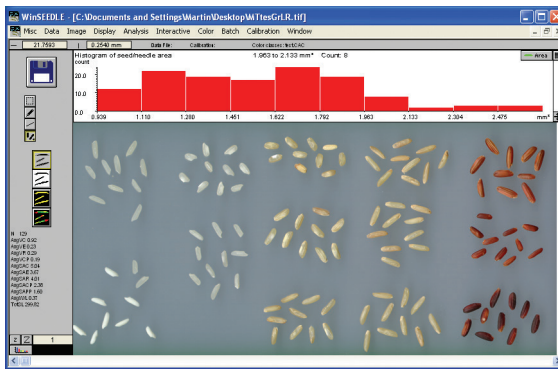




WinSEEDLE™

For SEED and Conifer NEEDLE Morphology and Disease Analysis

WinSEEDLE™ automatically analyses seedles (i.e. seeds and needles) much more precisely than conventional camera or conveyor based area meters.



You can purchase the software program alone (for Windows based computers) or a complete system including all the necessary image acquisition material.

Image Acquisition

WinSEEDLE™ can analyse images acquired with a scanner or a digital camera.

When portability is not required, we recommend our systems based on high quality, high resolution desktop scanners as image acquisition devices. They produce high quality images free of illumination problems such as non-uniform lighting or the presence of shadows around the seedles (see figures below). They are extremely easy to use. Desktop scanners cannot be used in the field, but are easily transportable and usable in remote locations where electrical power is available. Our scanners come in two sizes with scan areas up to 22 x 30 cm for Standard Area (STD) and 30 x 42 cm for Large Area (LA).



Needle digitized with a bad lighting setup. Shadows can be seen around the needle and can significantly reduce the accuracy of measurements.



Needle digitized with Regent's lighting system. No shadows are present.

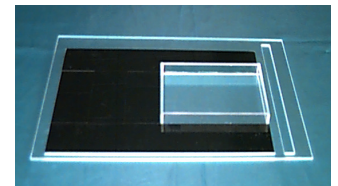
WinSEEDLE™ measures straight or curved seedles morphology (length, width, area, volume,...). The Pro software version can color classify them and quantify disease areas.

Seedles are classified in groups based on their color (brown vs. green, as in above image or different brownish tint as in image to the left) and are analysed separately. Measurement of the area occupied by each color is used to quantify disease or insect damage. Very subtle color differences can be detected.



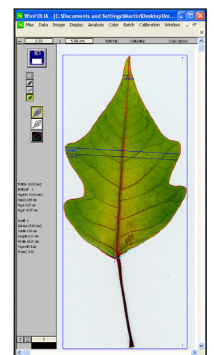
Our scanners come with accessories like the positioning system illustrated below.

This positioning system can accommodate up to 35 different scan areas or tray sizes for scanning seedles. Installed and removed in a few seconds, it allows to scan more effectively by repetitively placing samples at the same position in a few seconds and by bypassing the scanner preview step. When more than one tray is used, an operator can place the sample in one tray while the other is being scanned or analysed.



For broadleaf analysis, we offer the WinFOLIA™ program which can share with WinSEEDLE™ the same image acquisition hardware. A rebate is offered when both products are purchased.

WinSEEDLE™ is TWAIN compatible, meaning it can acquire images directly from TWAIN compliant image acquisition devices (scanners or cameras). Although WinSEEDLE™ works with most scanner models, it is advantageous to purchase one from us. It comes with our custom manual illustrating how to scan biological samples for analysis with our programs and how to obtain the best images for accurate measurement. It also gives some tips specific to the scanner you own. Besides, our scanners come with a fixed permanent calibration made by us and used by our programs to increase the precision of measurements made from their images.



WinSEEDLE™ Features and Measurements

WinSEEDLE™ measurement data are automatically produced on an individual basis (per needle or seed) and globally (total or average value for the analysed set).

Individual measurements

- Straight and curved length
- Maximum width
- Curvature
- Perimeter
- Projected and surface area
- Volume (estimated)
- Disease areas quantification (Pro version)
- Color classification (Pro version)
- Interactive length (done manually by the operator)
- Form coefficient

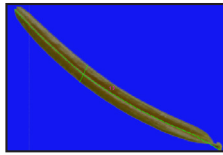
Global measurements and average values

- Average length (straight and curved)
- Average maximum width
- Average curvature
- Average projected and surface area
- Total projected and surface area
- Average volume
- Seed/needle count
- Total disease areas
- Total area per color or group of colors

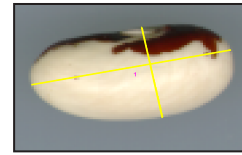
Other Features

- Analyse whole images or their sub-regions. Sub-regions can have any circular, rectangular or irregular shape made with the lasso tool. You can create practically an unlimited number of sub-regions and resize them at anytime.
- Exclude regions of the image from the analysis
- Batch scanning and analysis to scan and store images on disk and analyze them later interactively or without supervision.
- Histogram of morphological data (length, width, area, curvature, volume...) or area per color (Pro) displayed during measurement
- Automatic filtering of defects and debris based on shape (Reg & Pro) or color (Pro)
- Interactive image edition with any color present in the image or defined by users to remove artefacts or debris
- Display a single color channel (Red, Green or Blue) of an RGB color image and analyse only that channel (Pro version)
- Information about the dominant color class (area, hue, saturation intensity, and class name) saved with the data (Pro version)
- Available for Windows based computers including Windows 10

Data are shown on screen during the analysis and are saved to standard ASCII text files that can easily be opened from many types of programs (like Excel) for data visualisation and analysis.



Curved Length (following the object curvature) for needles

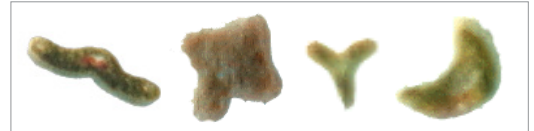
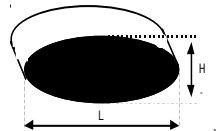


Straight length (from end to end) for seeds

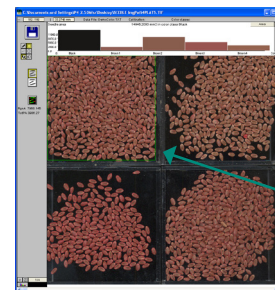
Measurements are visible on screen.

Projected area is the two dimensional area occupied by the seedles in the image (= area of the seedle projection). The surface area is the three dimensional area of the seedle epidermis (the part in contact with the air).

Seedle volume and surface area are estimated from a user selectable model of cross-section shape (some examples given below).



An irregular shape region to analyse only some needles in the image.



A rectangular region to analyse the color of one group of seeds.

WinSEEDLE™ comes with printed color manuals abundantly illustrated. It is backed with prompt and competent after-sales technical support by e-mail. Because WinSEEDLE™ software has been developed by Regent's personnel, you can give feedbacks or ask questions to the programmers behind it (via technical support). As our other products, WinSEEDLE™ is updated regularly.

For a list of scientific publications in which WinSEEDLE™ was used, please refer to:

<http://www.regentinstruments.com/assets/references.html>



www.regentinstruments.com
sales@regentinstruments.com

