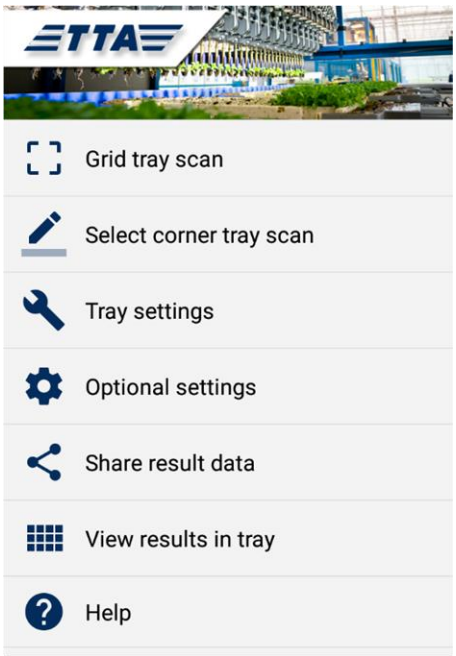
The Trayscan app is built to give you an easy way to evaluate the germination result of your trays or your tray batches. You will find a brief description of what is possible with the app below. This page is built to explain all features of the app and to give you a smooth start using them.

Full explanation

The starting screen of the app is shown at the right side. In this manual the options of the menu are explained one by one.

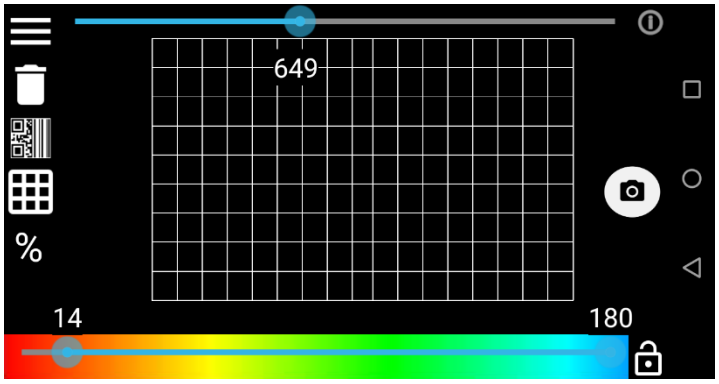


This app utilizes two scanning modes, ‘Grid tray scan’ and ‘Select corner tray scan’. The difference between these two is only in the way the tray is found. When using ‘Grid tray scan’ you need to hold your camera in such way above the tray that the grid you see on the screen and the grid of the real tray are matching. Then you click the camera button and a picture of the tray will be made. The resulting picture shows several plus signs at the corners of the gaps in the tray and some green squares. If there are no green squares, your tray was empty, or your settings were not correct. You can click the camera button a second time to save the result and continue taking a new scan.

If you want to edit your settings you can do that by clicking the lock at the bottom right of your screen. When you click that lock there will appear a slidebar at the top and one at the bottom of your screen. The top one can be used to set a threshold for the number of green pixels in a square that are required in order to validate the square as OK. So if you swipe it to the right only large plants will be taken into account and if you swipe it to the left all plants and probably some moss is taken into account. So you need to set it in such a way that fits your needs.

The slidebar at the bottom can be used to set a right color range for your plants. So preferably you set it in such way that all your plants are taken into account and that the moss and non-plants are left out.

At the top right corner of your screen you can find an information button. If you click it, the batch name, the tray ID and the tray type used are shown. You can hide it by clicking it a second time.

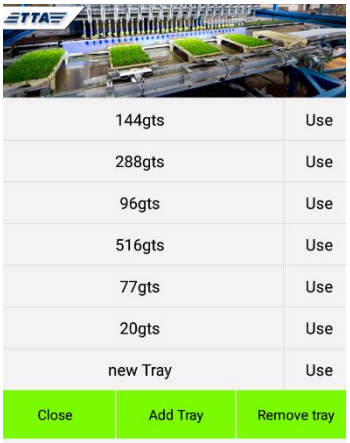


On the left side of your screen there are four options and a percentage displayed. That percentage is the percentage of the tray that has just been scanned. It is displayed upon making a picture. The first option can be clicked to return to the starting screen. The second option, with the bin, can be clicked in order to remove the last picture that is made. (Per picture only one result is saved, so changing the color range or the threshold has no influence on the number of results.) The third option can be used to scan the QR-code or the barcode of the tray. This tray ID will be saved with the first picture made after that.

