GAMMA PROCESSING: A PRACTICAL ANSWER TO QUARANTINE SECURITY

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Poster Session Summary

With increasing concerns over global warming, and the associated implementation of the Montreal Protocol resolutions, the fresh produce industry has been searching for a viable alternative to Methyl Bromide (MeBr) fumigation. The application of MeBr as a fumigant in treatment of commodities requiring quarantine security was developed several decades ago - long before the impact of MeBr on atmospheric ozone depletion and global warming became evident. MeBr was identified under the Montreal Protocol as a very potent ozone depleting substance (ODP = 0.6). The use and production of MeBr in the USA is scheduled to end by January 1, 2001. Additionally, products treated with MeBr elsewhere will likely be banned from distribution in the USA. Undoubtedly, this will have a significant economic impact on the industry. It will affect not only the domestic interstate trade, but more importantly the international trade. Areas that will likely feel the largest impact include Mexico and other Latin American countries.

Radiation treatment of many traded commodities represents a viable alternative to MeBr fumigation. Irradiation has been demonstrated to be an effective disinfestation treatment. Relatively low doses are required to incapacitate most of the insects of concern, such as various fruit flies and fruit weevils. Typical disinfestation doses are in the order of 150 Gy (or 15 krad). The US FDA has unconditionally approved irradiation of fresh fruits and vegetables to a dose of up to 1000 Gy.

Radiation processing is a well established technology that has been used for more than thirty years in sterilization of medical disposable products world-wide. Essentially the same technology can be used to treat fresh fruits and vegetables (except the applied doses are much lower). In addition to quarantine security, radiation treatment of these commodities will in many cases significantly extend the product shelf-life as a collateral benefit. The radiation treatment is relatively inexpensive, easy to control, and reliable. As with any product processing, the cost of irradiation is subject to the economies of scale. Verification of the treatment relies on documentary evidence (i.e. confirmation of applied dose) as is done with sterilization of medical products, rather than on inspection of the final product.

The most commonly used source of radiation is cobalt 60. The products can be exposed to the radiation emitted by cobalt 60, either in their shipping cartons, or on pallet loads, depending on particulars of a given processing scenario. A typical pallet irradiator can easily process upwards of 30,000 tonnes of product annually.