

# INFORMATION SHEET

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## Electronic collection of field data

### Instructions on how to create an application in CyberTracker

The goal is to make a CyberTracker application to collect data for the purpose of measuring growth over time of mango branches which have been trimmed.

1. Download the Cybertracker software from their website: <https://www.cybertracker.org/>

Go to 'Software' and select 'Free Download'.



Scroll down the page and click on "Download CyberTracker Software: Version 3.507 - 15MB" to obtain the CyberTracker software.

Let people know that you are using a CyberTracker Application - use the round CyberTracker logo with a link to [www.cybertracker.org](http://www.cybertracker.org).

Commercial users are free to use CyberTracker. However, we welcome donations to support ongoing software development. Please contact us at [louis@cybertracker.org](mailto:louis@cybertracker.org)

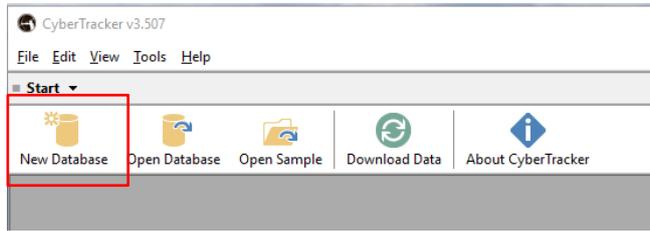
**To get started:**

- (1) First Download and Install the CyberTracker Software onto a Windows Desktop PC
- (2) Then Download a CyberTracker Application from you Desktop PC onto your Smartphone or Mobile Device - see [Getting Started](#)

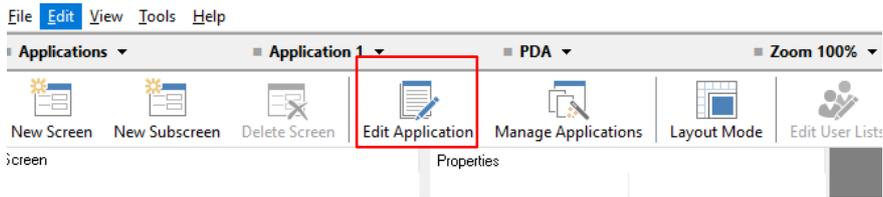
[Download CyberTracker Software: Version 3.507 - 15MB](#)

Follow the website instructions for any troubleshooting.

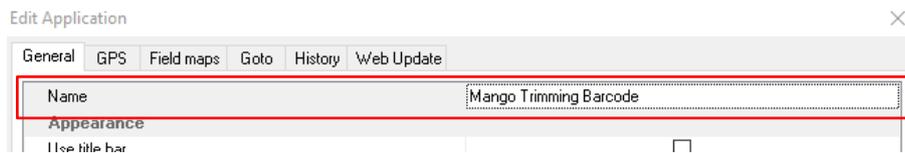
2. Open CyberTracker and select "New Database"



### 3. Select "Edit Application"

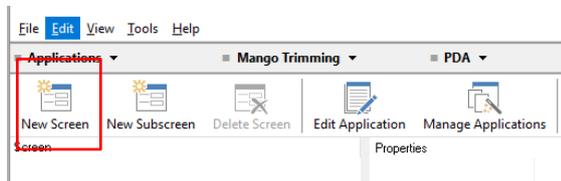


Change name to "Mango Trimming Barcode"

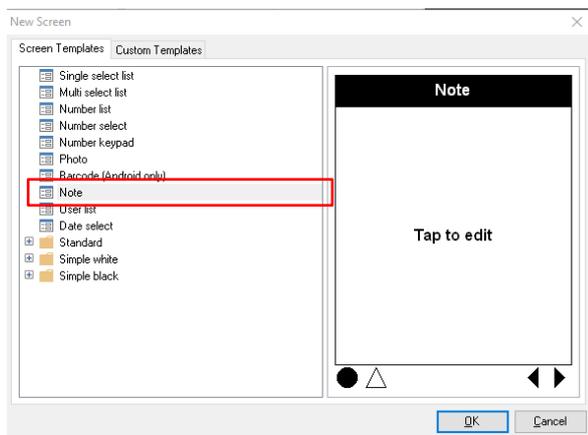


Select "OK"

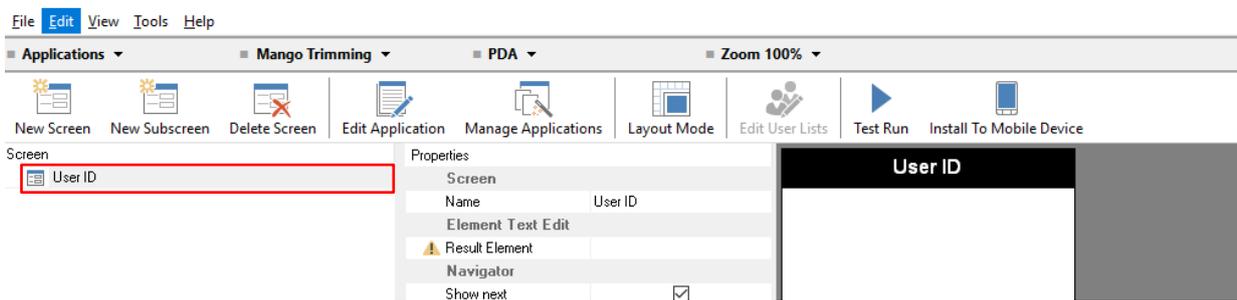
### 4. Select "New Screen"



