ICT4BXW

Combatting Banana Disease Through Digital Innovation

Combatting Banana Disease **Through Digital Innovation**

RAB
RWANDA

IITA
Transforming African Agriculture

viamo

IAMO
Leibniz Institute of Agricultural Development
in Transition Economies

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Introduction

The ICT4BXW Project Team, co-led by the International Institute of Tropical Agriculture (IITA) and Rwanda Agriculture and Animal Resources Development Board (RAB) introduced the use of digital and non-digital tools to mitigate the Banana Xanthomonas Wilt (BXW) disease, which is the most devastating disease for Banana plants in Rwanda.

The project developed and validated a smartphone-based tool, the BXW App, and non-digital tools including the Unstructured Supplementary Service data (USSD), Interactive Voice Response (IVR), Short Message Service (SMS), and chatbot, which is a computer program that simulates human conversation through voice commands, text chats or both. This was achieved with various stakeholders and partners, including Farmer Promoters and RAB Banana Team.

BXW App was developed with multiple functions such as information about BXW threat, stepwise module for standardized diagnosis of BXW incidence, and best practices on management and control of the disease.

Scale up the use of digital and non-digital tools
in Rwandan agriculture

Following the successful co-validation of the tools, the ICT4BXW project progressed into its second phase of implementation (2021-2023). The goal of this phase is to disseminate the BXW App and other tools nationally, and to diversify the reach of the multiple functions that the tool conveys, in digital and non-digital forms. This phase also aims to reach up to 250,000 farmers and extension delivery personnel (including Farmer Promoters) across the country, empowering them with relevant decision-support knowledge and tools to control the BXW disease and implementing best banana management practices.

In order to encourage the use of the BXW App and other tools (such as the Extension Remote Training, and the Banana Agronomy Guide), RAB and IITA equipped 140 farmer promoters and RAB Technicians with smartphones. RAB and IITA also provided trainings, with the intent that this cohort would inspire and mentor their peers, (and farmers) for broader adoption of the tools.

This cohort of farmer promoters, designated as "Scaling Champions", were selected across 25 districts of Rwanda, based on a systematic survey that assessed existing basic digital skills such as the use of smartphone and level of literacy.
Prior to receiving smartphones, the Scaling Champions were trained on the use of the BXW App to understand their critical role as mentors for their peers, designated as Scaling Enablers, with a major responsibility towards banana farmers within their respective villages.

Each Scaling Champion was assigned to between 7 to 9 Scaling Enablers. They train and mentor them on the use of the BXW App in their banana farming and report every month on the progress of activities, including the number of farmers assisted in using the BXW App for diagnosis and surveillance of BXW disease in their banana fields. The report is automatically channeled into RAB's system to support policy engagement and decision-making, and improve banana farming in Rwanda.

Additionally, the Scaling Champions were engaged, and they will be progressively incentivized for 9 months, to facilitate their support for Scaling Enablers and farmers within their respective villages.

THIS PHASE AIMS TO REACH UP TO
250,000 FARMERS

ICT4BXW

Strengthening capacities
of stakeholders for broader
dissemination and sustainability

IITA trained six RAB research technicians in the banana program and 140 Scaling Champions on banana agronomy and the use of digital tools to diagnose and control Banana Xanthomonas wilt in farmers' fields across the country. Their main responsibilities are to follow up and provide agronomic advisory to farmers in their areas of intervention, in close collaboration with farmer promotors and sector agronomists.

The training was organized to empower RAB technicians and Scaling Champions with skills to use the BXW App (Android application), and different tools (USSD/IVR/SMS/chart-boot). The goal was to support them on the control and surveillance of the BXW disease, and to implement best banana management practices.

Banana farmers in Kayonza District installing BXW App in their smartphones
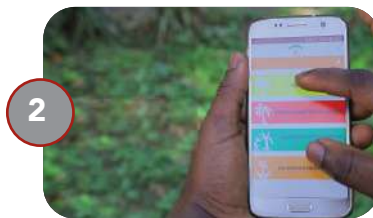
HOW DOES BXW APP WORK

1

AS A FARMER PROMOTER
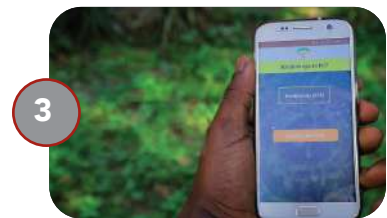YOU FIRST LOG IN WITH YOUR UPI

XXXXXXXXXXX

2
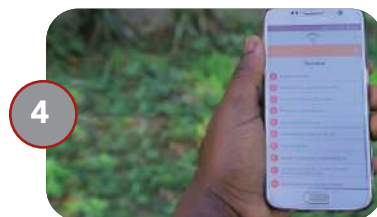
THEN YOU REACH THE
MAIN MENU
If you click on the first item you will get information on what BXW is

