

New Instructions!

If you plan to irradiate boxes with honey in them, you must wrap them securely in heavy gauge plastic. [Click here to see the instructions.](#)

Plan now to irradiate your American Foul Brood (AFB) infected or potentially infected equipment. The processing is typically scheduled for mid-March each year in order to have equipment ready prior to the arrival of spring packages. Please contact Mark Antunes to confirm your spot at (484) 955-0768 or by email at honeyhillfarm@verizon.net. See below for details and costs to participate. [For a printable version, click here.](#)

Mark Antunes has been the coordinator of PSBA hive irradiation program since he and Brian Marcy began it in 2008. It is available to all beekeepers throughout the Mid-Atlantic region to treat their bee hive wooden ware in a process that uses Cobalt 60 gamma irradiation. The goal of the program is to provide a viable, sustainable, and cost effective alternative to burning hive equipment to control AFB and to allow the safe use of contaminated or otherwise suspect supers, frames and honeycomb after treatment.

See the Video!

Check out the MCBAPA video about Hive Irradiation.

What is American Foul Brood (AFB)?

AFB is a bacterial contamination of the hive that destroys the brood. The spore-forming bacteria *Paenibacillus larvae* ssp. *larvae* are ingested by larvae under 3 days old through the ingestion of bacterial spores in their food. The bacterial spores germinate in the guts of the larvae and the vegetative form of the bacteria feed on the larvae, killing them. The vegetative bacteria also die, but not before releasing as many as 100 million spores per larvae. Bees cleaning the contaminated cells spread the spores throughout the hive, and contaminate brood food, thus spreading the bacteria quickly throughout the hive. As the hive weakens, the hive may be robbed by invading bees, thus spreading the contamination to other hives. Similarly, beekeepers can spread the disease through their tools or transfer of hive components to other hives, or through feeding bees contaminated honey. In the spore form, the bacteria can survive for more than 40 years in honey and beekeeping equipment. Although pharmaceuticals have been developed for AFB, there is controversy for their use, because it can control AFB but does not eliminate it, and some bacterial resistance has been observed in strains of AFB. Other methods such as scorching the interior of the hive, dipping in bleach or paraffin have also been tried, but rely heavily on adequate coverage and penetration of the affected surfaces. Therefore, prior to the advent of irradiation, the only sure control mechanism had been burning the hive and equipment.

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 any residuals or impart any radioactivity in the processed hive equipment. The process has been used for decades to sterilize imported leather goods, spices, wine corks, medical dressings, medical devices, pharmaceuticals, etc.

What are the advantages and benefits of gamma irradiation?

ALL hive components except metal outer covers can be sterilized using gamma irradiation – boxes, frames, comb and a **limited amount of** honey in the comb. Hive equipment is ready for immediate use after processing. The process is clean; no chemical or irradiation residues are produced or left in the hive equipment. Gamma irradiation destroys, not just suppresses, the pathogens (bacteria and 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.

Gamma irradiation is a proven strategy – There have been long-standing gamma irradiation programs for hive equipment in Massachusetts, California, Florida, Canada, and in Australia. During spring 2008, Penn State University cooperated with MCBA in the successful processing of live AFB samples that proved to be non-infectious after being treated. Subsequent field testing of the processed equipment proved it to be non-infectious for AFB after being treated.

Where will my equipment be irradiated?

The commercial facility for gamma irradiation in our area we use is Sterigenics Corporation, 75 Tilbury Road, Salem, NJ 08079. This location offers beekeepers in Pennsylvania, New Jersey, New York, Delaware, and beyond the opportunity to clean their known and suspect contaminated equipment.

How do I prepare my equipment for irradiation?

If you are interested in participating in our irradiation program, you will need to prepare your equipment as directed below. *For the latest information, a video on stacking pallets, and a step-by-step tutorial on the requirements for wrapping individual boxes go to: <https://www.montcopabees.org/> and look under the heading Services & Resources for IRRADIATION*

- It is the responsibility of each beekeeper to deliver his/her equipment to the irradiation facility or make arrangements to have it done by someone else.
- Groups or multiple individuals should select a regional staging site located away from known apiaries to load the equipment on whatever common carrier they have selected.
- If your equipment contains any honey at all and you are sharing a pallet of combined equipment, each individual box **MUST** be wrapped in heavy plastic or heavy gauge plastic trash bags that are tied and taped shut.
- You must print your full name and phone number on each piece of equipment and on a piece of duct tape fixed to the plastic or plastic bags it is wrapped in.
- **Special Note:** Any hive equipment known to be contaminated with American Foul Brood MUST be tightly wrapped and taped shut in heavy gauge 4 ml plastic or double plastic bagged before it is delivered to any staging site where equipment is being combined from different beekeepers. Single source pallets with hive equipment known to be contaminated with American Foul Brood must be palletized following all of the protocols.

****DO NOT** send equipment with live ants, insects, mice, or mouse nests or other loose debris. It will be rejected from the load.**

- Extract honey from the comb or be prepared to bag supers individually (to bag supers, see the attached instructions).
- Pack frames in their respective hive boxes.
- Use standard 4-way pallets (40" X 48"). NO SMALLER or LARGER.
- Pallets must be in good repair and free of stones, soil and debris.

