

Results of discussions at the Crops Subcommittee

Name: Yield-increasing and herbicide glufosinate tolerant corn (zmm28, pat,
Zea mays subsp. mays (L.) Ittis)
(DP202216, OECD UI: DP-202216-6)

Contents of first class use, etc.:

Use, cultivation, processing, storage, transportation and disposal for food or feed, and acts incidental thereto.

Applicant: DuPont Production Agriscience 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 was produced by introducing the T-DNA region of plasmid PHP40099, which was constructed based on the plasmid pSB1 derived from Agrobacterium etc., using the Agrobacterium method. . This recombinant maize has the expression cassettes of the zmm28 gene encoding the ZMM28 protein derived from Zea mays and the pat gene encoding the phosphinothricin acetyltransferase (PAT) protein derived from Streptomyces viridochromogenes integrated onto the chromosome. Due to the segregation pattern of the gene, it was confirmed by nucleotide sequence analysis of the border region using Southern bissequencing analysis that one copy of the gene had been integrated, and Southern blot analysis confirmed that it was stably transmitted over multiple generations. has been done. Additionally, it has been confirmed by ELISA that the target gene is stably expressed over multiple generations.

(1) Competitive Advantage Although corn has been used in Japan for many years, there have been no reports of it becoming wild in Japan and affecting the habitat or growth of wild animals and plants.

Regarding the morphology and growth characteristics related to the competitive advantage of this recombinant maize, cold tolerance in the early stage of growth, wintering ability of adults, seed production, shedding ability, dormancy, and germination rate, it was isolated in Japan in 2019. As a result of a field survey and a survey of agricultural characteristics conducted in 12 fields in the United States and Canada in 2017, there are traits that suggest that this recombinant maize may have an increased competitive advantage. was not recognized. In addition, the expected characteristic of this recombinant maize through constitutive expression of the ZMM28 protein is increased yield, but imparting this trait will allow this recombinant maize to grow naturally in the natural environment and further increase its competitive advantage. It was thought that there was no such thing. In addition, this recombinant maize has been given resistance to the herbicide glufosinate by the PAT protein, but it is difficult to imagine that this herbicide would be sprayed in the natural environment. Furthermore, it was considered that there was no possibility that the ZMM28 protein and PAT protein would interact with each other, and it was thought that no new characteristics beyond the intended characteristics of yield increase and herbicide tolerance would be imparted. . Based on the above, the applicant's conclusion that there is no risk of impact on biodiversity due to the competitive advantage of this recombinant maize is judged to be appropriate.

2) Productivity of harmful substances Corn has a long history of being cultivated in Japan, but to date there have been no reports of corn producing harmful substances. Since the ZMM28 protein produced in this recombinant maize is an endogenous protein of maize, it was not thought to produce harmful substances that would affect the habitat or growth of wild animals and plants. There are no reports that PAT protein is harmful to wild animals or plants. Although it has enzymatic activity, it is not thought to change the host's metabolic pathway because it exhibits substrate specificity, and it is not thought to produce new harmful substances. Furthermore, when glufosinate is sprayed, N-acetyl-L-glufosinate is produced by the PAT protein, but its toxicity to animals is lower than that of glufosinate, and under the Agricultural Chemicals Control Law, it has been designated as one of the target compounds for analysis in corn. Residue standard values are established, safe usage methods are determined through pesticide registration, and safety for humans, animals, and the environment is ensured. moreover,

It was considered that there was no possibility that unexpected metabolites would be generated due to the interaction between ZMM28 protein and PAT protein.

In fact, as a result of subsequent crop tests, plowing tests, and soil microflora tests conducted in isolated fields in Japan, no significant differences were observed between this recombinant maize and non-recombinant maize in all of the studies. There wasn't. Additionally, as a result of nutritional component analysis conducted in 12 fields in the United States and Canada in 2017, it was determined that this recombinant corn is equivalent to conventional corn. ZMM28 protein and PAT protein produced in this recombinant maize had no amino acid sequence homology with known allergens. Based on the above, the applicant's conclusion that there is no risk of adverse effects on biodiversity due to the productivity of harmful substances in this recombinant corn is judged to be appropriate.

(3) Hybridity

There have been no cases where the host maize has become wild in Japan, and there have been no reports of teosinte or *Tripsacum* sp., which are closely related wild species that can interbreed, growing wild. Therefore, wild animals and plants that may be affected by biodiversity due to the hybridity of this recombinant corn 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. Conclusion of the Agricultural Products Subcommittee Based on the above, the Biodiversity Impact Assessment Report concludes that there is no risk of any impact on biodiversity in Japan when this recombinant corn is used in accordance with the Type 1 Usage Regulations. The conclusion was judged to be reasonable.