3

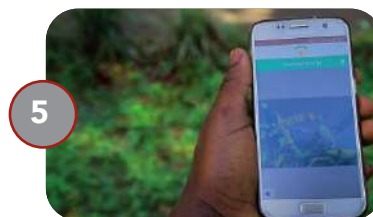THEN YOU REACH THE
MAIN MENU
If you click on the first item you will get information on what BXW is

4

MAIN MENU
If you click on the second item you will get access to the diagnostic procedure
This is what you use to collect data and perform a diagnosis of a banana plant

5

MAIN MENU
If you click on the third item you will get information on how to prevent and control BXW


6

MAIN MENU
If you click on the last item you will find tips on agronomic practices for banana

What happened to
non-smartphone users?

The project took into consideration the fact that up to 60% of farmers in Rwanda use basic phones, and are thus unable to access digital tools including the BXW_App.

The project used 845 service to cater for non-smartphone users. The 845 service has all the required information that farmers need to implement the best agronomic practices for banana crop management.

60%
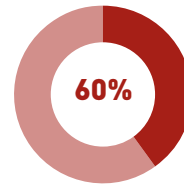
60% OF FARMERS IN RWANDA USE BASIC PHONES, THUS ARE NOT ABLE TO ACCESS DIGITAL TOOLS INCLUDING BXW_APP.

845 SERVICE AND CONTENT
CO-CREATION WORKSHOP

A content co-creation workshop was organised, and led by Viamo, to revise and update banana agronomic information which are disseminated through the 845 service.

The workshop brought together all partners of the project including RAB, IITA, and Viamo, to agree on the information that farmers need to acquire about the banana crop. The 845 service was equipped with relevant information on the effects of the BXW diseases on banana plants, causes and effects; and how to prevent and control them.

During the workshop, the team drafted all the required messages to feature within the 845 service.

A search engine where there is no Internet

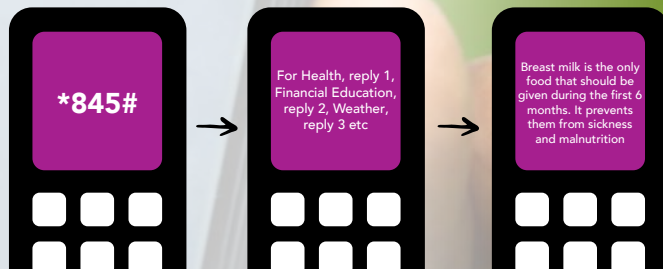**845**

1   2   3   4   5   6   7   8
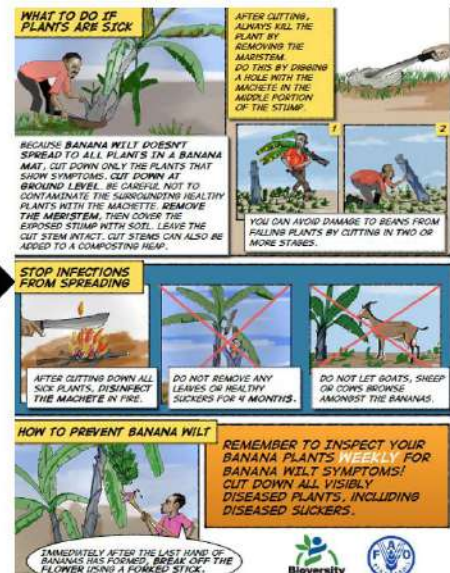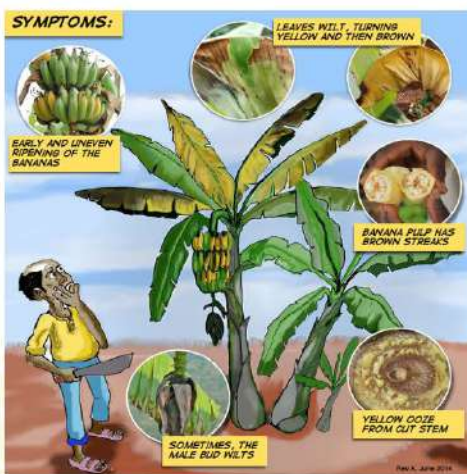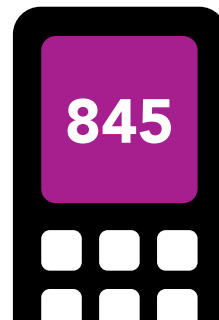
The 8-4-5 Service is a toll-free, automated hotline that was created in partnership with MTN Rwanda. It delivers information on a wide range of development topics in Kinyarwanda on even the simplest of phones in Rwanda, using interactive voice response (IVR) and USSD. Each month, eight calls are available free of charge on IVR and unlimited free interactions on USSD (*845#). It is an on-demand service, which means that callers can dial 845 at their convenience. Once they call, a series of 'listen and choose' steps identify the information they need - for example: «Welcome to the 8-4-5 Service. For legal aid press 1, for health press 2. For Agriculture press 3.»
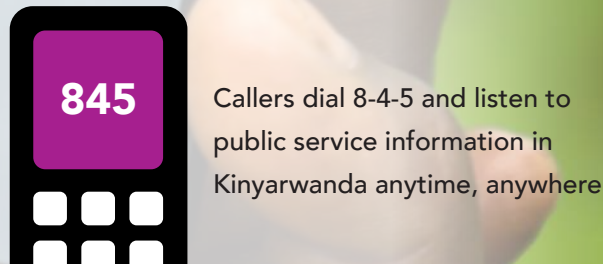
The service is available across Rwanda and is extremely popular. In September 2021, more than 400,000 people called 8-4-5 to listen to more than 3.5 million key messages. As of October 2021, 1.45 million individuals have called 8-4-5 this year, and more than 200,000 people identified as Farmers. This makes Viamo uniquely placed to reach a large number of people in Rwanda with positive messages and information at no cost to the end user.

