Australian Government
Department of Agriculture, Fisheries and Forestry

Irradiation insights

Streamlining produce supply chains

About irradiation

Global trade of fresh fruit and vegetables is increasing. But before fresh produce can be exported, it may need to be treated for pests such as fruit fly. Different types of pests and produce need different treatments. Traditional pest treatments rely on chemicals, gases or different temperatures, and sometimes a combination of these is needed to treat a range of pests.

An alternative pest treatment is irradiation, technically known as phytosanitary irradiation. The treatment works by making insects sterile, preventing their spread. Irradiation is effective against a broad range of pests, including fruit fly, with a single treatment. It is also a fast treatment option, which helps get produce into both domestic and international markets.

Irradiation treatment is performed at offsite facilities after produce has been harvested – no special equipment is needed at the growing source. Irradiation is a wave of energy that passes through the packaging and produce, much like an X-ray or a microwave, without affecting the quality of the produce.

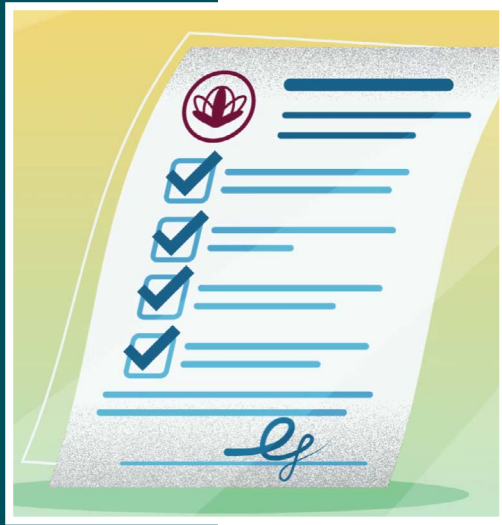
Supply chain benefits

Irradiation technology has been developed over decades of research and refinement. Many countries have existing irradiation facilities that can be used to treat plant produce for trade. For example, Australian irradiation facilities that are used to treat plant produce are also used to sterilise medical equipment.

The whole process is fast and free from heat, chemicals and gases, making it good for produce quality, people and the environment. Irradiation facilities that are powered by renewable energy also offer an environmentally friendly option for producers who are looking for a sustainable pest treatment for their supply chains.

A hands-off treatment option

Producers simply pack the produce at the growing source and send it to a central irradiation facility for treatment. The facility calculates the irradiation dose based on the type of pests and produce being treated, and the requirements of the importing country. The treated consignment is labelled with a certificate to tell biosecurity inspectors that the produce is safe to enter their country.



A fast way to meet consumer demands

Irradiation is a fast and safe way to meet the biosecurity requirements of importing countries. The speed of the treatment and lack of handling means that high-quality, fresh produce can reach consumers across the world. Because of this, it is a preferred pest treatment option for many businesses where produce can be exported and be on retail shelves within hours rather than weeks.

Internationally accepted and regulated

Irradiation is used in more than 60 countries and is helping producers across India, South-East Asia and Australia access international markets. Irradiation services are highly regulated, and international guidelines and treatment standards are in place to make sure everyone uses irradiation correctly. This has helped make irradiation a reliable biosecurity treatment that is trusted by producers, exporters and importers across the world.

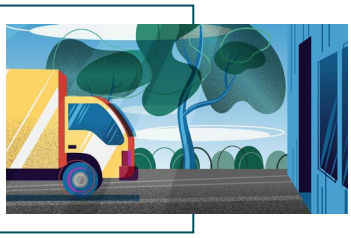
The *Guidelines for the use of irradiation as a phytosanitary measure* are regularly reviewed and updated to ensure that phytosanitary irradiation remains a safe and reliable treatment. The latest guidelines can be downloaded from the International Plant Protection Convention website at **ippc.int/en/core-activities/standards-setting/ispms**

How it works

Irradiation technology has been researched and refined for decades to ensure that irradiation doses effectively treat pests without affecting the quality and safety of produce. There are 3 types of irradiation commonly used for biosecurity treatments: Gamma, X-ray and e-Beam. Produce is simply packaged at the farm and sent to an irradiation facility.

1

Facilities have separate entry and exit points to keep treated produce safe from any pests arriving in an untreated delivery.

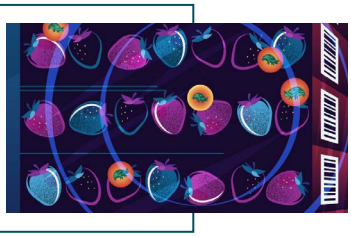


2

Packages are registered to record their treatment details and track them throughout the process.

3

A wave of energy passes through the pallet, treating any pests that may be on or inside the produce and its packaging. The amount of irradiation that is given is based on the type and amount of produce, and the pest being treated. It also considers any other treatments that have been done or will be done, such as more irradiation at the destination.



4

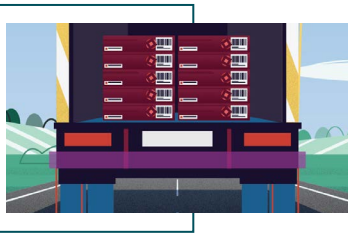
When all the energy has left the package, the treatment is complete. The package is wrapped in a pest-proof barrier to reduce the risk of untreated pests entering the package after treatment.

5

A verification certificate is included to tell biosecurity inspectors in the importing country that the produce has been treated in line with their requirements.

6

The consignment is loaded for distribution in a secure environment to avoid any pests entering from the outside environment.



How to start using irradiation

For more information on the benefits of using irradiation for plant produce – including videos and information sheets – see the Australian Government's plant protection website at **agriculture.gov.au/plant-protection**

To start using irradiation, contact your national plant protection organisation.