



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	TU18048
Title	Controlling Recombination for fast, innovative breeding of resilient crops (CORE)
Theme	Sustainable Plant-based production
Implementing institute	WUR
Project leader research (name + e-mail address)	Henk J. Schouten henk.schouten@wur.nl
Coordinator (on behalf of private partners)	Wim Vriezen, BASF-Vegetable Seeds. wim.vriezen@vegetableseeds.basf.com
Project-website address	https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksprojecten-LNV/Expertisegebieden/kennisonline/Controlled-Recombination-in-plant-breeding-CORE.htm
Start date	1 Febr 2019
Final date	31 Jan. 2023 (with go/no go on 1 Febr 2021)

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:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not approved
Additional comments concerning the annual report:	

Summary of the project

Problem definition and project goals	<p>When during plant breeding disease resistances are being introgressed from wild donors into elite lines, many undesired traits, so-called linkage drag, come along. For removal of these undesired traits, recombination (crossover) is needed between the resistance gene and the linkage drag. However, breeders cannot influence the positions of crossovers. Therefore, they make large populations, hoping for a lucky shot. It would accelerate breeding significantly, if breeders could control the positions of crossovers. This is the first aim of the project: targeted crossovers.</p> <p>Sometimes, resistance genes reside in chromosomal rearrangements, such as inversions. Homologous chromosomes do not show crossovers in inversions. If a resistance gene is located in an inversion, it is unbreakably connected to linkage drag in that inversion. This problem has been known for decades but has never been solved. Therefore the</p>
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	second aim of the project is reversion of inversions, after which recombination can occur in that area.
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Results	
Planned results 2019	Testing four approaches: 1. Targeted crossovers in meiotic cells; 2. Targeted crossovers in somatic cells; 3. Reversion inversions in meiotic cells; 4. Reversion inversions in somatic cells.
Achieved results 2019	We started testing all four approaches. We have not been successful yet for approaches 1 and 3, but we obtained very promising results for approach 4. Approach 2 has shown to be feasible by a foreign research group. We expect to obtain the first results for this approach during 2020.
Planned results 2020	The planning is providing by the end of 2020 insight in feasibility of the four approaches.

Deliverables/products in 2019 (provide the titles and /or a brief description of the products/deliverables or a link to a website.)
<u>Scientific articles:</u> -
<u>External reports:</u> -
<u>Articles in professional journals/magazines:</u> -
<u>(Poster) presentations at workshops, seminars, or symposia.</u> - TKI organized on the 3 rd September 2019 a workshop where Prof Avi Levy, Weizmann Institute, presented his results regarding approach 2.
<u>TV/ radio / social media / newspaper:</u> -
<u>Remaining deliverables (techniques, devices, methods, etc.):</u> Estimations of feasibilities of the four approaches by the end of 2020. From 2021, we want to further develop promising approaches, and several partner companies can apply an approach in their own crops.

