USER MANUAL

HANDHELD TISSUE ANALYZER

VERSION 2.0.0

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SOFTWARE DOWNLOADS

ANDROID USERS

Leaftech Ag App

Go to the Google Play Store, download the App, and install it on your smartphone.

https://shorturl.at/bs4qW

Power BI App

Go to the Google Play Store, download the App, and install it on your smartphone.

https://rb.gy/qbkxon

APPLE USERS

Leaftech Ag App

Go to the Apple App Store, download the App, and install it on your smartphone.

https://shorturl.at/0ctBG

Power BI App

Power BI software is used to view any scans you've taken. You will be provided with a login from Leaftech Ag via email once you've filled out the Scanner Onboarding Questionnaire. The link to this questionnaire can be found on the QR code inside your scanner case.

Go to the Apple App Store, download the App, and install it on your smartphone.

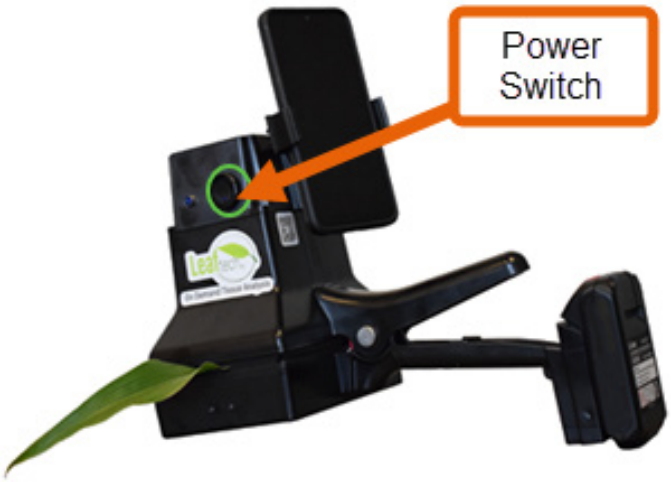
https://shorturl.at/RyPyC

POWERING ON THE SCANNER

STEPS FOR CONNECTING:

Power on the scanner by flipping the Power Switch on the side of the scanner.

Wait 2-3 minutes until the Indicator Light blinks three times before attempting to connect to the scanner on the app.



Pro Tip: Make sure your battery is fully charged before heading out to a field to scan plants. If your battery gets too low, the scanner's power light will still turn on, however, the scanner will not have enough power to connect to your phone app.

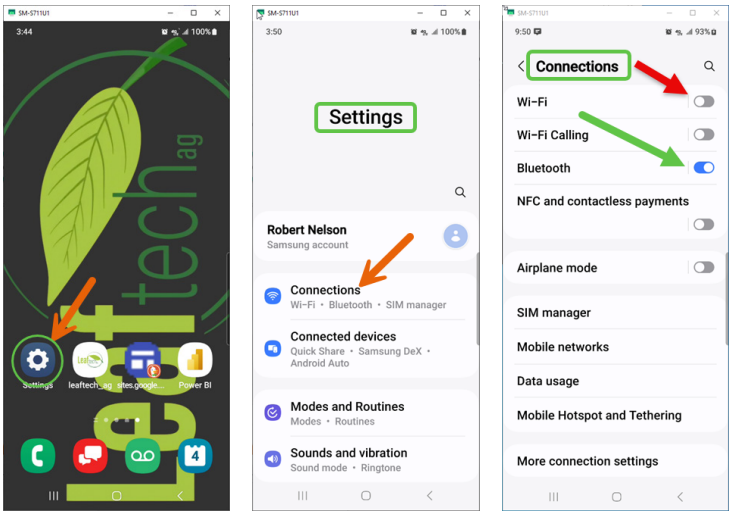
Pro Tip: Put a stopwatch on when you turn on the scanner. If you don't see the light flash when it boots up (if it's been more than 3 minutes), you can then check and see if your scanner shows up as a Bluetooth device. If so, you know it's ready to connect.

PREPARING YOUR SMARTPHONE

ANDROID USERS

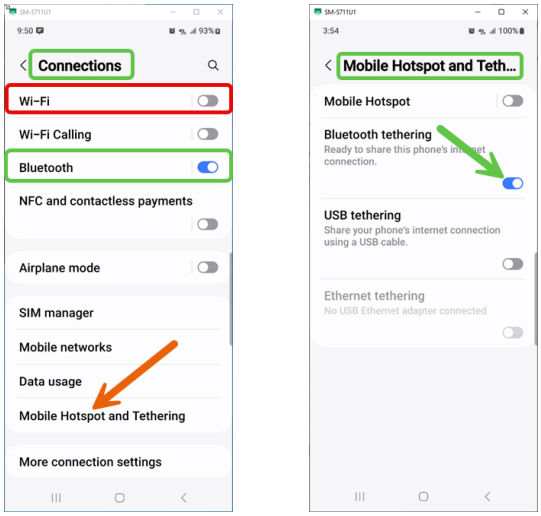
Turn off Wi-Fi

Click on the Settings icon, Go to Settings, Connections, and make sure Wi-Fi is turned Off, and Bluetooth is turned on.



Turn on Bluetooth tethering

Select Mobile Hotspot and Tethering. Turn Bluetooth tethering on.



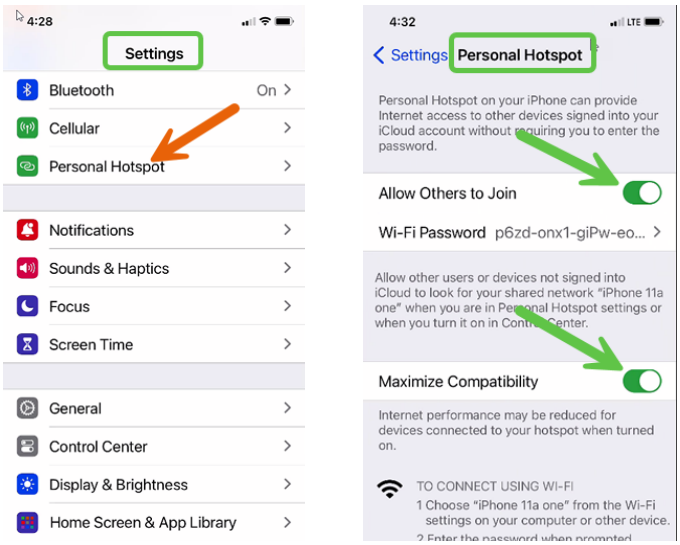
APPLE USERS

Turn off Wi-Fi
Turn on Bluetooth

Click on the Settings icon and make sure Wi-Fi is turned Off, and Bluetooth is turned on.

Turn on Personal Hotspot

Click on the Personal Hotspot. Make sure Allow Others to Join and Maximize Compatibility are both turned on.

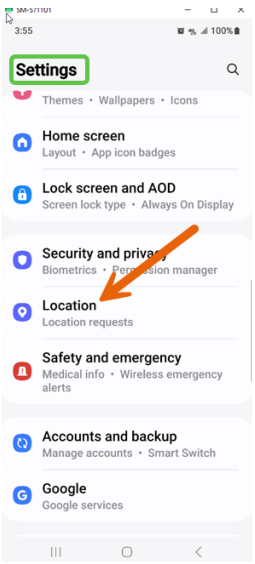


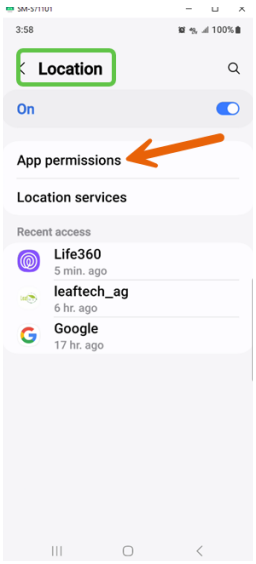
PREPARING YOUR SMARTPHONE CONT...

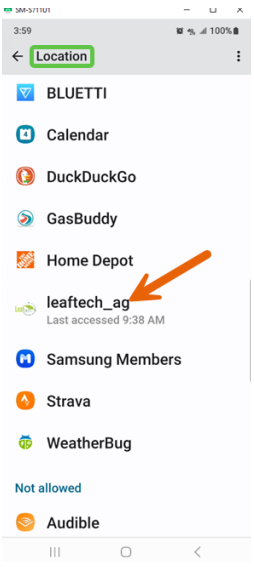
ANDROID USERS

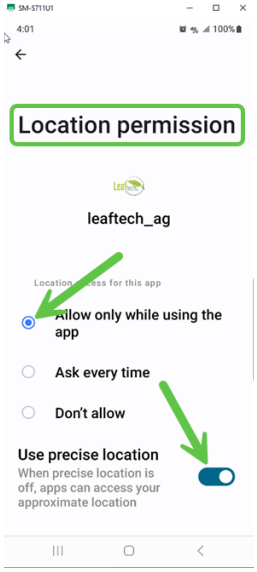
Turn on Location Services

Go to Settings, Location, App Permissions. Scroll down to find and choose the Leaftech Ag app.







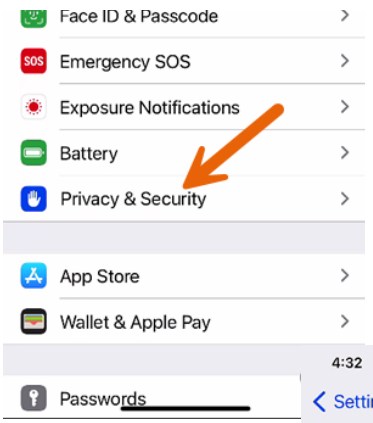


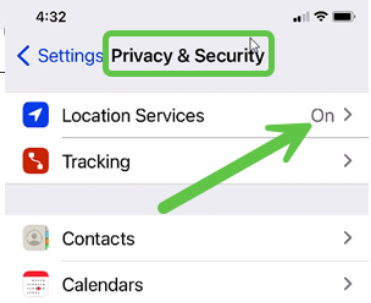
When you open the Leaftech Ag App, make sure the Location Permissions are set to Allow only while using the app, and Use precise location.

APPLE USERS

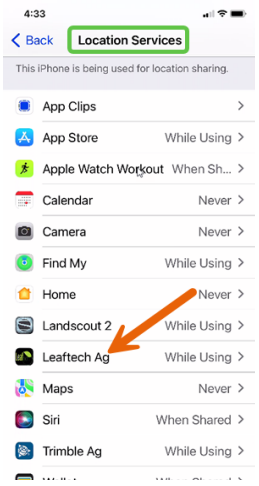
Turn on Location Services

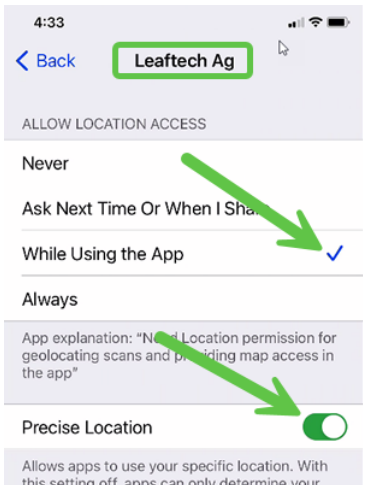
From the Setting screen, select Privacy & Security. In the Privacy & Security screen, select Location Services, it needs to be on.





In the Location Services screen, scroll down and locate and choose the Leaftech Ag App. Within the Leaftech Ag App, confirm that While Using the App is checked, and Precise Location is on.



