



Rwanda pioneers rapid responses to crop diseases

Nicolas Uwitonze, Egidie Niyonsaba, Callixte Gatali and Eric Boa

Summary

For millions of Rwandan farmers crop pests and diseases are a constant threat. The Rwanda Agriculture Bureau (RAB) and Plantwise have worked together since 2011 to alert farmers to risks and provide effective solutions. Quick and decisive action is needed to prevent major losses from diseases such as banana xanthomonas wilt, cassava viruses and maize lethal necrosis disease. Plant clinics across the country give regular advice at fixed locations to farmers, but this is not enough. Plant health rallies aim to take a more proactive approach, targeting specific pests and diseases and moving rapidly through rural communities to raise awareness of threats in short public events. This brief explains what the rallies have achieved in Rwanda, and draws on recent research by the University of Rwanda (UoR), supported by Plantwise, on extension campaigns.

Key highlights

- RAB, with Plantwise support, held 52 plant health rallies (PHR) from November 2013 to June 2014 in nine districts. The majority of PHRs (37) were on maize lethal necrosis disease (MLND). Working closely with local extension officers, RAB used the PHRs to raise awareness of MLND within months of it being confirmed at a plant health clinic in Byangabo, Northern province.
- The PHRs on MLND carefully targeted major maize areas. Venues included markets, village centres and road junctions where people awaited transport. Lasting around an hour and following a practiced routine, the MLND rallies attracted 3,471 people. Some audiences were 'mobilized' through prior publicity, others were encountered on the day. PHR teams held up to 23 rallies (in different villages) over a two day period.
- Farmers were given key facts about the selected topic in a short, broadcast introduction before the rally team discussed each topic in small groups. Fact sheets were distributed and nearby plant clinics pointed out.

- The PHR teams appreciated the more rapid and flexible way of delivering key messages to farmers over large areas compared to farm visits and group meetings. Some rally venues were more challenging than others because of competing events and noise. Farmers frequently wanted to know about other crop diseases and other topics and rally members were frustrated they couldn't address these more fully.
- Awareness of rallies outside RAB was relatively low. Only 19% of extension providers interviewed in the UoR study were familiar with PHRs.
- The same study found that extension campaigns generally were poorly coordinated, thus limiting the scope for creating synergies and optimising the use of existing capacities and resources.
- Building partnerships and strengthening those existing could be the first step in enhancing complementarity among extension providers, eliminating duplication of activities and harmonising extension approaches. The opportunities for creating synergies and stronger vigilance–response mechanisms are many.

Crop disease threats

Rwanda's agricultural sector is responsible for about one-third of the country's gross domestic product and employs 80% of the population, mostly subsistence farmers. Increasing agricultural production is key for poverty reduction and economic growth.

Diseases such as banana xanthomonas wilt, cassava brown streak virus, cassava mosaic virus and maize lethal necrosis disease (MLND) are major threats to agricultural progress. These diseases have become widespread in the country (see Tables 1 and 2) and are considered a threat to food security and exports. In 2015, for example, cassava virus diseases were so severe that the Prime Minister of Rwanda, Mr Anastase Murekezi, called for the collaboration of local governments and their partners to jointly tackle these threats.

Table 1. Short survey of major plant diseases present in farmers' fields (UoR study)

Problem	Farmers	Present
Banana xanthomonas wilt	188	88%
Cassava brown streak virus	92	90%
Cassava mosaic virus	103	90%
Maize lethal necrosis	116	70%

Table 2. Impact of major plant diseases as estimated by farmers (422 respondents)

Problem	Level of impact		
	High	Medium	Low
Banana xanthomonas wilt	55%	17%	28%
Cassava brown streak virus	45%	20%	35%
Cassava mosaic virus	40%	33%	27%
Maize lethal necrosis	43%	30%	28%

Seeking synergies to enhance extension response

The government and its partners are working to deliver quicker responses to crop problems. In 2011, CABI's Plantwise programme and Rwanda Agriculture Board (RAB) started working together on the establishment of plant clinics as a means to improve plant health advisory services for farmers. So far, 65 plant clinics have been established and 182 plant doctors trained.

In 2013, RAB staff were trained on how to run plant health rallies (PHR) for rural communities, to complement the services provided to individual farmers by plant clinics. PHRs were valued by RAB staff for their ability to reach many farmers over wider areas than plant clinics, delivering short messages to raise awareness of new as well as existing threats. PHRs are particularly suitable to the delivery of urgent messages on damaging plant diseases. This quality and the need for efficiency in

the use of the limited extension workforce in Rwanda (1,460 farms per extension agent in 2012) were the reasons the rallies were introduced.



A farmer in the Nyagatove model village showing cassava infected with cassava mosaic virus.

The potential of plant clinics and rallies to contribute to disease surveillance and prompt extension responses was demonstrated in 2013, when maize lethal necrosis disease (MLND) was first reported by the Byangabo plant clinic in the north (Adams et al., 2014). The discovery led to the establishment of a national MLND taskforce under RAB to coordinate actions for the management of a disease that can wipe out whole fields (Rurangwa, 2015). Short campaigns (based on PHRs) to raise awareness of this new disease were quickly put in place.

In 2014, the University of Rwanda carried out a study of extension campaigns, including plant health rallies, to find out what they had achieved and how the different extension services can respond better to address farmers' needs for good advice. A total of 500 small-scale farmers and 37 extension providers in five provinces were interviewed.

