Import into containment any new organism that is not genetically modified

Example of a fictitious plant application based on *Selaginella lepidophylla*

Application title:

Import into containment *Selaginella lepidophylla*

Applicant organisation:

Central Tree Crops Research Trust

Please provide a brief summary of the purpose of the application (255 characters or less, including spaces)

To import into containment *Selaginella lepidophylla* for research on the treatment of Huntington's disease.

PLEASE CONTACT ERMA NEW ZEALAND BEFORE SUBMITTING YOUR APPLICATION

Please clearly identify any confidential information and attach as a separate appendix.

Please check and complete the following before submitting your application:

All sections completed	Yes
Appendices enclosed	Yes/NA
Confidential information identified and enclosed separately	Yes/NA
Copies of references attached	Yes/NA
Application signed and dated	Yes
Electronic copy of application e-mailed to ERMA New Zealand	Yes

Signed: **Date:**

Section One – Applicant details

Name and details of the organisation making the application:	
Name:	Central Tree Crops Research Trust
Postal Address:	19 Downes Avenue, Wanganui, 4501
Physical Address:	
Phone:	06 1234567
Fax:	06 1234567
Email:	jbloggs@email.co.nz
Name and details of the key contact person:	
Name:	Mark Christensen
Postal Address:	As above
Physical Address:	
Phone:	As above
Fax:	As above
Email:	As above
Name and details of a contact person in New Zealand, if the applicant is overseas:	
Name:	Not Applicable
Postal Address:	
Physical Address:	
Phone:	
Fax:	
Email:	

Note: The key contact person should have sufficient knowledge of the application to respond to queries from ERMA New Zealand staff.

Section 2: Purpose of the application

Lay summary of the application (approximately 200 words)

Note: This summary should include a description of the organism(s), the purpose of the application or what you want to do with the organisms(s),

Use simple non-technical language

The purpose of the application is to import into containment *Selaginella lepidophylla* to grow and propagate it and to determine how it could potentially be used for the treatment of Huntington's disease.

*Selaginella lepidophylla (*Rose of Jericho) is a desert plant that produces a non toxic sugar called trehalose. Currently there are no plants in New Zealand that produce Trehalose.

In 2004 a study was published showing that Trehalose may have a use in the treatment of Huntington's disease, a genetic disease which affects about 900 New Zealanders.

Describe the background and aims of the project

Note: This section is intended to put the organism(s) in perspective of the wider project(s) that they will be used in. You may use more technical language but make sure that any technical works are included in the Glossary.

Selaginella lepidophylla is a native plant of desert and semi-desert regions from Texas to South America. *S. lepidophylla* has a moss-like appearance and grows on rocky soil or limestone talus As rock cover decreases and soil cover and soil depth increase, more vascular plants exist, reducing the growth of *S. lepidophylla* (Van Auken and Bush, 1992). *S. lepidophylla* requires a minimum temperature of 5ºC. As such a climate is not well represented in New Zealand year round, it would be necessary to grow the plants indoors in order for them to survive. Other species of *Selaginella* are already present in New Zealand including *S. kraussiana*, *S. martensii* and *S. moellendorffii*.

Trehalose is a sugar is found in certain desert plants including *S. lepidophylla*. During extreme drought conditions, levels of trehalose up to 20% have been recorded in the leaves of *S. lepidophylla* (Goddijn and Smeekens, 1998).

A study published in 2004 showed that the compound trehalose was capable of delaying the onset of Huntington's disease in a mouse model by inhibiting the clumping of misfolded Huntington protein.

Huntington's disease is an untreatable dominant genetic disease of the brain that affects about 900 New Zealanders. Symptoms of Huntington's disease include involuntary jerking, slurred speech and gradual loss of mental ability.

Section Three – Identification of the organism(s) to be imported

Complete this section separately for each new organism to be imported.

Identification of the organism to be imported

Latin binomial, including full taxonomic authority:	*Selaginella lepidophylla* (Hooker & Greville) Spring in Martius et al., Fl. Bras. 1(2): 126. 1840.
Common name(s), if any:	Resurrection Plant, Rose of Jericho
Type of organism (eg bacterium, virus, fungus, plant, animal, animal cell):	Plant
Taxonomic class, order and family:	**Class**: Lycopodiopsida **Order**: Selaginellales **Family**: Selaginellaceae – Spike-moss family **Genus**: *Selaginella* **Species**: *lepidophylla*
Strain(s) if relevant:	Not applicable
Other information, including presence of any inseparable or associated organisms and any related animals present in New Zealand:	No inseparable or associated organisms have been identified.

Section Four – The proposed containment System

Describe the containment facility and the proposed containment system (physical and operational)

Question	Answer
Which MAF/ERMA Standard is this containment facility approved under?	Standard 155.04.09
What physical containment level (AS/NZS 2243: 2002) is this containment facility registered to (where relevant)?	PC2, in accordance with the AS/NZS 2243:3 2002 standard
What other physical measures do you propose to use to contain this organism?	All living specimens of *S. lepidophylla* will be contained within cloches, except when specimens are being maintained (ie watering, re-potting etc).
What procedural and operational measures do you propose to use to contain this organism?	Only trained and authorised personnel will have access to the containment facility. All packages of organisms imported will be clearly labelled with the direction that the package shall only be opened within a registered PC2 containment facility.
Any other information relevant to the containment of the organism.	

