



PC Sample Application

User Guide

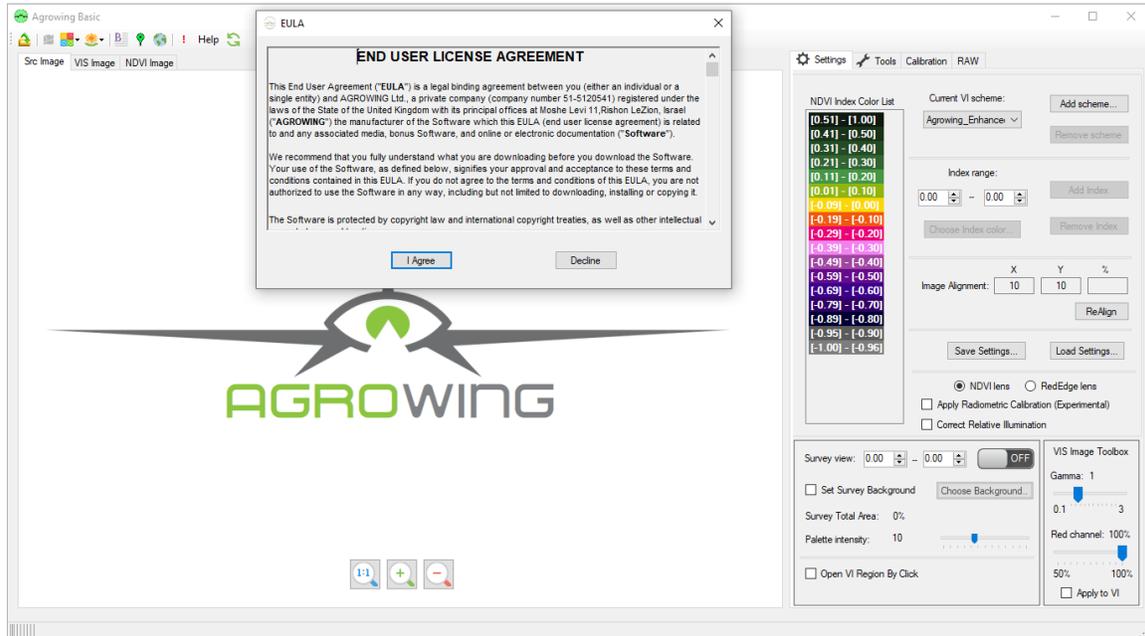
February 2021 V.1.2

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Getting Started

In order to start using the application, an approval of the end user license agreement is required.



The software is completely free for the Agrowing customers. The purpose of this software is to show the users the basic usage of high quality images produced by Agrowing multispectral lens.

Update Notes.



Update menu button



When "!" appears, this is a sign that there is an update for the current version.

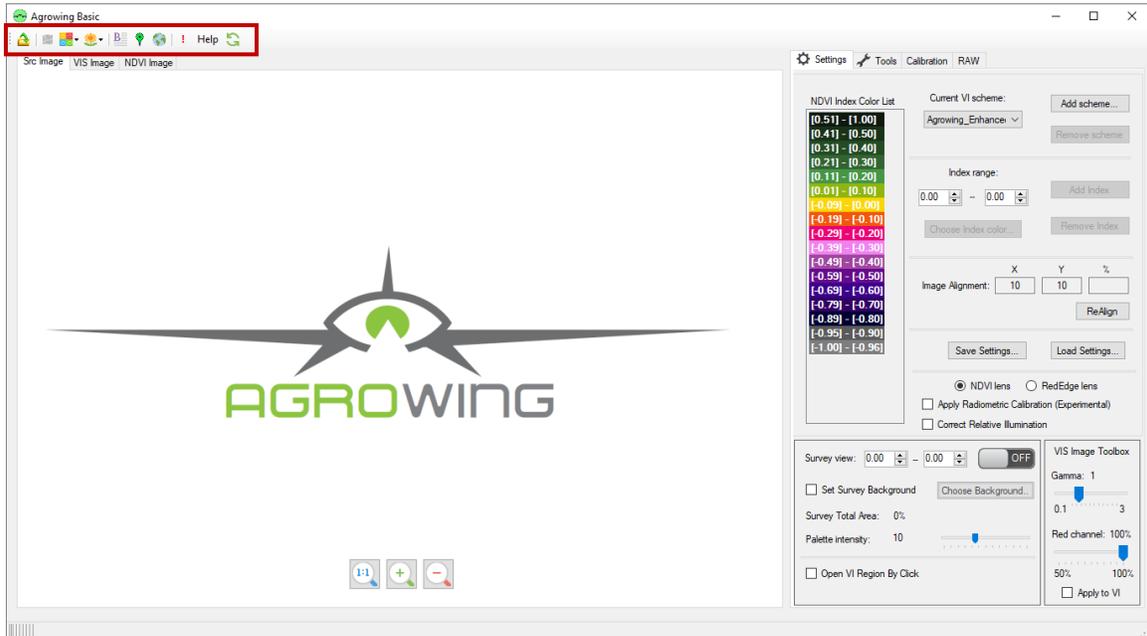
Updates are checked automatically every week, user also can check it manually by pressing the Update button on the top toolbar menu, you must have an internet connection during update checking and update process.

Updates are downloaded to user computer from secured site, extracted and old files are overwritten, at the end of the process updated Agrowing Basic application reopened.

All instances of the Agrowing Basic application should be closed in order to update the version.

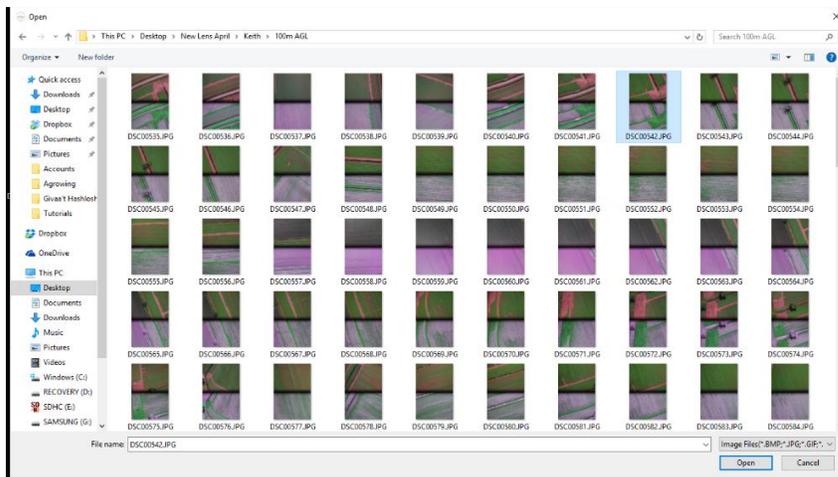
Agrowing Basic Application's main screen includes the interface to the application's settings.

The top toolbar icons (from left to right) are: File; Load Agrowing image/video; Show location; View RGB channels; Calculate SG metrics; Batch conversion; End user license; Help.

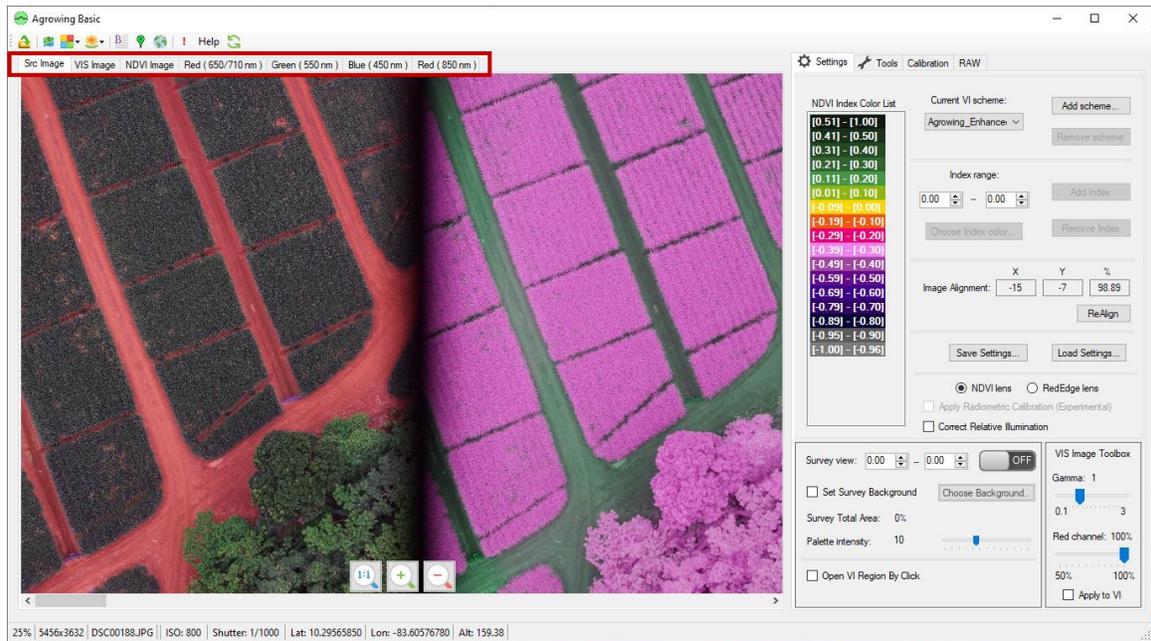


Agrowing files

Agrowing Basic Application is designed to process side by side multispectral images or video streams, which were captured using Agrowing NDVI or Red-Edge lens technology. The files can be of JPG, Tiff, BMP, PNG, AVI, MP4 and other types.



