



Summary of the Application for a Permit to Release GMPs for Experimental Purposes

A. General Information

Application number

B/CH/14/01 (B14001)

Date of publication of application in the Swiss Federal Gazette

25 November 2014

Title of the project

Investigation of Cisgenic Potatoes with Improved Late Blight Resistance

Proposed period of release

2015-2019, March to October in each year

Name of the institute

Institute for Sustainability Sciences ISS and Institute for Plant Production Sciences IPS, Agroscope

Is the same genetically modified plant (GMP) release planned elsewhere?

No

Has/Have the Applicant(s) already applied for a permit to release the same GMP? If so, what were the Application numbers?

No

B.1 Genetically Modified Plant (GMP)

1. Complete name of the recipient or (if applicable) parental plant(s)

Common name	Family name	Genus	Species	Subspecies	Cultivar/breeding line
potato	<i>Solanaceae</i>	<i>Solanum</i>	<i>Solanum tuberosum</i>	<i>tuberosum</i>	Atlantic and Désirée

2. Description of the traits and characteristics which have been introduced or modified, including marker genes and previous modifications

One, two or three different resistance genes against *Phytophthora infestans* (*Rpi* genes), which originate from wild relatives of the cultivated potato, were introduced into potato varieties Atlantic and Désirée. *Phytophthora infestans* is the causal agent of late blight.

The GM potato lines do not carry a marker gene.

B.2 Genetic Modification

3. Type of genetic modification

Insertion

4. In case of insertion of genetic material, give the source and intended function of each constituent fragment of the region to be inserted

Five different *Rpi* genes with native promoters and terminators conferring resistance to late blight. These genes originate from the wild potato species *Solanum venturii*, *Solanum stoloniferum*, *Solanum chacoense*, *Solanum demissum* and *Solanum bulbocastanum*.

6. Brief description of the method used for the genetic modification

The target genes (*Rpi*-genes) were cloned into a „disarmed“ T-DNA of *Agrobacterium tumefaciens*. The transfer of the T-DNA into potato genotypes was mediated by agrobacteria using a binary vector system.

C. Experimental Release

1. Purpose of the release

- evaluation of late blight resistance under field conditions
- evaluation of the agricultural value

2. Geographical location of the release site

„Protected Site“ of Agroscope at Zurich, Reckenholz, Reckenholzstrasse 191, 8046 Zurich

3. Size of the site (m²)

The size is variable. It is less than 34,000 m² (3.4 ha) in each year.

4. Relevant data regarding previous releases carried out with the same GMP, if any, specifically related to the potential environmental and human-health impacts from the release

In 2013 and 2014, the same GM plants were grown in the Netherlands (B/NL/12/L02). Other GM potato plants carrying *Rpi*-genes were grown from 2008 until 2012 (B/NL/07/01 and B/NL/09) in the Netherlands. No adverse effects on the environment or human health were observed. Compared to classical breeding stocks, no deviations of any kind were observed. Cultivars, derived by classical breeding methods, containing *Rpi*-genes are being cultivated for several decades without any negative impact on the environment or human health.

D. Environmental Impact and Risk Management

1. Summary of the potential environmental impact from the release of the GMPs

The examination of the GM *Rpi* plants showed that the risk of possible harmful effects on the environment is negligible:

- The risk of the GM plants having a significant selective advantage in the natural environments and of persistence therein is negligible.
- The risk of the GM plants outcrossing is negligible, given that potato is a self-pollinator and that isolation distances to potential outcrossing partners are respected. Even in the very improbable event that pollen were to be transferred to genetically unmodified potato plants, no consequences are to be expected, since potato propagation conventionally takes place via tubers and not via seeds.
- Since *Rpi* genes occur naturally in potato and previous studies have given no indications of significant effects on non-target organisms, the risk of such effects is to be gauged as negligible.
- The influence on the environment from the sowing, management of the trials and harvesting of the GM plants is regarded as not differing from that of other potato trials.
- There are no indications of nutrient cycles being at risk, nor of the development of resistance. The risk is negligible.

2. Brief description of any measures taken for the management of risks

General measures:

- Perimeter fencing around the test field
- Training of all persons who enter the field for the handling of GM material
- Transport of tubers (and seeds) from GM plants in closed, double-walled and labelled containers/bags
- Cleaning of the planting and harvesting equipment
- An emergency plan governs the measures in case of special events

Culture-specific measures:

- Distance requirements (i.e. isolation distances) to other potato fields
- Destruction of volunteer plants
- Crop rotation: The subsequent crop grown on the release site has to allow an effective destruction of potential volunteer potato plants. No potato crop is grown commercially on the release site for at least the following two years.

Final Report

(Not yet available)

Decision of the Swiss Federal Office for the Environment (FOEN) on the granting of the permit
Authorised on 21 April 2015.

Version: 22 April 2015