



DIGITAL INNOVATION TO PROTECT COLOMBIAN COFFEE FARMS AND FARMERS

Locations Colombia

Dates 31/05/2019 - 31/03/2026

Summary

The coffee berry borer (CBB) is the most serious coffee pest worldwide, causing crop damage in excess of \$US500 million, annually. In Colombia, 75% of coffee crops are affected by this pest. It directly damages coffee beans, destroying their taste and making them unsaleable. Climate change is exacerbating the problem because it enables the wider spread of CBB, especially at higher altitudes. To overcome losses, the trend amongst farmers is to intensify their activities and expand growing areas. CABI and partners are producing an alert system that uses climatic data and remote sensing technology to give farmers advance warnings of CBB surges, allowing them time to access and apply controls effectively. The project will also focus on overcoming gender disparities in coffee farming due to reduced participation by women.

The problem

Coffee berry borer (CBB) (*Hypothenemus hampei*) is devastating coffee crops in Colombia and destroying farmers' livelihoods, many of whom are smallholders. With 75% of coffee crops affected by CBB in Colombia, worldwide, the pest is causing more than \$US500 million worth of damage each year.

Previously confined to coffee grown below 1500m altitude, CBB has now spread upwards as climate change creates warmer and wetter conditions – perfect for the CBB, but worse for the arabica coffee grown in Colombia.

The trend amongst farmers is to intensify their activities to escape the pest, clearing natural borders to make fields bigger, or moving upwards and clearing native forests to create new fields. But it's not working, nor is it sustainable. It is damaging the environment and causing deforestation. There is also an increase in the frequency of chemical pesticide sprays used by farmers, meaning that on the farms, families and children are exposed to more poisons. Furthermore, women farmers' participation in coffee farming is reduced due to a lack of access to information and on-farm decision-making control to tackle the CBB and adapt to climate change impacts. The farmers need help.

Biopesticides for CBB do exist and will safely kill the pest. But farmers are reluctant to use them because they are perceived to be ineffective and slow-acting. The actual problem is that biopesticides are often applied at the wrong time to be most effective.

What we are doing

The project aims to produce an alert system that uses climatic data and remote sensing technology. The alert system will give advance warnings to farmers of CBB surges, allowing them time to access and apply controls effectively. Once built, the aim will be to scale out the system further into coffee growing regions of Colombia.

To help overcome gender disparities in coffee farming, women farmers will be integral to the project. The project will focus on helping to increase their participation, make them more central in the decision-making for CBB control and increase their awareness of the dangers of insecticide on their farms. It will provide access to critical information and ensure that those involved become aware of the alert system, its value and the need to move towards cleaner, safer, more sustainable methods of controlling crop pests.

The project will be completed across two phases. Phase one will produce the alert system using climatic data and remote sensing technology. CABI will also profile biopesticides and relay them into the alert system to further advance the farmers' abilities to select the right product, at the right time.

Phase two will focus on validating the CBB alert system and testing the implementation of the biopesticides during call-to-action windows. The aim will then be to scale out the alert system further.

Results so far

Phase one of the project is complete. A prototype model has been developed based on crop phenology, pest behaviour and environmental parameters.

Project partners captured data, such as temperature, relative humidity, CBB numbers and berry maturity, from coffee fields, using remote sensing technologies and in-person analysis with farmers.

This approach will enable geographical scaling-out of the CBB alert system and can inform climate-smart coffee farming practices. Under different climatic conditions, in CABI's labs, CABI scientists identified the best conditions for the growth of the CBB biopesticide (a living fungus), which will feed into the alert system and tailored to biological control.

Women farmers were integral to the project with the aim of increasing their decision-making and access to information, helping to overcome gender disparities in coffee farming. Analysis of the barriers to more gender-equitable coffee farming was carried out, resulting in recommendations for practice changes. CABI and its project partners aim to integrate these into phase two of the project in Colombia.

Phase two is now underway.

Donors	Darwin Initiative (Phase 2), Prosperity Fund Colombia: Agri-Tech Catalyst Challenge Project; administered by Innovate UK (Phase 1)
Partners	Assimila, UK (Phase 1 and 2), Cafexport (Fundación Local Partners), Colombia (Phase 1 and 2), Climate Edge, UK (Phase 1)
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