Displaying the acquired imagery



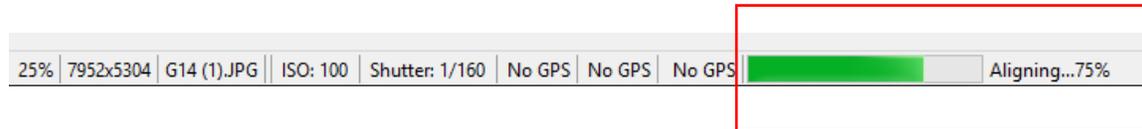
The display type can be selected by clicking on the tabs below the top toolbar. The application allows viewing the source image, the VIS part of the image, the NDVI (and other presentation of the analyzed image according to the selected metric), and the different split color channels (450nm; 550nm; 650nm/710nm; 850nm).

The software also support the A7Rii/iii/iv Full Frame – 10-14 band images

There are some differences in menus and GUI interface, but in general it is the same flow as for 4 – band sensor data.

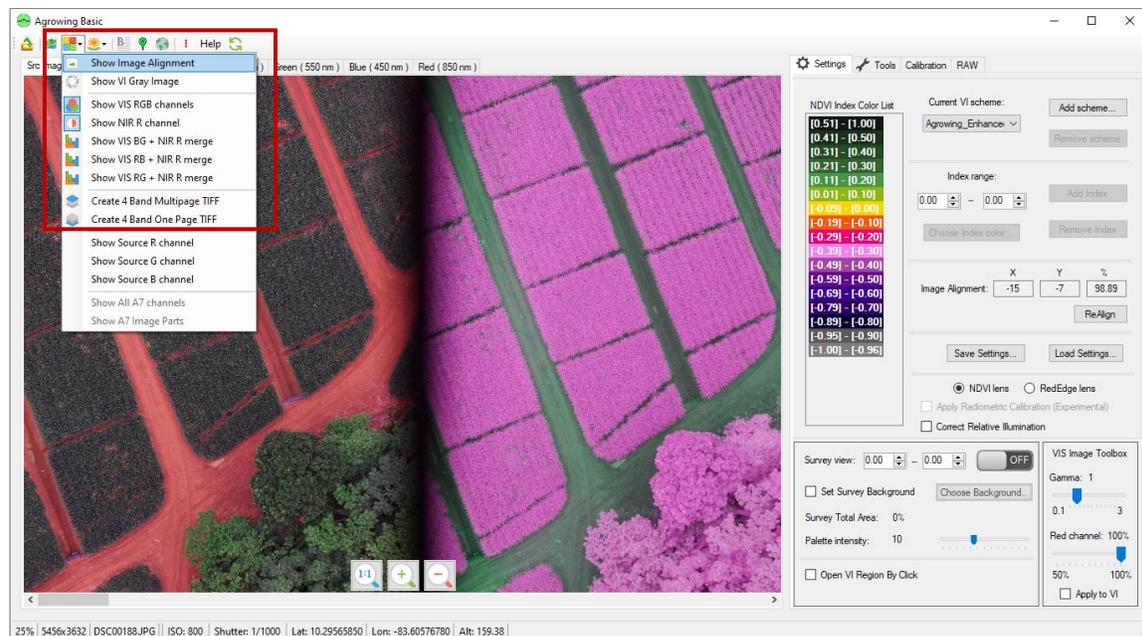


When loading the A7 image please wait till the alignment is finished, you can track the progress on the status bar at the bottom of the application window.



Advanced display

Clicking on the “Show Image Alignment” menu item, allows viewing combined color channels for alignment verification. Agrowing’s unique lens technology provides identical green channel for continuous alignment.



Alignment verification

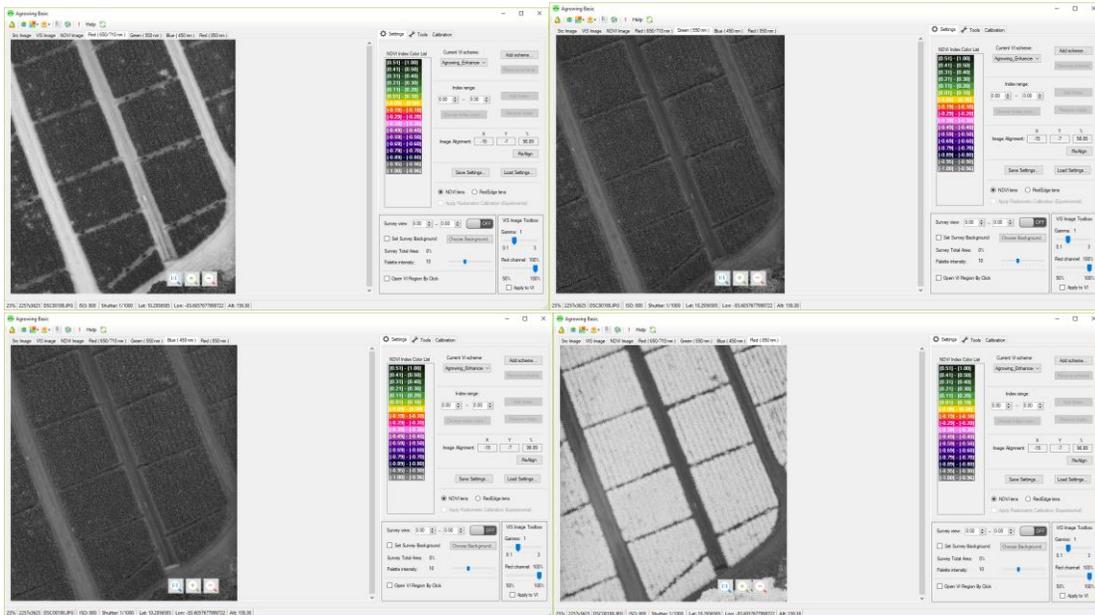
The automatic alignment displays the digital correction to the hardware tolerance (which can never be pixel accurate). Clicking on the “Check mode” button, shows the actual difference and alignment quality level of the green channels of the left and right lenses, based on which the color channels are aligned.



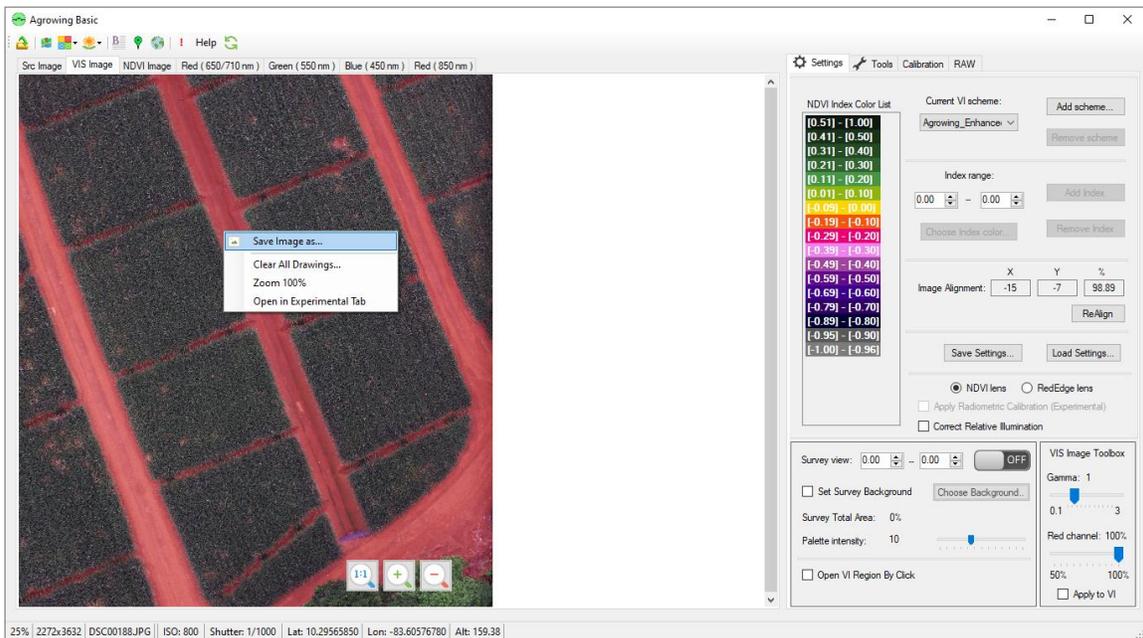
As the lenses are ~11mm apart, the digital alignment varies according to the elevation of the shooting session. The digital alignment is performed automatically whenever an image file is opened. The (X;Y) correction is also displayed on the application's main screen. In case of misalignment user can correct it manually by shifting images using arrows, when images are aligned correctly then press OK to save the results.

Viewing the different color channels

The application separates the color channels and allows saving them for external analysis.

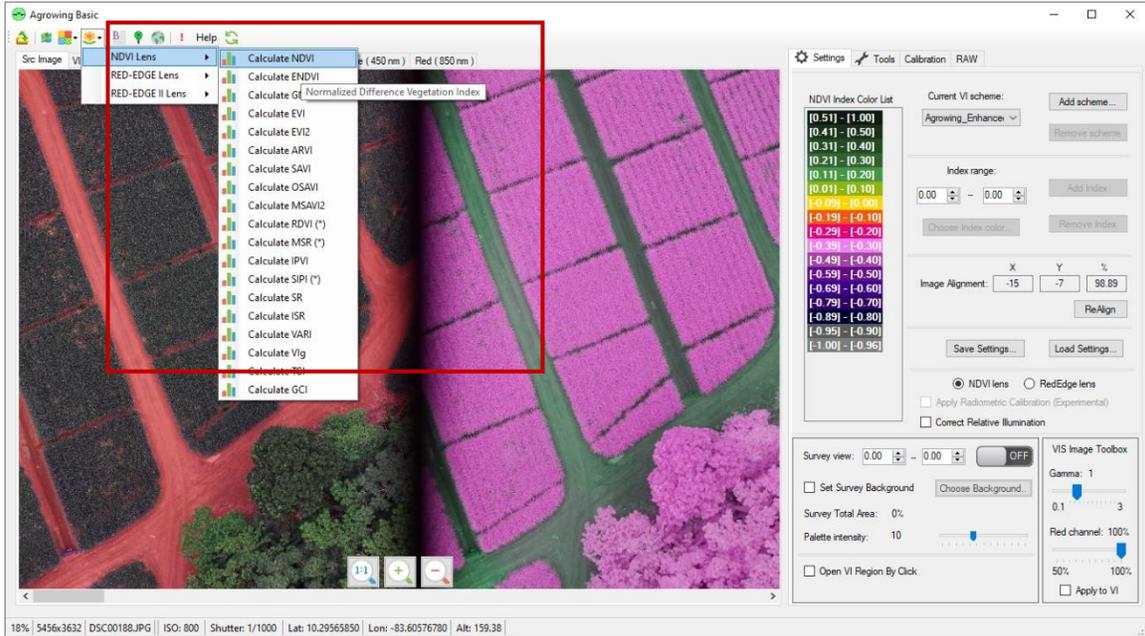


The images can be saved by right clicking on them.