Plant health rallies

PHRs are based on a mass extension approach known as Going Public first used in Bolivia in 2001 (Bentley et al., 2003). They are intended to reach farmers in public places where they normally meet, such as markets, with tailored information on one topic, often on a severe pest or disease. The rally begins with a short explanation on the topic followed by questions from farmers and distribution of fact sheets with validated recommendations on how to manage the pest or disease. After that, the rally team moves on to the next location.

Fifty-two rallies were held in nine districts over five separate days from November 2013 to June 2014, reaching 4,652 farmers. Audiences ranged from 22 to 350 people, with most having 50-100 present. Thirty-seven of the rallies focused on MLND, reaching a total of 3,471 farmers including children (Table 3). Overall, 43% of the participants were female.

The PHR teams appreciated the more rapid and flexible way of delivering key messages to farmers over large areas compared to farm visits and group meetings. The rallies were found to have a friendly atmosphere and the use of the farmers' language by the extension staff encouraged farmers to ask questions. Some adaptations of the rally method were made during the implementation. For example, some audiences were 'mobilized' through prior publicity to guarantee numbers attending and held away from markets.

Table 3. Plant health rallies on maize lethal necrosis disease held over five days in the period Nov 2013 to June 2014.

District	PHRs	Participants		
		Male	Female	Total
Gicumbi	1	25	16	41
Karongi	8	618	473	1,091
Musanze	1	38	19	57
Ngororero	7	250	193	443
Nyabihu	1	30	13	43
Rubavu	12	477	450	927
Rutsiro	7	527	342	869
Total	37	1,965	1,506	3,471

The study found that the rallies alone do not fully address farmers' concerns. Farmers frequently wanted to know about other crop diseases and other topics and rally members were frustrated they couldn't address these more fully. For example, in some rallies where MLND was the topic, farmers also had questions about cassava mosaic virus and other problems that they considered important. This confirms that complementary extension approaches are needed to meet the vast demand for plant health advice.

Awareness of rallies outside RAB was relatively low. Only 19% of extension providers interviewed in the study were familiar with PHRs.

Extension service providers

The Rwanda government is the main provider of extension services, working mostly through district and sector agronomists with support from RAB. Nongovernmental organisations (NGOs) come second. Farmer field schools constitute the most prominent approach, followed by field demonstrations and farmer promoters. Mass extension campaigns are used on a needs basis.

Although there are many institutions providing extension services to farmers, coordination is lacking, even among government agencies. There was no linkage found between PHRs/ plant clinics and other extension approaches. Coordination of extension activities is restricted by the way extension providers work. Organisations tend to work separately with each their own funding, preferred extension approaches, planning and reporting mechanism. Little is known about how they interact with each other and RAB on priority plant diseases. This makes it difficult to optimise the use of existing capacity and resources and hinders the creation of synergies within the extension system.



Farmer field school participants.

Way forward

Plant diseases and pests persist in Rwanda and their impact remains high despite the many extension efforts. New strategies are needed. Building partnerships and strengthening those existing among extension providers could be the first step in enhancing complementarity, eliminating duplication of activities and harmonising extension approaches.

A new disease might first come to attention through a plant clinic as was the case with maize lethal necrosis; or the importance of a problem be confirmed by the numbers of farmers requesting advice on it and subsequently become the subject of rallies and other extension efforts, as happened with banana xanthomonas wilt. Conversely, plant clinics can be the place for farmers to go for extra help on a problem covered during a rally or a field demonstration. Farmer field schools can be used for testing and validating management practices to control key pests identified at a plant clinic. The opportunities for creating synergies and stronger vigilance–response mechanisms are many.

Plant clinics, PHRs and other extension approaches each have their advantages, but they need to be better linked to increase the responsiveness of extension services to farmers' needs and constraints.

References

Adams, I.P. et al. (2014). First report of maize lethal necrosis disease in Rwanda. *New Disease Reports* 29, 22.

Bentley, J.W., Boa, E., van Mele, P., Almanza, J., Vasquez, D., Eguino, S. (2003). Going Public: A new extension method. *International Journal of Agricultural Sustainability* 1(2), 108-123.

Rurangwa J.-L. (2015). Maize crop stakeholders' training on maize lethal necrosis (MLN) and its management. Rwanda Agriculture Board ([http://rab.gov.rw/about-rab/news-Details/?tx_ttnews\[tt_news\]=65&cHash=c06e68afc3c0941bb65cc9063caad91b](http://rab.gov.rw/about-rab/news-Details/?tx_ttnews[tt_news]=65&cHash=c06e68afc3c0941bb65cc9063caad91b))

Uwitonze, N., Niyonsaba, E., Gatali, C., Boa, E. (2015). Mass Extension in Rwanda and Plant Diseases. Plantwise internship report.

Acknowledgements

CABI is an international intergovernmental organisation, and we gratefully acknowledge the core financial support from our member countries (and lead agencies) including the United Kingdom (Department for International Development), China (Chinese Ministry of Agriculture), Australia (Australian Centre for International Agricultural Research), Canada (Agriculture and Agri-Food Canada), Netherlands (Directorate-General for International Cooperation), and Switzerland (Swiss Agency for Development and Cooperation).

Project donors

Plantwise is supported by:



Project partners



Authors

Nicolas Uwitonze, Egidie Niyonsaba, Callixte Gatali and Eric Boa

Technical Writer: Kellen Kebaara

Editorial Coordinator: Solveig Danielsen

How to cite this paper

Uwitonze, N., Niyonsaba, E., Gatali, C., Boa, E. 2016. Rwanda pioneers rapid responses to crop diseases. CABI Study Brief 11. DOI: <https://dx.doi.org/10.1079/CABICOMM-62-8115>