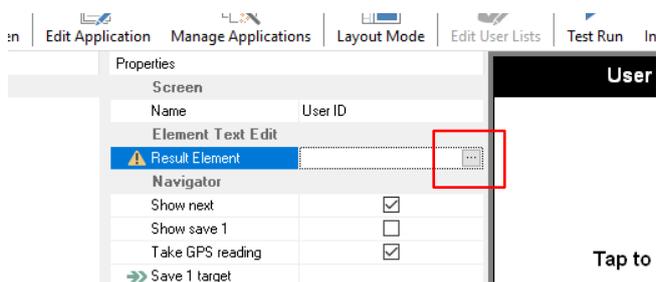
In the window, select "Note" then "OK"



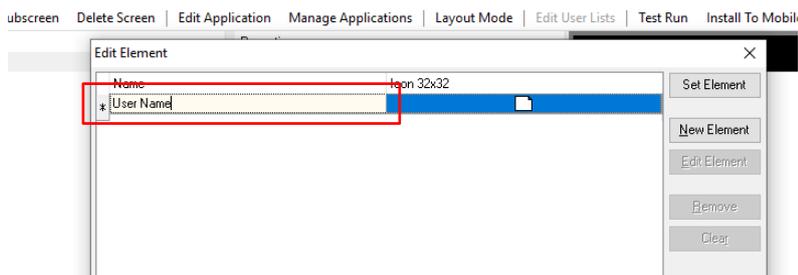
### 5. Rename the screen to "User ID" and then press Enter



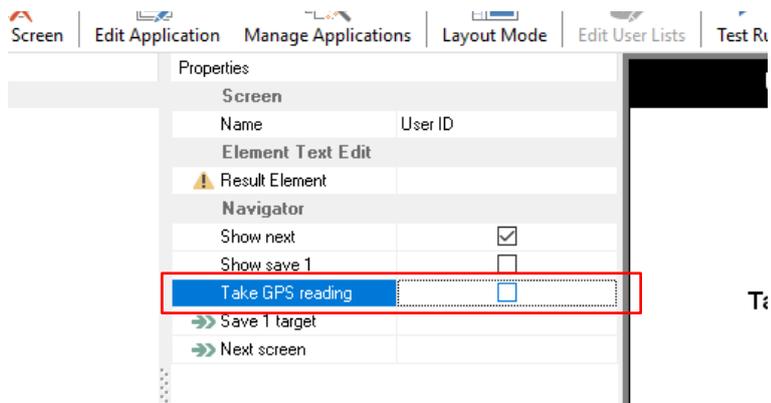
6. Click on the three dots (...) to the right of "Result Element"



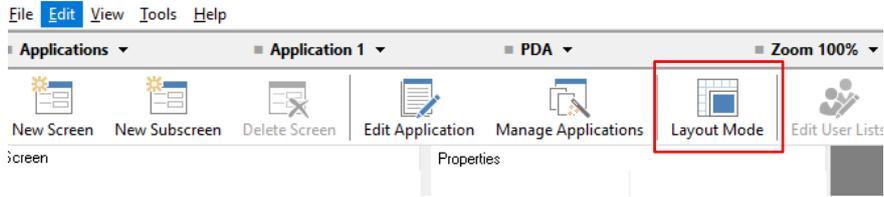
In the new window, type in "User Name", press Enter and then "OK"



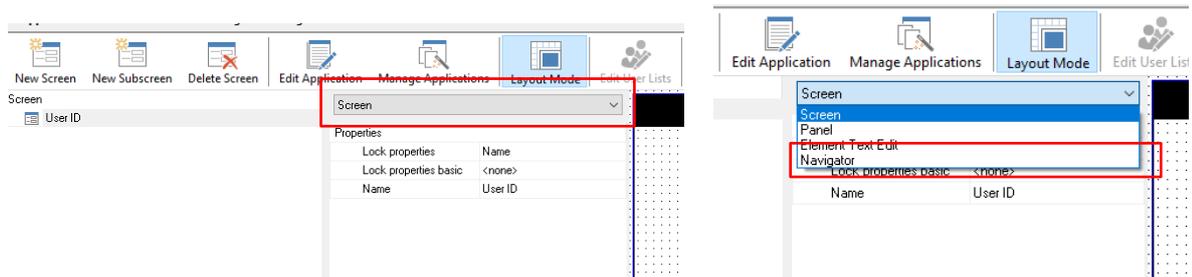
7. Untick "Take GPS reading"



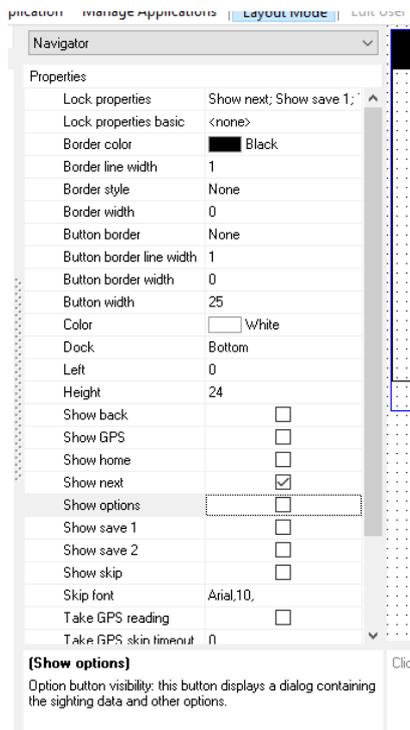
8. Click on "Layout Mode"