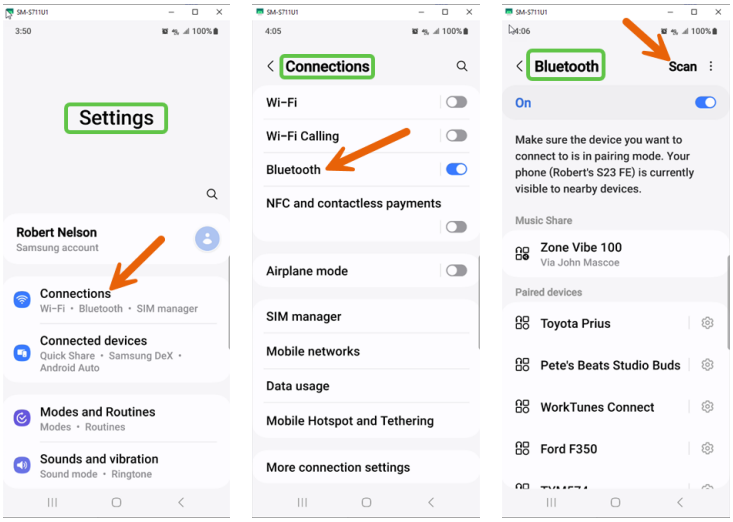


PAIR SCANNER

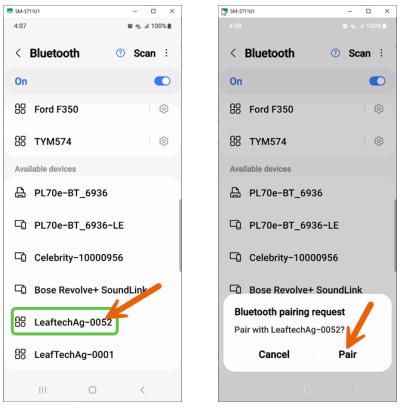
ANDROID USERS

Bluetooth Pairing

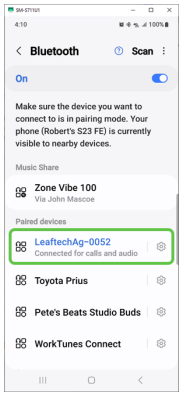
On the Connections page, click on Bluetooth. Click on Scan to scan for your scanner.



Once you see your scanner, select it, and then select Pair to pair with it.



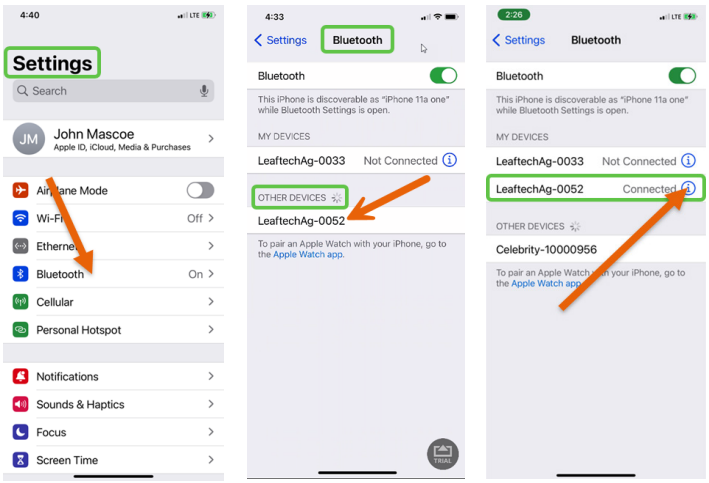
Once pairing is completed the scanner will move to the Paired devices area and indicate it is Connected for calls and audio.



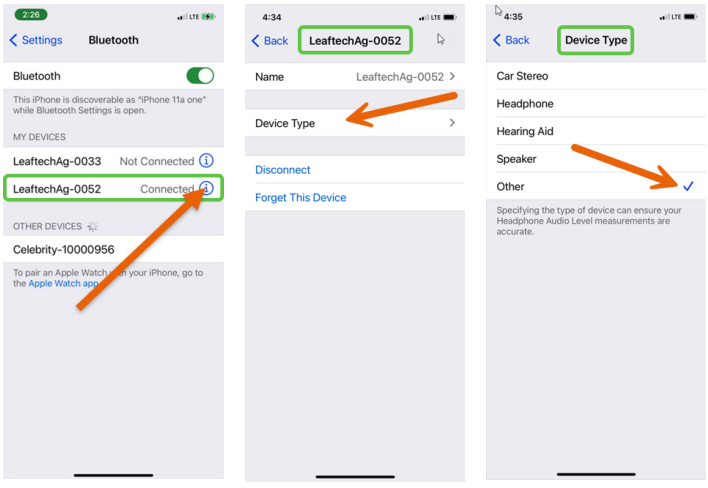
APPLE USERS

Bluetooth Pairing

In the Setting screen, select Bluetooth in the Bluetooth screen look in the Devices area to find your scanner. Select your scanner (Example: LeaftechAg-0052). The phone will now connect to the scanner and indicate “Connected” once it has paired.



Once paired, select the device, and click on the Connected (I). Select Device Type and Other.

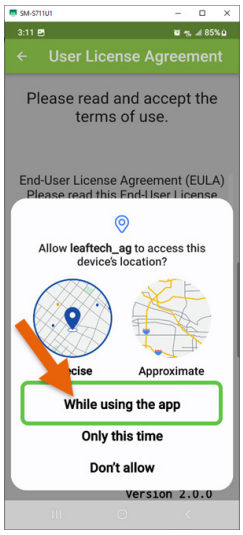


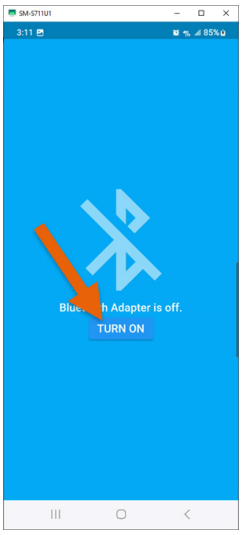
You can now open the Leaftech Ag application.

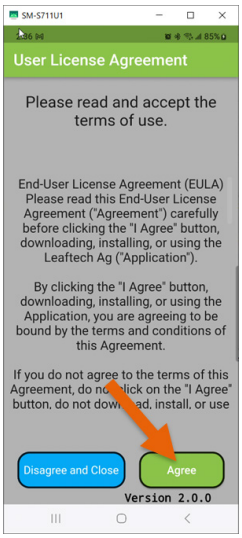
LEAFTECH AG APP

Once installed, open the App. You will be asked to “Allow Leaftech Ag to access this device’s location?”, select While using the app. This will allow the map feature of the App to identify the Latitude and Longitude of the crop’s location when you take a scan. If your Bluetooth is off, you will receive a message to Turn it On. You will need to go to your Bluetooth setting on your phone to turn your Bluetooth on.

Read the User License Agreement and Select Agree.

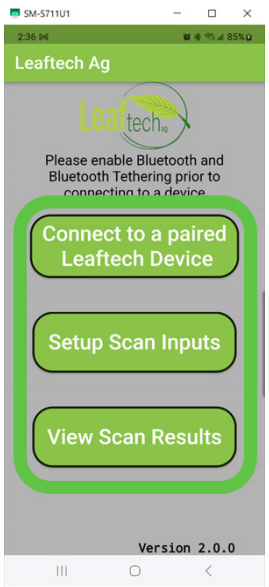


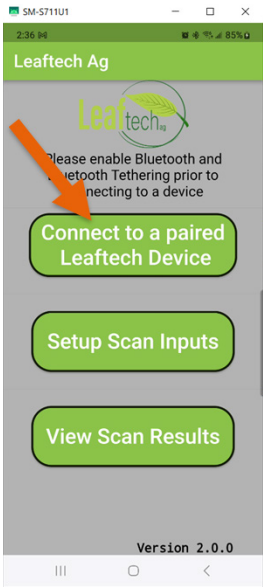




Note: The pop-ups will only ask questions regarding Location Services and Bluetooth Connections the first time you install the App.

On the main screen. There are three options, Connect to a paired Leaftech Device, Setup Scan Inputs and View Scan Results. The Connect to a paired Leaftech Device requires your scanner to be powered on, the other two options can be done with the scanner off. Select Connect to a Paired Leaftech Device.

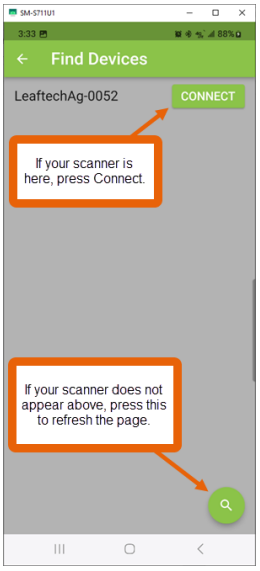




OPEN LEAFTECH AG APP

You are now on the Find Device page.
If the Find Devices page is blank, press the green magnifying glass to reset the search for nearby devices.

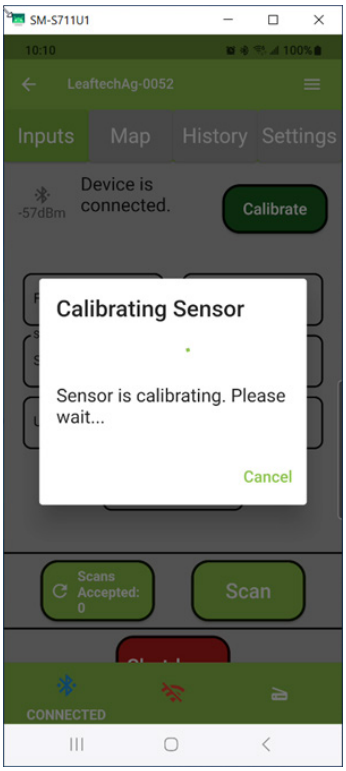
Once the device appears available on the screen, push the green Connect to the right of your scanner's name.



CALIBRATE

Make sure the scan glass is clean, and if needed clean it with a glass cleaner and a micro cloth provided in your case. Once the device has connected with your phone, the scan bed is clean and empty, press Calibrate.

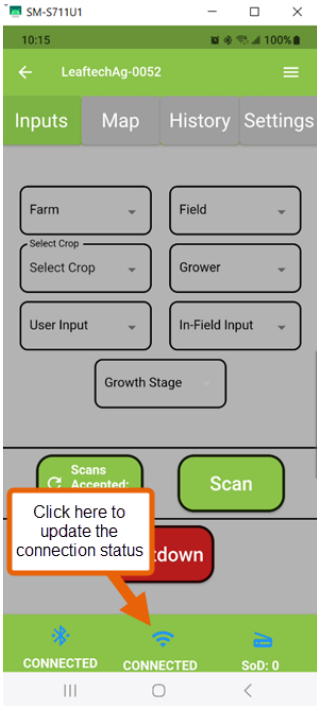
A screen will pop up letting you know the sensor is calibrating and **the indicator light will turn on** to show that an image is being taken. **If the light doesn't come on, the calibration was not successful.** Once finished a pop up will appear, letting you know the status of your calibration. If successful, press Ok and continue, if Unsuccessful, press Ok and check your Bluetooth connection (reconnect). You will repeat the calibration at the beginning of each scanning session. A session can last an entire day, or a few minutes, depending on how long you are in the field.

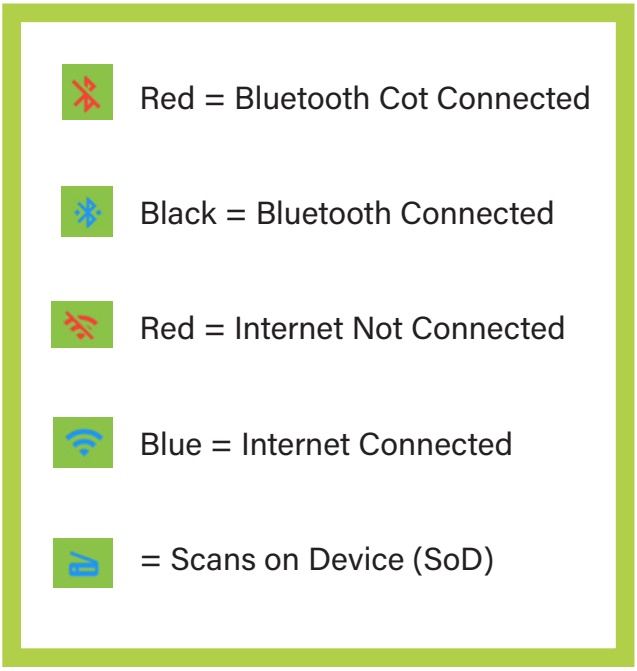


Pro Tip: You can press the SoD icon immediately after calibration and it will show the calibration scan (see image below) queued for uploading. If you started the session without any scans remaining on the scanner from a previous session, SoD will show one (1), the calibration scan. Note: The calibration scan will not show up on your scanning report in Power BI.

CHECK CONNECTION STATUS

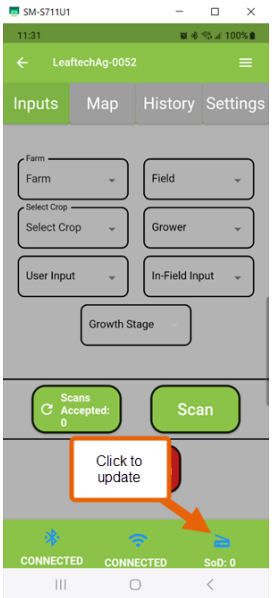
To update your connection status, click on the Array or





Pro Tip: If you can't see the connection status on the bottom of your phone (some phones screen resolutions are set for larger text), scroll down to display the Internet and Bluetooth connection status.

