

Results of discussions at the Biodiversity Impact Assessment Committee

Name: Herbicide glyphosate and glufosinate tolerant soybean (modified cp4 epsps, pat, Glycine max (L.) Merr.) (DBN9004, OECD UI: DBN-Ø9ØØ4-6)

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

Applicant: National University Corporation University of Tsukuba, SCC Scientific Consulting Company Japan Co., Ltd.

The Agricultural Crops Subcommittee will determine whether the Category 1

We examined the content of the applicant's assessment regarding the impact on biodiversity when using Type 1 of this recombinant soybean in accordance with the usage regulations. The main items confirmed are as follows.

1. Results of biodiversity impact assessment This recombinant soybean was produced by introducing the T-DNA region of pDBN4003 using the Agrobacterium method. This recombinant soybean contains the modified cp4 epsps gene encoding the modified CP4 EPSPS protein derived from Rhizobium radiobacter strain CP4 and the modified cp4 epsps gene derived from Streptomyces viridochromogenes.

It has been confirmed by Southern blot analysis that one copy of the expression cassette for the pat gene, which encodes the original PAT protein, is integrated onto the chromosome and is stably transmitted over multiple generations. Furthermore, it has been confirmed by ELISA that the target protein is stably expressed over multiple generations.

(1) Competitive advantage

Soybean is thought to have been cultivated in Japan since the Yayoi period, and has the longest history of use along with rice and wheat, but so far there have been no reports of it becoming a weed in Japan's natural environment. do not have. This recombinant soybean is endowed with tolerance to the herbicides glyphosate and glufosinate by expressing the modified CP4 EPSPS protein and PAT protein. The herbicide glyphosate and glufosinate tolerance possessed by this recombinant soybean gives it a competitive advantage only in environments where the herbicide glyphosate and/or herbicide glufosinate is sprayed; however, in the natural environment, these herbicides It is difficult to imagine an environment in which the agent would be sprayed, and this trait is unlikely to increase competitive advantage. In addition, the modified CP4 EPSPS protein and PAT protein expressed in this recombinant soybean

It was thought that there was a low possibility that this would affect the metabolic system of the host other than conferring tolerance to the herbicides glyphosate and glufosinate. Based on the above, this recombinant soybean has a competitive advantage 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 biodiversity impacts resulting from this was judged to be appropriate.

(2) Production of harmful substances Soybeans have been cultivated in Japan since the Yayoi period, and have been used for the longest time together with rice and wheat.

Although there is some experience, no production of harmful substances has been reported in soybean so far. This recombinant soybean has a modified CP4 EPSPS protein that confers tolerance to the herbicide glyphosate.

The modified CP4 EPSPS protein and the PAT protein are not known to be harmful substances, although the PAT protein that confers resistance to the herbicide glufosinate and the herbicide glufosinate is expressed. Furthermore, these proteins were not thought to have allergic properties. The EPSPS protein, which is functionally identical to the modified CP4 EPSPS protein, contains aromatic

Although it is an enzyme that catalyzes the shikimate pathway for the biosynthesis of amino acids, it is not the rate-limiting enzyme in this pathway, and even if the activity of the EPSPS protein increases, the concentration of aromatic amino acids, which are the end products of this pathway, will decrease. It is thought that it will not increase. Therefore, it is unlikely that new harmful substances will be produced due to the modified CP4 EPSPS protein. In addition, PAT protein has high substrate specificity and does not use compounds other than glufosinate as a substrate 15, so it is difficult to imagine that PAT protein acts on the host's metabolic system to produce harmful substances. Based on the above, this recombinant soybean 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 any biological diversity impacts resulting from the project was judged to be appropriate.

(3) Hybridity Glimbing soybean was identified as a wild animal or plant that may be affected due to hybridity. Based on conventional knowledge, it is known that the hybridization rate is low even when soybean and wild soybean populations grow adjacent to each other and their flowering periods overlap. Even if soybeans and wild soybeans are hybridized, the resulting hybrid and its hybrid

It is thought that the generation of soybean, which has a certain proportion of soybean genes, will be at a disadvantage compared to wild soybean in adapting to the natural environment, and will be culled. Therefore, it was considered that the possibility that soybean genes would infiltrate wild soybean through repeated hybridization between the hybrid and its hybrid progeny with wild soybean was considered to be extremely low.

In addition, this recombinant soybean has tolerance to the herbicides glyphosate and glufosinate.

It has a competitive advantage only in environments where the herbicide glyphosate and/or herbicide glufosinate are sprayed, but it is difficult to imagine an environment where these herbicides would be sprayed in the natural environment. Even if this recombinant soybean crosses with wild soybeans and produces hybrids or progeny that are resistant to the herbicides glyphosate and glufosinate, it will have an advantage over wild soybeans in a natural environment where the herbicides glyphosate and/or glufosinate are not sprayed. It is thought that there is no such thing. Therefore, it was considered that the possibility that the genes of this recombinant soybean would infiltrate into wild soybean through repeated hybridization of the hybrid and its hybrid progeny with wild soybean was considered to be extremely low, similar to conventional soybean. Based on the above, this recombinant soybean is not hybridizable 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 any biological diversity impacts arising from this is valid.

2. Conclusions of the Biodiversity Impact Assessment Study Group Based on the above, this recombinant soybean is suitable for cultivation, storage, transportation, disposal, and associated activities in isolated areas based on certain work procedures in a limited environment. Within this range, the conclusion of the biodiversity impact assessment report that there is no risk of impact on biodiversity in Japan was judged to be appropriate.