Where it says “Screen”, select the drop down to the right then select “Navigator”

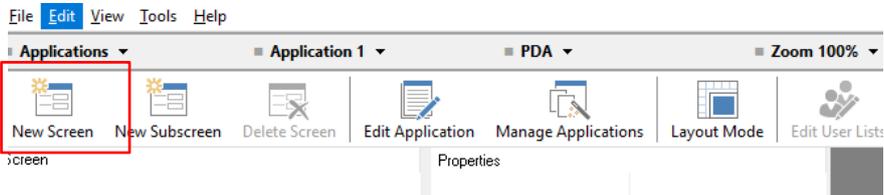


Untick all the boxes except “Show next”



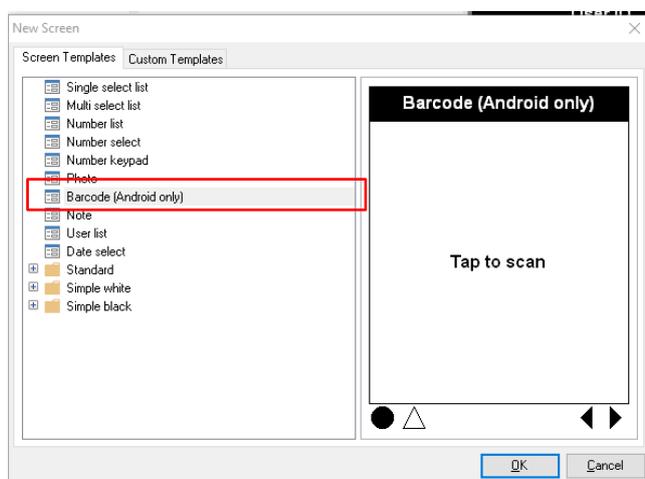
Click on “Layout Mode” again to exit

9. Click on “New Screen”

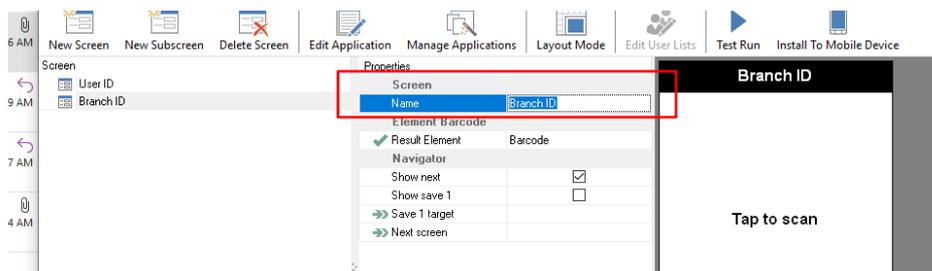


In the new window, select “Barcode (Android only)” then “OK”.

Please note the mobile device must have a separate barcode reading app installed.



10. Rename the screen to “Branch ID” and press Enter



11. For the “Branch ID” screen,

Select “Layout mode”, then from the drop down next to “Screen” select “Navigator”

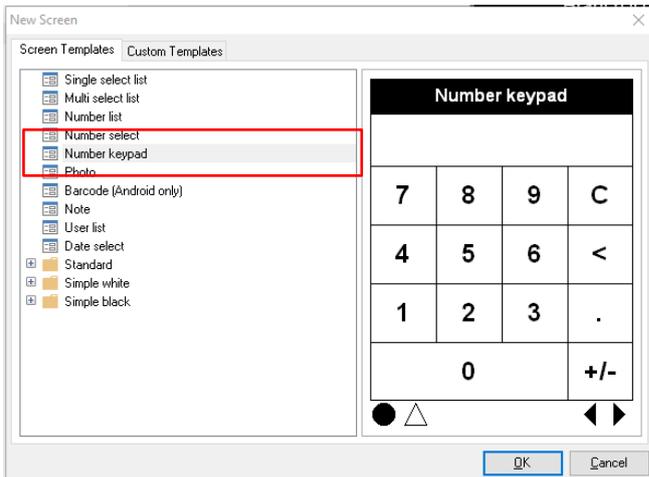
Untick all the boxes other than “Show next” & “Show back”.

Be sure to scroll down to untick the “GPS”.

Select “Layout mode” again to exit

12. Click on “New Screen”

Select “Number Keypad” then “OK”



Rename to “Length of New Growth” and press Enter

13. For the “Length of New Growth” screen

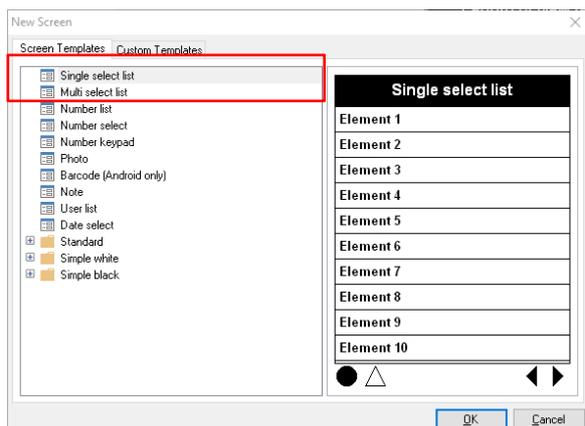
Click on the three dots (...) to the right of “Result Element”

Type “Length of New Growth” in to the window that pops up, press enter first then “OK”

Go to “Layout Mode”, select “Navigator”, untick everything other than “Show Next” and “Show Back”.