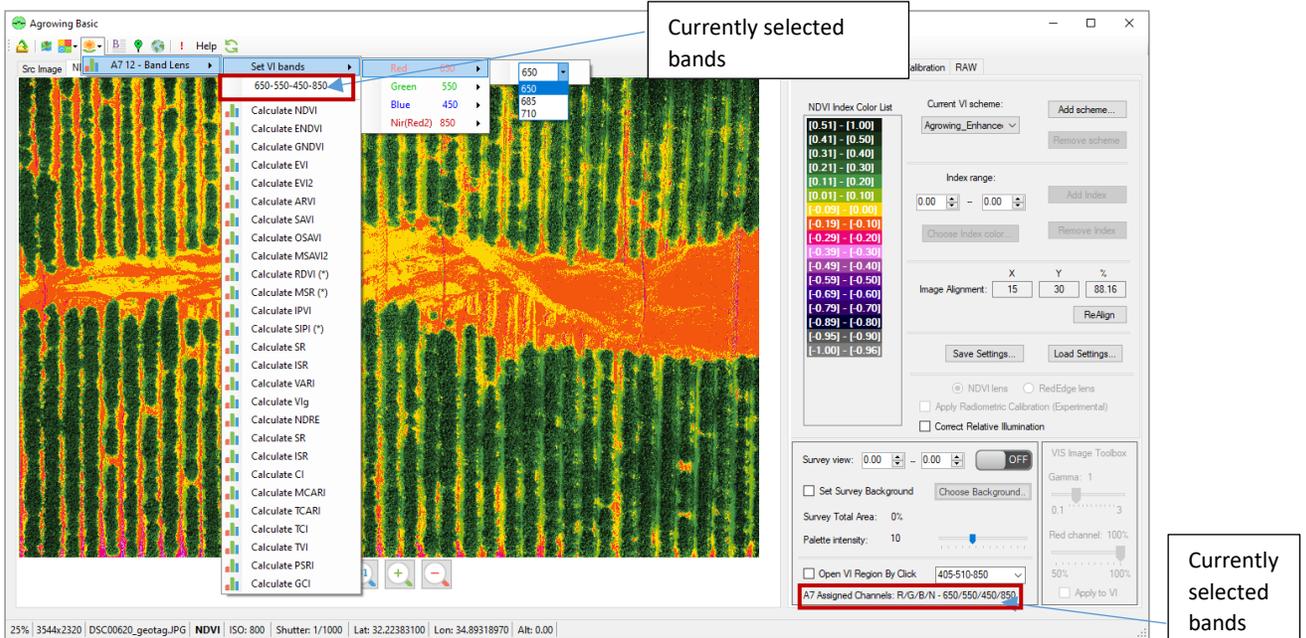


NDVI, NDRE, ARVI, OSAVI and additional metrics

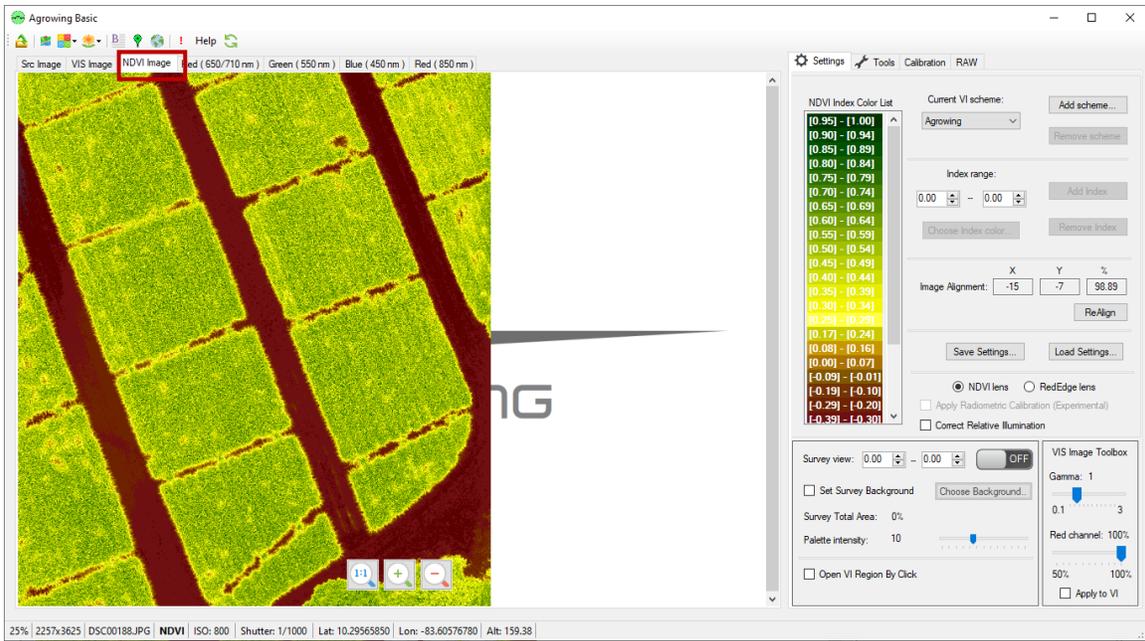
Based on the lens type used during the acquisition process, many analyzing metrics are supported by the application. A simple description of the metric is shown in a box when the cursor is placed on the metric line. Clicking on the selected line will initiate the required analysis.



Click on the “NDVI” image to view the analyzed image. Scroll to zoom in and out.

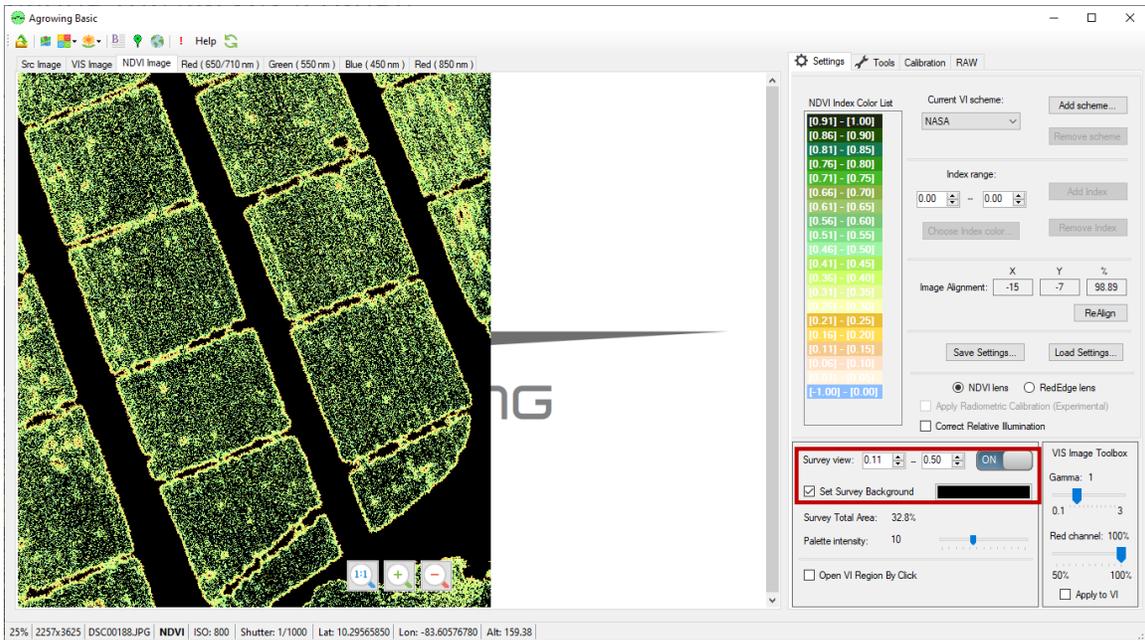


For A7 – 10-14 band sensors, before applying VI user have to choose the desired bands from list of available, and



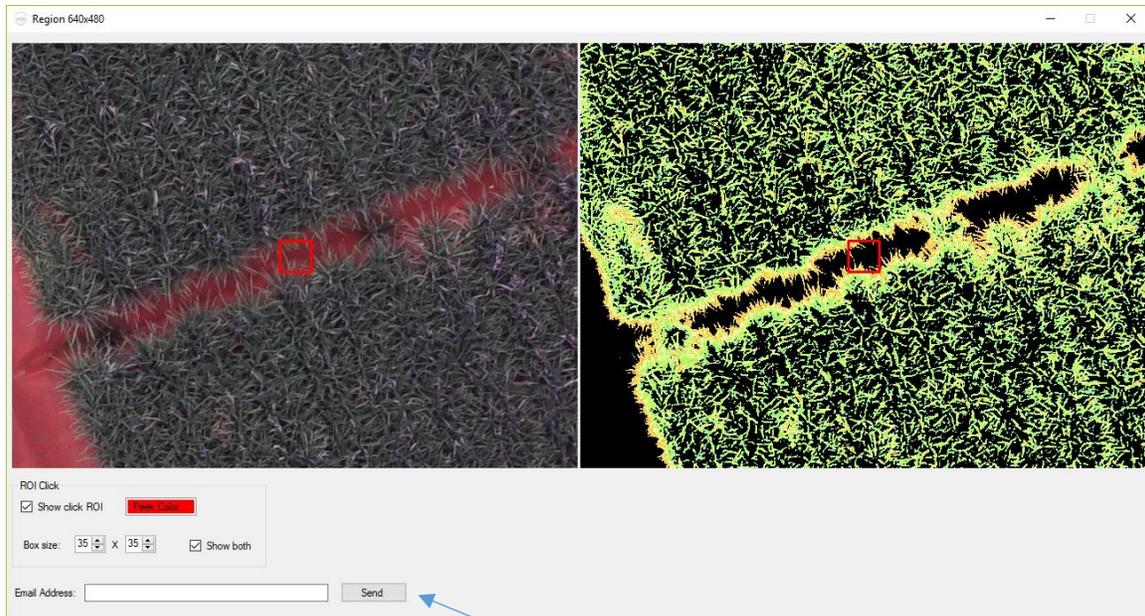
Selecting the survey's range

The application allows changing the vegetation index view range, according to chosen values.



