

# Hive Equipment Sterilization

Plan now to irradiate your American Foul Brood (AFB) infected or potentially infected equipment. Please contact Mark Antunes to confirm your spot. See below for the details and costs to participate.

## Contact Information:

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## Hive Equipment Sterilization - A Regional Gamma Irradiation Program for PA Beekeepers -

Mark Antunes and Brian Marcy are the coordinators of an emerging program that allows PA and regional beekeepers to sterilize their hive wooden ware and other contaminated equipment using gamma irradiation. The program goals are to provide a viable, sustainable & cost effective alternative to burning hive equipment to control AFB and to allow the safe use of contaminated or otherwise suspect supers, frames & honeycomb after treatment.

### What is Gamma Irradiation?

Gamma irradiation is a physical means of decontamination – it kills bacteria by breaking down bacterial DNA, inhibiting bacterial division, using high-energy photons that are emitted from an isotope source (Cobalt 60). Energy (gamma rays) passes through hive equipment, disrupting the pathogens that cause contamination. These photon-induced changes at the molecular level cause the death of contaminating organisms or render such organisms incapable of reproduction. The gamma irradiation process does not create residuals or impart radioactivity in the processed hive equipment. The process has been used for years to sterilize imported leather goods, spices, wine corks, medical dressings and devices, pharmaceuticals, etc.

### Advantages & Benefits

ALL wooden hive components can be sterilized using gamma irradiation. Hive equipment is ready for immediate use after processing. The process is clean; no chemical residues are produced. Most importantly, gamma irradiation destroys, not just suppresses, the pathogens (bacteria, viruses, fungi) that may contribute to CCD and other biological threats that contaminate hive equipment. The process also eliminates the need to replace equipment or comb contaminated by American Foul Brood (AFB). There is also some evidence that gamma irradiation reduces levels of toxins (i.e., pesticides) present in honeycomb by modifying their chemical structures.

### A Proven Strategy

Long-standing gamma irradiation programs for hive equipment have been operating in Massachusetts, California, Florida, Canada, and in Australia. While in Florida, Dave Hackenberg, one of Pennsylvania's largest commercial beekeepers, uses gamma irradiation to sterilize selected hive equipment. During spring 2008, Penn State University cooperated with MCBA in the successful processing of hive equipment that was known or thought to be contaminated with AFB, IAPV and other honey bee pathogens. Subsequent testing of the processed equipment proved it to be completely clear of all biological contaminants that could have threatened our honey bees!

### **Location:**

The commercial facility for gamma irradiation in our area is the **Sterigenics Corporation; located at 75 Tilbury Road, Salem, NJ 08079**. This location offers beekeepers in Pennsylvania and southern New Jersey, and perhaps Delaware, the opportunity to clean their known and suspect contaminated equipment.

### **Preparing Equipment for Irradiation**

If you are interested in participating in our irradiation program, you will need to prepare your equipment as follows:

- Select a regional staging site located away from known apiaries.
- Print your name on each piece of equipment if you are combining equipment with other beekeepers on one pallet.
- Thoroughly clean & repair all hive boxes. **Do not send equipment with ants, insects, mouse nests, or other loose debris. It will be rejected from the load.**
- Extract honey or be prepared to bag supers individually.
- Pack frames in their respective hive boxes.
- Use standard **4-way** pallets (40" X 48").
- **Pallets must be in good repair and free of debris, stones, or soils.**

### **Stacking & Wrapping Pallets**

All collected equipment must be stacked onto standard **48" X 40" pallets**, shrink wrapped, with top and bottom sheet 4 mil. plastic before shipments to, and processing by Sterigenics, can occur. Please follow these necessary steps to prepare your equipment for processing:

1. Cover pallet top with cardboard sheet.
2. Cover cardboard with enough 4 mil clear plastic sheeting that extends 12" up each side of your stack.
3. **Stack the hive boxes in a 6-column configuration.** Supers may over hang the 48" dimension by ½ inch. **There can be no overhang on the 40" dimension at all. If that occurs the pallet can not be processed.**
4. Top-sheet stack with enough 4 mil clear plastic sheeting to extend 12" down each side of your stack.
5. Shrink-wrap stacked hive boxes tightly from top to bottom.
6. Extend bottom sheet of plastic up the stack on the outside of the shrink-wrap.
7. Shrink-wrap stack again, making sure that the top & bottom sheets of plastic are sealed under the second wrap.

8. **The total weight of a pallet may not exceed 1,500 Lbs. due to the carriers used in the irradiation chamber.**
9. **Your hive equipment and pallet may not have any live insects or mice in it.** If so it will be rejected and not processed and it could cause the entire run to be rejected.

### **Transporting Equipment to Sterigenics**

A sufficient quantity of equipment is needed to make an irradiation “run” practical and economical. Persons who will be responsible for consolidating prepared equipment and delivering it to Sterigenics must follow these preparation and shipping rules:

- Clearly label & ID all equipment on each side of the stack with a full size sheet of 9” X 11” paper that has bold print on it. Tape it on to the equipment before you shrink wrap the equipment at eye level. If you are hauling in rain or bad weather have a second set of labels to insert at the loading dock in case the first set is not legible.
- Label each box with first & last name on any mixed beekeeper equipment pallets.
- Maximum allowable height of stack, including pallet, is 6 feet
- Advise Mark Antunes that a shipment is planned so that a shipment/processing date can be confirmed.
- Loading dock height trucks unload in the rear of the building, low trucks and trailers unload in front of the building.
- Line delivery vehicles with plastic or cardboard to prevent contamination of that vehicle – destroy liner after delivery.
- Arrive at the agreed time at Sterigenics 75 Tilbury Road, Salem, NJ 08079

### **Costs & Payments**

Please contact Mark Antunes if you have hive equipment that you wish to process at Sterigenics. An account will be set-up in conjunction with the Pennsylvania Beekeepers Association to allow for payment of gamma irradiation processing at Sterigenics. Without exception, all expected processing costs for prepared pallets must be prepaid before equipment is transported to Sterigenics.

- Minimum cost per run is \$900.00 for 1 to 7 pallets
- **\$125/pallet** (full or partial) based on a full capacity equipment run of 8 pallets
- **Payment in full for all pallets you deliver must be with a certified bank check. This is required before or upon drop off of pallets at Sterigenics.**

Help yourself and your fellow beekeepers by spreading the word about hive equipment sterilization!

Thanks,

Mark S. Antunes