Click on Layout Mode to exit navigator

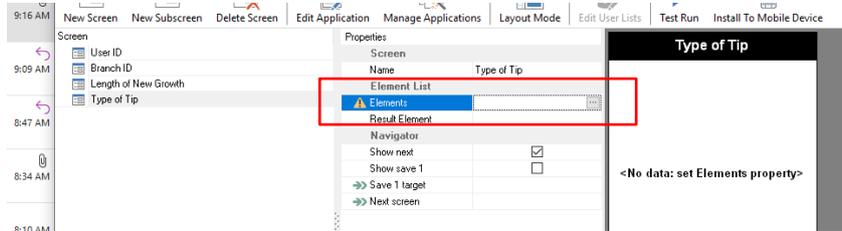
14. Click on New Screen – select “Single select list” then “OK”



Rename to “Type of Tip”

15. For the "Type of Tip" Screen

Click on the three dots at Elements



Write the following, pressing "Enter" after each one

- Leaf development
- Budding
- Flowering

Be sure to press ENTER after "Flowering".

Your list should look like this

EDIT ELEMENT LIST

Name	Icon 32x32	
*		Add Elements
Leaf development		New Element
Budding		Edit Element
Flowering		

Now select "OK"

16. For the "Type of Tip" screen

Click on "Layout Mode", select "Navigator"

Untick everything other than "Show Next" and "Show Back"

Click on "Layout Mode" to exit

17. Click on "New Screen" and select "Single select list" then "OK"

Rename to "Tip Health"

Click on the three dots to the right of "Elements"

Type in the following, pressing enter after each one

- Mostly green, healthy and growing
- Mostly brown, looks unhealthy
- Mostly brown, may be dying off
- Dead

Name	Icon 32x32
* Mostly green, healthy and growing	
Mostly brown, looks unhealthy	
Mostly brown, may be dying off	
Dead	

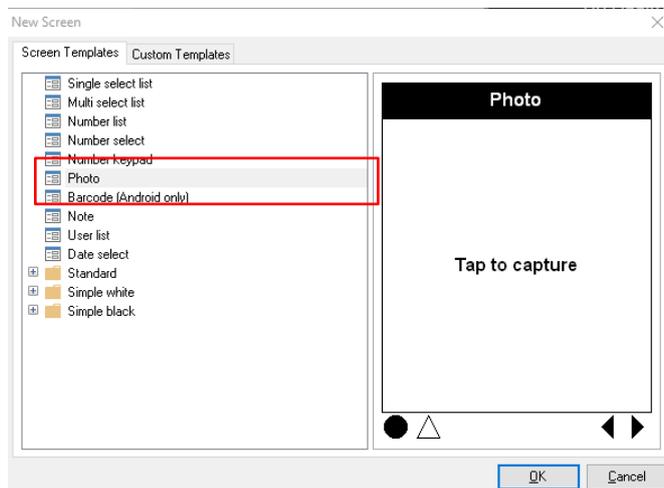
Select “OK”

Click on “Layout Mode”, select “Navigator”

Untick everything other than “Show Next” and “Show Back”

Click on “Layout Mode” to exit

18. Click on “New screen” and select “Photo” and “OK”



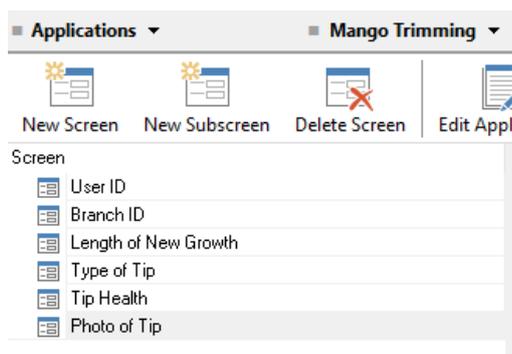
Rename to “Photo of Tip”

Click on “Layout Mode” and select “Navigator”

This time untick all but “Show back” and “Show Save 1 Target”

Select “Layout Mode” to exit

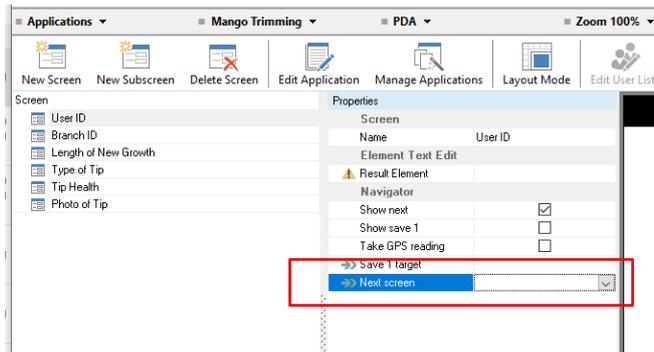
**Now you have made all your screens and they have all the elements you need. Now it is just a matter of connecting the screens.**



For each screen you will now need to indicate in what order the screens are linked and which screen saves the data.

1. Start with “User ID”

Click next to “Next Screen” and select the drop down arrow.