Click on the Scans on Device Icon to show how many unprocessed scans that you've taken. Once clicked, if any scans are waiting to be uploaded, it will show the number here. You must click on this icon to see the updated number. Scans you have taken will automatically upload when your phone is connected to the internet.

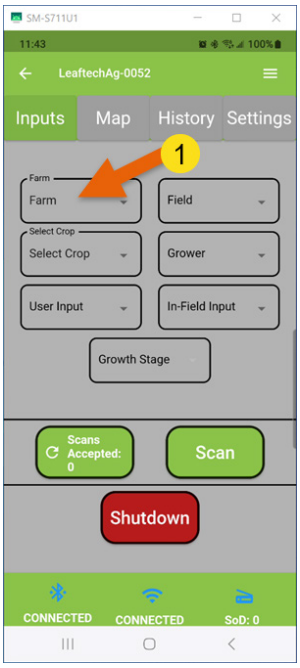


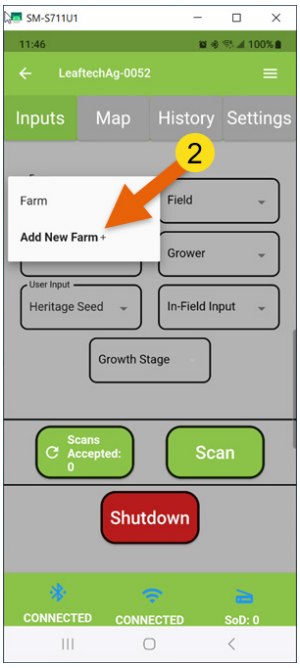
USER INPUTS

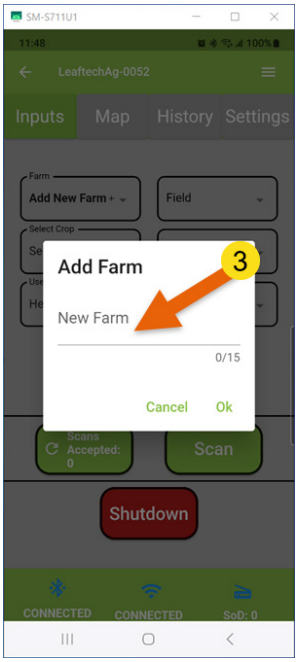
ADDING INPUTS

User Inputs consist of Farm, Field, Grower, User, and In-Field. Each input uses the same format. Follow these steps for adding inputs (Example is the Farm Input).

1. Select the input you want to change by clicking on it.
2. Select Add New Farm.
3. Select New Farm.
4. Type in the name (Note: Name cannot exceed 15 characters).
5. Select Ok to save.





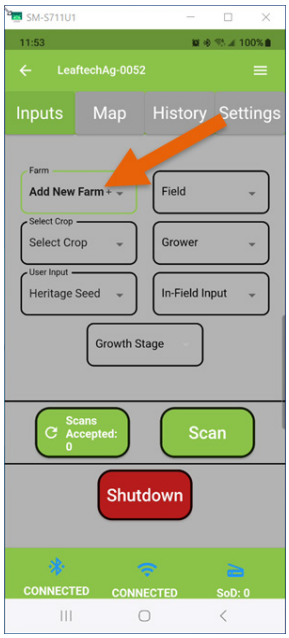


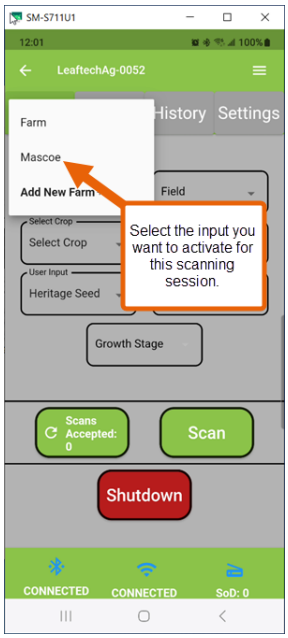
Pro Tip: You can prepare ahead by adding all user inputs before going out to the field. You can do this from the main screen under the Setup User Inputs Tab without having to turn on a scanner.

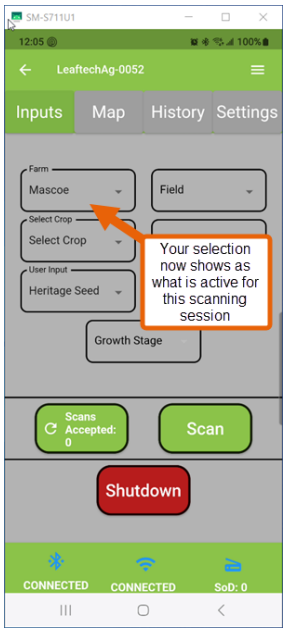
USER INPUTS CONT...

ADDING INPUTS CONT...

You must activate an input once you've entered it. Open the input area by clicking on it and select one of the options you've entered. This makes the input you selected active for the next and successive scans. This input will remain active until you change it or turn off and restart the scanner. Recalibrating the scanner will not cause inputs to reset.

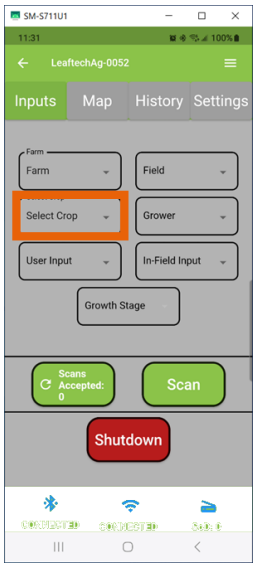


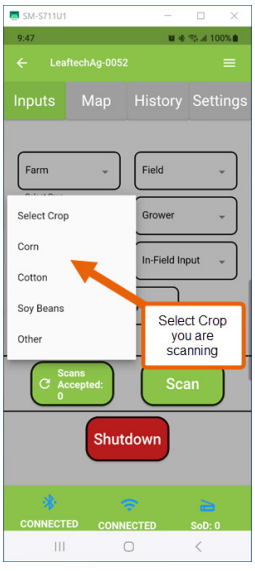


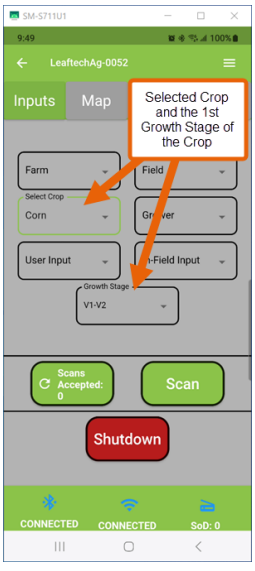


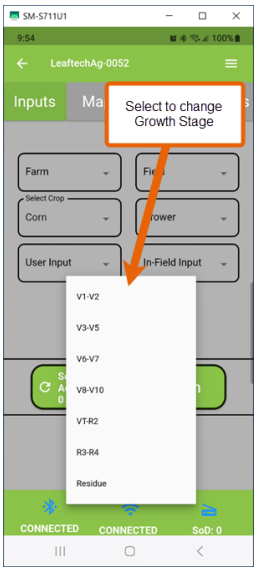
CROP SELECTION

Leaftech Ag has validated crops for scanning. Click on the Select Crop button and choose the crop you want to scan. Once selected the 1st growth stage of the crop will be shown. Click on Select Growth stage to change the Growth Stage.





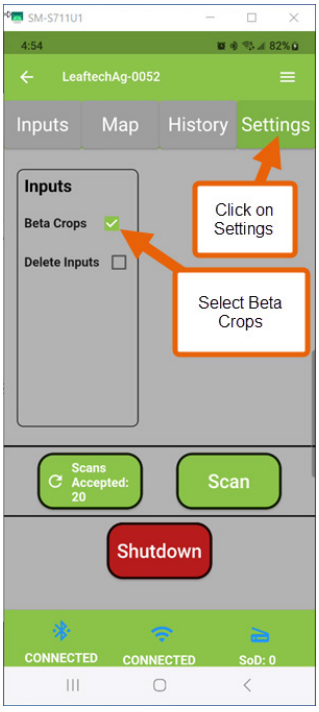


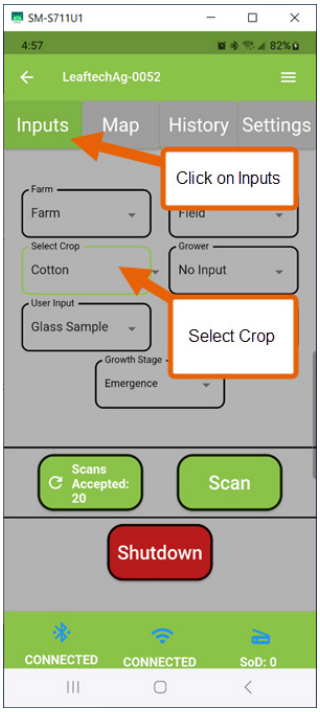


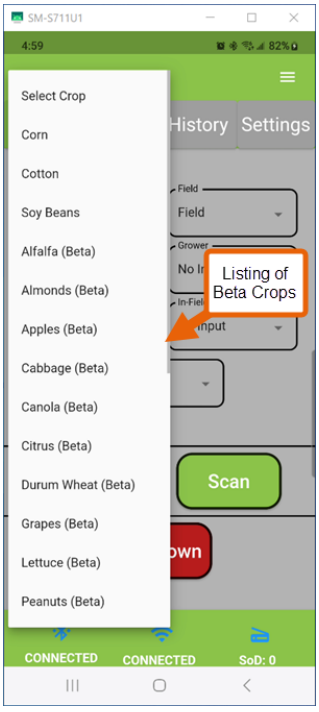
USER INPUTS CONT...

CROP SELECTION CONT...

Leaftech Ag also has the option of choosing additional crops aside from corn, cotton, and soybeans (crops validated for our scanner). These other crops are 'Beta" options. To select Beta Crops, click on the Settings Button, and then select Beta Crops. All crops currently approved and in beta are shown and can be selected. A selected crop will be active for the entire session until otherwise selected.





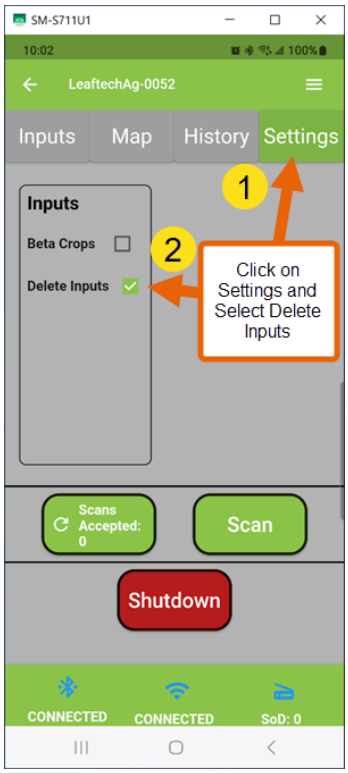


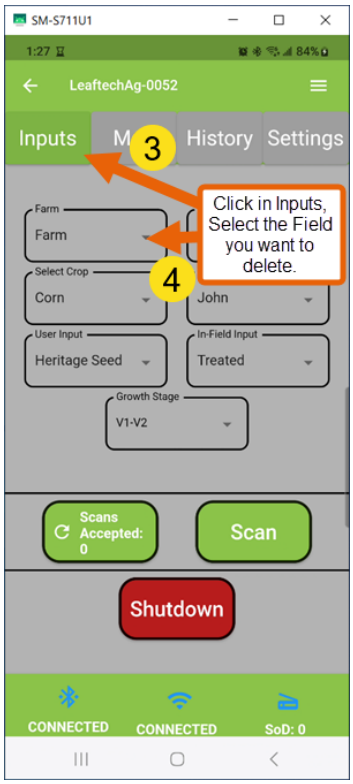
USER INPUTS CONT...

