Instructions for 'PotatoSize Slim' image analysis tool

The PotatoSize Slim software tool is a slimline version of an app under development at the James Hutton Institute for measuring size and colour of potatoes sampled from crops and experiments. Each tuber's width and colour are measured, and summary statistics given in output files. The software is freely available under the GNU General Public Licence v3.0 at https://github.com/MattAitkenhead/PotatoSizeSlim.

Below is a list of guidelines and instructions for getting the best results from the software tool and understanding its results. For queries, please get in touch with matt.aitkenhead@hutton.ac.uk. Use of the software is freely available on the condition that use is referenced in any publications as follows:

Aitkenhead, M.J., Donnelly, D., 2020. PotatoSize Slim software tool. https://github.com/MattAitkenhead/PotatoSizeSlim.

An example of a 'good' image is given here:

Image credit: Damian Bienkowski, James Hutton Institute

Specific instructions:

1. Background should be dark, and relatively clean.
2. Potatoes should not be too close to one another (at least 2cm separation).
3. Potatoes should also be at least 2cm away from A4 sheet.
4. Potatoes should be well within the frame of the image.
5. A4 sheet should be in 'portrait'.
6. Image should be taken in 'landscape'.
7. Make sure to take the image from as close to directly overhead as possible.
8. The black background should completely fill the field of view.
9. Potatoes should be relatively clean (i.e. no big clumps of soil).
10. All photographs should be in one folder.
11. No more than 500 photographs per folder.

12. Photograph should be taken from 1-1.5 metres above the potatoes.
13. Potatoes smaller than 2cm wide will not be detected.
14. Potatoes with a width of greater than 10cm are likely to be missed.
15. When running the software, a dialog box will ask for the directory to use. Double-click on the directory and ensure that its path has appeared in the text box before pressing 'Ok'.
16. Depending on computer processor speed, each image will take 30-40 seconds to process.
17. The results will be given in two output files, saved into the image folder.

The two output files are named 'results_summary' and 'results_detailed' and are saved as text file format.

Results_summary

Each line in this file contains as follows: image name; number of tubers found; the count of tubers from 18 width classes (beginning with <20mm, then 20-25, 25-30 etc. and ending with >100mm); mean Red proportion in tuber pixels; mean Green proportion; mean Blue proportion.

Results_detailed

Each image is given multiple rows of data, corresponding to the measurements of individual potatoes. There are two header values for each image, giving the image file name and the number of potatoes detected. This is followed by a row for each potato, with the following: measured length; measured width; mean Red proportion in tuber pixels; mean Green proportion; mean Blue proportion.

Matt Aitkenhead

James Hutton Institute

Aberdeen AB15 8QH

Scotland, UK

17th June 2020