2. For the “Branch ID” screen

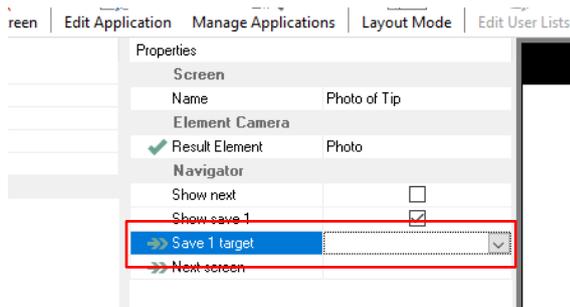
Select the dropdown next to “Next Screen” and select “Length of New Growth”

3. For the remainder of your screens select the following as “Next Screen”

- “Length of New Growth” screen choose “Type of Tip”
- “Type of Tip” screen choose “Tip Health”
- “Tip Health” screen choose “Photo of Tip”

4. For the “Photo of Tip” screen

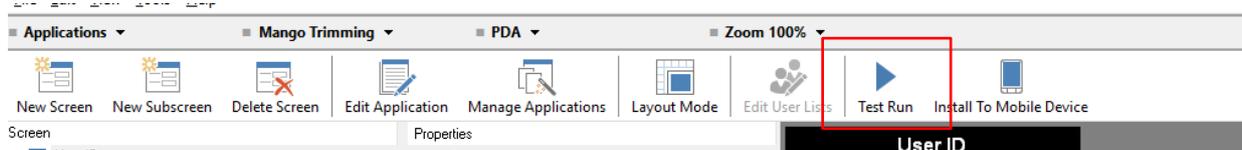
Select the drop down next to “Save 1 target”



Choose “Branch ID”

**Note: By looping back to the “Branch ID” it avoids having to enter in “User ID” again.**

Now, let’s test out your loop by clicking on “Test Run”



Other than barcode and photo you can enter data and see if the loop works.

## Errors

Common errors are; no next screen arrow, or extra icons at the bottom of the screen.

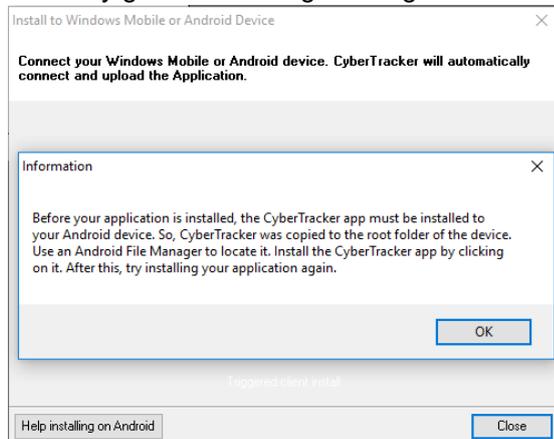
If you are having problems, identify which screen you are having problems with and check that you followed the steps correctly above for that screen. I.e. Make sure a “Next Screen” is selected, and that the correct boxes in “Navigator” are checked/unchecked.

5. When you are happy with your loop, select “File” and “Save Database As”.

Save your database in the folder you would like with the file name “Mango Trimming Barcode”

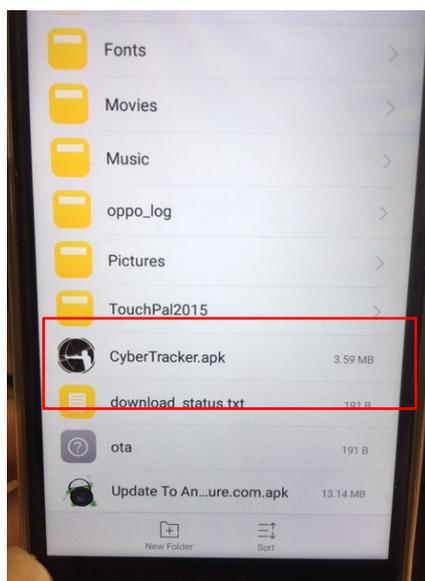
6. Once the test run works currently connect your android phone or tablet to your computer, via a usb cable, and click on “Install to Mobile Device”.

You may get the following message

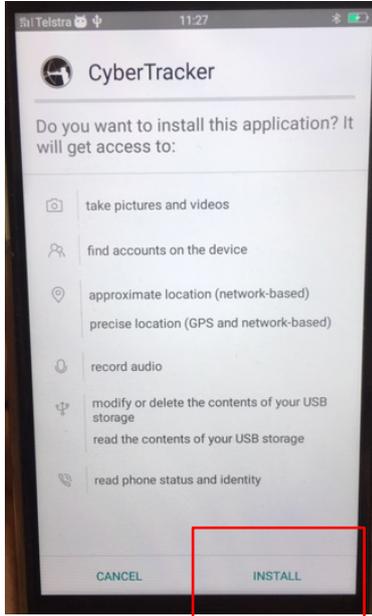


If so, select “OK”

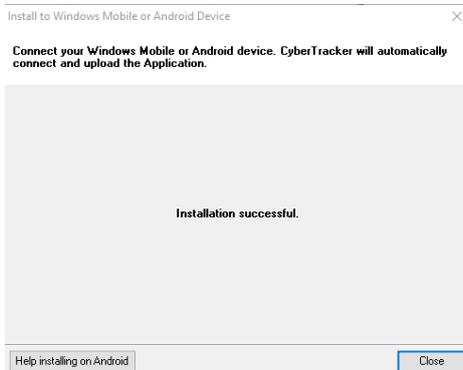
Go to the “Files” folder on your phone and scroll until you see “Cybertracker”.