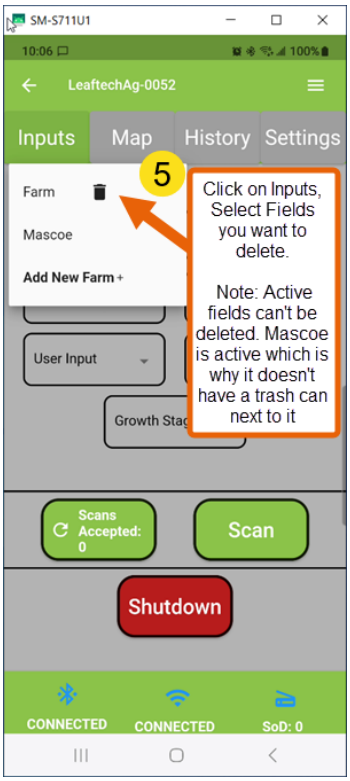
DELETING INPUTS

Follow these steps for deleting inputs (Example used is the Farm Input. This process works for all Input Fields.

1. Click on the Settings tab.
2. Select Delete Inputs.
3. Click on the Input.
4. Select the Farm Inputs area.
5. Select the trash can by the farm you want to delete.



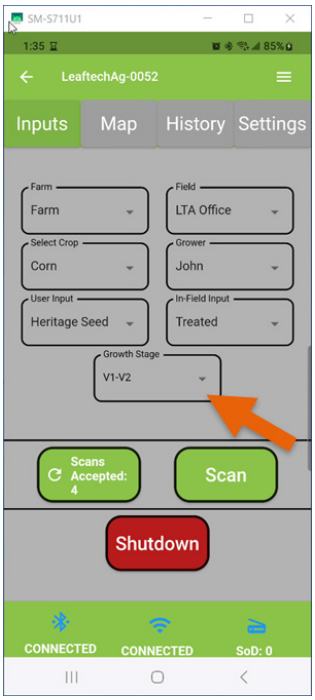


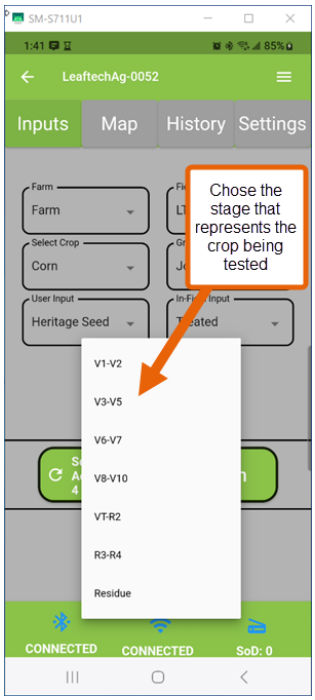


Note: If Mascoe is the currently selected (Active) farm, it can't be deleted. To delete it, go back to the Settings tab and unselect the Deleted box. Once this is done go back to the Inputs tab and select another listed name as the active farm. Once you have selected a different listed name go back to step 1 above.

SELECT GROWTH STAGE

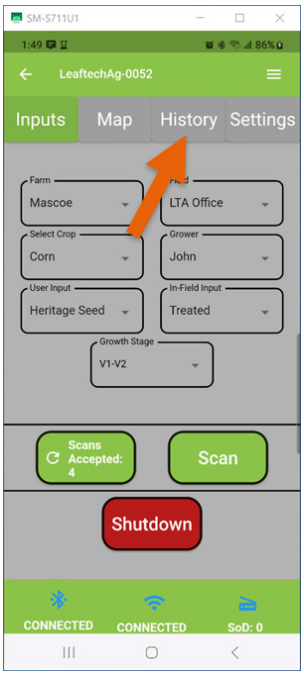
Growth Stages are automatically selected as the earliest growth stage of the crop. To change this, click on the Growth Stage button and choose the stage that represents the crop being tested.

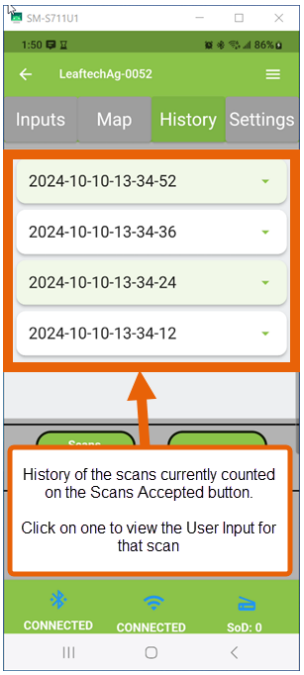


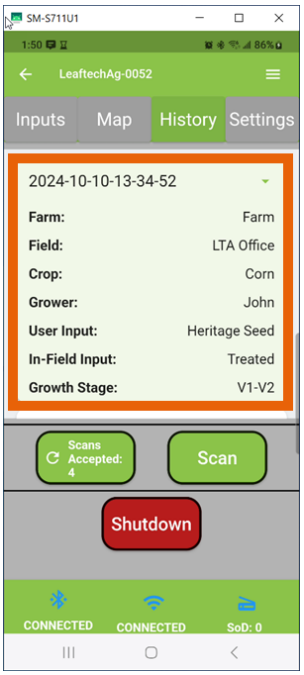


SCANS ACCEPTED

Maintains a count history of the scans taken during a scanning session. Each time you press Accept after a scan is taken, the Scans Accepted button will increase by one. It will continue to increase until you reset the counter. To view the User Input Information on the scans in the scan counter click on the History tab.



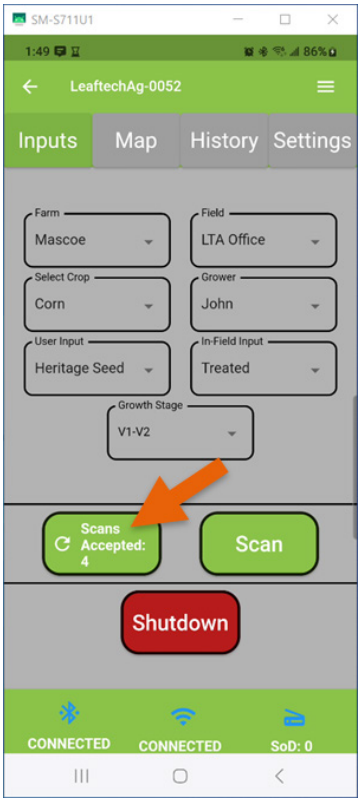


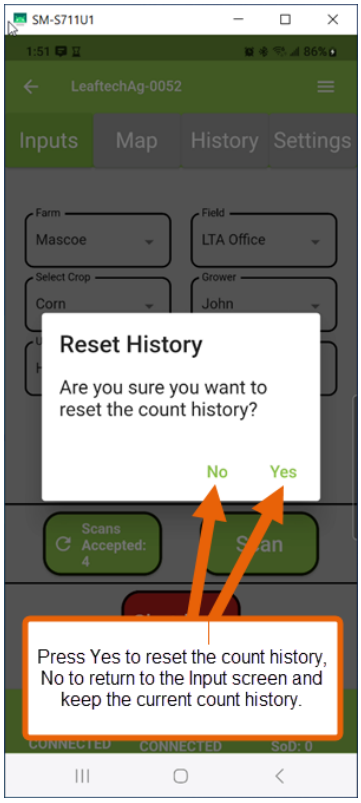


USER INPUTS CONT...

SCANS ACCEPTED CONT...

To reset the counter, click on the Scans Accepted button. You will see a message “Reset History” that asks, “Are you sure you want to reset the count history?”. Press Yes to reset, and No to maintain the count history.

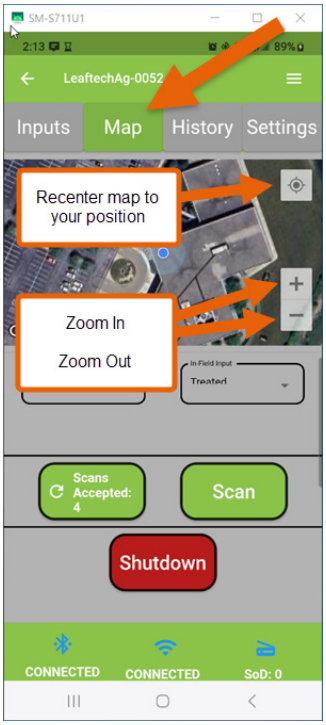




USER INPUTS CONT...

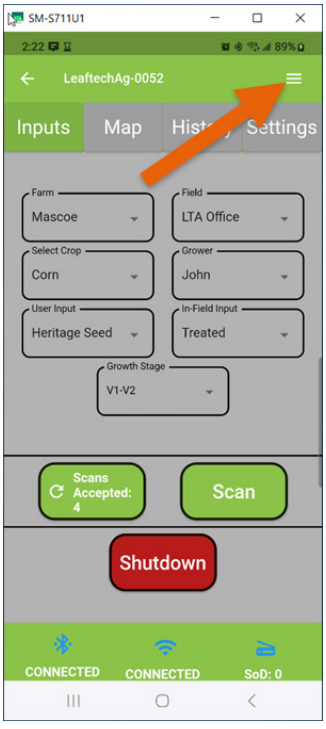
MAP SCREEN

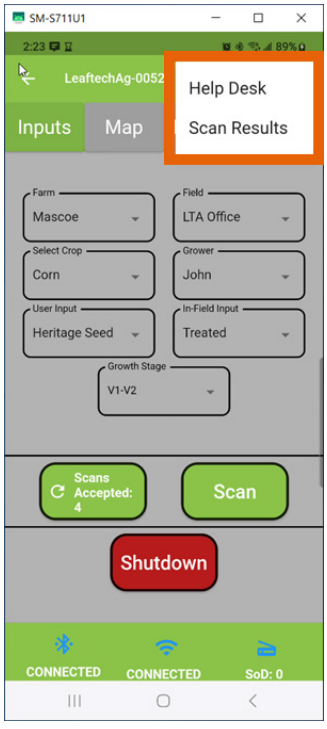
To open the map and see where you are located, select the Map tab. Selections for Growth Stage, In-Field Inputs, Scans Accepted, and Shutdown buttons are also available on this page.



HELP DESK & SCAN RESULTS

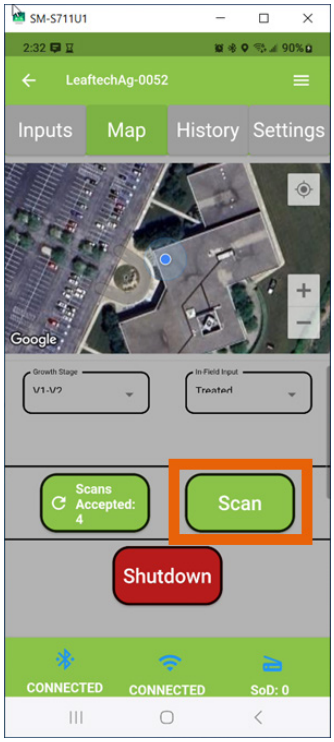
The Help Desk and Scan Results (Power BI), can be found by clicking on the three lines at the top right of the screen.

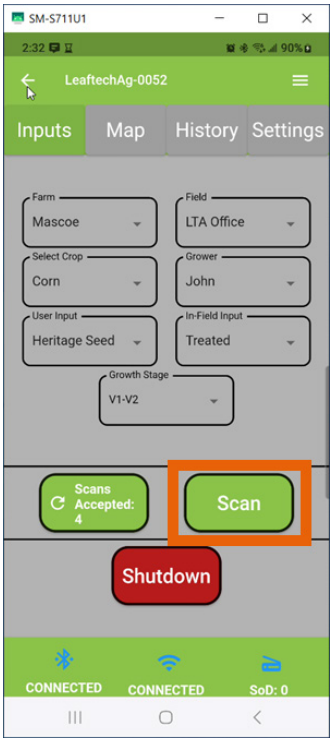




SCANNING

You can scan from both the Inputs Screen, and the Map Screen. Once you have placed the leaf in the scanner bed and closed the scanner, press the Scan button and the blue indicator light on the side of the scanner will turn on to indicate the image is being taken. **DO NOT OPEN THE SCANNER WHEN THE BLUE LIGHT IS ON.** Once the light is off (5-6 seconds) you may remove the leaf.



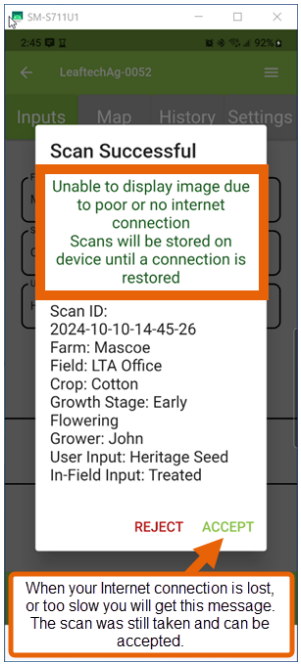


ACCEPT OR REJECT SCAN

After the scan, an image of the leaf will appear. If the image looks good (leaves are mostly centered on the scan bed, laid flat, and not bunched where light can't get through them), press ACCEPT. If it doesn't look as it should, press REJECT, and go back to Leaf Placement (step 8).

