PPP Annual Report 2019
PPP projects which are under supervision of the "Topsectoren" must report annually on the scientific content and financial progress. This form is used to report the progress of the content of the project. PPP projects that finish in 2019 should make use of a different form: "PPP-final report."
The annual report will be published on the TKI / topsector website. Therefore, please ensure that there is no confidential information in the annual report.
The PPP-annual report must be sent, at the latest, by the 1st of March 2020 to the "TKI's": info@tkitu.nl or info@tki-agrifood.nl. For Wageningen Research, the report has to be sent to the "Topsector secretary" of your respective institute.

General information	
PPP-number	TU18155
Title	Re-booting potato: enhancing the breeding of hybrid diploid potato using statistical genetics and computer simulations
Theme	Tuinbouw & Uitgangsmaterialen
Implementing institute	WU
Project leader research (name + e-mail address)	Fred van Eeuwijk fred.vaneeuwijk@wur.nl
Coordinator (on behalf of private partners)	Pim Lindhout
Project-website address	n.v.t.
Start date	14 February 2019
Final date	17 February 2023

Approval by the coordinator of the consortium The annual report must be discussed with the coordinator of the consortium. The "TKI's" appreciate additional comments concerning the annual report.	
Assessment of the report by the coordinator on behalf of the consortium:	ξ Approved □ Not approved
Additional comments concerning the annual report:	

Summary of the project	
Problem definition	Potato is now a crucial agronomic crop for the future of reliable and sustainable starch production. Between its contributions to the fresh, processed, and industrial markets, annual tuber production exceeds 388 million tonnes. Despite its role in global food security, the genetic potential of potato has been greatly neglected in contrast to other major food crops (e.g. wheat, maize, and rice), the cause of which, is primarily related to differences in breeding systems, crop ploidy, and fertility-related properties. These conditions have effectively barred potato access to modern genetic techniques like genetic mapping and genomic prediction, methods which have substantially changed breeding endeavours across crop systems. In recent years, breeders and researchers alike have developed self-compatible diploid populations as a means of accessing the benefits of these technologies making the genetical exploitation of potato more attainable. Such diploid populations can thus serve as a resource for an area of crop research that has previously suffered from a knowledge deficit. The objective of this project is to develop an efficient breeding pipeline for diploid potato

Project goals	• Using diploid breeding populations in place of conventional experimental/mapping populations for *in silico* mapping efforts • Identifying recent selection signatures inside a diploid potato breeding program to get insight in the relevant parts of the genome open to improvement • Understanding the role and presence of heterosis in agronomic traits in diploid potato • Developing and improving predictive models utilising marker data and multi-environment trial data

Results	
Planned results 2019	Description of diploid potato data as present in Solynta's phenotype and genetic databases. Phenotypic and genetic analyses.
Achieved results 2019	The capacities of Solynta's data generating pipeline (for both phenotype as well as marker data) were evaluated and used to define research goals for optimizing the diploid breeding pipeline.
Planned results 2020	Developing genomic prediction models including heterotic effects for diploid potato. Developing methods for the identification of selection signals in an active diploid potato breeding programme.

Deliverables/products in 2019 (provide the titles and /or a brief description of the products/deliverables or a link to a website.
Scientific articles: NA
External reports: NA
Articles in professional journals/magazines: NA
(Poster) presentations at workshops, seminars, or symposia. NA
TV/ radio / social media / newspaper: NA
Remaining deliverables (techniques, devices, methods, etc.): NA