Open VI Region

By selecting this checkbox upon mouse left click within vegetation index view the corresponding RGB region of 640x480 will be open according to the center of clicked point.



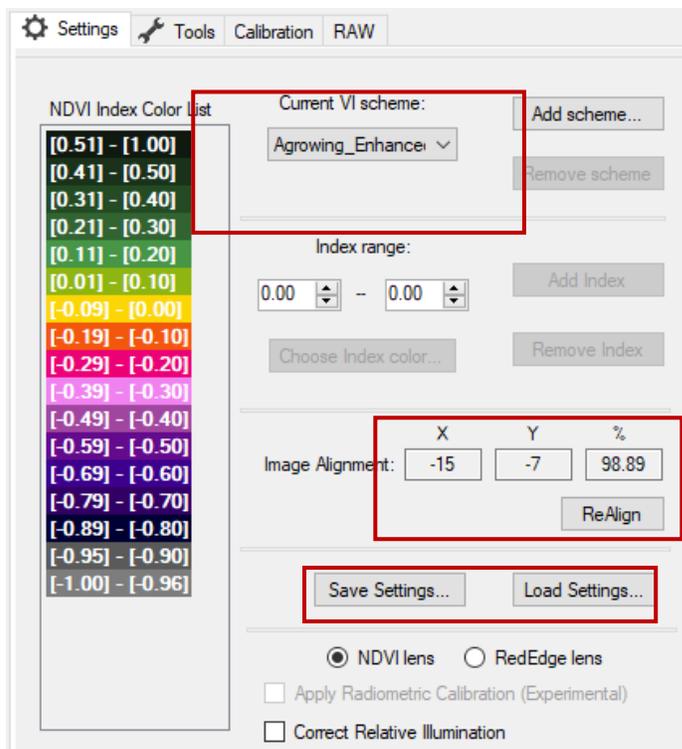
You can send an email with two images attached. Just type the address.

Palettes

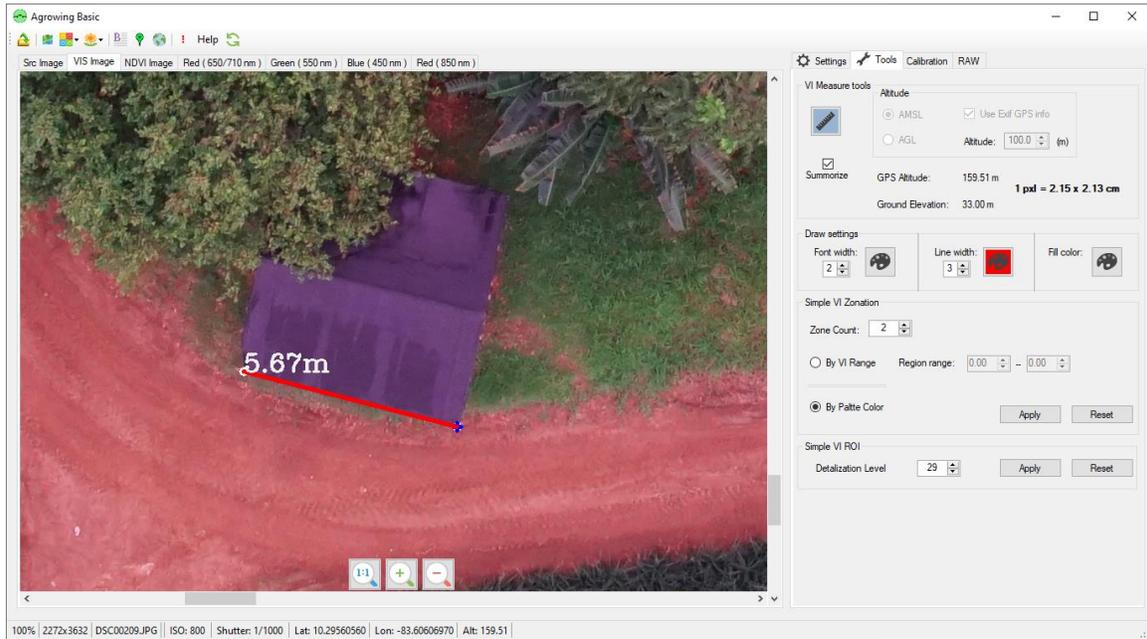
The application allows selecting, customizing and adding palettes, according to the required range and survey. It also includes a few sample palettes.

The range of index colors, indices' colors, adding and removing ranges, creating new palettes, are all supported by the application. Customized indices' palettes can be saved and loaded.

In order to define a new palette, chose a pre-defined palette as a basis, and then click on "Add scheme". You'll be asked to name the new scheme in a dialog window. The name of the new scheme will be added to the schemes' drop menu. You can remove/add define the range of indices, and choose their colors. In order to save the palette, which you designed, click on "Save Settings" and save the settings file in a directory of your choice.



Tools Tab



Tools tab is designed for applying different metrics to Visual part of Agrowing image and NDVI images.

User can choose the font and line color and width.

User can choose to apply manual settings or automatic which are taken from image EXIF GPS tags or combine them.

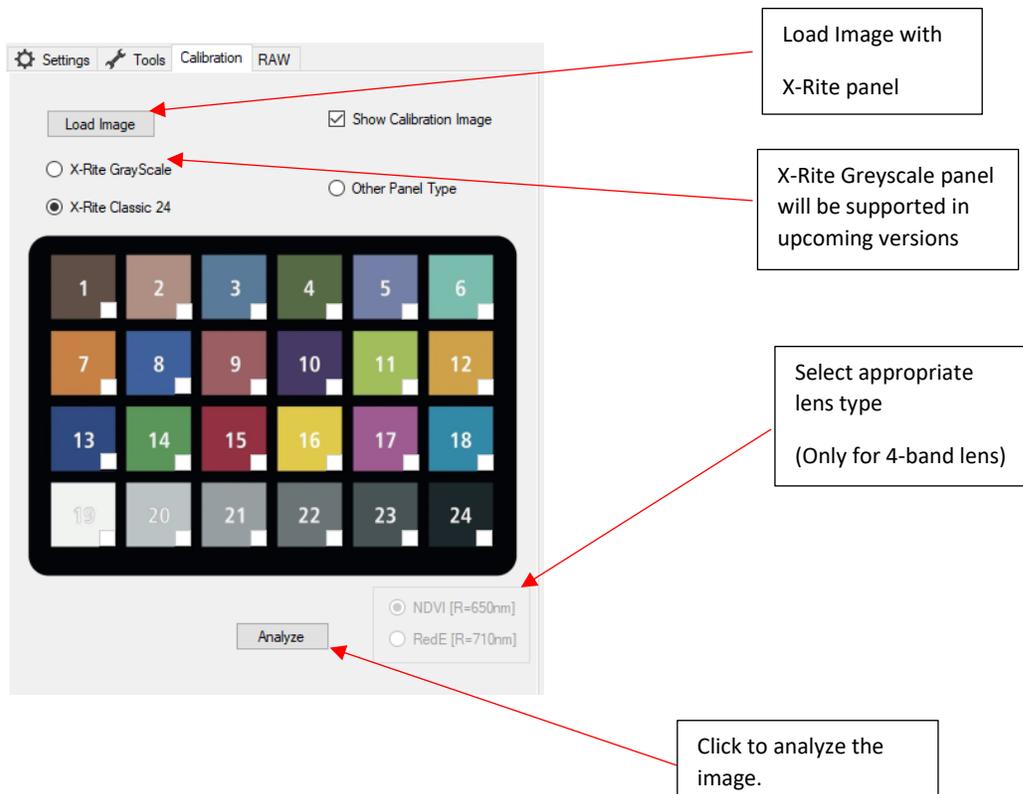
Also all the measurements are calculated with the respect to altitude and ground elevation of the GPS point if the image includes telemetry data. In case valid GPS EXIF Tag information manual setting will be disabled.

The calculation of ground elevation is done by using Google Maps Elevation service API. The valid internet connection is necessary for this feature to work properly.

Calibration Panel Tab

Currently Agrowing Basic support only X-Rite Classic 24 calibration panel for radiometric calibration and color calibration. By clicking “Load Image” you will choose the image with the panel which was taken before the flight or session. For 4 band sensors it is important to select the lens type.

