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Once your submission has been received the submission becomes a public document and may be made publicly available to anyone who requests it. You may request that your contact details be kept confidential, but your name, organisation and your submission itself will become a public document.

Submission on application number:	APP201774
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I wish to keep my contact details confidential

The EPA will deal with any personal information you supply in your submission in accordance with the Privacy Act 1993. We will use your contact details for the purposes of processing the application that it relates to (or in exceptional situations for other reasons permitted under the Privacy Act 1993). Where your submission is made publicly available, your contact details will be removed only if you have indicated this as your preference in the tick box above. We may also use your contact details for the purpose of requesting your participation in customer surveys.

The EPA is likely to post your submission on its website at www.epa.govt.nz. We also may make your submission available in response to a request under the Official Information Act 1982.

- I support the application
- I oppose the application
- I neither support or oppose the application

The reasons for making my submission are¹:

The release from containment of any organism that is new to the New Zealand environment is an act of such biological significance that it warrants the utmost caution and the strongest justification. I find the Application wanting in certain respects in both of these areas.

Unassessed Risks

The risk of these Neotyphodium strains escaping from their biological confinement seems very small. The evolution of these asexual endophytes is thought to have involved superinfection of the host and subsequent intrahost hybridisation. Such a process clearly provides a potential route for the acquisition of the ability for stromal growth and dispersal by means other than direct vertical transmission. There is no assessment of the possibility of such events occurring. This would presumably require the infection of the host plant by a species that is competent in horizontal transmission. To assess the risk of this process occurring, there needs to be information about the presence of such competent organisms in New Zealand; the membership of the 'epichloae' in NZ. The phylogenetic uncertainties in this group of fungi means that such a wide range must be considered.

There is also the requirement for effective transmission of a competent endophyte to the host plants. The assessment of this element of a potential risk pathway requires information not only about the ability of competent epichloae to colonise the crop plants directly (probably nonexistent) but also and more importantly about the presence of potential vectors such as aphids, the range of plants used by these vectors and the presence of epichloae in this feeding range.

This is a very large information requirement, but without at least this, the sustained biological confinement of the endophytes that is fundamental to the safety of their release cannot be assumed.

Unjustified claims of benefit

The major benefit claimed for the release of endophytes is the reduced use of chemical pesticides that will result. This is a highly questionable claim, largely because of the unrealistic assessment of the agronomic situation in which the agent will be employed. There is an unsupported assumption of proportionality between the reduction in pest damage that can be achieved in the presence of the endophytes and the reduced use of pesticides. I contend that because of the economic pressures to maximise production volume and quality, pressures that a market economy ensures are unrelenting, there is unlikely to be any significant reduction in pesticide use because pest damage is not eliminated but only marginally diminished by the presence of the endophytes. Empirical evidence of sustained reduction in pesticide use in arable farming as a result of a marginal reduction in pest damage by non-chemical means is required to justify this claim.

Furthermore, the Application includes a graphical representation of growth in arable sector production in NZ. If this growth is sustained, it will in itself overwhelm any small reduction in pesticide use that might occur; the total quantity of pesticides released into the environment will increase.

The main benefit in reduced use of pesticides is presented as being from reduced insect damage and insecticide use. The figures given in the Application indicate that arable use of fungicide is an order of magnitude greater than that of insecticides. The evidence for reduced damage from fungal pathogens in the presence of endophytes is relatively scant and the agronomic effect not well established.

The proposed benefits in crop plant physiology (drought tolerance, yield increases) seem highly conjectural.

¹ Further information can be appended to your submission, if you are sending this submission electronically and attaching a file we accept the following formats – Microsoft Word, Text, PDF, ZIP, JPEG and JPG. The file must be not more than 8Mb.

I accept that some of these agronomic effects can only be well assessed following release and large scale use of the endophyte-crop plant association. However, if benefits are to be considered in the deliberations of the EPA, they need to be supported by documentary evidence and more convincing than is presently the case.

In summary, I believe that the risks of uncontrolled spread of these organisms has not been comprehensively assessed and the benefits have not been accurately represented. Unless these deficiencies can be addressed, the Application should be rejected.

I wish to be heard in support of my submission (this means that you can speak at the hearing)

I do not wish to be heard in support of my submission (this means that you cannot speak at the hearing)

I wish for the EPA to make the following decision:

Reject the Application
