Discussion Topics

• Who is Nordion

• Why choose Gamma?

• Processing issues for Phytosanitary products

• Gamma Designs for Phytosanitary Processing
### Nordion is the Premier Global Supplier of Radioisotopes

**Safeguarding Global Health**

<table>
<thead>
<tr>
<th>Gamma Technologies (GT)</th>
<th>Medical Isotopes (MI)</th>
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<tbody>
<tr>
<td>Global leader in Cobalt-60 (&quot;Co-60&quot;) supply</td>
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<td>- Co-60 is the key input for Gamma sterilization</td>
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<td>- Established market leader</td>
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<td>Exclusive long-term Co-60 supply contracts with nuclear reactors at multiple reactor sites</td>
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<td>40 active customers including contract sterilizers and medical device OEMs, served via multi-year agreements</td>
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<td>Leading global supplier of critical medical isotopes for research, diagnostic and therapeutic uses</td>
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<td>Manufactures various medical isotopes for the nuclear medicine industry</td>
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<td>Supply relationships with TRIUMF, Canada’s particle accelerator centre as well as research reactor sites</td>
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<tr>
<td>Customers include pharmaceutical companies, hospitals, and radiopharmacies.</td>
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**Safeguarding Global Health**

*with every critical isotope we supply.*
Why Choose Gamma for Phytosanitary Processing?

- Used for over 60 years
- Over 200 large scale irradiators in the world
- Equipment is simple
- Reliability is high, does not fail
- Maintenance of equipment – low and cheap
- Good penetration for high density product

*Source: Recent Development of Nuclear Application Technology, Sueo Machi, IAEA, 2012

Phytosanitary Irradiation – Development and Application, Guy Hallman, Paisan Loaharanu, IAEA, 2016

Fig. 1. Tons of produce irradiated per year for phytosanitation worldwide since continuous commercial use began in 1995.
Phytosanitary Processing Issues

• Product Handling
  o Damage
  o Weight
  o Pest Control

• Dose Delivery

• Cold Chain
  o Temperature Control
Gamma Solution

2 pass, 2 level Parallel Row Pallet Irradiator

• Ability to process a large variety of pallet sizes (80 cm W to 122 cm W with varying product height and length)
• Nordion’s Parallel Row Pallet Gamma Irradiator
  o Allows less manipulation of product, unloaded directly from truck
  o Pest Controls already in place would not be compromised by extra handling
  o If product is not unloaded off the palettes then less labour will be required
  o Heavy product is moved with lift trucks into the irradiator instead of manually transferring product onto a conveyor
  o DUR 2.3 for a 0.4 g/cc product stack
Cold Chain

- Temperature controlled shipping from the grow/packing site to the facility
- Controlled cold rooms at the facility to maintain temperature prior to irradiation
- Product insulation by blankets or covers to maintain temperature
- Insulating the carrier system
- Using dry ice to maintain or lower temperature
- Cooling the irradiation chamber
• Gamma is the solution for phytosanitary processing for these reasons:
  - Simplicity
  - Reliability
  - Adaptability
  - Proven Technology
  - Experience in industry
Thank you
Carlo Coppola

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Learn more about Sotera Health at www.soterahealth.com