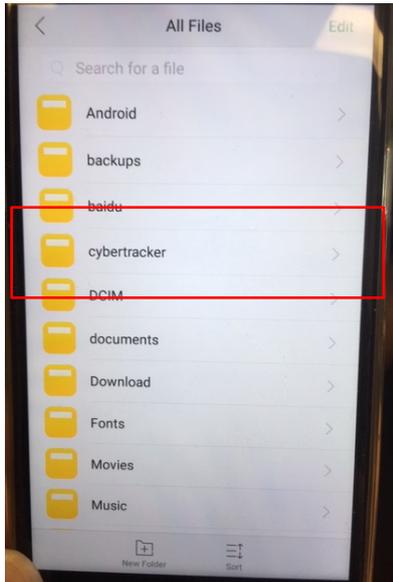
Select and then select “Install”.



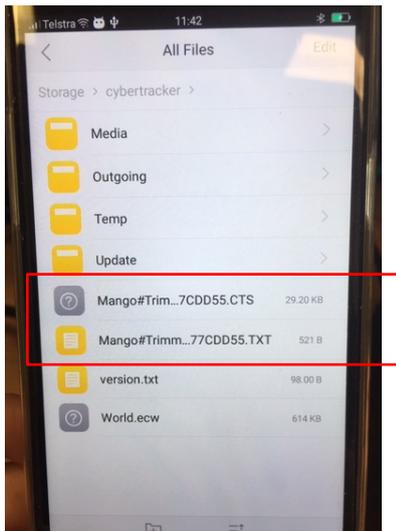
7. Go back to your PC, and select “Install to Mobile Device” again. You should get the following message



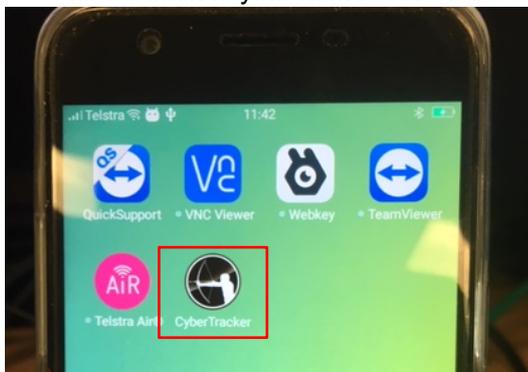
8. Go back to your phone and go to “Files” again. Scroll down until you find a file called “cybertracker”



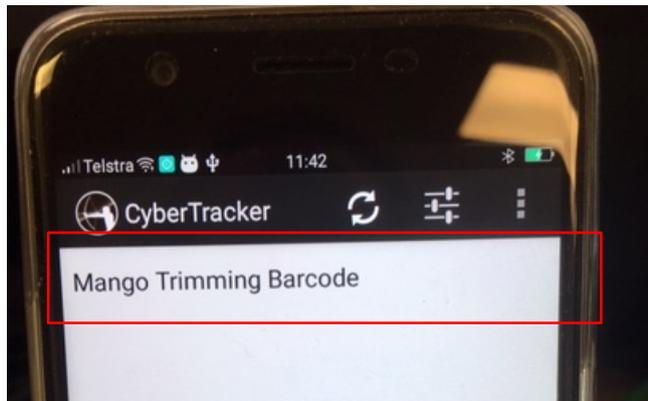
When you select that folder you should find the file to “Mango Trimming Barcode” there.



9. Go back to your home screen and find the downloaded CyberTracker App and select.



Your database should appear on the first screen.



10. You will need to unplug your device to collect data.

### You are now ready to go!

Cybertracker has help options here to assist you.