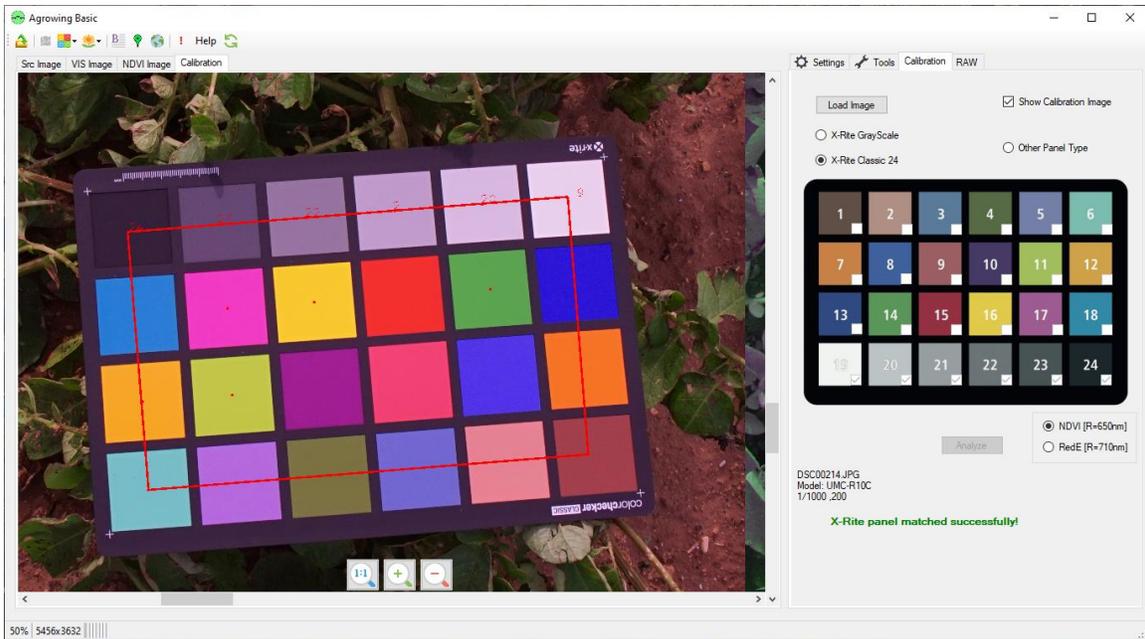
Please be sure that X-Rite panel is placed in the middle of the frame.



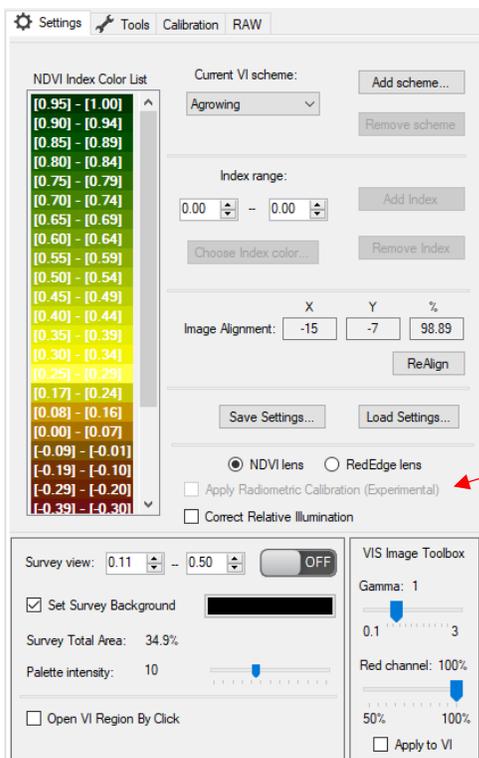
The screenshot shows the 'Calibration' tab in a software interface. It includes a 'Load Image' button, a 'Show Calibration Image' checkbox, and radio buttons for 'X-Rite GrayScale' and 'X-Rite Classic 24'. Below these is a 4x6 grid of 24 color calibration patches numbered 1 to 24. At the bottom, there is an 'Analyze' button and radio buttons for 'NDVI [R=650nm]' and 'RedE [R=710nm]'. Red arrows point from callout boxes to these elements:

- Load Image with X-Rite panel**: Points to the 'Load Image' button.
- X-Rite Greyscale panel will be supported in upcoming versions**: Points to the 'X-Rite GrayScale' radio button.
- Select appropriate lens type (Only for 4-band lens)**: Points to the 'NDVI [R=650nm]' and 'RedE [R=710nm]' radio buttons.
- Click to analyze the image.**: Points to the 'Analyze' button.

By successful analysis completion the appropriate message will appear, in case that analysis fails please load another image with panel positioned in the middle of the frame.



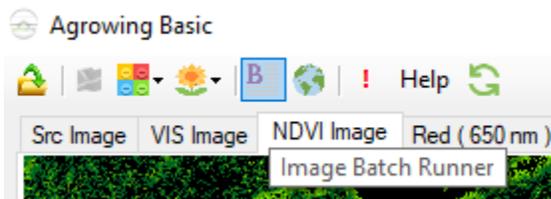
After successful panel match the option to use calibration results in Vegetation Indexes will be available.



Option is available when calibration panel loaded and matched.

The Batch Runner

The batch runner prepares the acquired GPS tagged imagery for processing using standard orthophoto and mosaic stitching tools. The application allows manipulating and analyzing directories through a simple and intuitive GUI. Selecting the desired output files is done by checking the right boxes. You can start the Batch Runner by pressing the “B” button on the main menu on the top of the Agrowing Basic app.



You can choose a variety of different output combinations for your imagery.

Down sample images, save in different file formats and combinations including Multipage TIFF files, and correct the visual image colors.

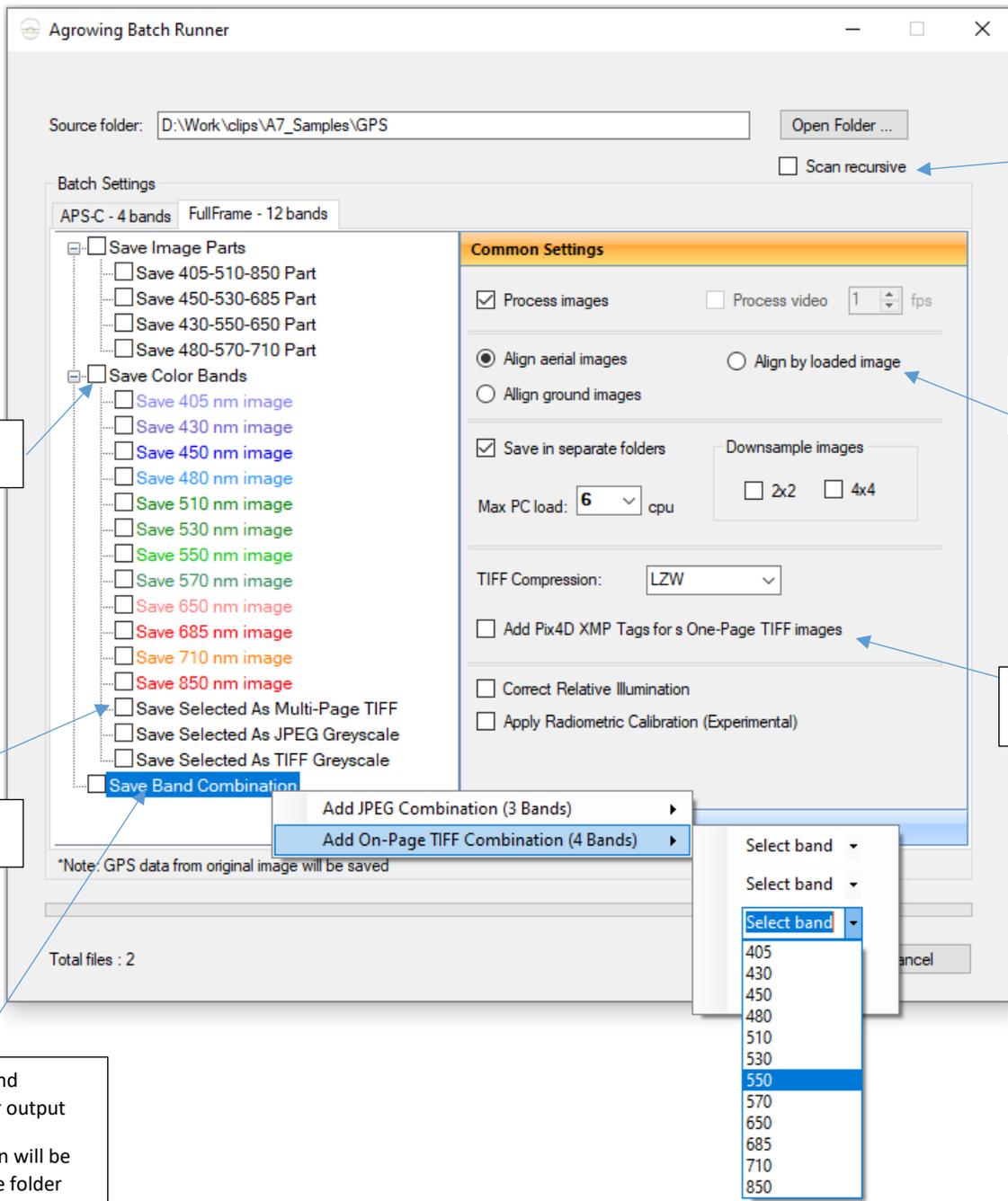
Align modes:

Align every image: - Every image is alignment independently. Slow process

Align only first image: - Application chooses arbitrary image and alignment result of this image applied to all the rest images. Fast process but can be less accurate in some images from the same set, because of small altitude and shooting angle differences.

Align ground images: - Images which were taken from the ground, from a close distance ~1m-1.5m to the object.

Align by image point (Align by loaded Image (A7)): - The alignment start point is chosen from previously loaded image in Agrowing Basic application. Rather fast and accurate process, all the images should be from the same lens and altitude.