Pro Tip: If the image has a purple hazy quality to it, there may have been too much foliage in the scan bed. Try the image again with less crop leaf so that there is enough light for a quality image.

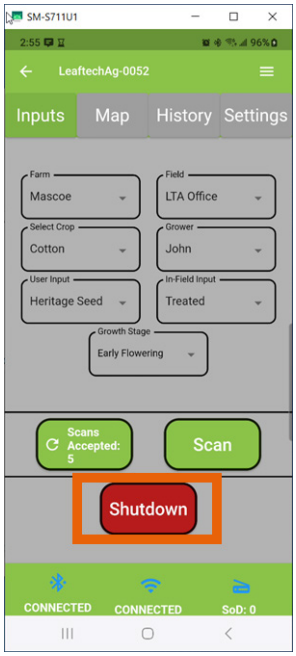
Continue scanning even if you lose your connection to the internet. Scans done without an internet connection will be stored on the scanner (See Accepted Scans (aka Scan Counter) and can be uploaded later once you have reestablished a connection.

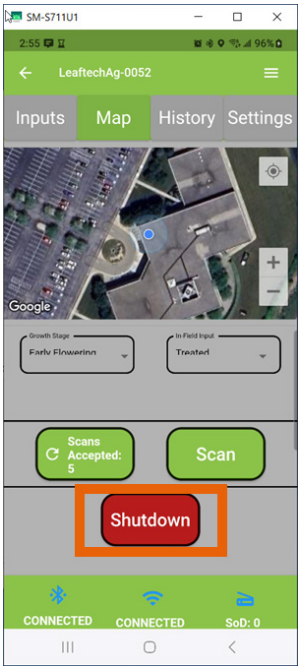


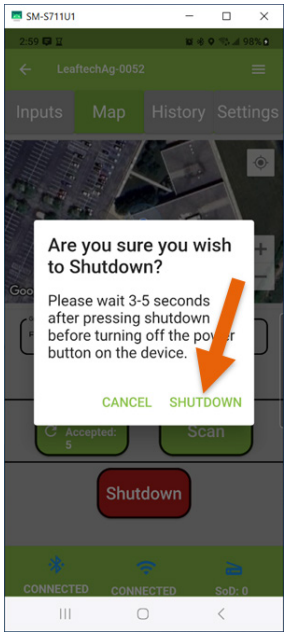
POWERING DOWN

STEP 1

Shut down your scanner using the Shutdown button. This button appears on both the Input Screen, and the Map Screen. **To prevent damage to the scanner it is important to shut down the scanner via the app prior to flipping the power switch on the scanner.**



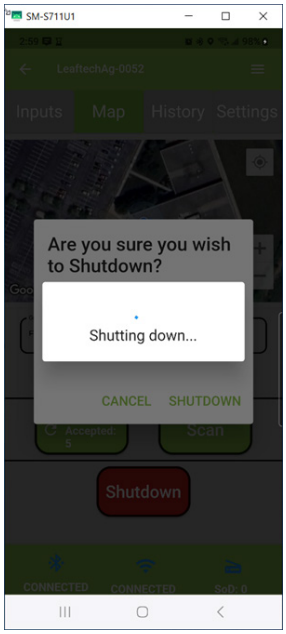




You will be asked to confirm your shutdown request. Press Shutdown if you are finished scanning for that session.

STEP 2

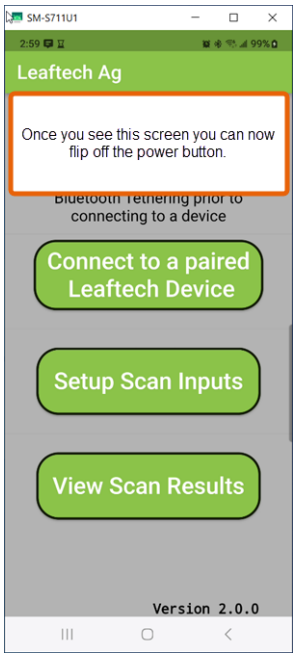
Wait for the Shut Down screen to disappear.

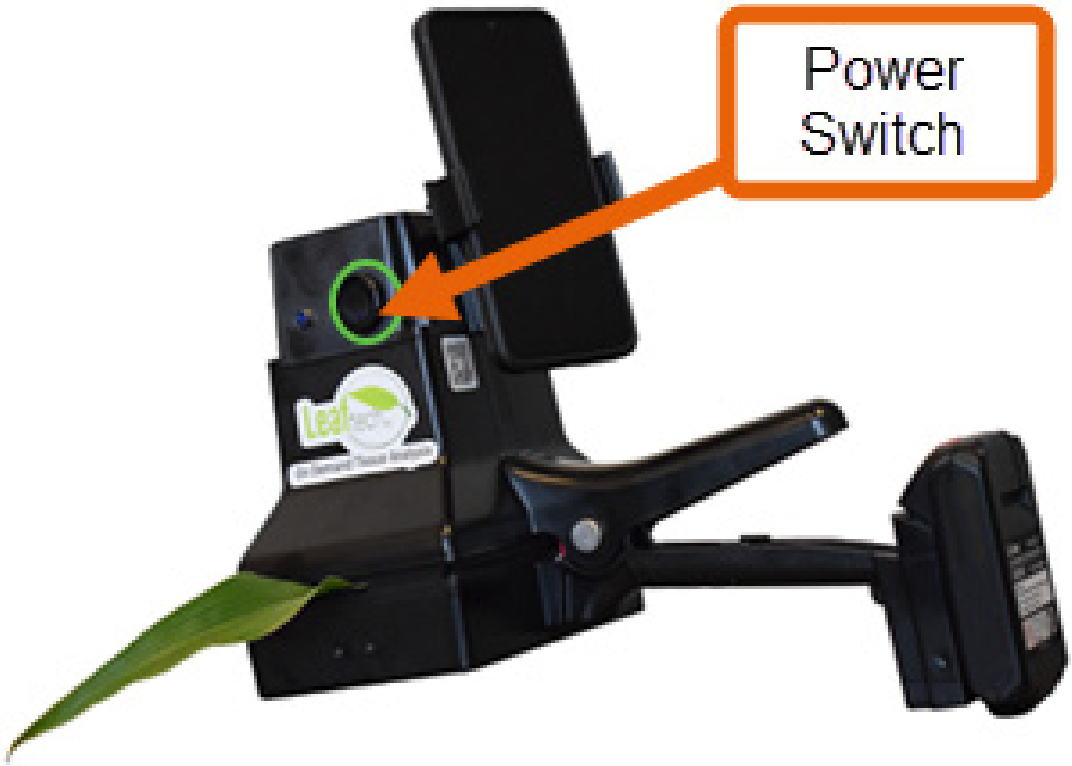


POWERING DOWN CONT...

STEP 3

Step 3 - Flip the power switch to power down the scanner.





Note: Charge your battery daily. It can run down to the point that it can't be charged. If your phone stopped pairing with your scanner, check your battery, it may be too low. The scanner power light may be on; however, the battery is too low to provide enough power for pairing with the phone.

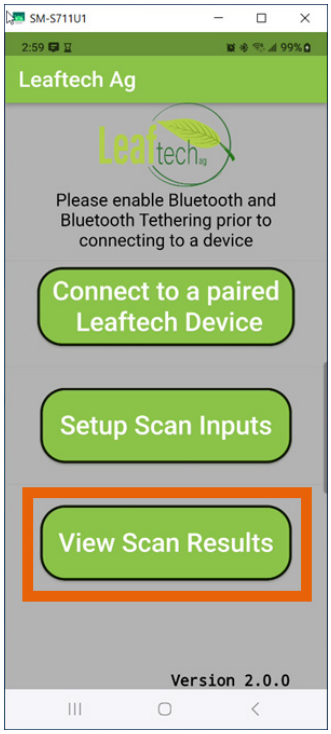
SCAN RESULTS

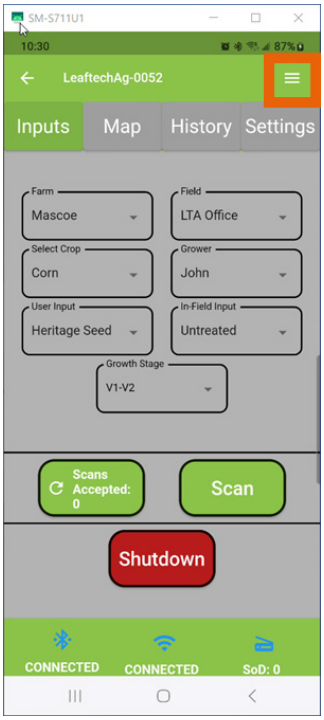
REVIEWING SCANS

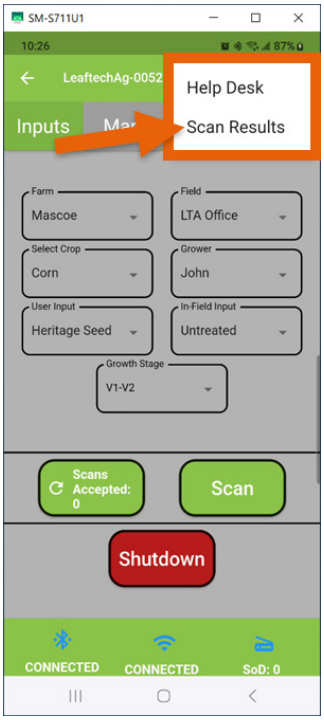
Note: You must have downloaded and installed the Power BI App.

There are two ways you can access your scan results.

1. Click on View Scan Results from the Leaftech Ag introduction screen.
2. Click on three lines in the upper right of the menu screens and select Scan Results







After selecting one of the above options, the Power BI App will open in a seperate app/window.

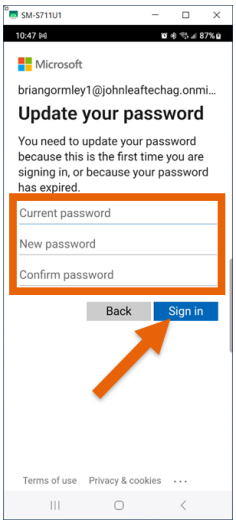
SCAN RESULTS CONT...

SIGNING INTO POWER BI

This will take you through the initial setup of Power BI

Signing In.
The first time you open the Power BI application you will need to sign in. Click on the SIGN IN button. You will use the User Name and Password you received from Leaftech Ag to set up this account.

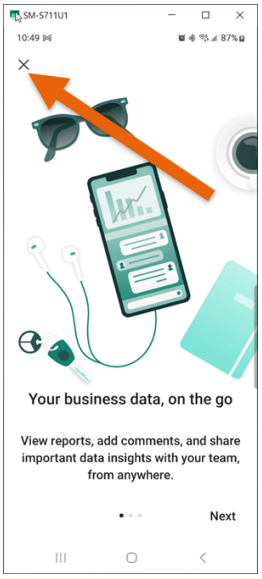
After you've logged in the 1st time, you will need to change your password. This will be the same password needed to log-in on the computer.

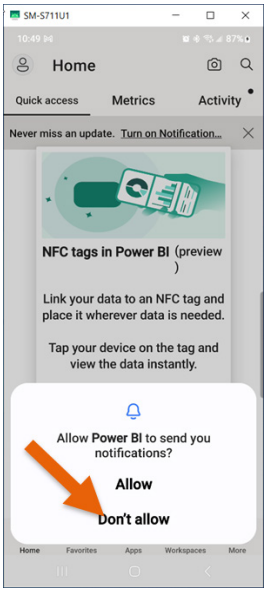


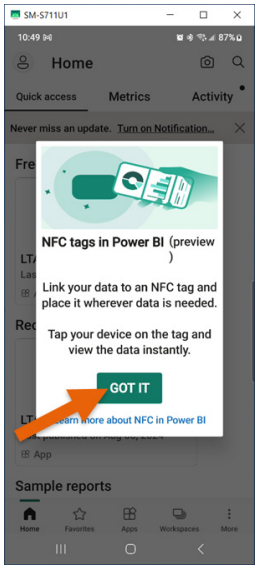
SCAN RESULTS CONT...

