



PRODUCT REFERENCE

Plant material requiring gamma irradiation treatment

What is gamma irradiation treatment and why is it used?

Gamma irradiation is used by the department as a physical means of sterilisation or decontamination. This treatment effectively kills microorganisms throughout products and their packaging, in addition to devitalising viable seeds that may pose a weed or disease risk if propagated. The treatment exposes products to gamma rays; electromagnetic radiation of very short wave lengths (similar to UV). It works by the gamma rays penetrating the product down to a nuclear level and inflicting direct or indirect damage to the product's DNA.

Gamma irradiation is known as a 'Cold Process' as the temperature of the processed product does not significantly increase. It is not dependant on humidity, temperature, vacuum or pressure thus, the packaging remains intact and the seals are not stressed.

How high is the dose of radiation and where does it take place?

To mitigate all potential biosecurity risks of a product, plant material for research purposes is required to be irradiated at a minimum rate of 25 kGy. However, if during inspection the sample is found to be contaminated with soil or animal biosecurity risk material e.g. faeces, it is required to be irradiated at a dose of 50 kGy. It is the responsibility of the importer to organise the gamma irradiation treatment for their product at an Approved Arrangement within the state the product will arrive. Untreated material may not cross state borders. A list of Approved Arrangements may be found on our website at <https://www.agriculture.gov.au/import/arrival/arrangements/sites>

Is gamma irradiation the only option for my material?

Gamma irradiation treatment is not always appropriate as a treatment for research material. Depending on the nature of the research, the effects of the gamma rays can render the results biased or invalid. For example, gamma irradiation has cross-linking effects on DNA that makes it unsuitable for the treatment of samples used in research in which PCR (Polymerase Chain Reaction) characterisation is a necessity. gamma irradiation is also not suitable for treatment of viable material to be used in growth experiments as it renders the plant material non-viable.

If the nature of the research proposed does not allow for the imported products to be treated with gamma irradiation, the material must have undergone sufficient processing offshore prior to import or must be contained in post-entry quarantine. More information regarding containment may be found on the alternative pathways of the 'Plant material for research purposes' BICON case.

Irradiation of Food

Samples used in research involving taste testing are classed as food samples. There are certain restrictions posed by Food Standards Australia New Zealand (FSANZ) on the gamma irradiation of



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food products. If it is to be classed as a food sample it is necessary to check that it is on the list of approved products for gamma irradiation.

Further information regarding food Irradiation can be accessed on the FSANZ website at:
www.foodstandards.gov.au.