SAMBUG

User Manual

Subtrop

July, 2015

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1 System Overview

The main goal of the SAMBUG system is to help Macadamia nut farmers (or any other farmers dealing with stink bugs as a pest). Please note that this system was developed with specific work flows in mind, which will be addressed later. The farmers can use the system in two ways, namely an Android application and a browser interface.

The way in which the system will help farmers will be listed below:

- Farmers can easily use the Android application to classify stink bugs while in the field. These bugs may be part of a sample that was taken during scouting. Classification can be done using two methods, manual classification and automatic classification:
  - **Manual Classification:** This method allows the user to take a photo of a specific bug (one at a time) and then selecting another photo from a gallery. This photo must be chosen to most resemble the bug of which the initial photo was taken. The application makes this easy by placing the captured image next to the possible selected photo to make comparison easier.
  - **Automatic Classification:** This method also allows the user to take a photo of the specific bug, and thereafter the application will do the classification. This classification is done using artificial intelligent systems. Automatic classification will be more accurate than manual classification.
- While scouting and classifying bugs, the application makes it easy to enter additional data, such as the number of that specific bug that was found, in which block of the far it was. etc.
- After doing a scout trip, a summary will be shown, summarising the number and types of bugs found during that trip. Using this summary, farmers can decide with more confidence if spraying pesticide is necessary or not.
- When taking a photo during classification, the geolocation will be taken as well. With this feature, farmers will find it easier to make sure that scouts actually go out to random locations.
- After capturing the data for a scout trip, this data will be stored in a database such as to later look back at the data.
- The browser interface can be used by the farmers to manage his/her farm and to view data from previous scout trips. It will be able to view the data through means of graphs and also tables. Various filters can then be applied to these graphs and tables, such as blocks and dates, making it easier to draw conclusions.

2 System Configuration

Before we go into any further detail, it is important to ensure that you are fully equipped with the necessary prerequisites to enjoy the SAMBUG system. This section outlines everything you need to get started.

2.1 Setup Overview

SAMBUG is intended to be an integrated solution. The Android application and Website are complementary. Figure 1 depicts the common high-level configuration of the system. Please note that 1c may be interchanged with any Web-enabled device.

(a) Data Capture (b) History & Analysis (c) Farm Management & Consolidation

Figure 1: Illustration of SAMBUG's Configuration

2.2 Hardware & Software Requirements

The design of the system as indicated above lends itself to a number of required devices and services, including:

- An Android Smartphone or tablet [1] (Android 4.1 or higher) - This will house the application used during Scouts, your main access point to the system.
- A Second Web-enabled device - This is where you will manage your farm and view consolidated information of your scouts. Although you may choose to use the same phone/tablet you use in the field, the Web-based nature of this part of the system will allow you to work on a device with a large display, suitable for office work (e.g. a PC)
- Internet Connection - Our application is designed to perform all of its functions even where no mobile/WiFi network reception is available. However, the information you'll be gathering during your scouting trips will have to be uploaded to the server at some point, and for that, you need to be connected to the internet.

[1] You are advised to use a device with a camera that's able to take good quality macro photos in a medium level of light