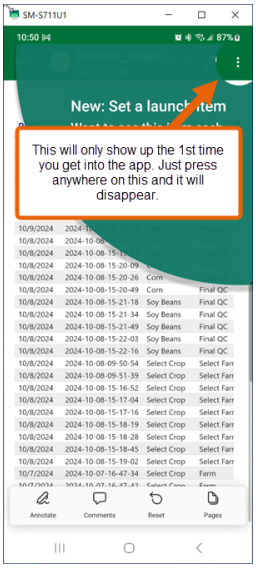
SIGNING INTO POWER BI CONT...

The next couple of screens you'll only see this one time when you first log in. X out of the first one and select Don't' Allow on the second one (if you don't want to get alerts).





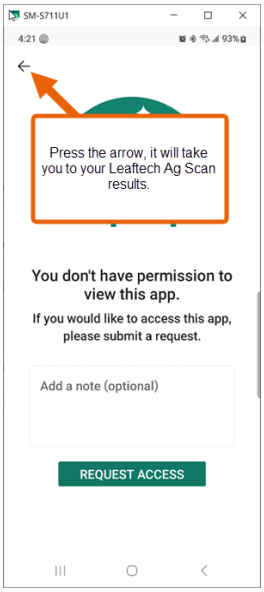




Note: Putting a shortcut on your smartphone is a way to see your scans in one click.

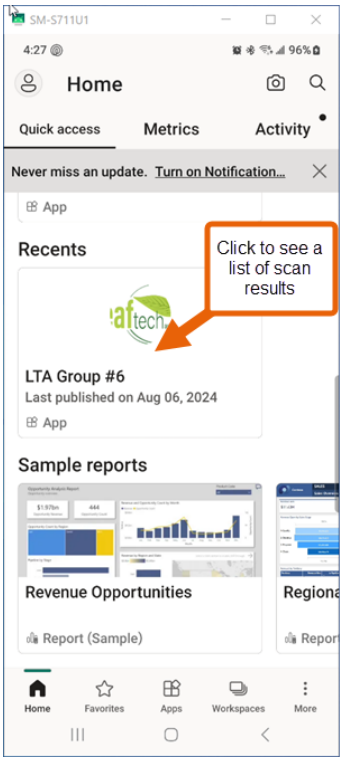
GROUP SELECTION

This is the page you'll land on after your log in credentials have been established. DO NOT REQEST ACCESS, you already have access, just press the arrow on the top left of the screen.

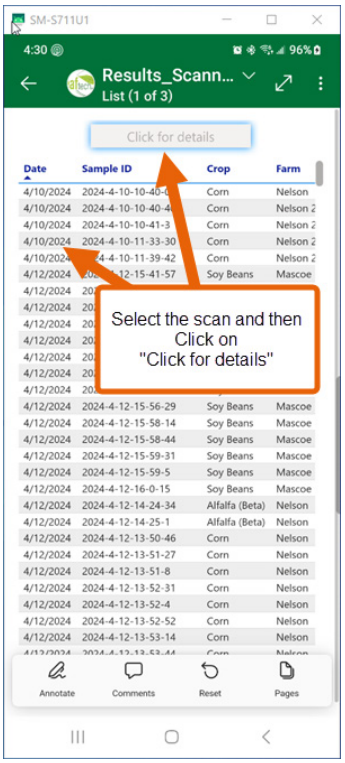


SCAN RESULTS CONT...

The LTA groups you have permission to view will appear here. You can scroll to see additional LTA Groups, if they are available to you. Click on an LTA Group, and a listing of your scanner results will appear.



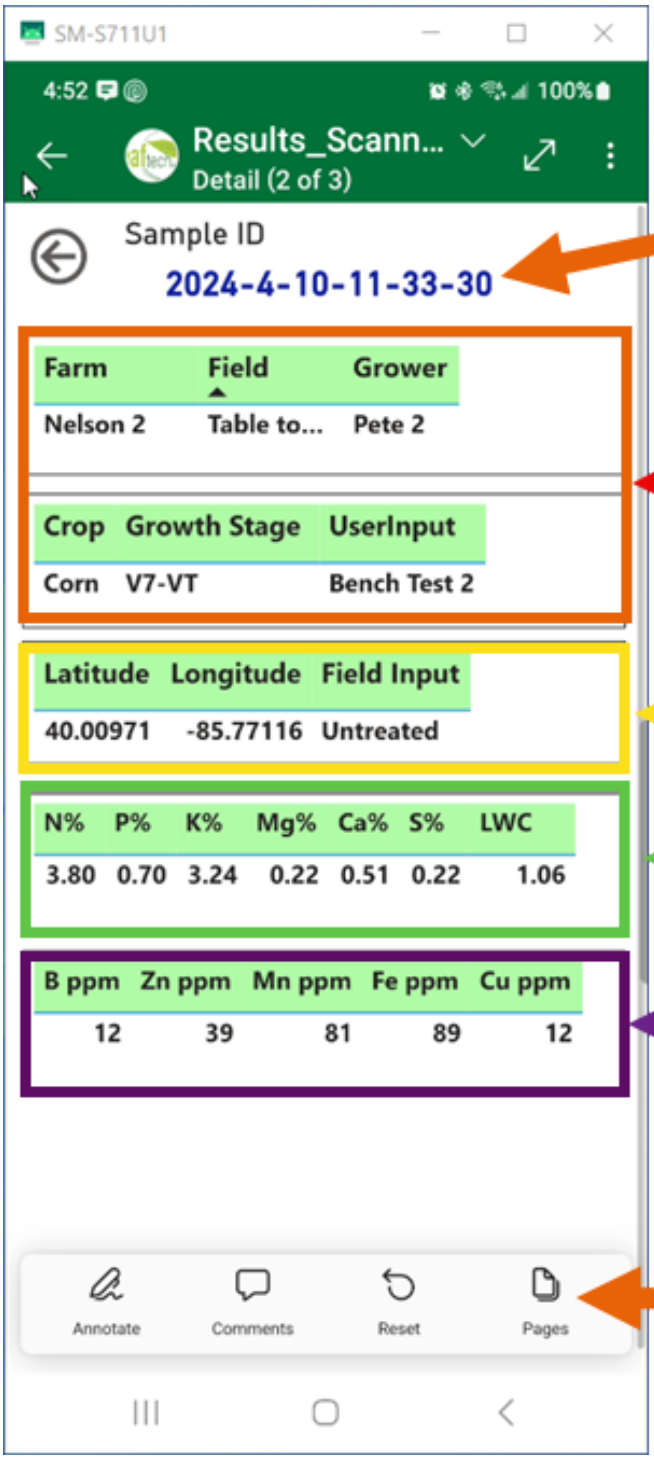
Once you've decided on what options you'd like to use, it's time to see the scan results. Select the scan you want to view the results of and press the Click for Details button.



SCAN RESULTS CONT...

DETAILS PAGE

Below is an explanation of what is on the details page.



Yr-Mon-Day-Hr-Min-Sec
Scan was taken

Used as the scan reference number
(Sample ID)

This information comes from what was inputed in the User Input Fields, an selected for this scan.

This is the location where the scan was taken.

This is the percentage and Leaf Water Content (LWC) of these nutrients.

This is the parts per million (ppm) of the nutrients listed.

Use Pages to see the Export page = entire list of all the scanned items. (see below for more details)

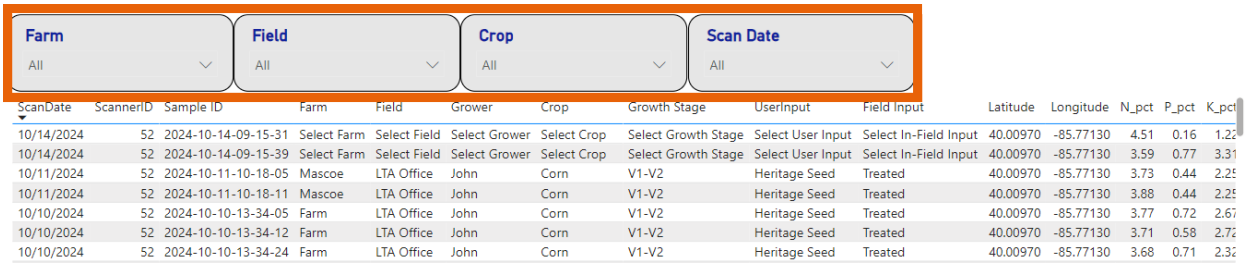
SCAN RESULTS CONT...

EXPORTING DATA

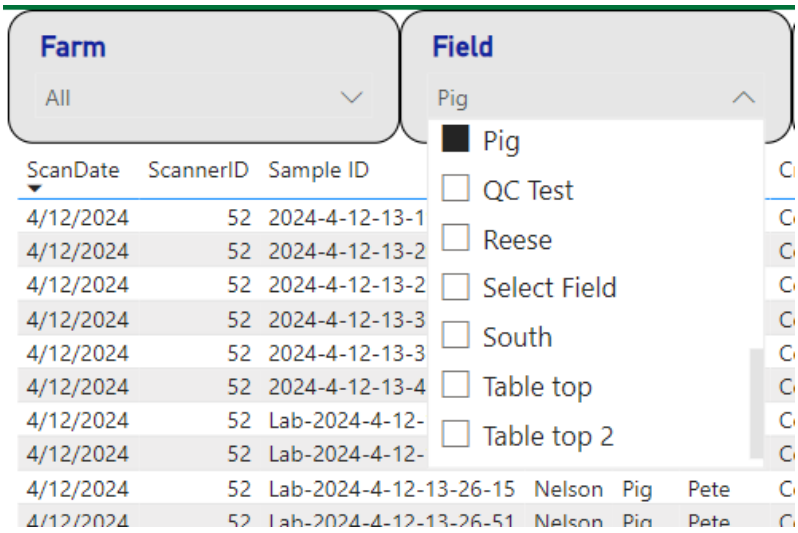
Note: The Export option on a smartphone is for viewing only. You'll need to use the Power BI App on your computer to export a set of scans into an excel spreadsheet where it can then be used to import into the crop management software you use. You can convert the excel file into a csv file from excel. You will need to consult your crop management software for details on how to import this data.

To view all the scans, click on Export.

This will create a report of every scan taken on this scanner during the period you had the scanner. You can view these scans by zooming in on the report. There are four areas you can choose to filter this report, Farm, Field, Crop, and Scan Date. Each area has a radio button (you can only select one option) where you can choose how you want the data filtered.



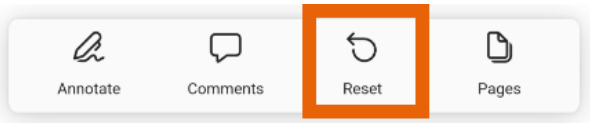
ScanDate	ScannerID	Sample ID	Farm	Field	Grower	Crop	Growth Stage	UserInput	Field Input	Latitude	Longitude	N_pct	P_pct	K_pct
10/14/2024	52	2024-10-14-09-15-31	Select Farm	Select Field	Select Grower	Select Crop	Select Growth Stage	Select User Input	Select In-Field Input	40.00970	-85.77130	4.51	0.16	1.22
10/14/2024	52	2024-10-14-09-15-39	Select Farm	Select Field	Select Grower	Select Crop	Select Growth Stage	Select User Input	Select In-Field Input	40.00970	-85.77130	3.59	0.77	3.31
10/11/2024	52	2024-10-11-10-18-05	Mascoe	LTA Office	John	Corn	V1-V2	Heritage Seed	Treated	40.00970	-85.77130	3.73	0.44	2.25
10/11/2024	52	2024-10-11-10-18-11	Mascoe	LTA Office	John	Corn	V1-V2	Heritage Seed	Treated	40.00970	-85.77130	3.88	0.44	2.25
10/10/2024	52	2024-10-10-13-34-05	Farm	LTA Office	John	Corn	V1-V2	Heritage Seed	Treated	40.00970	-85.77130	3.77	0.72	2.67
10/10/2024	52	2024-10-10-13-34-12	Farm	LTA Office	John	Corn	V1-V2	Heritage Seed	Treated	40.00970	-85.77130	3.71	0.58	2.72
10/10/2024	52	2024-10-10-13-34-24	Farm	LTA Office	John	Corn	V1-V2	Heritage Seed	Treated	40.00970	-85.77130	3.68	0.71	2.32

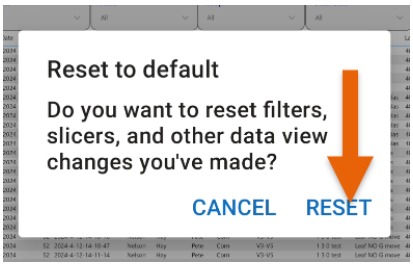


SCAN RESULTS CONT...