Messages on the management and prevention of the banana disease have been developed in partnership with RAB and IITA and are now being hosted on 8-4-5, allowing free and open access to banana farmers at their own convenience.

How does 8-4-5 work via USSD ?

*845# → For Health, reply 1, Financial Education, reply 2, Weather, reply 3 etc → Breast milk is the only food that should be given during the first 6 months. It prevents them from sickness and malnutrition

How does 8-4-5 work via voice ?

845   Callers dial 8-4-5 and listen to public service information in Kinyarwanda anytime, anywhere

400,000 PEOPLE
CALLED TO LISTEN TO MORE THAN 3.5 MILLION KEY MESSAGES ON 8-4-5

1.45 MILLION INDIVIDUALS
INDIVIDUALS HAVE CALLED 8-4-5 THIS YEAR, AS OF OCTOBER 2021

200,000 PEOPLE
PEOPLE IDENTIFY AS FARMERS. THIS MAKES VIAMO UNIQUELY PLACED TO REACH LARGE NUMBERS OF PEOPLE
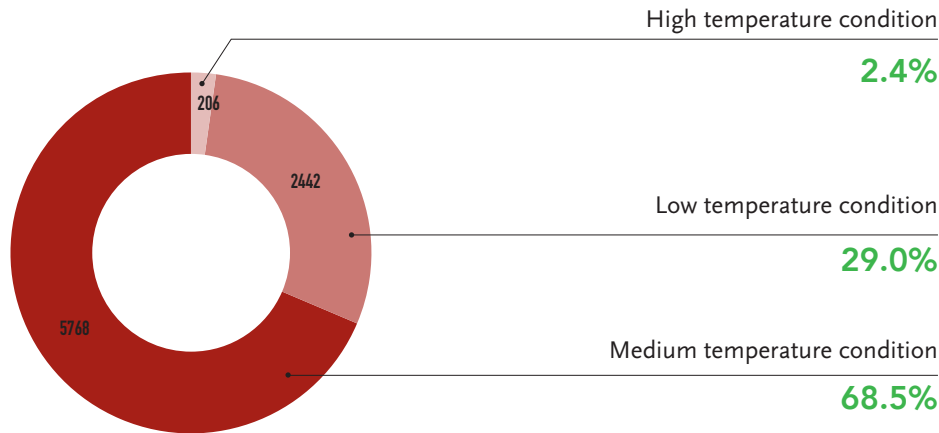
Baseline survey
results

The ICT4BXW project, through its partner Viamo, conducted a survey to assess the knowledge of banana farmers on banana agronomy and BXW disease in Rwanda. The study would contribute to future project's interventions and plan the scaling tools based on the end users' existing knowledge on banana agronomy, as well as their preferred communication channels.

More than 12,000 farmers participated in the survey, 8,981 of which are banana farmers

The survey comprised of six questions on banana agronomy, existing and expected skills, using the ICT4BXW digital tool (BXW App) and non-digital tools (Remote training, IVR, USSD, Chatbot).

