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āta mātai, mātai whetū

GE Free New Zealand
WELLINGTON

For Claire Bleakley, President
By Email – claire@gefree.org.nz

Tena koe Claire,

Official Information Act Request – Endophyte Field Trial

Further to your request of 13 September 2024, we have worked through the questions you have asked and provide answers to these for you below.

First, to frame up our response, we thought it useful to address the nature of *Epichloë* endophytes and ryegrass. *Epichloë* endophytes are entirely separate and distinct organisms from ryegrass. *Epichloë* endophytes are microscopic fungi which form a symbiotic relationship with their host grass species, including ryegrass. *Epichloë* endophytes confer a number of benefits on their host plants which promote plant health, including resistance to insect pests. Seed of ryegrass and fescue varieties sold for pasture in New Zealand is commonly inoculated with *Epichloë* endophytes in order to support pasture performance.

The purpose of the proposed field trial is to trial the performance of gene edited *Epichloë* endophytes. The *Epichloë* endophytes cannot be trialled in the field without a host grass species, which in this case will be a non-GE ryegrass. AgResearch's HME (GE) ryegrass uses an entirely different and separate technology, and will not be used in the proposed trial. It was the HME ryegrass technology that was trialled in the USA, not the gene edited *Epichloë* endophytes.

We answer your questions below (your questions noted in italics):

1. *We would like to know if the ryegrass being trialled is defined as a null segregant in terms of its GMO status?*

   No, it isn't. The ryegrass genotype used in the trial is neither genetically modified nor a null segregant. It is a 'wild-type' genotype. The *Epichloë* endophytes being trialled are not null segregants either.

2. *Was the null segregant parent line from the HME GE ryegrass trialled in the USA?*

   No.

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Please could we have all the data on

1. *The strains of Epichloë endophyte/s that have been gene edited for use in the trial?*

   The strains of *Epichloë* endophytes that have been gene edited for use in the trial are AR37, AR5 and AR6.

2. *Why the endophyte needed to be gene edited?*

   We are investigating the bioactivity of intermediate compounds in secondary metabolite pathways. The endophytes are being modified to see if novel endophytes can be developed that have the desired characteristics of good insect protection without affecting animal health.

3. *the gene editing tool that was used, e.g. CRISPR/Cas, TALENs, ZFN or RNAi?*

   CRISPR/Cas9 has been used to develop the endophytes being tested.

We are aware that the AR1 and AR37 Epichloë endophyte/s were trialled in the USA field trials and their the performance was identical to the non-GM ryegrass.

1. *We request the documentation on this outcome?*

   We are assuming you are referring to an HME ryegrass trial in the USA. Both AR1 and AR37 endophytes were used in a trial to investigate the compatibility of the endophyte with the HME trait in the ryegrass. The endophytes used in the HME ryegrass trial were not genetically engineered. Outcomes of this part of the trial are published in:

   > Richardson KA, de Bonth ACM, Beechey-Gradwell Z, Kadam S, Cooney LJ, Nelson KA *et al.* (2023) Epichloë fungal endophyte interactions in perennial ryegrass (*Lolium perenne* L.) modified to accumulate foliar lipids for increased energy density. *BMC Plant Biology*. **23**:*1*, 636. https://doi.org/10.1186/s12870-023-04635-8.

2. *May we have documentation on the research to show if the genetically engineered ryegrass genes were transferred/up taken into either of the AR1 or AR37 Epichloë endophytes trials in the USA?*

   No data was taken on this point.

If you wish to discuss any aspect of your request and our response, please feel free to contact me.

You have the right to seek an investigation and review by the Ombudsman of our response. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Yours sincerely,

Nick Barraclough

Team Leader - Legal