Describe the characteristics of the organism to be imported that may influence its ability; to escape from containment, to form a self sustaining population, or to cause adverse effects. *Refer to sample applications for guidance on how to answer these questions.*

Question	Answer, *Attach copies of the references used in an appendix*
What are the characteristics of the organism that may prevent/enable it to escape from containment? *eg size, spore production, infectivity, seed/pollen characteristics etc.*	*S. lepidophylla* is a desiccation-tolerant pteridophyte found in desert climates (Correll and Johnston, 1970; Mickel and Beitel, 1988). Factors that control the occurrence and growth of *Selaginella lepidophylla* are not well known, but factors such as net CO_2 balance, slow rates of desiccation, extended periods of hydration and low temperatures all play a role (Eickmeier 1988). *S. lepidophylla* is capable of vegetative propagation and can also reproduce via the production of spores. Reproduction via spores requires that both mega and microspores come into contact with each other in a suitable habitat. Successful sexual reproduction further requires water for the transfer of sperm contained within the microgametophyte to fertilise the megagametophyte, and warm dry conditions for the development of the subsequent sporophyte. The intended use of cloches over the plants, to assist with creating the right ambient temperature, would also reduce the risk of escape of spores. *S. lepidophylla* lacks the spreading, matting growth habit and has poor competitive ability compared with *S. kraussiana* which has become a weed species in New Zealand.
How could this organism escape from containment? *ie what are the possible pathways for escape?* *How does the proposed containment regime address these pathways?*	Seed may escape from containment via the following pathways: • Escape during transport from the border to containment facilities and between containment facilities, • escape due to accidental/unintentional or deliberate removal by people or animals, • escape from containment following natural disaster (flood, earthquake etc.) or fire, and • escape of spores, both mega and microspores, via extraction fans. The containment provisions required by standard 154.04.09 require measures to be taken to prevent escape by any of these pathways.

If it were to escape, could this organism establish a population outside of containment in New Zealand? *ie what conditions are required for growth and reproduction? And are those conditions present in New Zealand?* *What factors might prevent this from occurring?*	The formation of a self-sustaining population would depend on escape of both micro and megaspores from containment, the spores being deposited at the same site and coming into contact with a suitable habitat. Given the New Zealand climate, with ample rainfall throughout the year and winter frosts, *S. lepidophylla* would be unlikely to survive outdoors.
If a population did establish could it be eradicated? How? Would it be noticed immediately? How would such a population be identified?	If a self-sustaining population were to develop, it would be easily identified and could be easily eradicated through the use of common herbicides.
Additional information	

Section Five – Identification and assessment of effects

Identify and assess the effects of the organism. Look primarily at the effects if the organism remains in containment, but also consider what might happen if the organism were to escape. If the organism were to escape think about what additional things would need to occur for these effects to be realised.

What are the beneficial effects of the organism(s) and the application? *These benefits must be relevant to the purpose and scope of the application*

The purpose of the importation is to study this plant for its potential in the treatment of Huntington's Disease. Therefore, a benefit of this research is the increase in scientific knowledge of Huntignton's disease as a result of research.

What adverse effects could this organism have on the environment? *For all stages of the life cycle*

S. lepidophylla is not known to be pathogenic or toxic to plants or animals and *S. lepidophylla* has no known adverse effects on the environment either within containment or out of containment.

There are no New Zealand native species in the family Selaginellaceae or genus Selaginella. Therefore, it is highly improbable that Selaginella could hybridise with New Zealand native species and have any adverse effect.

What adverse effects could this organism have on public health? *For all stages of the life cycle*

No adverse effects on public health (including occupational exposure) are identified for this application.

What adverse effects could this organism have on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna and other taonga (taking into account the principles of the Treaty of Waitangi)?

No potential adverse effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna and other taonga are identified for this application.

Are there any other potential adverse effects (including effects on New Zealand's international obligations, social or economic adverse effects)?

No potential adverse effects (such as New Zealand's international obligations, social or economic adverse effects) are identified for this application.

Are there any ethical considerations associated with the organism or the proposed research?

No potential adverse effects (ethical issues) are identified for this application.

Section Six – Additional Information

Additional Information	Y/N	If yes, explain
Do any of the organism(s) need approvals under any other New Zealand legislation?	N	To our knowledge, none of the organisms in this application need approvals under any other New Zealand legislation
Does New Zealand have any international obligations relating to (any of) the organism(s)?	N	To our knowledge, none of the organisms in this application are affected by international obligations.
Have any of the new organism(s) in this application previously been considered in New Zealand or elsewhere? What was the outcome	N	Not to our knowledge
Is there any additional information that you consider relevant to this application that has not already been included?		There is no additional information that we consider relevant to this application that has not already been included.

Provide a glossary of scientific and technical terms used in the application:

Desiccation: To dry out thoroughly. To make dry, dull, or lifeless (through lack of water)

Neuroleptics: antipsychotic drug.

Spore: A small, usually single-celled reproductive body that is highly resistant to desiccation and heat and is capable of growing into a new organism, produced especially by certain bacteria, fungi, algae, and non-flowering plants.

Sporophyte: The spore-producing phase in the life cycle of a plant that exhibits alternation of generations.

Talus Slope: A sloping mass of rock debris at the base of a cliff.

Vascular Plants: Any of the various plants, such as ferns and seed-bearing plants, in which the phloem transports sugar and the xylem transports water and salts.

List of appendices:

N/A

List of references:

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