68.5% of banana farmers responded that medium temperature condition is optimal for banana plantation.

High temperature condition

2.4%

Low temperature condition

29.0%

Medium temperature condition

68.5%

*Furthermore, more than 89% of banana farmers said that BXW disease is the most severe disease that affects banana production in Rwanda*

Black/yellow leaf spot (Sigatoka disease)

3.7%

Banana Streak Virus

6.8%

BXW

89.6%
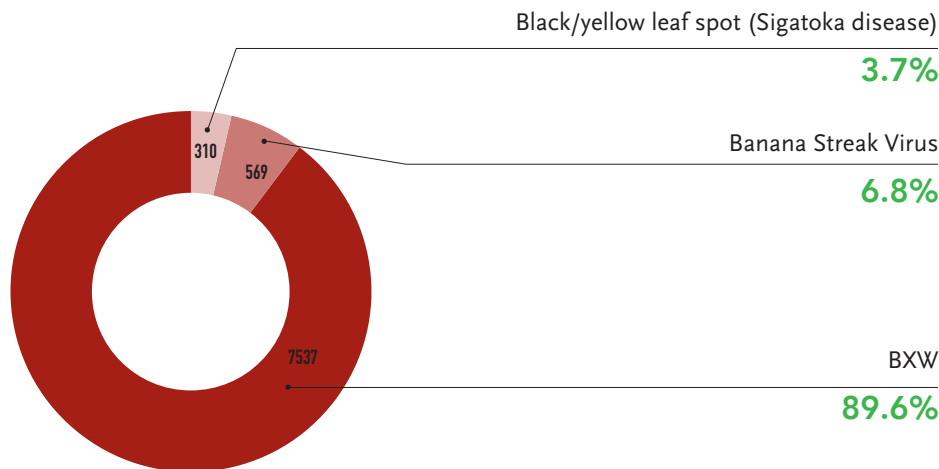
Among the banana farmers who responded to the survey questions, up to 87% agreed that digital tools could help farmers increase productivity.

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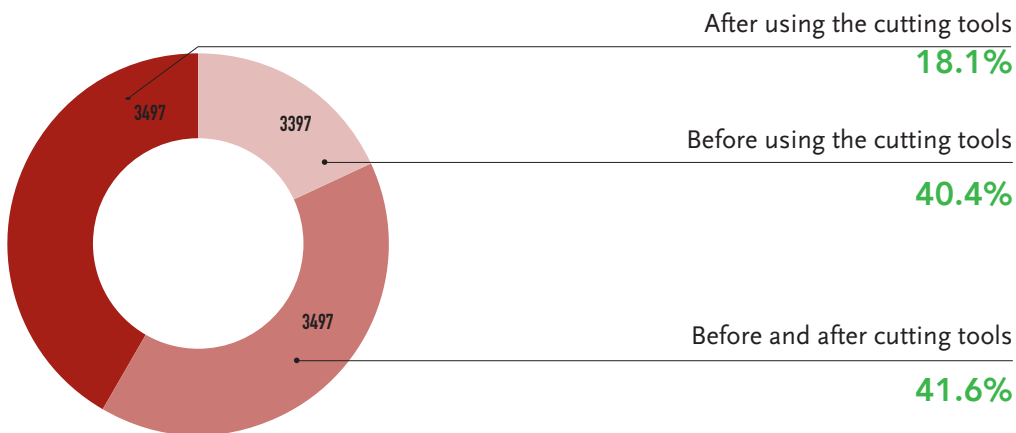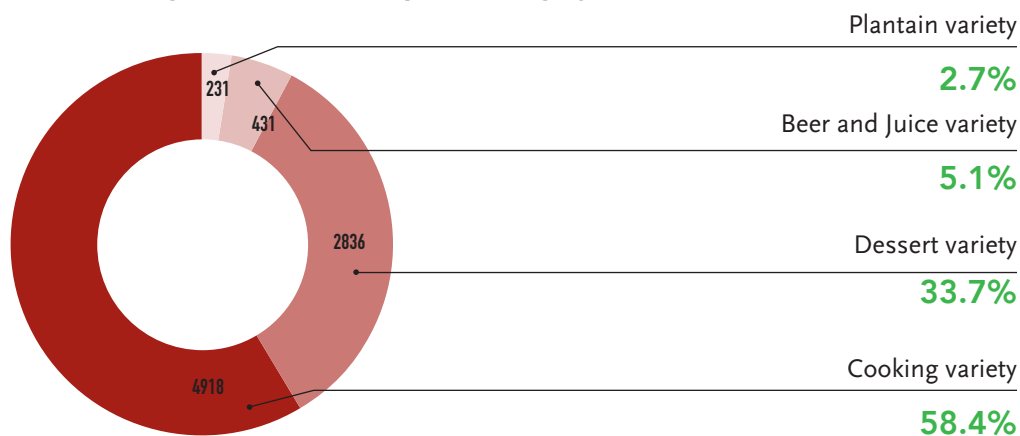Combating Banana Disease Through
Digital Innovation
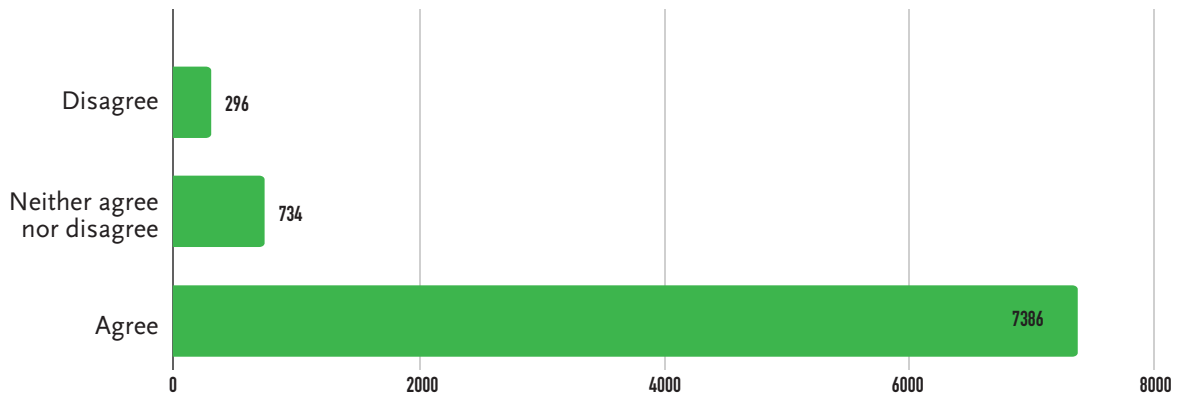
7,386 (87.76%) of the banana farmers agreed that digital tools can help farmers increase productivity

