

This comment concerns the [Working Document "Agronomic consequences of the use of GM crops. Part 1: arable crops"](#), version July 6, 2009, topic 3.4 "Resistance management and interactions with pests and diseases", Paragraph "Potatoes, late blight" (pg. 5).

Managing crop damage by late blight remains a big challenge in organic, integrated and conventional potato production, as the required agricultural measures are labor-intensive, expensive, and can have a negative environmental impact. Due to the high degree of genetic adaptability of the pathogen *Phytophthora infestans*, classic breeding programs relying on the limited set of race-specific R genes available in crop potato cultivars have been of limited success so far – after many years of breeding, the blight resistance of newly available potato cultivars has usually been broken within a few years.

As an alternative, the introduction of resistance genes from wild Solanum species conferring broad-spectrum resistance against Phytophthora seems to be a very promising approach to achieve a more durable blight resistance in cultivated potatoes. Genetic engineering approaches permit the rapid transfer of new genetic information into established elite cultivars without linkage drag, and broaden the range of available gene donors to sexually not compatible species (recently reviewed by Park 2009). Potatoes carrying resistance transgenes from the resistant wild species *Solanum bulbocastanum* turned out to be highly resistant against all Phytophthora isolates tested, both in the lab and in field trials (Song 2003, Staples 2004, van der Vossen 2005, Kuhl 2007, Haltermann 2008). Since several years, potatoes carrying Solanum bulbocastanum resistance transgenes are field-tested at various locations in Europe, (e. g. Summary Notifications ([B/DE/06/186](#); [B/NL/07/01](#)), and have entered the pipeline for commercial development. Therefore, transgenic potatoes with broad-spectrum resistance against Phytophthora have been suggested by the competence team «GM plants» as one of the promising [prototype crops for evaluation within the current "GM-Impact" research program](#).

It is therefore surprising that in their [report the competence team «farming systems»](#) simply dismisses the potential of these developments by concluding for the model plants: "The R genes which confer resistance against late blight are known not to be durable (e.g. (Flier et al. 2007). Therefore, all fungicide treatments will be retained." The paper cited refers to research on organic potato crops with susceptible and moderately resistant varieties, not varieties with a broad-spectrum Phytophthora resistance transferred from wild Solanum species, and thus seems not to be directly relevant for judging the potential of transgenic approaches. It remains unclear whether the experts from the competence team «farming systems» are not aware of the recent progress of genetic engineering approaches to Phytophthora resistance breeding in potatoes, or simply do not believe in its potential. For the success of the "GM-Impact" research program it is important to take into account the "state of the art" of research and development for the respective GM model crop plants. If the expert teams differ in their judgment of the potential agricultural impact of these plants, it would be desirable if those differences could be resolved in a transparent

and scientific manner, to ensure an open and unbiased outcome of the intended sustainability assessment of the impact of GM plants in Swiss agriculture.

In apparent contradiction to the experts recommendation in the main text of the [Working Document](#) that "...all fungicide treatments will be retained", the number of fungicide applications for GM potatoes in the "Detailed description of the crop rotations" at the end of the document are reduced by a factor of two relative to the non-transgenic plants, the remaining treatments being required for resistance management and/or treatment against *Alternaria*. It would be desirable to resolve this discrepancy, and to state clearly which of the conclusions should be the basis of the subsequent sustainability assessment.

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References

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