PAGES OPTIONS

You can use the Reset button at the bottom of the report to set all your selections (filters) back to none, thereby showing all the scans again. After hitting the Reset button, you'll be asked to confirm resetting the filters back to the default (none selected) setting.

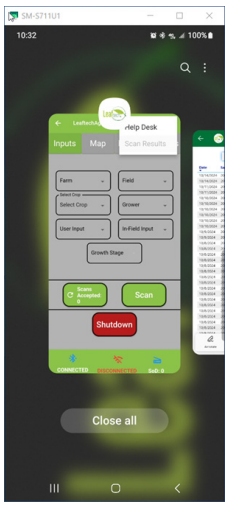


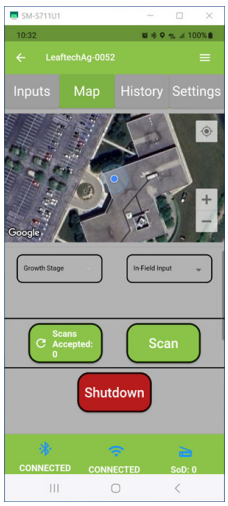


NAVIGATION

To get back to the Leaftech Ag App, click on the three (3) bars on the bottom of your smartphone.

Scroll across until you see the Leaftech Ag App and select it.



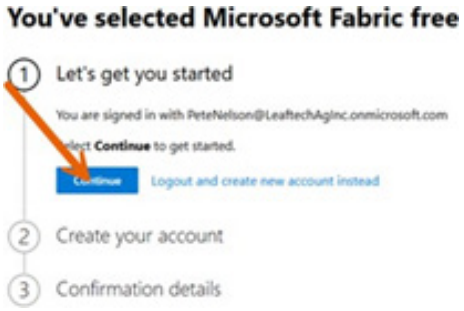


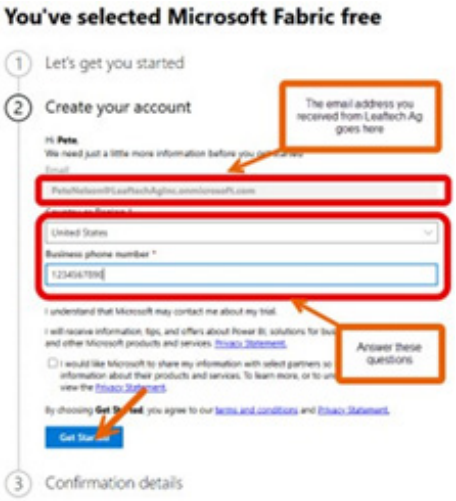
You can now check to see if you still have scans on the device, continue taking scans, or shutdown (all features are available to you in the Leaftech Ag App as stated above in this manual).

SCAN RESULTS CONT...

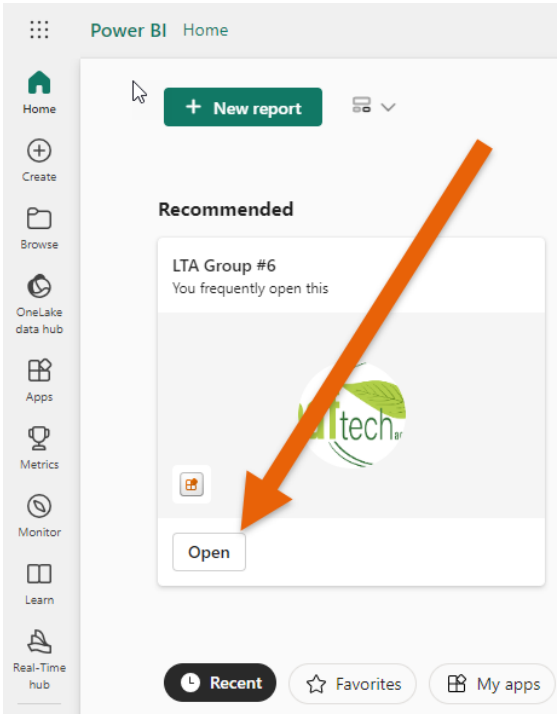
SIGN INTO POWER BI ON A COMPUTER

Type in http://app.powerBI.com/ into your web search location on your computer. A Microsoft Fabric free account logon will appear. Press Continue. A second screen will appear. Put in the email address you received from Leaftech Ag, enter your country and business phone number, then press Get Started.





Once logged into the Power BI App on your computer you will see a screen like the one below. Click on the LTA Group that appears on your screen. If you have access to multiple groups, you may need to click the apps button to view them.

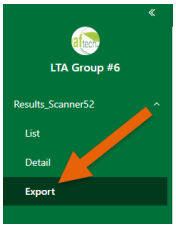


SCAN RESULTS CONT...

EXPORTING RESULTS TO EXCEL

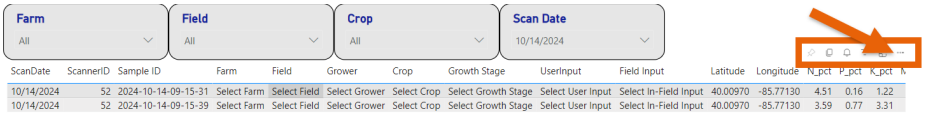
You can export all your scan results into an excel spreadsheet so that you analyze the results or import them into crop management software.

1. On the left navigation, choose the Export tab

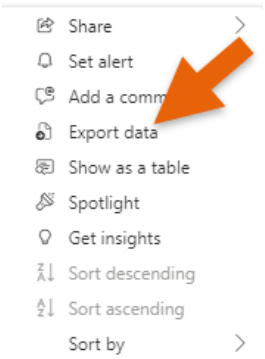


2. If needed, narrow the results by Farm, Field, Crop, and/or Scan Date

3. When you have the data showing that you want to export, look to the top right corner of the report and you'll see three dots, click on those dots. **Note: Your cursor must come from the report up to the dots, or the dots will disappear.**

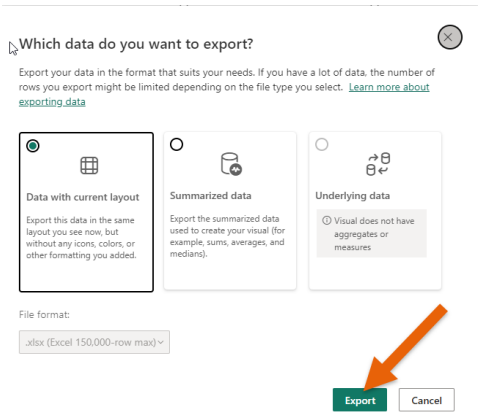


4. Click on Export Data:

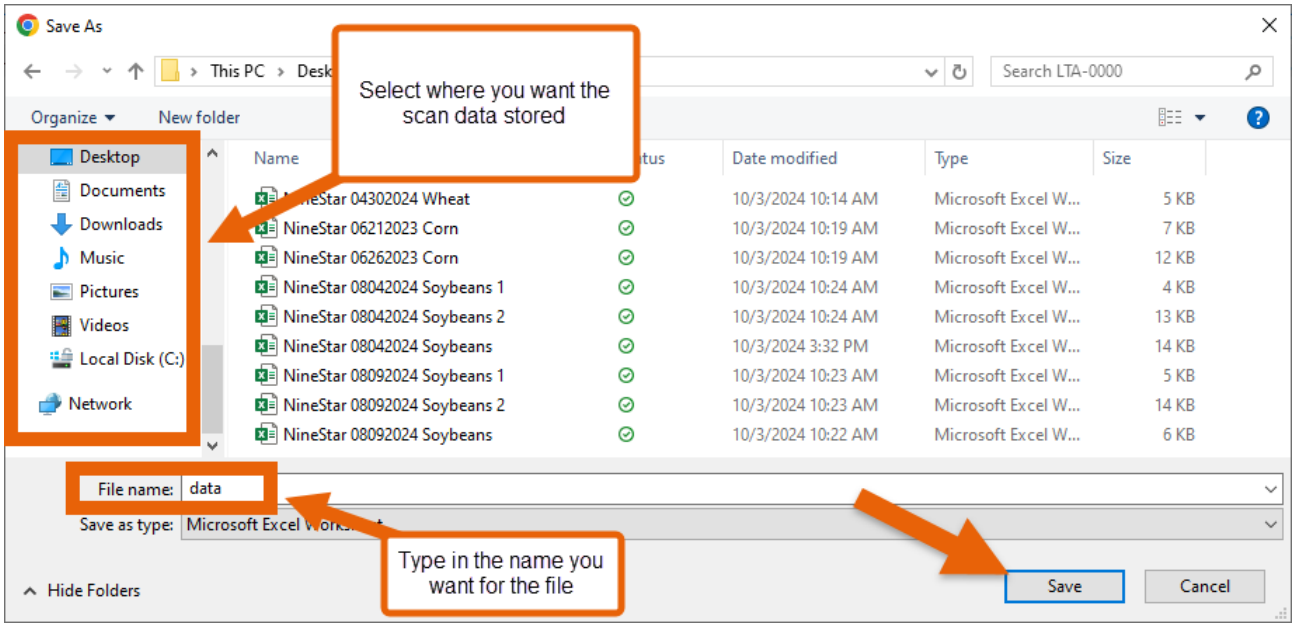


SCAN RESULTS CONT...

5. Choose the defaults shown and click on Export.



6. On the next screen, select data and rename the file, then select where you want the file to be stored and press save.



CASE CONTENTS

V 1.0 CASE

Green or black durable plastic carrying/shipping case measuring 21″x8″x16″. It weighs between 15.4 lbs. to 15.88 lbs. It comes with a custom cut-out interior that holds all the components of the scanner.

CASE CONTENTS CONT...

V 1.0 CASE CONT...

In each case you will find the following:

1. One Scanner.
2. One 20V 6.0Ah Lithium-ion battery (DeWalt compatible).
3. One carrying strap for the scanner.
4. One Lithium-ion battery charger.
5. One Field Guide.
6. One DO THIS FIRST & QR code card.
7. Six Lens & Screen Cleaning Wipes
8. Two Leaftech Ag stickers

CASE CONTENTS CONT...

V 2.0 CASE CONT...

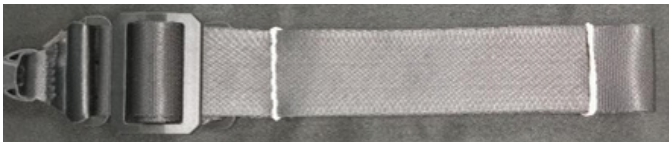
Black durable plastic carrying/shipping case measuring 22″x16″x12″. It weights 17.48 pounds. It comes with a custom cut-out interior that holds all the components of the scanner.

CASE CONTENTS CONT...

V 2.0 CASE CONT...

In each case you will find the following:

1. One Scanner.
2. One 20V Lithium-ion battery (DeWalt compatible).
3. One carrying strap for the scanner.
4. One Lithium-ion battery charger.
5. One Field Guide.
6. One DO THIS FIRST & QR code card.
7. One Lens Cleaning spray bottle with micro cloth
8. Two Leaftech Ag stickers



LEAF PLACEMENT

Below are examples of leaf placement on different crops.

