000).

In BBTV hot spots in Malawi, Cavendish bananas, other AAA bananas and some plantains (AAB) were first wiped out before ABB cultivars. There was a slow symptoms appearance in the ABB cvs such as 'Bluggoe' and 'Pisang awak' (Mwenebanda 1998, pers. observation). In Angola, the disease was spotted on False horn plantains (AAB) and Cavendish bananas (Pillay *et al.* 2005).

Tushemereirwe and Bagabe (1998) reported that no study to establish yield losses due to BBTV has been reported in Africa. However, it was reported that severely infected plants of highly susceptible cultivars fail to produce bunches resulting into 100% yield loss.

Geering (2003) reported that there was partial resistance to BBTV in various banana genotypes. The same reporter cited 'Gros Michel' as having a low susceptibility to BBTV with delayed symptom expression. He also stated that 'Highgate', a member of the 'Gros Michel' banana subgroup, is used by the breeding programme of the *Fundación Hondureña de Investigación Agricola* (FHIA) as a potential source of partial resistance to BBTV.

This is the first reported case of BBTV in both Mozambique and Zambia.

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INIFAT 02: a new cooking-banana hybrid is born in Cuba

MusaNews

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In recent years, geneticists have produced more disease-resistant banana and plantain hybrids that have contributed to worldwide food security. This was favoured by the introduction of clones from the *Fundación Hondureña de Investigación Agrícola* (FHIA). In Cuba, important results have also been achieved, such as the clone Burro CEMSA (ABB), highly resistant to Fusarium wilt and to yellow Sigatoka and, to some extent, to black leaf streak (black Sigatoka). For a further breeding programme, several clones were selected as parental material (Table 1), and among them, Burro CEMSA (♀) and Pelipita (ABB) (♂) produced 508 seeds and (after discarding abnormals) in turn 84 seedlings for evaluation. The promising clone INIFAT 02 was successfully produced from this cross, despite the triploid condition of both parents, due to their residual fertility and to the *Musa* phenomenon of unreduced meiosis – or reduced though irregular meiosis