Stacking & Wrapping Pallets

Sterigenics will no longer allow hive equipment to be stacked and wrapped on site. Therefore, you must deliver all hive equipment properly stacked and stretch wrapped and ready to be unloaded by forklift at the facility. For processing, all collected equipment must be stacked onto standard 48" x 40" pallets covered with a single sheet of heavy gauge cardboard, shrink wrapped, with a top and bottom sheet of 4 mil plastic before processing by Sterigenics can occur. You must follow these necessary steps to prepare your equipment for processing:

- Cover pallet top with a single sheet of heavy gauge cardboard. You may not piece or tape cardboard together to cover the pallet.
- The pallet and cardboard must be covered with a **single sheet of heavy 4ml plastic that has no holes**, which extends beyond the pallet on all sides by 12" which will then extend up the sides of the stacked equipment. This is to prevent any honey that liquefies from leaking out. Watch the video at <https://www.montcopabees.org/Irradiation>
- Stack the hive boxes in a 6-column configuration. Supers may overhang the 48" dimension by 1/2 inch. There can be no overhang in the 40" dimension at all. All cleat handles or tie down hooks that extend beyond the face of the super or brood box **MUST** be removed. If equipment is delivered with cleat handles or tie down hooks that extend beyond the footprint of the pallet, that pallet cannot be processed.
- The total height of the stacked hive equipment including the pallet cannot exceed 78 inches (6' 6").

- Top-sheet the stacked equipment with 4 mil heavy gauge plastic sheeting to extend 12” down each side of stacked equipment.
- All equipment must be tightly stretch wrapped from top to bottom before wrapping the top and bottom sheet plastic.
- Extend bottom sheet of plastic 12” up the stack on the outside of the first layer of shrink wrap.
- Shrink-wrap stack again, making sure that the top and bottom sheets of plastic are sealed under the second layer of shrink wrap.
- IMPORTANT: DO NOT EXCEED 1,500 POUNDS TOTAL WEIGHT PER PALLET due to the weight limitations of carriers used in the irradiation chamber.
- Your hive equipment and pallet **may not** have any live insects or mice in it. If so, it will be rejected and not processed. That may cause the entire run to be rejected.
- **Special note:** To prevent the spread of disease, any staging site where hive equipment is being gathered from different beekeepers should use a heavy gauge tarp to protect the location from contamination by stacking and wrapping all pallets on the tarp. No contaminated equipment should be set on the ground. At the end of the palletizing process the ground tarp should be neatly folded and stacked on top of the last pallet to be irradiated and disinfected along with the hive equipment.

Transporting Equipment to Sterigenics

We need to have a minimum of 7 pallets of equipment get the lowest per pallet cost and make an irradiation “run” practical and economical. Persons who will be responsible for consolidating prepared equipment and delivering it to Sterigenics must follow the preparation and shipping rules below. ***Please note: Over the years the staff at the Salem, NJ Sterigenics facility has worked very hard to accommodate our special needs and allow us to work with them on this annual event. As a gesture of good will we have provided a 1 pound jar of local honey from each participating beekeeper to everyone on the staff at Sterigenics every year we have delivery hive equipment. Make sure you bring a jar or send a jar of honey for the kind folks at Sterigenics to whoever transports your hive equipment.***

- Clearly label and ID all equipment on each side of the stack with a full 8.5” x 11” paper that has bold print on it. Tape this label to the equipment at eye level before it is shrink wrapped. (Note: If you are hauling in rain or bad weather, have extra labels on hand to insert at the loading dock in case the first set is illegible or place the labels in clear plastic sleeves before use.)
- Any pallets with combined equipment from multiple beekeeper’s must have each box labeled with the first and last name of the equipment owner on the equipment and/or the plastic wrapping of the individual boxes.
- Maximum allowable height of the stacked equipment, including the pallet, is 6 feet 6 inches tall.
- 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.
- For the delivery of equipment known to contain AFB and prevent reinfection; it is highly recommended to line delivery vehicle with plastic or cardboard to prevent contamination of the delivery vehicle then destroy that liner after delivery.
- Schedule your arrival on the correct date with Mark Antunes at Sterigenics Corporation, 75 Tilbury Road, Salem, NJ 08079.

How long does it take to process the hive equipment?

Sterigenics offers three different fee structures for the irradiation of materials all based on how quickly the materials need to be irradiated. This program uses the least expensive turnaround time which usually takes 3 – 5 business days. Same day service is three times as expensive and 48 hour service is twice as expensive.

When the hive equipment is ready to be picked up, Sterigenics will notify Mark Antunes and he will then send out an e-mail to everyone who delivered equipment for that run stating it is available to be picked up. Picking up the processed

equipment does not require the same unified timing that delivering the equipment does, so you can pick up your pallets of equipment within a weekday or two of when it is ready.

What are the costs and who do I contact?

Please contact Mark Antunes if you have hive equipment that you wish to process at Sterigenics. Without exception, all expected processing costs for prepared pallets must be paid upon in the full amount with a certified bank check or money order made out to Sterigenics International, Inc. *Note: There is a U.S. Post Office only 1/2 mile from Sterigenics where a money order may be easily purchased.*

If 7 or more pallets of equipment are delivered for **2020** the cost per pallet is \$214.30. 1 full pallet can accommodate 48 deeps @ \$4.45 per box all with frames or 66 mediums on a pallet for about \$3.30 per box.

Contact Information:

Mark Antunes

E-mail: honeyhillfarm@verizon.net

Cell: (484) 955-0768

HELP YOURSELF AND YOUR FELLOW BEEKEEPERS AND SPREAD THE WORD ABOUT HIVE EQUIPMENT STERILIZATION!