



## TACKLING BANANA WILT DISEASE IN THE DEMOCRATIC REPUBLIC OF CONGO (DRC)



Location: Minova Health Zone, DRC

*Banana wilt is a devastating bacterial disease caused by the *Xanthomonas campestris* pv. *musacearum* bacteria. The wilt dries out the male bud and causes premature ripening of the banana plant's fruits, making it impossible to consume or commercialize the product. In 2008 Action Against Hunger (ACF-USA) implemented a food security and livelihoods program to reduce wilt disease's impact and propagation.\**

### CHALLENGE

A September 2008 study determined that 95 percent of villages surveyed in the Buzi and North Mbinga groupings in the Minova health zone were affected by the banana wilt (*Xanthomonas*). On the numerous diseases infecting banana, the wilt disease is one of the most devastating. The bacteria turns the leaves of banana trees yellow, rots their fruit and eventually kills the entire tree. The disease is most commonly transmitted through vectors such as insects, infected tools—machetes, knives, and hoes—and domestic animals that graze from infected plants to healthy ones. The region was categorized based on the different rates of infection: *endemic* area (zone one), *epidemic* area (zone two) and *healthy but at risk* area (zone three). Overall, 62 percent of the villages surveyed belonged to zone one, 33 percent to zone two, and five percent to zone three.

Along with cassava, banana is one of the most important sources of agricultural income for the Minova health zone. Four varieties of banana are cultivated in the area: beer banana, cooking banana, desert banana, and plantain. In the town of Kalehe, 59 percent of the population depends to some extent on the banana crops, and 62 percent of these banana plantations were severely affected by the wilt bacterial disease. It affected the entire region, with banana production falling 25 percent in 2008. Decreased income from banana losses caused some producers to grow alternative agricultural products, including eggplant, amaranth, gourd, tomato, and soybean. Others abandoned agriculture altogether and resorted to business or mining activities. Households reported that since the disease appeared, the price of a banana bunch quadrupled from 500-1,000 Congolese Francs (Fc) (\$0.54-\$1.08) to 2,000-4,000 Fc (\$2.17-\$4.33). The disease also contributed to significant price hikes for other basic foods such as maize (up 500 percent) and beans (up 320 percent). This rise was exacerbated by the arrival of displaced populations fleeing violence in neighboring regions. Together, these factors further destabilized the region's economy, threatening livelihoods.

### RESPONSE

In 2008, as part of its food security and livelihoods program, ACF, with support from UNDP and USAID, implemented several initiatives to fight wilt disease through social mobilization and capacity building. The project objectives were threefold: popularize techniques to curb the disease's propagation; create sustainable access to healthy banana shoots; and provide livelihood support to affected households actively practicing crop protection techniques, such as clearing of infected banana plantations. Herbicides such as 2,4-Dichlorophenoxyacetic acid (2,4-D) and Glyphosate can be used to fight the disease, but are expensive to buy for farmers, and can also be very damaging for the environment and human health. The techniques employed by the project therefore focused on ecological solutions.

Specific activities were conducted:

- **Identification of problem areas and establishment of banana wilt surveillance committees:** during the pilot phase, nine severely wilt-affected villages were targeted; 144 villages were targeted in the second phase. Eighty-four surveillance committees were elected to support local mobilizers, who educated farmers about disease control, distributed healthy banana shoots, and monitored the implementation of wilt-eradication techniques.
- **Capacity-building:** surveillance committee members received training sessions on their roles and responsibilities as well as different techniques to manage the disease—how to diagnose symptoms and propagation modes. They also learned how to build disease awareness among community members.
- **Distribution of substitution seeds and clearance kits:** a social mobilization campaign was conducted to uproot diseased plants in endemic zones. In order to ensure the complete decontamination of their fields, farmers were encouraged to substitute banana plants with staple crops—beans, groundnut, maize—for at least one season. This allowed them to produce a crop—for either consumption or sale—during the mandatory six-month vegetal quarantine period, during which bacteria was eliminated from the soil. After six months, the same fields were planted again with healthy wilt-free banana shoots. Each surveillance committee received toolkits containing 20 hoes, 20 axes, 20 machetes, ten forks, and ten files, which they could lend to households with infected plants.
- **Monitoring wilt-affected plantation clearance:** regular monitoring of the uprooted fields ensured that no bacteria remained before healthy shoots were planted.
- **Production of disease-free shoots from the macro-propagation sites:** instead of purchasing and distributing healthy banana shoots, the construction of macro-propagator sites established a reliable local-level, long-term access to clean planting material. The construction of macro-propagators was done in partnership with technical organizations such as the Institut National pour l'Etude et la Recherche Agronomiques (INERA) and the Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA). These sites usually started producing healthy shoots four months after their construction.
- **Awareness campaign and training of local authorities and committee members on disease propagation modes:**

5,362 households, representing 32,172 individuals, were sensitized on banana wilt symptoms, transmission modes and eradication measures via theatre sketches organized with local theatre groups and radio programs. Regular information-sharing meetings on disease propagation modes with local authorities and leaders ensured that wilt eradication initiatives would continue after the project. Since project inception, 66 training sessions were conducted for 427 committee members and 495 local officials and leaders.



The banana macro-propagator. © Muriel Calo, ACF DR Congo

## RESULTS

- Since September 2009, 84 banana wilt surveillance committees have been formed, trained and are operating in villages with high prevalence of banana wilt disease. Each village committee established a demonstration field with clean planting material, displaying proper disease control techniques.
- Installing macro-propagators enabled farmers to quickly replant contaminated fields with healthy shoots and provided a long-term income-generating activity, making clean planting material available to affected households on a cost recovery basis.
- 783 households uprooted a total area of 177 hectares and received substitution seed kits—in total 4.2 metric tons of beans, 1.7 metric tons of maize, and 4.2 metric tons of peanuts—that resulted in approximately 136 metric tons of

harvested food crop. Households determined whether they wanted to cultivate these substitution crops for their own consumption or sale, thereby ensuring that their livelihoods were not diminished during the vegetal quarantine period.

- 36,149 healthy banana shoots were produced in the macro-propagators and transferred to 57 nurseries for acclimatization.
- Sensitization of local officials and affected households has increased farmers' responsiveness to disease appearance. Awareness-building activities on disease-fighting techniques contributed to behavior change, showing farmers that they do not need to abandon banana production and other agricultural activities because of the wilt bacteria. Planting substitution crops during the quarantine period incentivized farmers, demonstrating that livelihoods would not be greatly affected during the treatment period.
- Since banana trees prevent soil erosion by limiting water streaming and reducing topsoil and mineral element loss, efforts to control wilt virus also protect the local agro-ecosystem.
- The intervention is expected to have lasting returns: in total, the program is expected to generate roughly \$1.62 million in increased income for vulnerable populations through 2014.

\* This case study is based on ACF internal reports, including a consultancy by Dr. Ir. Ndungo Vigheri conducted in September 2008 (unpublished).

This case study was produced by the Oakland Institute. It is copublished by the Oakland Institute and the Alliance for Food Sovereignty in Africa (AFSA). A full set of case studies can be found at [www.oaklandinstitute.org](http://www.oaklandinstitute.org) and [www.afsafrica.org](http://www.afsafrica.org).

**FRONT PAGE PHOTO:**

The banana wilt surveillance committee. © ACF DR Congo

“It’s good they are setting up village committees and teaching them to manage these sites themselves so these actions can continue after the project ends.”

—Bushu Kaoma, a farmer in the village of Nyabyuka



Healthy banana shoots in the macro-propagator.  
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[info@actionagainsthunger.org](mailto:info@actionagainsthunger.org)