Scan folder recursively

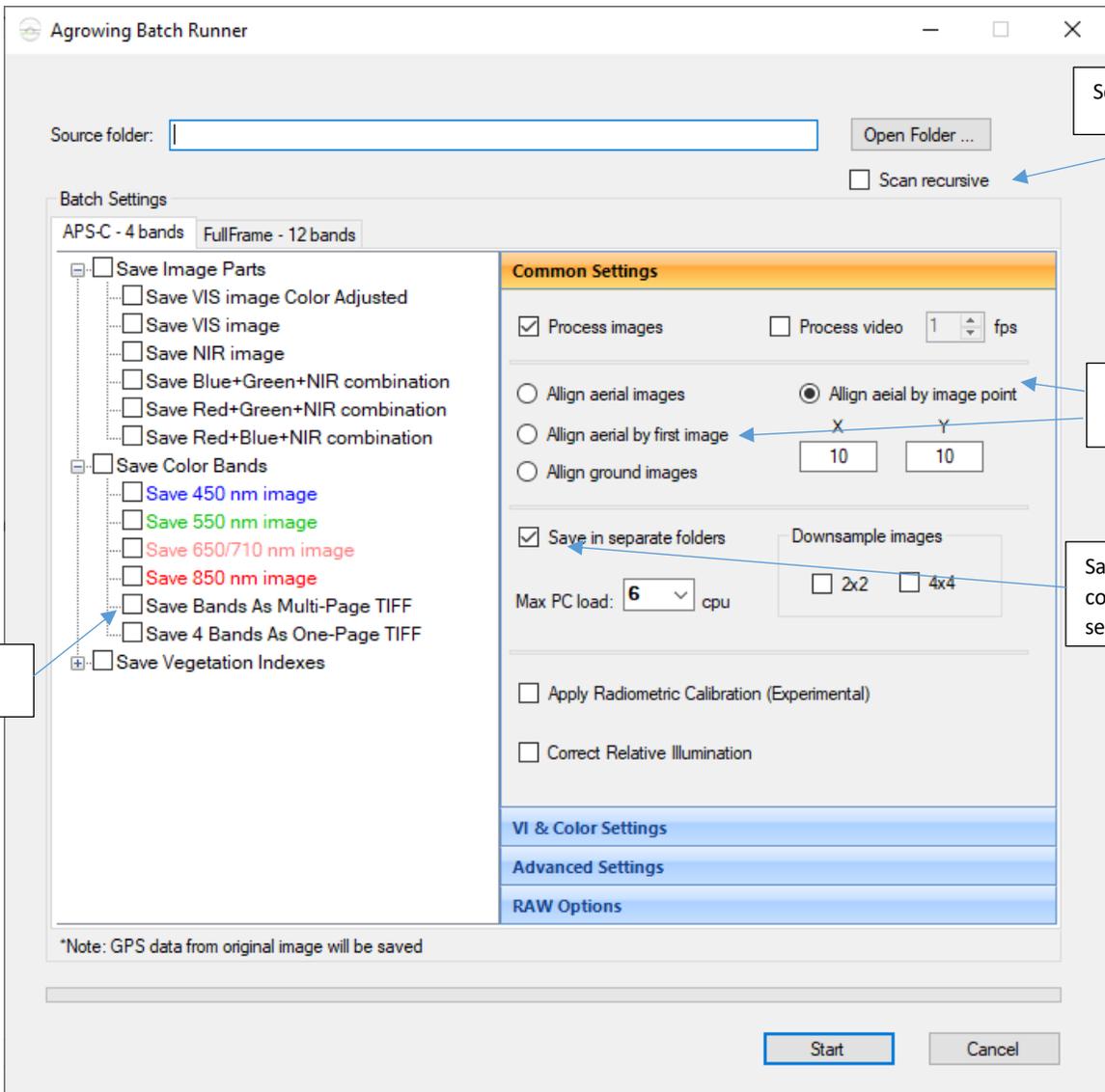
Recommended for fast process

Select for Pix4D mosaic software

Click to select all bands

Save Multipage TIFF images

Add different band combinations for output
Each combination will be saved in separate folder

