

First application for approval of CRISPR/Cas plants in the EU

Maize is resistant to herbicides and produces insecticides
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The first application for approval of CRISPR/Cas plants is now in the European Food Safety Authority (EFSA) register. Maize DP915635 is resistant to the herbicide glufosinate and produces an insecticidal toxin found in specific ferns growing on trees. Pioneer (associated with DowDupont/Corteva) has also filed several patent applications for the plants, some of which have already been granted in Europe.

The maize was generated with a combination of old and new genetic engineering methods (GE): to deliver the CRISPR/Cas 'gene scissors' into the plant cells, they are first bombarded with small particles ('gene canon'). In consequence, the cells produced the enzyme for the gene scissors which then inserted a DNA-sequence into the maize genome. This additional DNA-sequence is meant to facilitate the insertion of other genes, and therefore is called a 'landing pad'. In a next step, again involving 'old GE', a further gene construct is inserted into the 'landing pad' in the maize genome, conferring resistance to the herbicide and producing the fern toxin.

This laborious way of transferring the genes is necessary because CRISPR/Cas is less efficient at inserting longer DNA sequences. In comparison to the methods of 'old GE', the resulting plants do not represent any real progress in respect to their traits or lower risks. However, the 'landing pad' might render the production of transgenic plants more efficient and could be seen as advantageous for the company.

"In the last 30 years, the biotech companies have mostly generated and marketed plants with herbicide resistance and insecticidal toxins. In result, the environmental impact has been increased," says Christoph Then for Testbiotech. "It is interesting to see that CRISPR/Cas does not bring real benefits in this case: The multistep process can result in many unintended changes of the genome that go along with risks. At the same time, the plant traits do not provide real advantage for the environment."

The company already has patent protection for its CRISPR/Cas plants in Europe: Patent EP3191595 covers gene scissor applications in maize and soybeans, including the resulting transgenic plants with the 'landing pad'. In addition, patents EP3102592 and EP3102684 cover transgenic plants with the fern toxin. Besides these three granted European patents, the associated companies DowDupont/ Corteva/Pioneer (which in last years have been restructured several times) have filed many other patent applications on the technology and the resulting plants.

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Further information: [The application](#) [2]

[The patents](#) [3]

[A publication on the 'landing pad'](#) [4]

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