



Knowledge

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Farmer innovations in Rwanda: Cassava scientists and farmers combine knowlegde Management of Cassava mosaic disease by farmers in Gahara sector, Kirehe district in Eastern province of Rwanda by *Rose Njeru and Gervis Gashaka*



African *cassava mosaic disease* (CMD) is caused by geminiviruses. The viruses are transmitted by whiteflies (*Bemisia tabaci*) and perpetuated by use of infected cuttings. Most of the landraces are susceptible to the disease causing agents. The most sustainable and cost effective management of CMD, has been to introduce improved cassava cultivars with varying levels of inbuilt mechanisms to resist the virus. Improved varieties are characterized by restriction of disease symptoms (manifestation). In collaboration with the farmers, Institut des Sciences Agronomiques du Rwanda (ISAR) scientists are investigating appropriate practical approaches to manage CMD. The high disease pressure and short supply of introduced varieties have been a challenge and has accelerated innovation by

cassava farmers in Gahara sector, Kirehe district in Eastern province of Rwanda.

Case study 1

Over the years, farmers in Gahara sector have observed that in a diseased plant, some shoots remain healthy and do not develop CMD symptoms. Therefore, to reduce disease incidence farmers have been cutting back diseased shoots. They have also observed that when diseased shoots are cut back the sprouts are often disease free. Through this approach, farmers have exploited the genetic traits of landraces which also possess consumer preferred organoleptic properties to sustainably manage CMD, the most devastating disease of cassava in the African continent.

Scientific evidence to support the practice

Cutting back diseased shoots eliminates source of the virus, thus whiteflies cannot spread the disease to healthy plants. There is also documented evidence that some cassava varieties do not seem to be infected systemically. The possibility exists to obtain healthy cuttings and there is also an element of recovery (Fargette et al., 1996; Thresh et al., 1994). Together with the farmers, scientist will embark on screening landraces for resistance to CMD.

Case study 2

Response of cassava varieties to cassava mosaic disease

The farmers in Gahara sector, Kirehe district in Eastern province of Rwanda grow a wide range of cassava cultivars. They have observed that the manifestation of CMD varies with soil conditions. Based on their innovations, farmers in Gahara have articulated their research demand: in collaboration with the local scientists, they want to evaluate improved cassava cultivars and identify those most suited to their local conditions.

Scientific evidence to support the practice

There is documented evidence that factors responsible for disease manifestation include cultivar characteristics, soil conditions and temperature (Hillocks, 2000; Fargette et al, 1996).

Case study 3

Effect of cassava re-growth on tuber quality

For the management of CMD, researchers supplied limited number of cuttings of disease resistant cassava cultivars to Non-Governmental Organisations (NGOs) for multiplication and release to farmers. By the time plants are mature for harvesting cuttings, they have also formed tubers. The goal of the multiplication is to quickly provide maximum number of cuttings and entails leaving tubers underground to support re-growth (established plants grow fast in subsequent seasons). It is logical to harvest tubers after the first harvest of cuttings, and to accommodate this, the NGOs recommend: harvest cuttings, wait for a few months for shoot re-growth and then harvest tubers. Farmers in Gahara sector found out that leaving tubers underground long after re-growth renders tubers tasteless (because stored sugars are used for new growth). The farmers are experimenting on the appropriate period for optimal cutting yield and tuber quality. When fully developed, the technology will be promoted so as to enhance multiplication of cuttings.

These collaborations based on farmer innovations are bound to shape the future of cassava research for development.

Figure: Some members of Gahara sector and ISAR scientist observe yellowing (characteristic Symptom of Cassava Mosaic Disease) on landrace Gitamisi (foreground). Note healthy improved cassava cultivar in the background.

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