The fourth option is a little bit more difficult. The standard way to check if a gap of the tray is being filled, is by checking if there are enough green pixels in the square so that the threshold value has been reached. When you click this button another way of checking, called ‘scanmode masspoints’ is used. What this option does is finding the middle point of all leaves of the plant (indicated as little blue dots) and if such a blue dot is within a square the surface of that whole leave is set to that square. If the total surface set to a square is higher than the threshold, it is seen as filled. By clicking the button a second time you can return to the standard scanning mode, ‘scanmode grid’.

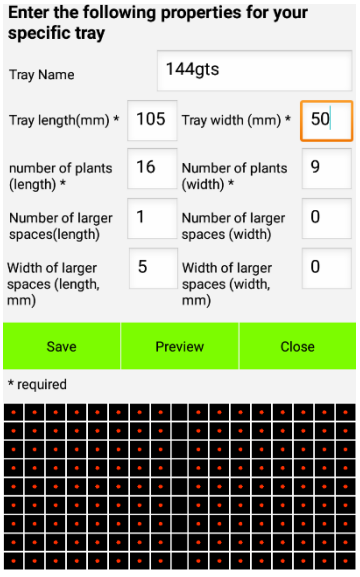
The second option on the starting screen is the ‘Select corner tray scan’ mode. All options in this mode are the same as the previous mode, the only difference is the way the picture should be taken. In this mode place your mobile device above your tray in such way that the whole tray is visible, then push the camera button. This button then changes into a green checkmark. Now click exactly the four corners of the tray. You can move the yellow circles afterwards. If they are on the right spot, click the green checkmark and the tray will be evaluated. The rest of the settings can be set the same way as in the ‘Grid tray scan’ mode.

The third option on the starting screen is called ‘Tray settings’. When you click this option you get a screen in which you can select which tray you want to use by clicking ‘Use’ behind the tray you want to use. You can add trays by clicking ‘Add tray’, you can remove trays by clicking ‘Remove tray’ and you can return to the starting screen by clicking ‘Close’. When you click the name of one of the trays you can edit the dimensions and the name of that tray.

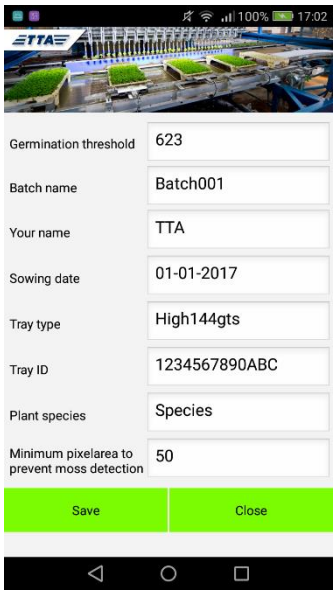


The dimension ‘tray length’ should be the longest side of the tray. The number of plants are the number of gaps in that direction. You only need to edit the number of larger spaces if your tray has one or more big spaces ('bridges') in the middle or divided over the tray. Sometimes you get the error message ‘please edit tray dimensions’. This indicates that the dimensions you entered are not right. For example, if the number of plants in the length is 16, like in the pictures, and you set the number of bridges to two, it means that your tray is divided into three parts. However, 16 divided by three is not a round number and therefore your device does not know where to place that bridges, which will result in the error message.

When you click preview, you can check if you entered the dimensions the right way, for it will show a preview of the grid of the tray which should look like your real tray. The red dots indicate the gaps in the tray, where a plant should grow. The rows of squares without a dot indicate the bridges.



The forth option in the starting menu is ‘Optional settings’. Clicking this option brings you to a screen in which you can enter all sorts of settings. The first box is the same as the threshold which can be edited when scanning your trays. So editing this value is only handy when you want to have a specific value for that threshold. The rest of the settings, except for the last one, are mostly there to save all the information you like with the pictures you are going to make. And will only be shown in the output excel file.

