THE Bee-Files
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Integrated Pest Management for Honey Bee Pests and Predators in the Northeast

Equipment Repairs

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Key Words

Mechanical method: a non-chemical method for managing pests in an IPM program. Examples include barriers, traps, fences and bee-tight equipment.

Cultural method: a broad class of methods for managing pests in an IPM program emphasizing management strategies. One example is establishing and following a regular program of equipment maintenance.

I frequently see beehives that resemble several large blocks of Swiss cheese stacked on top of each other. The openings in these hive bodies present opportunities for pests to enter your hive where they can damage your bees and equipment. So, I spent much of my last article emphasizing the value of maintaining a secure hive for your bees. This month, I want to finish up my obsession for bee-tight equipment with a few tips on maintenance. The tips presented here are based on what I learned when I worked as an apiary technician for Vic Thompson at The Ohio State University Bee Laboratory. Remember! A regular program of equipment maintenance is not only an important component of an IPM program, it is important to the long term economic viability of your operation, because it will extend the useful life of your equipment by many years.

When to Repair

When the fit between two hive bodies deteriorates to the point where you can see through them, you should be thinking 'repair-time'. Even though pests may not yet be able to move freely in and out of the hive, the opening will promote robbing and will certainly make it more difficult to control robbing if it gets started (Fig. 1). Carry several good hive bodies with you when you work an out yard. If you notice a damaged hive body or if you split off a piece of wood from one while working your bees, replace it with a sound one, and take the damaged equipment to your shop for repair. When you are scraping your frames over the winter, pull out damaged hive bodies and store them for repair. I accumulate damaged shells until I have 30-40 that I can work on at once, and then I spend a day restoring and painting them. I use two basic methods to repair damaged hive bodies – the wood insert and the metal patch.

The wood insert

When the frame-rest end of a hive body is damaged along a substantial part of its length, I cut it off and replace it with a hardwood insert sawn from a block of well-seasoned white oak. The repair part is 16-1/4” long by 3/8” thick by 1-3/4” high, although you may need to adjust those dimensions slightly to fit your equipment. Since the repair part is hardwood, you have to pre-drill 3/32” pilot holes in it before nailing it in place, otherwise, you will split the wood.

Begin the repair by removing all nails within 2” of the top of the shell on the damaged end. A nail puller helps if you have several shells to repair (Fig. 2). Next, remove the metal frame rest (Fig. 3) and pull out any remaining nails (Fig. 4). Scrape the frame rest clean, and double check for nails, unless you enjoy sharpening your saw blade. The shell is now ready for the table saw.

You will need to make two cuts in the shell to remove the damaged end and to accommodate the repair part. One cut removes the outer 3/8” of wood along the entire 16-1/4” width of the damaged end. This cut is set 1-3/4” deep. The second cut is made perpendicular to the face of the damaged end, 1-3/4” from the top and 3/8” deep. These two cuts remove a piece of wood from the shell the same size as the repair part. If you have a lot of shells to repair, make all of one cut first, then make the other cut. This way, you only have to set your saw twice. The dimensions of your equipment may vary somewhat from what I have given. So, be sure to set your saw so that you do not remove any of the actual frame rest area.

2. Pull out nails

3. Then remove frame rest

4. Remove any remaining nails

5. Cut out the damaged area and glue in the replacement parts.

6. Nail it in but predrill the holes.

7. Paint replacement part and you're done

Once the damaged end is removed, apply waterproof wood glue to the joining surfaces of the repair part and the shell (Fig. 5), then, press them together. Nail the repair part in place with 2, 7d galvanized nails on each end. Grip the repair part tightly against the shell to keep it aligned, then, drive in the nails (Fig. 6). Prime and paint over your repair work. The repair will last longer than the shell (Fig. 7).

If the shell is damaged along a bottom rail, I use hardwood pieces cut ¾” wide by 1” deep. I cut them either 19-7/8” long (the length of the shell) or 16-1/4” long (the width of the shell). I pre-drill 3/32" pilot holes every few inches along the ¾” side, then, I countersink the holes to accommodate the nail head on a 7d galvanized nail.

Begin the repair by removing all nails within 1-1/2” of the bottom of both ends of the damaged side of the shell. Set your table saw to a depth of ¾”, then, remove 1” of wood from the bottom of the damaged side of the hive body. Apply waterproof glue to the joining surfaces of the repair part and the shell, press them together, then, nail the repair part in place. If a shell is heavily damaged, consider cutting it into a shallow, or patching together two good remnants from two damaged shells. To patch together the halves from two shells, apply wood glue to the joining surfaces, then, clamp the pieces together. Drive in several hive staples along the inside surfaces of the shell. Be sure to place the shell on a solid, flat surface when hammering the staples into the wood so that the joint stays aligned. Orient adjacent

staples at opposing angles. Keep the pieces clamped together until the glue is set.