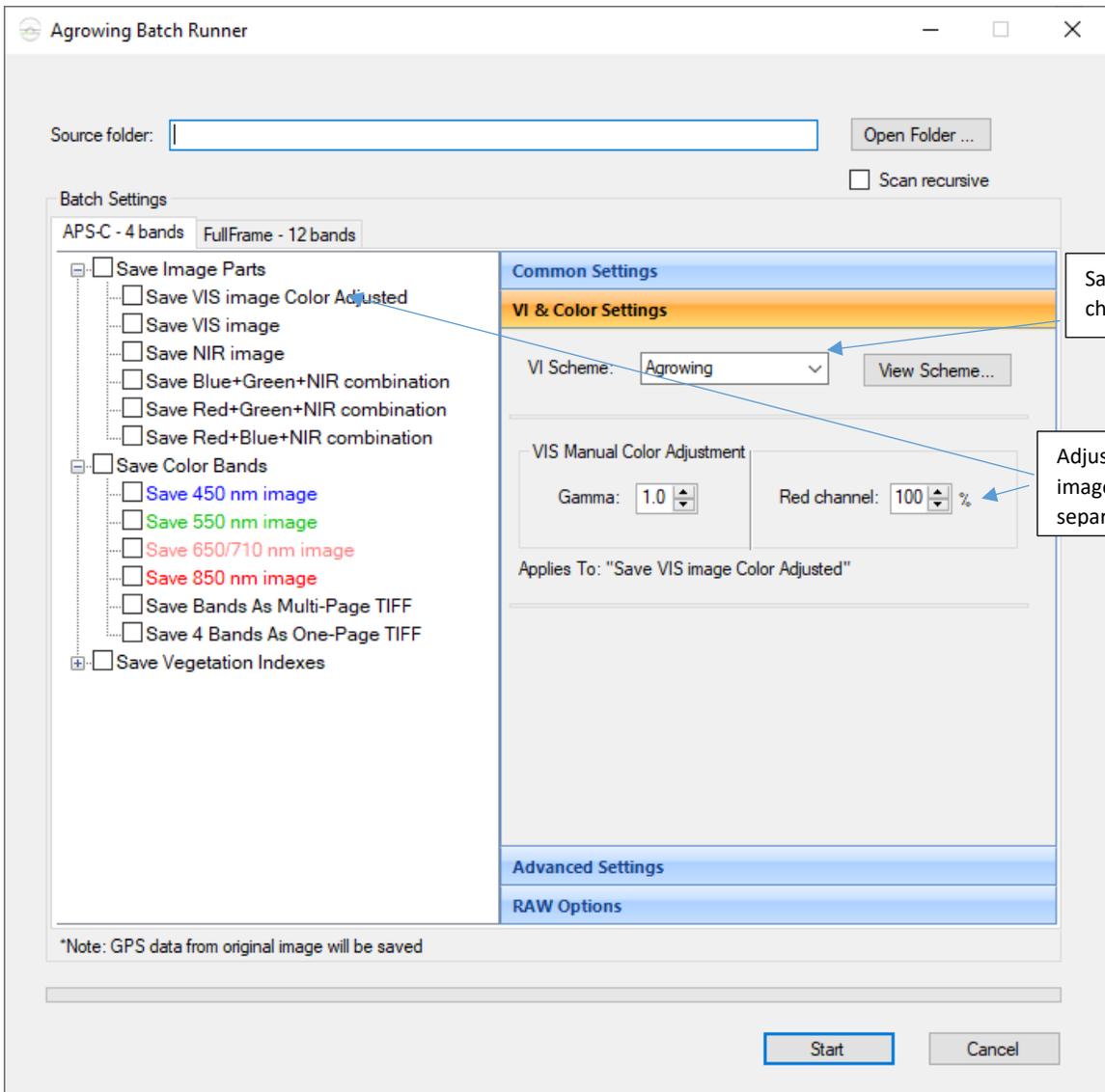


Scan folder recursively

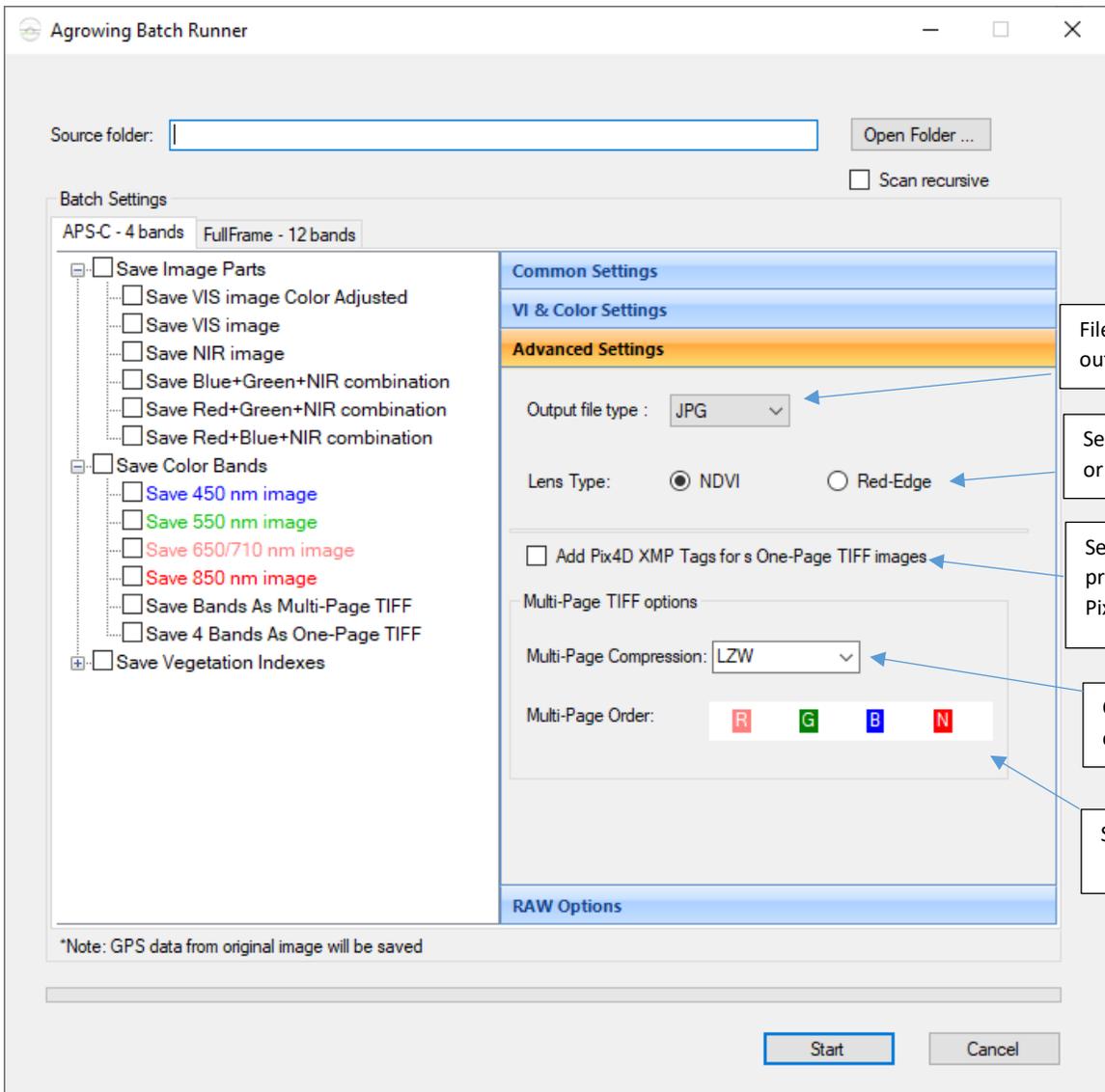
Recommended for fast process

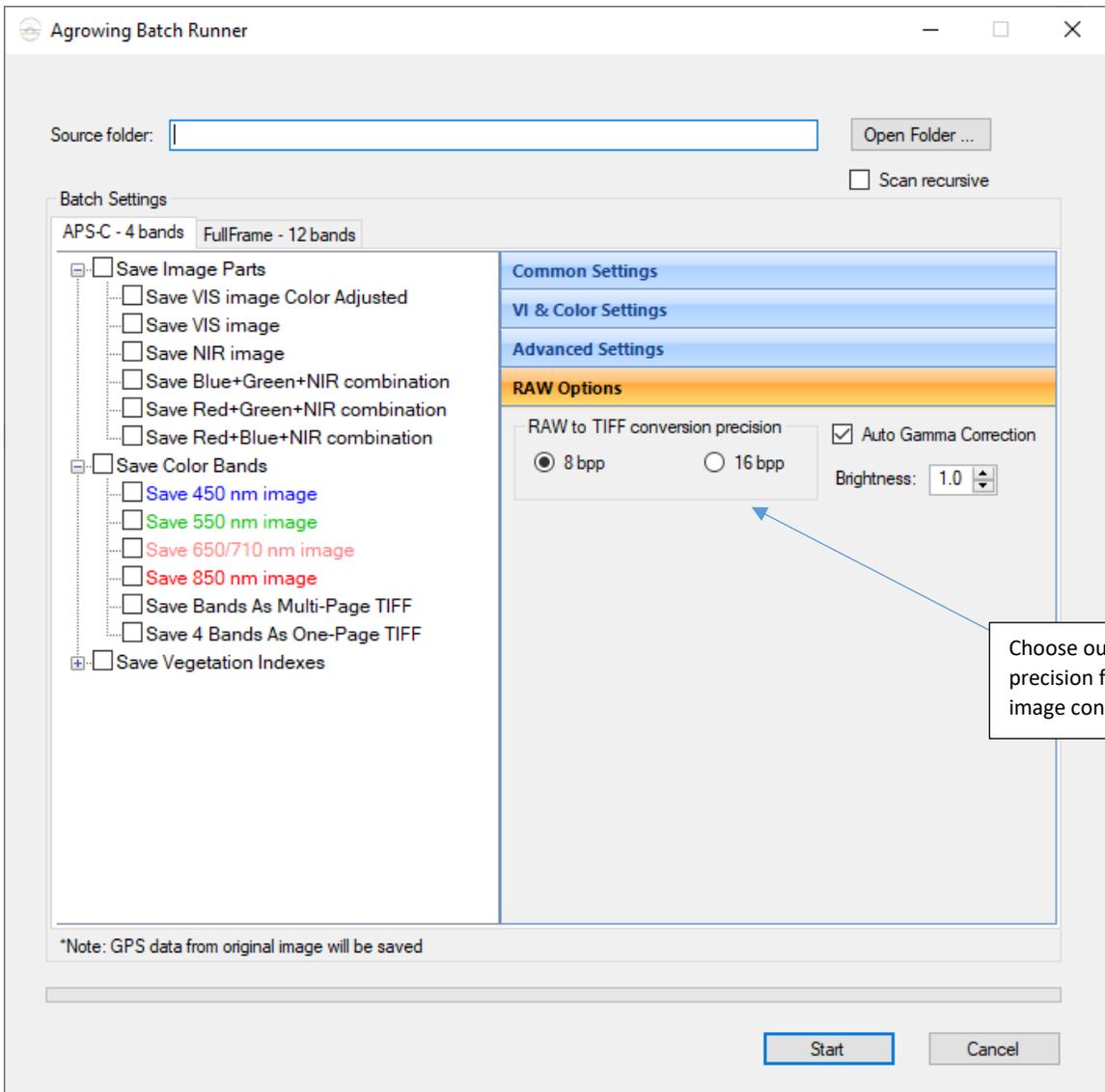
Save each combination in separate folder

Save Multipage TIFF images



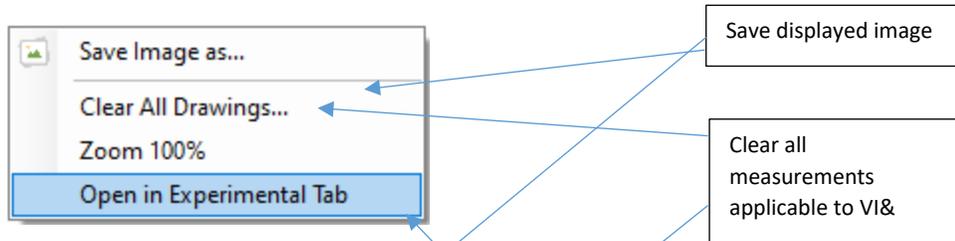
Note*: When you save the VI index images you **can not** use them for building mosaic.



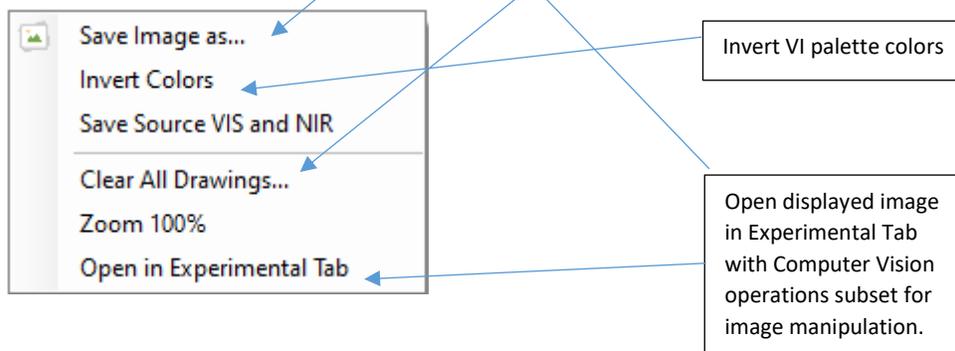


Right Click Menu

Image right click menu



VI image right click menu.



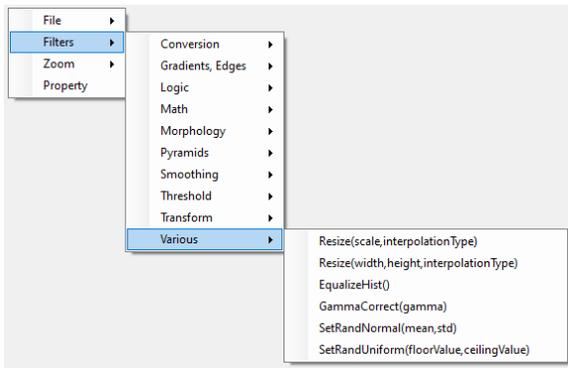
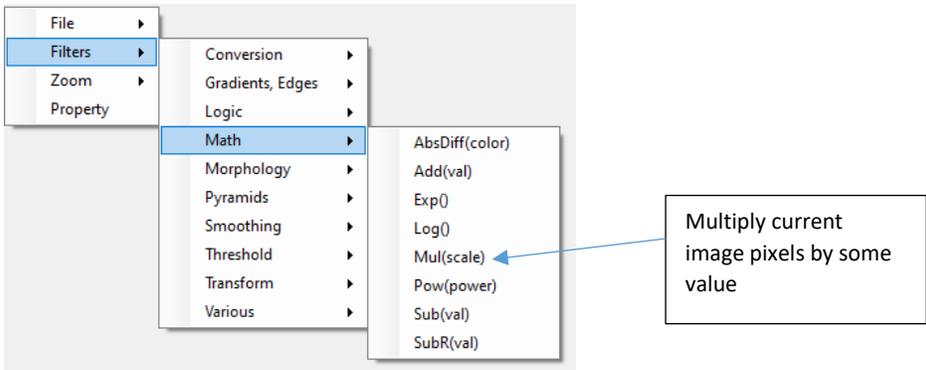
Experimental Tab with Computer Vision functions

By clicking “Open in Experimental Tab” right click menu, viewed image will be copied to “Experimental Tab”

