

Company

Solynta

Case Title

'Dry matter in potato tubers'

Participants

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Problem description

Solynta is a leading potato seed breeding company based in Wageningen. They have developed inbred diploid potato lines which can be easily combined in hybrids and yields true seeds. Their approach allows for faster breeding and selection of traits. This allows optimization of the potato for a range of desirable outcomes such as: higher yields, resistance to stress, disease resistance and higher nutritional values. Solynta is currently interested in expanding their capabilities in terms of phenotypic analysis of the potato tubers that they breed. At the moment their facility consists of an automated laser set-up that rapidly scans tubers and yields information on the morphology of tubers. The problem studied in this report pertains to the analysis of both total dry matter content and the distribution of the dry matter within the tuber. An appropriate method would allow for quantification of the dry matter, and would yield information on the spatial distribution thereof. Any additional information can be considered interesting but not part of the core question to be answered. Preferably the method would be fast, allowing for many tubers to be screened in a short time.

Aim

During the workshop, an overview of different analysis techniques that can be used for determining tuber dry matter amounts and distribution should be made using 3 main parameters: cost, throughput and amount of information obtained.

Scope (requirements)

In discussions with Solynta representatives the following scope was decided upon:

A method for determining the dry matter quantity per potato tuber and the spatial distribution of dry matter over the tuber is required. Any additional structural or chemical information is considered a bonus. The machine parts should be incorporated in the current automated tuber phenotyping line. Due to potential issues with throughput it is desired to use a whole tuber as a substrate for analysis, but pre-processing such as slicing and dicing individual tubers can be considered. The method is not to be outsourced to other companies and is preferably based on physical parameters.

Approach

We determined the makeup of a potato tuber and assessed various (15) methods which could be able to identify dry matter in the potato tuber. Descriptions and assessments of every method on costs, throughput and output has been made.

Conclusion

In conclusion, a lot of methods are available and feasible. Yet, these methods should be tested as these assays have not been performed and tested before on potato tubers or other food.