The metal patch:
If the damage is less extensive, I use 28-gauge aluminum sheet metal to complete the repair. This is thinner than standard flashing, but it can be ordered from most sheet metal fabrication shops. Use the templates provided below to produce repair pieces for the top and bottom corners of the shells. Stack up 5-10 repair pieces and pre-drill the nail holes with a 1/16” bit. Store until needed.
Begin the repair by cleaning the damaged area with a sharp hive tool. Next, use a wood rasp to remove just enough wood from the top or bottom of the narrow edge of the shell to accommodate the thickness of the sheet metal. This ensures a flush fit where two hive bodies come into contact. Next, fold the repair part on the corner of an undamaged shell to produce the correct fit. You want crisp, right angles for a good fit. Finally, place the repair part in position on the damaged shell and nail it to the sides. Use ¾” or 3/8” nails, depending on the thickness of the wood into which you are nailing.

If you like, you can partially fill the folded repair part with wood putty before positioning it. Work the repair part into place. The putty will fill any depressions in the wood and provide additional support for the sheet metal. Clean off any excess putty that oozes out. Complete the job by nailing the repair part into place. Prime and paint over your repair work. The corner should be as good as new. You can use smaller pieces of sheet metal to repair small damaged areas anywhere on the shell. Always rasp out the thickness of the sheet metal on the contact edge of the shell.

Maintaining your equipment is a great way to spend cold winter days in your shop. You can make the entire process go more smoothly if you build or purchase equipment of uniform dimensions for your operation. That way, each repair part will be compatible with all of your equipment, and you will not have to set your saw as often. Sharp saw blades also make for good joints. Remember! Well-maintained equipment is easier to work with, protects your bees from pests, and is economical in the long run. I can restore 40 supers (one major repair per super) in a day at a cost of $2.00 per super. Weigh that against the cost of purchasing 40 new supers, assembling and painting them. So, whether you use the methods outlined here, or those of your own making, be sure to incorporate routine equipment maintenance into your overall management program.


Well maintained equipment.

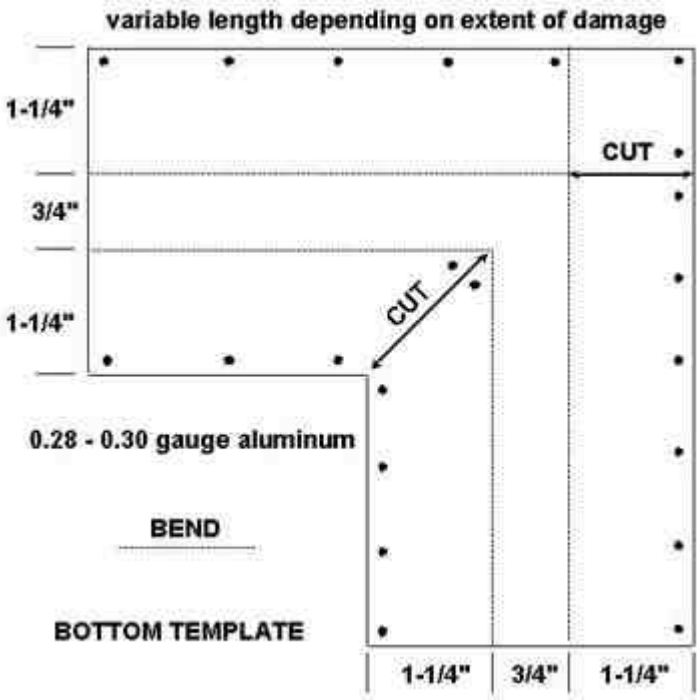
Safety tip: ***Always wear appropriate eye protection when working with a table saw or any other tool. Wear a particle mask when sawing wood to protect your lungs.***

TEMPLATES

Note: **These templates are not to scale but dimensions are correct.**

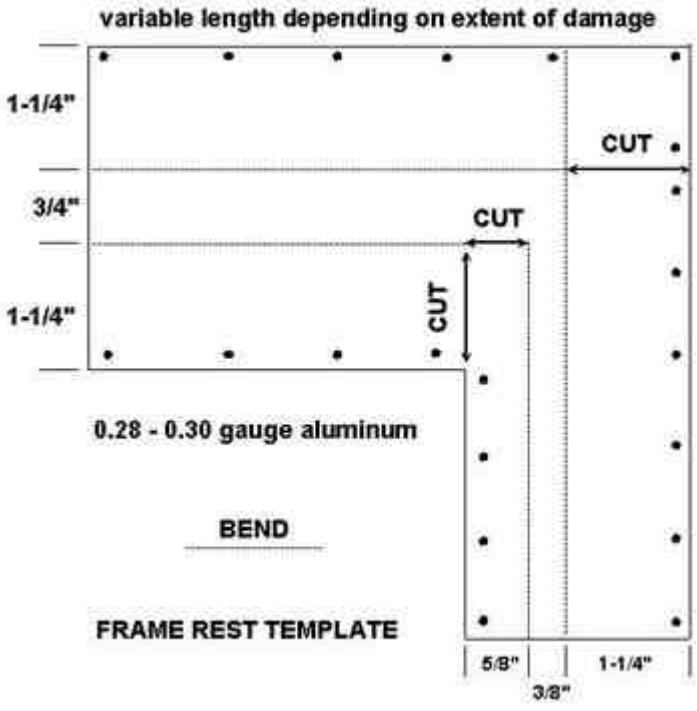
For exact templates go to the PDF files at the end.

Bottom Template



Frame Rest Template

note: ***Template not to scale but dimensions are correct.***



These Templates are to scale:

Template for Bottom (PDF)

Template for Frame Rest (PDF)

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