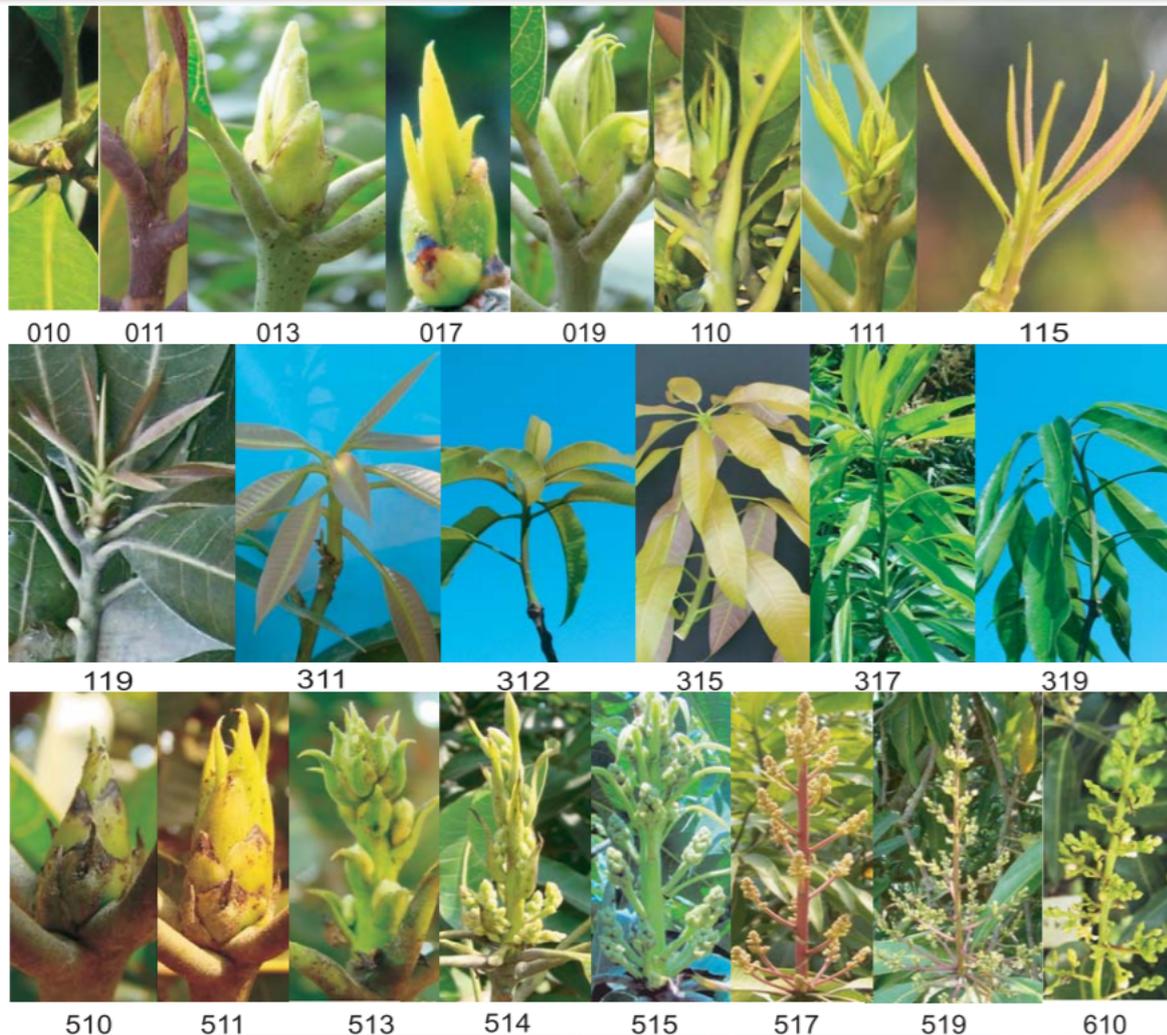
### Collecting data

**NOTE: A barcode reading app must be installed on the mobile device before collecting data.**

1. Open the cybertracker app on your device
2. Select Mango Trimming Barcode
3. Tap centre of screen and align camera with barcode
4. Move device to allow focus
5. If it reads it correctly then select next. If read incorrectly then click on the screen again to reread.
6. Select the Next arrow
7. Using calipers or a ruler, measure the distance of new growth from where the branch was trimmed (cm).
8. Enter the length of the new growth.
9. Select the next arrow
10. Identify the types of tip as best you can to the following categories, based on the phenophase photograph and corresponding codes:

Leaf development	Budding	Flowering
017 - 319	010, 011, 013 510, 511	513 and above

The program prescribes that data is collected once a month – if a wrong assessment is made then it will become obvious next time the branch is assessed. For example you may believe the tip is leaf development and when you revisit it in a month you record it as flowering. This can be expected when developing such skills and adds a level of interpretation and discussion to your data. It is also the benefit of taking images to look back at assessments made.

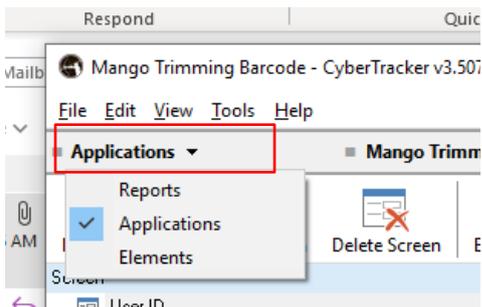


11. After selecting the tip type select the Next arrow.
12. Assess the health of the tip by judging the colour and texture of the tip.
13. Select the most appropriate option and select the Next arrow
14. To take a photo of the tip tap in the main screen and the camera should appear. Consider light and angles and take a photo of the tip. Option to RETRY if image is not acceptable or OK if acceptable.
15. This is the last screen for this branch. Select the Save button (down arrow).
16. The Branch ID screen (barcode) should now appear.
17. Select the second branch to be recorded on the same tree and repeat the process.
18. Each tree should have five marked branches,
19. When you want to exit the application – after saving data select the back option of your device (not back on cybertracker).

## Downloading data from your device

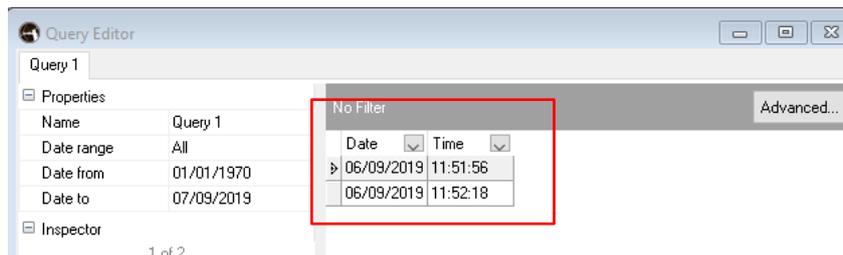
Now that you have collected some data points you can download them and export them to excel.