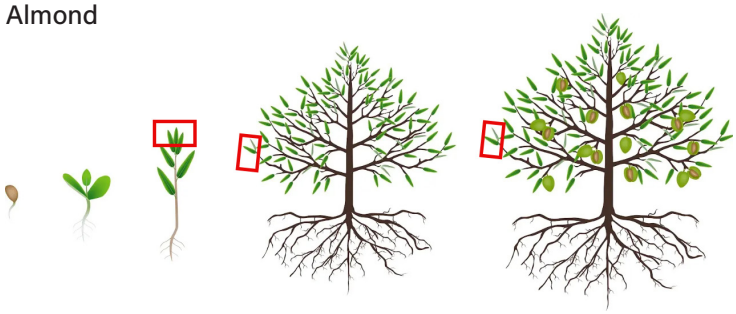
Corn

Cotton

Soybeans

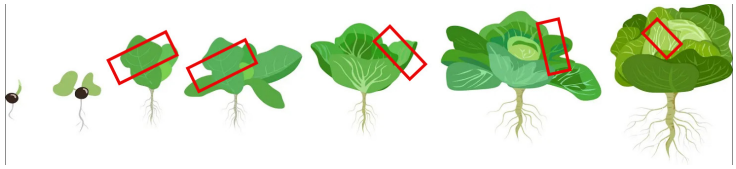
Alfalfa

Almond

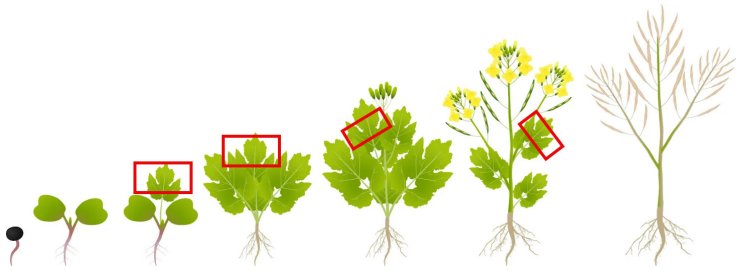


Apple

Cabage

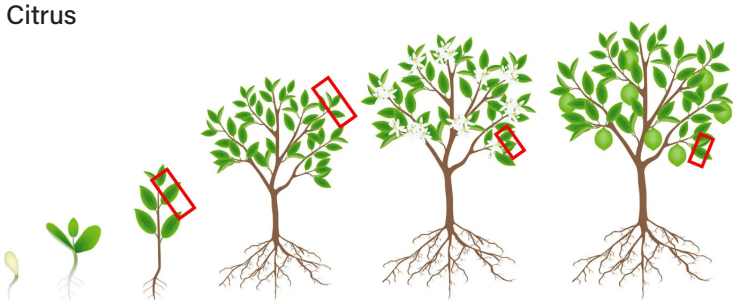


Canola

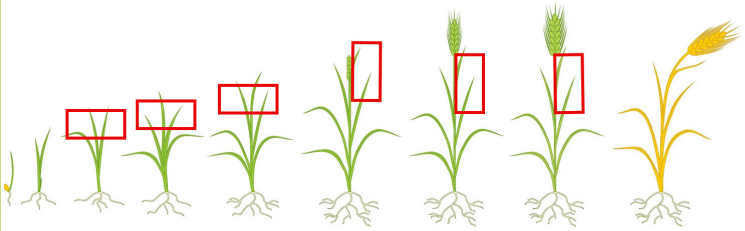


LEAF PLACEMENT

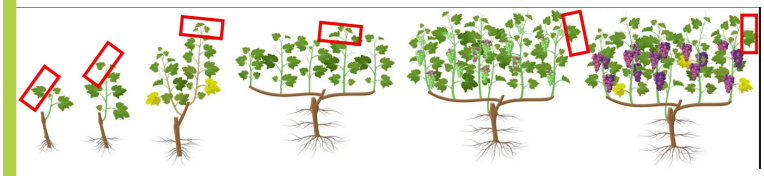
Citrus



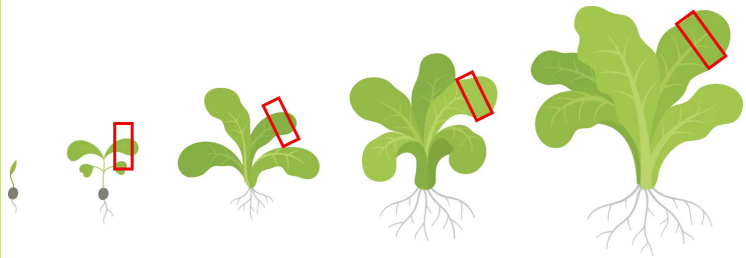
Drum Wheat



Grape

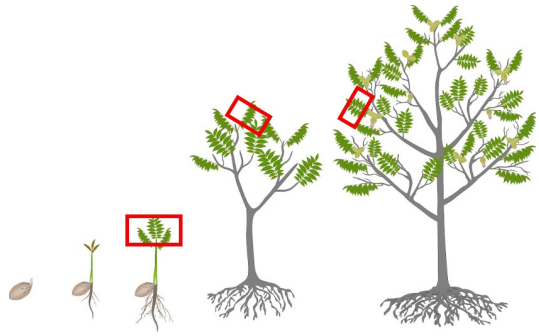


Lettuce



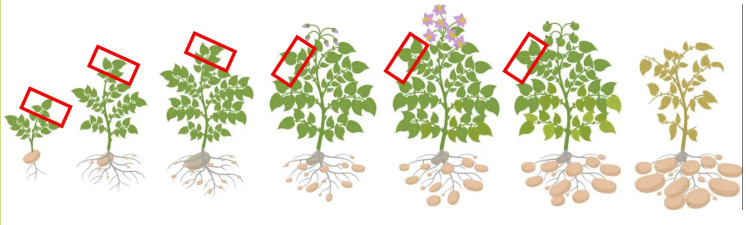
Peanut

Pecan



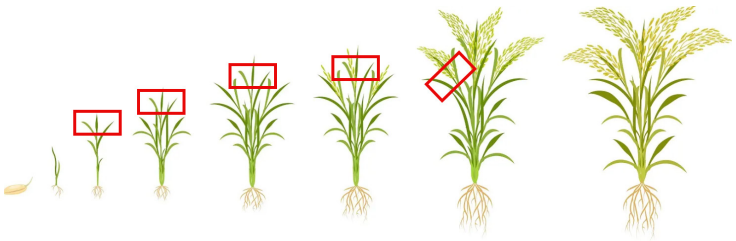
Pepper

Potato

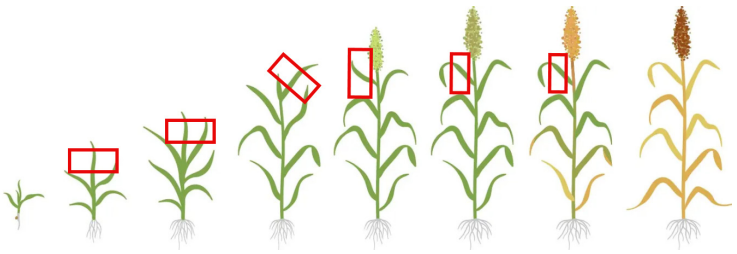


LEAF PLACEMENT

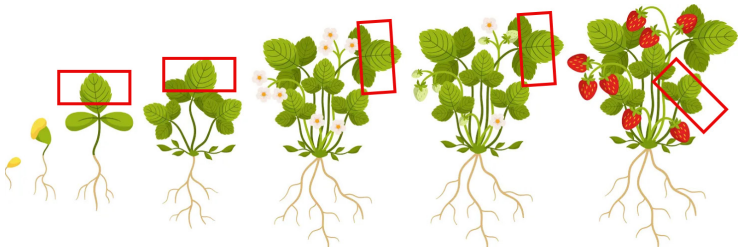
Rice



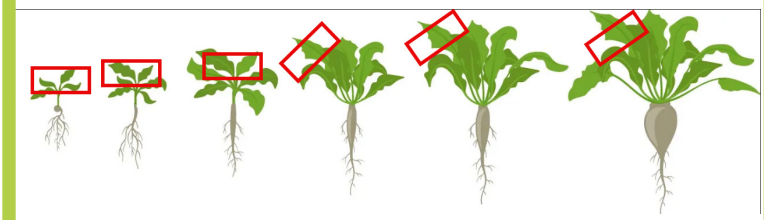
Sorghum



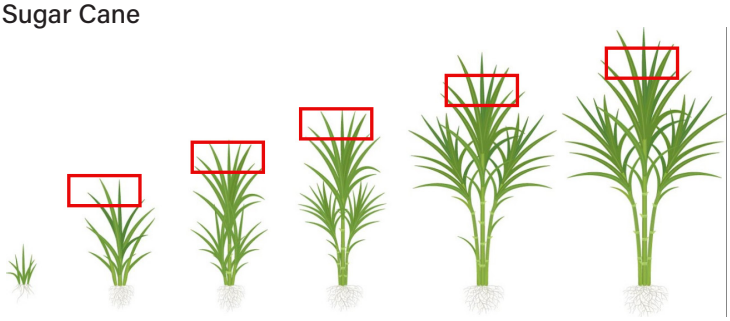
Strawberry



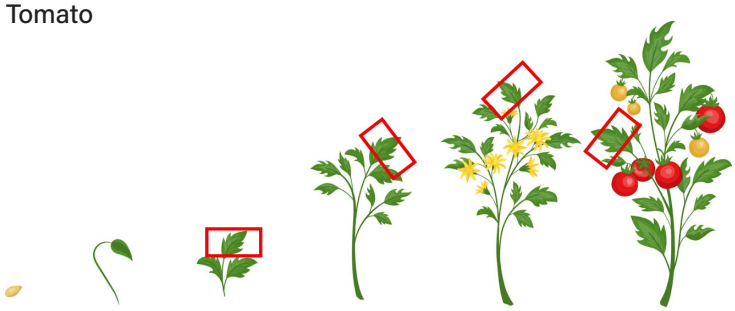
Sugar Beet



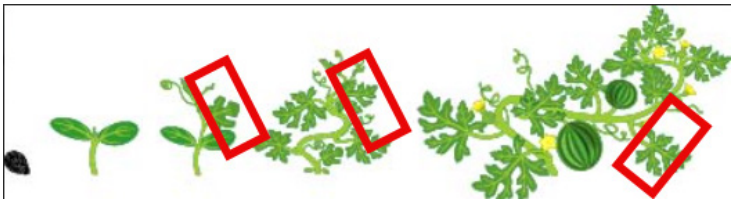
Sugar Cane



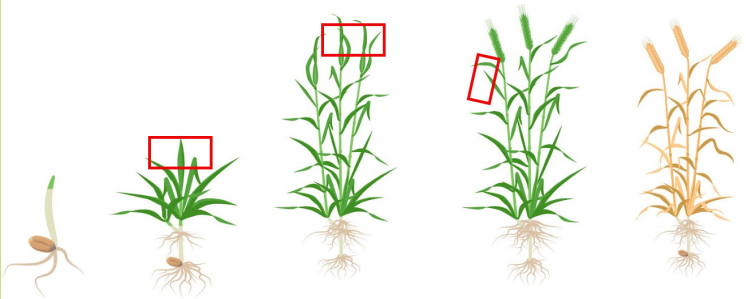
Tomato



Watermellon



Wheat



TROUBLESHOOTING

CAN'T PAIR WITH BLUETOOTH HOTSPOT

Turn hotspot security off. There isn't any way for the scanner to type in a security password to gain access to the smartphone's hotspot.
Is the phone's Operating System up to date? If not, update it.
Pair from the phone, not the Leaftech Ag App.

TETHER KEEPS DISCONNECTING

Set defaults on the phone to keep the tether connected (active) when the connection is lost. This will allow the scanner to reconnect if you are scanning in an area with intermittent internet connectivity.

BLUETOOTH CONNECTED BUT SCANS NOT RECORDING

Restart the Leaftech Ag App and pair with the scanner. If you paired with the scanner, then got into your truck and your radio connected with your phone, the Bluetooth session with the scanner ended. It may show connected, but the scanner will not scan = blue light will not come on.

SCANNER POWER LIGHT ON BUT NOT ABLE TO CONNECT

Check battery power. If the battery is low, it will light up the power switch but not the internal electronics. Replace battery with a charged one. **Note: charge your battery nightly so that you get to the field with a full battery.**

UNABLE TO CONNECT TO TETHER

Make sure Bluetooth tethering is on. Make sure Location services are on. Make sure Wi-Fi is off (on Androids). Make sure hotspot is on (on Apple smartphone). Is the phone's Operating System up to date? If not, update.

SCAN LIGHT NOT COMING ON WHEN SCANNING

Exit Leaftech Ag App, restart and reconnect.
Probable cause: Session with Bluetooth was interrupted by another Bluetooth connection.

TROUBLESHOOTING CONT...

NUMBER OF SCANS ON DEVICE NOT GOING DOWN

Check to see if you have an Internet Connection, click on the Tether Connection or Internet Connection icon.

Probable Cause:

Internet connection lost = no scans being uploaded.

Internet connection slow = give it time, the scans will be uploaded. Uploads depend on the local internet upload speeds which are effected by congested internet hubs.

If there is no Internet connection, no action is needed. Scans will be uploaded once the connection is reestablished.