

Advisory Committee on Releases to the Environment Advice

Advice on the precision bred status of organisms described within a precision breeding marketing notice

Precision Breeding Marketing Notice Reference: PBM/26/Fran/008

Date: January 2026

Notice summary: A precision breeding marketing notice describing eight gene edited lines of strawberry plant (*Fragaria x ananassa*) where CRISPR-Cas9 has been used to knock out one or more Terminal Flower 1 (*Tf1*) genes. The resultant phenotype is a remontant strawberry with an altered flowering pattern and longer harvest season compared to the parent variety.

Advice of the Advisory Committee on Releases to the Environment (ACRE) under section 7 of the Genetic Technology (Precision Breeding) Act 2023 to the Secretary of State for Environment, Food and Rural Affairs

ACRE considers the organisms described within the referenced marketing notice **to be precision bred**, based on the definition of a precision bred organism outlined in Section 1.2 of the Genetic Technology (Precision Breeding) Act 2023.

Overview

ACRE has assessed the information provided in this marketing notice against the definition of a precision bred organism outlined in Section 1.2 of the Genetic Technology (Precision Breeding) Act (the act). ACRE's advice is as follows:

‘(a) Any feature of its genome results from the application of modern biotechnology’

The strawberry plant lines have insertion-deletion and substitution edits in one or more of plants' seven nuclear Terminal Flower 1 (*Tf1*) genes resulting from the application of a site directed endonuclease (CRISPR-Cas9) and appropriate guide RNAs introduced *via* Agrobacterium mediated transformation. This is a technique of modern biotechnology as defined by the act.

‘(b) Every feature of its genome that results from the application of modern biotechnology is stable’

Commercial strawberries are vegetatively propagated and therefore, the progeny plants do not undergo meiotic recombination and are considered genetically and phenotypically stable. The stability of the edits in the precision bred strawberry lines was further confirmed by PCR and nanopore sequencing over three rounds of consecutive vegetative propagation demonstrating stability of the targeted edits.

‘(c) Every feature of its genome that results from the application of modern biotechnology could have resulted from traditional processes, whether or not in conjunction with selection techniques, alone’

The transformation of the strawberry plants with CRISPR-Cas9 and appropriate guide RNAs are accepted to have resulted in incorrect repair by non-homologous end joining within one or more of the seven *Tf1* genes across the eight strawberry plant lines. This resulted in insertion-deletion and substitution edits being introduced at the target sites, resulting in loss of function of the gene. ACRE issued information notices to the notifier requesting additional information on the specific genes targeted and which of the seven genes had been edited in each of the eight strawberry plant lines. ACRE accept that the genetic changes described could have resulted from traditional processes, as defined in the Act.

‘(d) Its genome does not contain any feature that results from the application of any artificial modification technique other than modern biotechnology’

The strawberry plants generated do not contain any feature within its genome made by artificial modification techniques, other than modern biotechnology. No transgenic DNA remained in the final precision bred strawberry lines. The plasmid was introduced using *Agrobacterium tumefaciens* transformation and was transiently expressed but not integrated into the plant genome. Sixteen PCR assays were designed to identify plasmid integration. The PCR analysis confirmed the absence of plasmid DNA in the precision bred strawberry lines.

Therefore, based on the information provided within the referenced marketing notice, ACRE considers these plants to be precision bred.