



The role of Nordion technology in preventing the spread of the Zika virus

According to the International Atomic Energy Agency (IAEA), the global effort to combat the spread of the Zika virus is to include an important role for Cobalt-60, an isotope supplied by Nordion and produced in Bruce Power reactors.

The Zika virus has been linked to birth defects, paralysis (Guillain-Barré syndrome) and, more recently, to a life-threatening type of brain inflammation. On February 1, 2016, the World Health Organization (WHO) declared Zika virus a public health emergency of international concern.

According to the US Centers for Disease Control and Prevention (CDC), Zika is spread primarily through a bite by infected *Aedes aegypti* mosquitoes.¹ Recently, Zika has been reported in South and Central America but the CDC expects the virus will spread to new areas. (In the past, Zika had been reported in tropical Africa, Southeast Asia, and the Pacific Islands.)

Nordion Cobalt-60 has been used for decades as the key component of the Sterile Insect Technique (SIT), a process aimed at eliminating or, at a minimum, suppressing the population of insects that spread disease or damage agricultural crops. Pioneered in the 1950s, SIT involves using gamma irradiation to render insects such as male tse-tse flies, screw-worm flies, and other fruit flies sterile. After irradiation, large numbers of sterile males are released into the wild, dramatically reducing the number of insects in the next generation. Repeated release can eventually wipe out a population of insects. The process has been used primarily as an agricultural control practice in southern climates, including in the US and Central America, where the targeted insects typically do not die off over the winter.²

Nordion is the world's largest supplier of Cobalt-60, an isotope which is purpose-made in Canadian nuclear reactors such as those at Kincardine, Ontario's Bruce Power. Cobalt-60 is a key source of gamma radiation, a technology that has proven to be a reliable, safe, and effective method to irradiate insects for pest control. Nordion supplies production irradiators and Cobalt-60 gamma sources that are used in SIT programs around the world.

Other applications of gamma technology include the sterilization of single-use medical disposables, pharmaceutical components, implantable devices and labware, as well as irradiation of food products and consumer goods for microbial reduction and irradiation of produce for phytosanitary control for import and export.³

¹ The CDC provides a historical overview of the virus first discovered in the Zika forest in Uganda.

<http://www.cdc.gov/zika/about/index.html>

² For more information on SIT's agricultural applications, see the following description from the joint Food and Agriculture Organization – International Atomic Energy Agency's program at: <http://www-naweb.iaea.org/nafa/ipc/sterile-insect-technique.html>

³ Nordion and Bruce Power's role in the use of Cobalt-60 in the medical field is described here:

<http://www.cleannuclearpowersafehospitals.com/#medical>

The IAEA has announced that it will be deploying the Sterile Insect Technique using gamma irradiation in Brazil as part of an integrated control program for the *Aedes aegypti* mosquitoes.⁴ Using SIT to sterilize male *Aedes* mosquitoes will reduce the number of infected insects in subsequent generations, thereby suppressing the spread of the Zika virus. As the *Aedes* mosquito has also been linked to the spread of dengue and West Nile virus, additional societal benefits can be expected.

A form of insect birth control, SIT poses no risk to the environment or to public health. In fact, the Sterile Insect Technique is considered one of the most environmentally-friendly insect pest control methods ever developed. The process does not introduce exotic species into an ecosystem – sterile insects are not self-replicating and therefore cannot become established in the environment. As a result, sterile insects are categorized as beneficial organisms under the International Plant Protection Convention.⁵

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⁴ The equipment will be sent to Juazeiro, Brazil. <https://www.iaea.org/newscenter/news/iaea-helps-brazil-step-up-the-fight-against-zika-mosquitoes>

⁵ [International Standards For Phytosanitary Measures](#) ISPM No. 3, Guidelines For The Export, Shipment, Import And Release Of Biological Control Agents And Other Beneficial Organisms (2005), under “Scope,” p. 24. The International Plant Protection Convention falls under the jurisdiction of the Food and Agriculture Organization.