

Tools and Technologies for Broad-Scale Disease Surveillance of Crop Plants in Low-Income Countries with Bill Gates Foundation

The challenges

The goal of this challenge was to solicit innovative tools and technologies for crop pests and disease surveillance over large geographic regions in low-income countries. The Gates Foundation were looking for tools and approaches that have the potential to transform crop pest and disease surveillance globally, with a focus on low-income countries. It's hard to believe that a small worm could destroy millions – millions of tons of crop yields, millions of dollars in farm income, and millions of tons of food for families. The Fall Armyworm (FAW), an invasive pest spread quickly across the African continent. Originally from the Americas, FAW was first reported in West Africa in early 2016 and now seriously threatens food supplies across the continent.

The pest has a catastrophic combination of traits. It travels fast (at up to 1,600 kilometers in 30 hours). It loves maize, a staple food crop in Africa (as well as 80 other plant species), and it's active at night and burrows into plants, making it hard to spot and treat. FAW has now been identified in well over 40 African countries, and agriculture experts estimate the pest could cause losses of up to 20 million metric tons of maize in just 12 African maize producing countries annually.

To avoid such losses, it is imperative to get information into the hands of farmers so they can properly identify and manage FAW. However, given the rapid spread, and, the lack of precedent on the African continent, it has been challenging to get up-to-date and accurate information on the pest.



The actors

Alta Robotics

Description

Alta Robotics offers software solutions based on artificial intelligence for the benefit of precision agriculture. Alta's AI technology allows farmers to quickly identify problem areas with their land so they can apply the software's recommendations, identify the best crops for soil composition, and increase crop yields. Our products are destined for agricultural research centres or agricultural cooperatives.

Role

- Working as an effective member of a project team, exhibiting strong communication skills and ability to work collaboratively within a multi-disciplinary team
- Writing compelling grant funding applications which demonstrate the innovative aspects of the projects, and demonstrate a strong underlying business case
- Application of advanced problem solving skills and critical thinking to assist with project execution and delivery to ensure grant applications are submitted to often tight deadlines

The Bassiouni Group

Description

TBG Consulting provides a range of consulting and advisory services for corporations, institutions, INGOs, development agencies, governments. We focus our services in OECD and Emerging Markets in ASEAN, Central Asia, Sub-Saharan Africa and MENA.

With a global network of more than 500 experts in over 150 countries, TBG works selectively with the best international professionals who are sensitive to diversity and cultural context. Our experts have worked with international as well as local/regional organizations, including government ministries, INGOs, development agencies and banks, and, SMEs and global corporations.

Role

- Providing strategic counsel and introducing to senior leaders and decision-makers in government, INGOs and the corporate world
- Developing turnkey solutions for time-sensitive challenges and high-threat issues to ensure rapid response and governmental, business and civic continuity
- Provide the necessary research and analytical support
- Apply quantitative methods and techniques to manage and analyze research data
- Construct and document large datasets for both internal and project-related use
- Manage administrative aspects of all research projects
- Support the preparation of technical procedures and reports

- Write, compile, and edit assigned portions of project reports
- Review work products to ensure quality and consistency of content



The solutions

Context

The solution that we provided for this challenge was in two main parts: the first one was the pest detection and the second was the treatment of the field infected.

Through the contact of the Bassiouni Group we have an opportunity to work in a farm in Ghana in West Africa. This farm is a cocoa plantation where the fall armyworm infected many crops. By introducing the local authorities in order to work in the test farm for our technical product the Bassiouni Group acted as an international public agency.

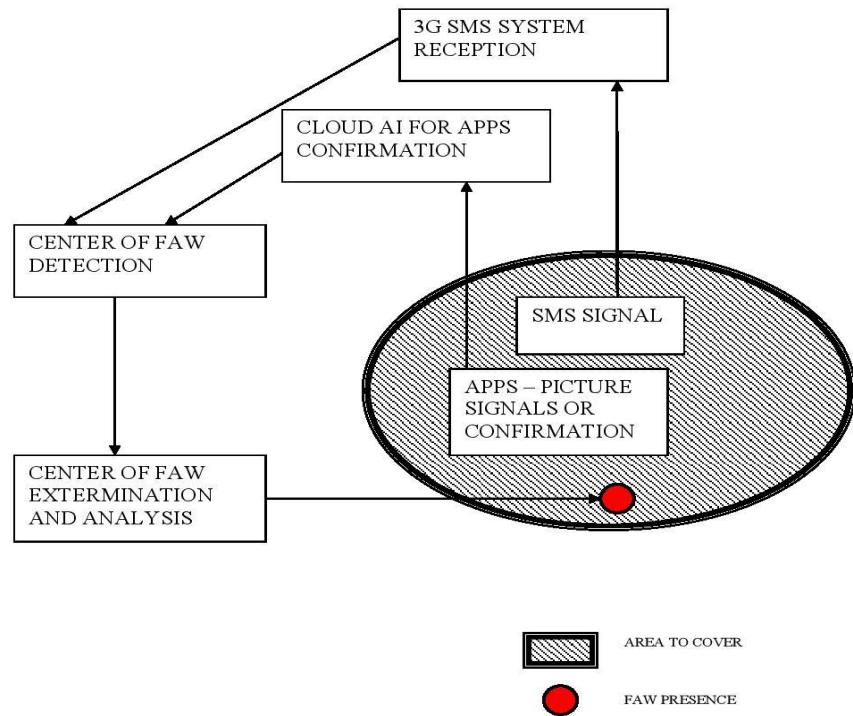
FAW Detection and awareness

Alta Robotics worked on the technical side by defining the elements and strategy for the pest detection and the treatment of the crops. The strategy of detection consisted of the drone flight to monitor the field and take pictures of the crops. A software in the background was able to analyse the pictures and find the area infected by the swarm. The farmers from their phone were also able to send an sms alert with the position of their farm to the software in case of infection. The sms alert is very practical in the low income countries.

FAW Treatment

For the treatment the central were able to send a drone to spread the area infected with the accurate gps coordinates provided by the drone of detection or from the sms alert from the farmers. This operation could be set up until the rate of infection decreases from 80-90%. At this level of infection the farmer is able to apply by himself the pesticide on the target areas.

**SOLUTION FOR
FAW DETECTION AND
EXTERMINATION**



Eventuals opportunities

- Working closely in partnership with the local deciders
- Training and creating new employments
- Opportunity to introduce many others precise agriculture solutions
- Opportunity to be funded by international organisations like FAO, UN and EU for the millenium goals or zero hunger program.