1. Open "Cybertracker" on your computer
2. Select "Open Database" and select the folder where you saved your database "Mango Trimming Barcode.MDB", select the file and then "Open"
3. Plug your mobile device in to your PC using the usb cable
4. Under "Applications" in the top left, select "Reports"



5. Under "File" select "Download Data from Connected Device"

You should now have a list of dates and times in the "Query Editor" window

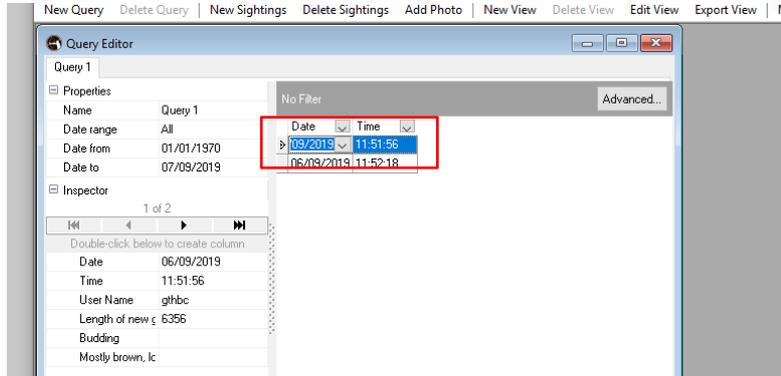


At the bottom of the query editor it should also identify how many entries you have (record 1 of ....)

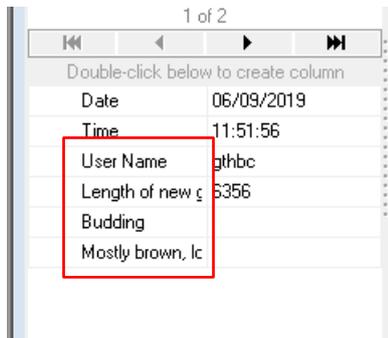


6. To visualize all the data in the window

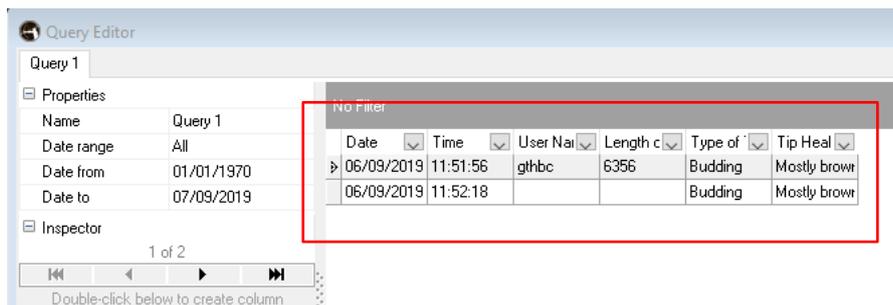
Select the first entry.



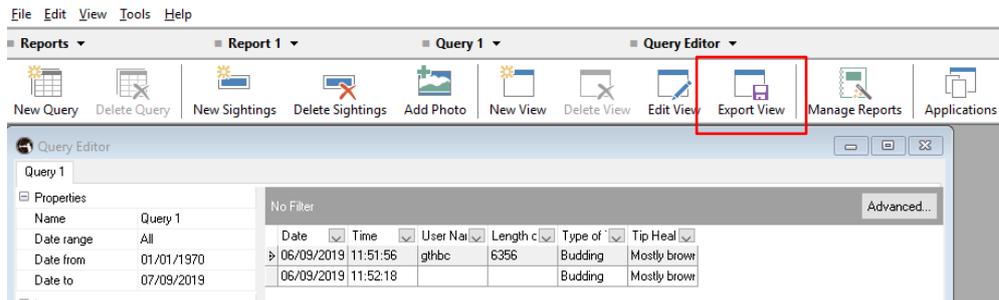
Now, double click each of the fields under “Time” (ie “User Name”, “Length of new growth”) that appear on the left hand side.



This will add each of your fields into your window.



7. When you have all the data listed on the right hand side of the window, select to “Export View”



You will be asked to save your file as a .csv file. Choose the location where you would like it to be saved, and label it “Mango Trimming Barcode xx\_xx\_xxxx” with xx\_xx\_xxxx as today’s date

The saved .csv file can be opened in excel, where you can edit and analyse your data.

Each time you collect data using the “Mango Trimming Barcode” application on your phone, and download it to your computer, Cybertracking will add any new data points to your database, under the entries you already have.

### Analysing the data

There are a number of options for how to interpret and discuss the data collected:

Within a term	<ul style="list-style-type: none"> <li>• Look at how accurate each user group were. Ask questions such as:               <ul style="list-style-type: none"> <li>○ Did the branches get bigger or smaller</li> <li>○ Was the average between groups or trees comparable</li> <li>○ What was the range of measurements</li> <li>○ What predictions can be made about the number of fruit to be harvested</li> <li>○ Was there a correlation between branch death and time it was trimmed</li> </ul> </li> </ul>
After a Year	<ul style="list-style-type: none"> <li>• Which trees produced the highest number of fruit</li> <li>• Compare the harvest between trimming groups</li> <li>• Make an informed decision as to when the best time to trim the trees are</li> <li>• Was there a difference between varieties</li> </ul>