

Results of discussions at the Biodiversity Impact Assessment Committee

Name: Coleoptera pest resistant and herbicide glufosinate tolerant corn

(ipd079Ea, part, Zea maize subsp. mays(L.)Ittis)

DP915635, OECD UI: DP-915635-4

Contents of Type 1 Use, etc.: Cultivation, storage, transportation, disposal, and related acts in isolated fields.

Applicant: Corteva Agriscience Japan Co., Ltd.

Based on the biodiversity impact assessment report submitted by the applicant, the Crops Subcommittee will discuss the impact on biodiversity when using Type 1 use of this recombinant maize in accordance with the Type 1 Use Regulations. We considered the content of the applicant's evaluation. The main items confirmed are as follows.

1 Regarding the results of biodiversity impact assessment

This recombinant maize has the target gene introduced through two-step sequence insertion. As a first step, we are creating an intermediate strain using the particle gun method into which a landing pad (LP) sequence containing the target sequence of the recombinase FLP protein has been introduced. In the second step, plasmid PHP83175, which was constructed based on plasmid pSB1 derived from Agrobacterium (Agrobacterium tumefaciens), was introduced by the Agrobacterium method, and T- The DNA region flanked by the target sequence of the FLP protein was replaced with the corresponding sequence in the LP sequence of the intermediate strain. This recombinant corn is

pmi gene encoding the PMI protein derived from Escherichia coli

pat gene encoding PAT protein derived from Streptomyces viridochromogenes ipd079Ea gene

encoding IPD079Ea protein derived from Ophioglossum pendulum

Base sequence analysis of the border region using Southern by Sequence analysis revealed that the expression cassette with the expression cassette is integrated on the chromosome, depending on the segregation pattern of the gene, and that one copy of the expression cassette is integrated in the LP sequence. It has been confirmed by. Furthermore, it has been confirmed by PCR that it has been stably transmitted over multiple generations. Furthermore, it has been confirmed by ELISA that the target gene is stably expressed over multiple generations.

(1) Competitive advantage

Although corn has a long history of being cultivated in Japan, there have been no reports of it growing naturally in the natural environment.

This recombinant maize is endowed with the following properties: resistance to Coleoptera pests due to the IPD079Ea protein, resistance to the herbicide glufosinate due to the PAT protein, and selection marker characteristics due to the PMI protein, all of which have properties such as seed shedding and dormancy. It is not a trait related to From this, it was considered that possessing these traits would not allow this recombinant maize to grow naturally in Japan's natural environment, and therefore would not increase its competitive advantage.

Based on the above, we judged that the applicant's conclusion that this recombinant maize, within the scope of this application, is not likely to cause impacts on biodiversity due to its competitive advantage is appropriate.

(2) Productivity of harmful substances

Although corn has a long history of being cultivated in Japan, there have been no reports of corn producing harmful substances.

The effects of the IPD079Ea protein, PAT protein, and PMI protein produced in this recombinant maize are specific, and it is thought that they will not produce harmful substances by acting on the metabolic pathway of the host. Also, No amino acid sequence similarity was observed between IPD079Ea protein, PAT protein, and PMI protein and known allergens.

Additionally, when the herbicide glufosinate is sprayed, N-acetyl-L-glufosinate is produced by the PAT protein. However, the toxicity of this metabolite to animals is lower than that of glufosinate, and under the Agricultural Chemicals Control Law, residue standards have been established for corn as one of the target compounds for glufosinate analysis, and its safety has already been evaluated.

On the other hand, the IPD079Ea protein produced in this recombinant maize exhibits insecticidal activity against Coleoptera pests such as Western corn rootworm, so when this recombinant maize is grown in an isolated field, We identified four species of Coleoptera insects that are designated as endangered or near-threatened species living in Japan as wild animals and plants that may be affected by pollen dispersal. However, in view of the habitat and food of these Coleoptera insect species, it was considered that the four identified Coleoptera insect species were not locally living around this isolated field.

Additionally, it has been reported that the amount of pollen deposited around corn fields decreases to less than 10 grains/cm² at a distance of 10 m from the field. Furthermore, during cultivation in this isolated field, measures will be taken to prevent pollen from scattering outside the field by emasculating the plants. In addition, during cultivation in this isolated field, bird netting is installed at the time of sowing and from the ripening stage to the harvesting stage, and plowing is performed after cultivation, so there is no possibility of plants and seeds leaking outside the field. It was thought that there was no such thing. Therefore, it is unlikely that the four identified Coleoptera insect species will be affected at the population level by this recombinant maize, either through pollen dispersal or by feeding on plant matter together with humus. it was thought.

Based on the above, this recombinant corn does not produce harmful substances within the scope of cultivation, storage, transportation, disposal, and related activities in isolated fields with certain work procedures in a limited environment. The applicant's conclusion that there is no risk of causing biodiversity impacts due to this is considered to be appropriate.

(3) Hybridity

Maize can interbreed with related wild species of the genus *Teosinte* and *Tripsacum*, but these have not been reported to grow naturally in Japan. Therefore, three wild animals and plants that may be affected by biodiversity due to the hybridization of this recombinant maize were not identified.

Based on the above, the applicant's conclusion that there is no risk that this recombinant maize will cause any impact on biodiversity due to hybridization is judged to be appropriate.

2 Conclusions based on biodiversity impact assessment

Based on the above, this recombinant corn can be cultivated, stored, transported, and disposed of in isolated fields with certain work procedures in a limited environment, and within the scope of related activities, it will reduce biodiversity in Japan. It was judged that the conclusion of the biodiversity impact assessment report that there is no risk of impact on nature is appropriate.