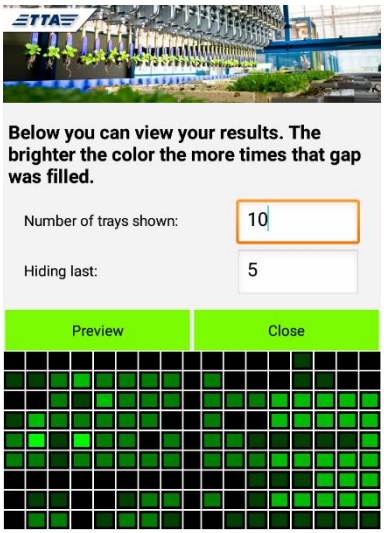


The last option, which is called ‘Minimum pixelarea to prevent moss detection’ can be very useful for preventing moss detection. The value you enter here will give you a threshold on how big an area of pixels in range of the color settings must be before being taken into account. If you scan with this option being zero, you will probably get results with some green areas, but also some very small green dots or even separate green pixels. If you enter for example the value 50 here and you scan with that option, you will see that it removes all these smaller green areas and you only have the bigger groups left. If you do enter too big numbers the scanning will leave the bigger green areas out of consideration too and thus some of the plants that are big enough are not taken into account. There is one drawback using this option: when using it on a device that is not very fast, it can make your scanning considerably slower.

The difference between this threshold and the ‘Germination threshold’ is that the first option takes all pixels into account and by adding them all up within one square it compares it to the threshold and when the total number of green pixels in that square is high enough, a plant is germinated on that spot. The last threshold removes all groups of pixels that are not big enough before the first option can do anything with it. If you do not get the difference, just try it out by setting one of the two thresholds to zero and the other one to a reasonable value and try one of the scanning modes. Then set the other one to zero and the first to a reasonable value and scan again. You will see that one option removes all small groups of pixels, whereas the other one take them into account, and when there are enough of these small groups in a square, that square can even be seen as filled.

The fifth option is ‘Share result data. This option can be used to send the generated excel file via mail, put it on Dropbox, on Google Drive and several other options. All excel files are saved on your phone too. So if you lost the file with the results of yesterday that is no problem. The easiest way to get it back is to set the date of your phone to yesterday and restarting the app. You can also find the files on your phone in your (All) Files folder: (All) Files -> Android -> data ->tta.trayscan -> files

The sixth option on the starting screen is called ‘View results in tray’. This option gives you an insight in how often a specific part of your tray was filled compared to the rest of the tray. If you enter a zero in both boxes, you will get all results for that specific kind of tray for that day. If you enter for example a 10 in the first box, you will see the last ten results. If you then enter a 5 in the second box, you will get the ten results before the last five. So if you want to see the result of the tray you scanned ten trays back, you enter in the first box a one and in the second box a ten. When you click on preview then, you will get a grid filled with green squared. The brighter the color of a square the more that gap was filled.



The last option is called ‘Help’, if you click that you will open this page.

Quick start

If you have read the full explanation and you are ready for scanning, this quick start guide will help you getting to work with the app.

1. Open the app.
2. Accept both permissions. (The app will not use your camera when you are not scanning, nor access any of your storage else than the storage where the excel files are saved.)
3. Click the option ‘Tray settings’.
4. Click on the button ‘Click to Edit’.
5. Enter a name and the tray settings.
6. Click preview to check if you have done it right.
7. Click ‘Save’.
8. Click ‘Optional settings’.
9. Enter all information you would like to see in your excel file.
10. Click ‘Save’.
11. Click use behind the tray you just edited.
12. Click one of the two scanning modes.
13. (optional): Clink on 'Scan QR/bar code' to attach the coming trays to that code
14. Make a picture in the right way, as explained above in the section about the scanning modes.
15. Click on the lock at the bottom right of your screen.
16. Edit the slidebars until you get the result you like.
17. Click the lock again to hide the slidebars.
18. Click on the camera button again to make a new picture.
19. Most likely you do not need to edit the values at the slidebars for every tray, so you can focus on doing a lot of scanning in the right way.
20. When you are finished click on the menu button to go back to the starting menu.
21. Send your results to your computer via the ‘Share results button’ or view the results via the ‘View results in tray’ button.