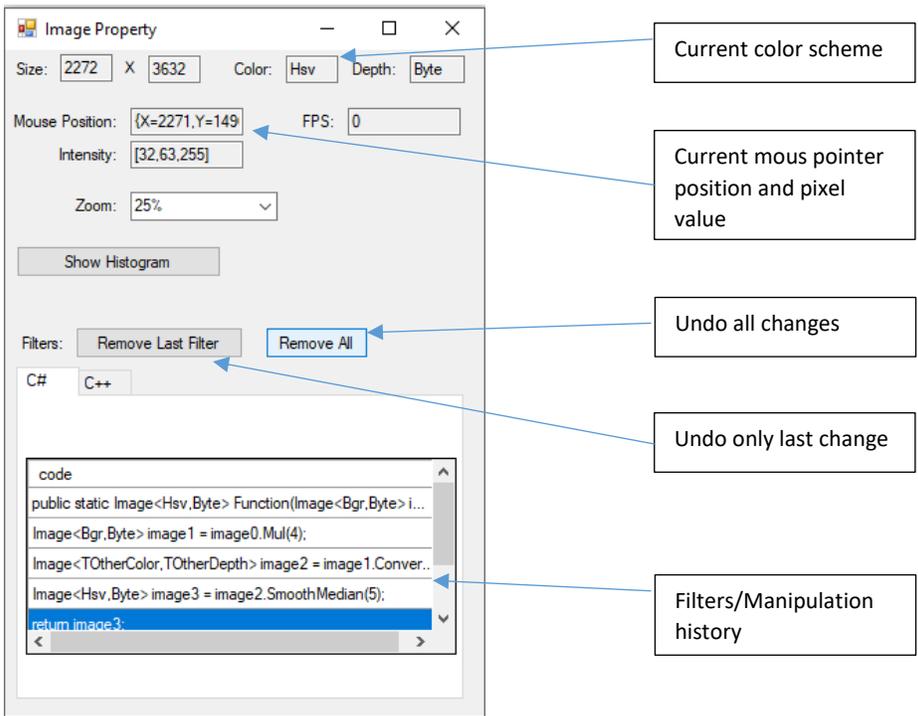
On this tab you can experiment with different image manipulation functions available from Computer Vision library. It could be very helpful in research, with this set of filters you can manipulate any image in a certain way to emphasize some hidden features inside the image or just see those features more clearly.

Please see some OpenCV menu examples and image manipulations below:

By clicking right mouse button on Experimental Tab image OpenCV menu will open.



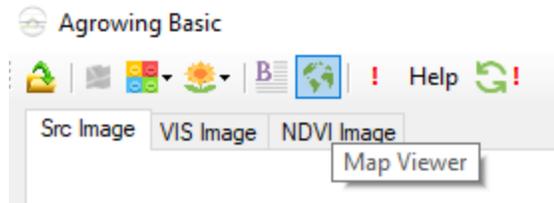
In order to see a pixel values or undo last operator applied please click on “Property” menu item. A dialog will open with some options displayed below.



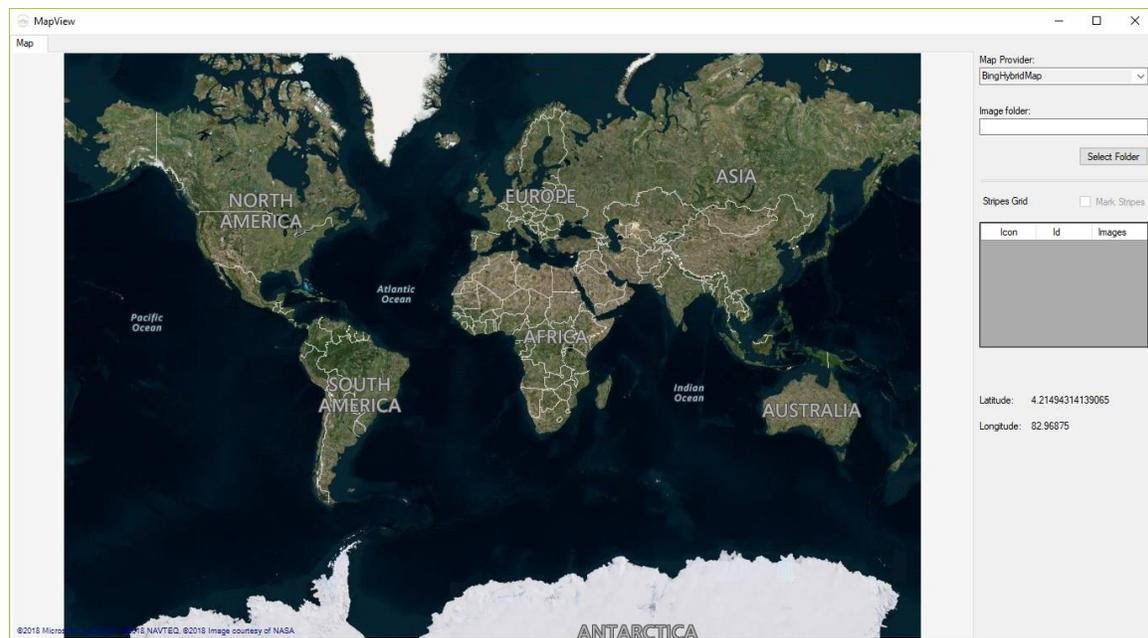
Map Viewer

In Map Viewer you can view the survey image positions on the map, the images must be geotagged.

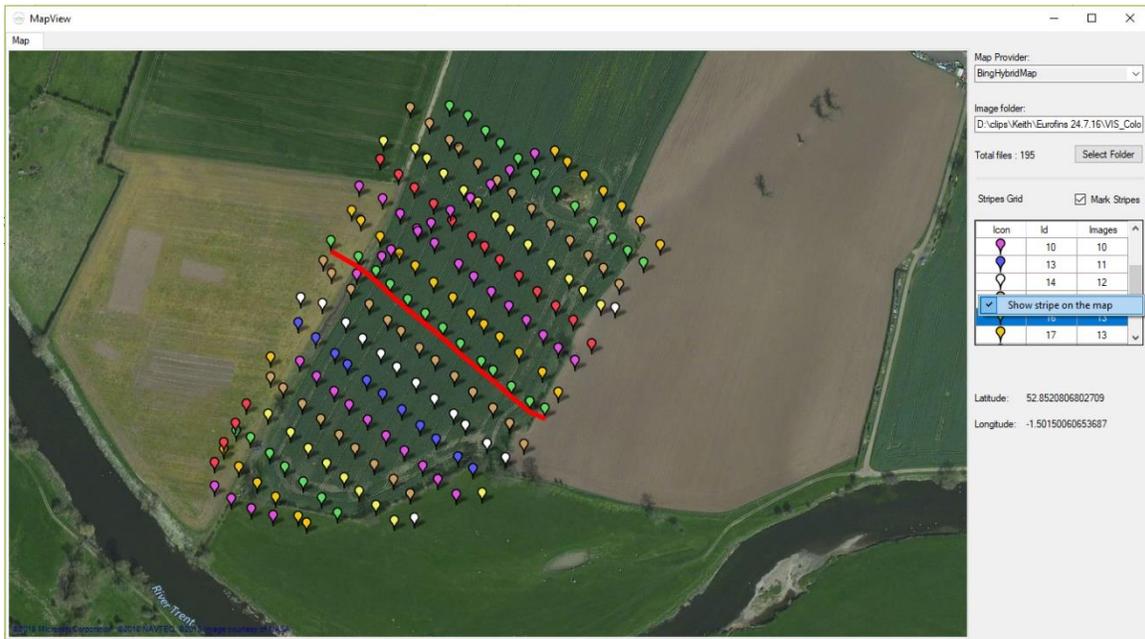
Click on the globe icon on the Agrowing Basic toolbar menu.



In the Map Provider combo box list you can choose the map provider and map type.

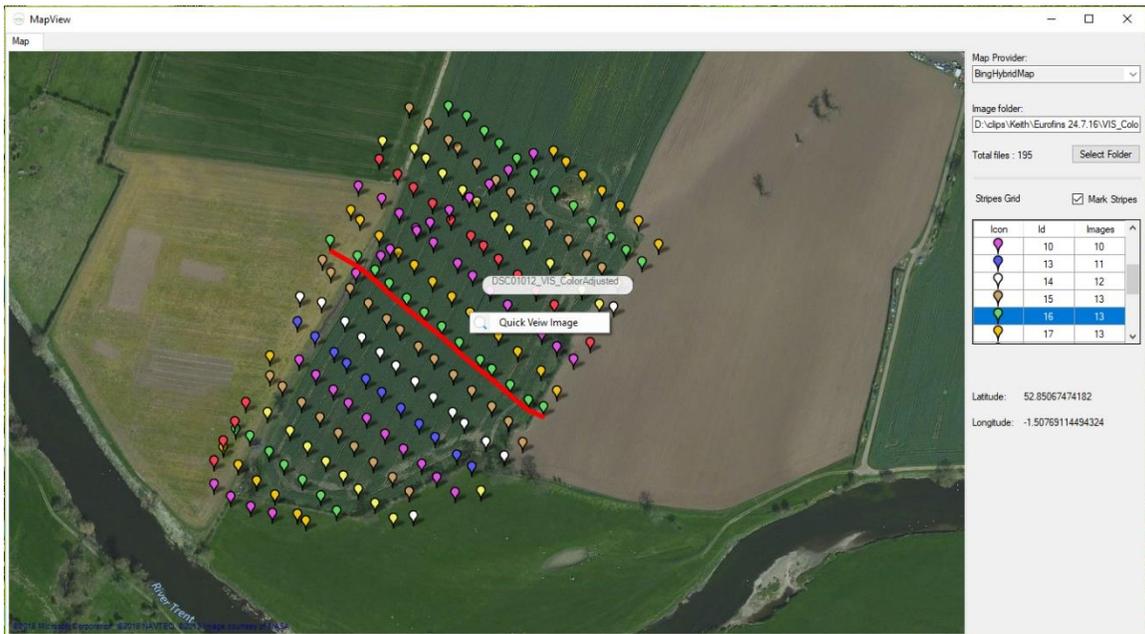


After loading the dataset you can click on “Mark Stripes” checkbox to mark the stripes in different colors, also by right clicking on the stripes table you can choose to mark selected stripe on the map.



By right clicking on the image mark you can choose to view the image in a separate window.

By left clicking on the image mark you will see the image GPS coordinates.



For additional information and/or requests/questions,
please write to support@agrowing.net