The study revealed that up to 60% of banana farmers were not aware of the adequate time for disinfecting cutting tools to avoid the spread of BXW disease. Moreover, 41% were not aware that the cooking variety of banana produces high yields.

It is important to disinfect cutting tools to avoid the of BXW control. When should the disinfecting be done? (N=8,416)

After using the cutting tools
18.1%

Before using the cutting tools
40.4%

Before and after cutting tools
41.6%

The following banana varieties produce high yields? (N=8,416)

Plantain variety
2.7%

Beer and Juice variety
5.1%

Dessert variety
33.7%

Cooking variety
58.4%

Project Focal
Points

DR SVETLANA
GAIDASHOVA

Svetlana Gaidashova is the RAB focal point for the ICT4BXW project. RAB is a key partner in the project baseline survey, GIS field diagnostic activities, coordination of the SDSR demonstration sites, and liaison with Government policy actors. Svetlana is also engaged in participatory gender research throughout the project to ensure the ICT application and its feedback system will be gender-sensitive with regard to decision-making on BXW control. Svetlana has a strong research background in crop variety selection and banana pests and diseases. She holds a PhD in Crop Science from the Belgian Catholic University of Louvain-laNeuve, and a MSc and BSc in Biological Sciences from the Moscow Lomonosov State University, in Russia. She has subsequently published well over 25 research papers, many as a first author.
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CHARLES
MWIZERWA

Charles Mwizerwa is a Field Scaling Specialist at International Institute of Tropical Agriculture (IITA) in Kigali, Rwanda. He holds a First Class Honours (BSc) in Soil Sciences department from University of Rwanda. He is ODK forms programmer and supports digital tools development and implementation. He provides hand-on support for overall implementation of the ICT4BXW project, including design, planning and implementing field surveys, supervisor of enumerators and engagement with different stakeholders in the Country. Charles made significant contributions to the translation of the digital content of the BXW tool into local language (Kinyarwanda) in text, voice, and illustrated formats. In addition, he has been instrumental in the training of next and end users (farmer promoters, sector and district agronomists, and RAB technicians), in support of capacity building for the use of BXW App and 845 service for the control and prevention (surveillance system) of Banana Xanthomonas Wilt in Rwanda.
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