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Beekeepers School

BABA Beekeepers School 2025

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Week Two Setup

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What is Covered in this Module

- Week 1 Recap
- Announcements
- Agenda

Welcome to Week 2

Week One

- *Week One Recap*
  - Learning about Langstroth Bee Boxes
  - Guidance for Purchasing Bee Equipment
  - Sourcing Protective Clothing, Gloves, etc.
  - *and*…We baselined the style (treatment beekeeping, with Langstroth Equipment)
- *The objective for the week was to get you setup with your equipment purchases*

Presentation Materials

❑ Week One Presentation Materials Available

- *The presentation can be accessed on the web*
  https://managedmentoring.com/baba-bee-school

❑ Presentation Access Going Forward

- *Each week the presentations will be added to that page*
- *If you want to follow along for this week – Week 2 is there*
- *As we start each week, the weeks lessons will be available*

This weeks Agenda

- **Equipment and Apiary Setup**
  - *This week we focus on **building your equipment***
  - *We focus on choosing your **apiary setup***
  - *As part of Apiary Setup, we provide a foundation for rules you must follow for your state – and guidance for placing bees in your neighborhood*
    - We will cover Massachusetts and Boston City Regulations

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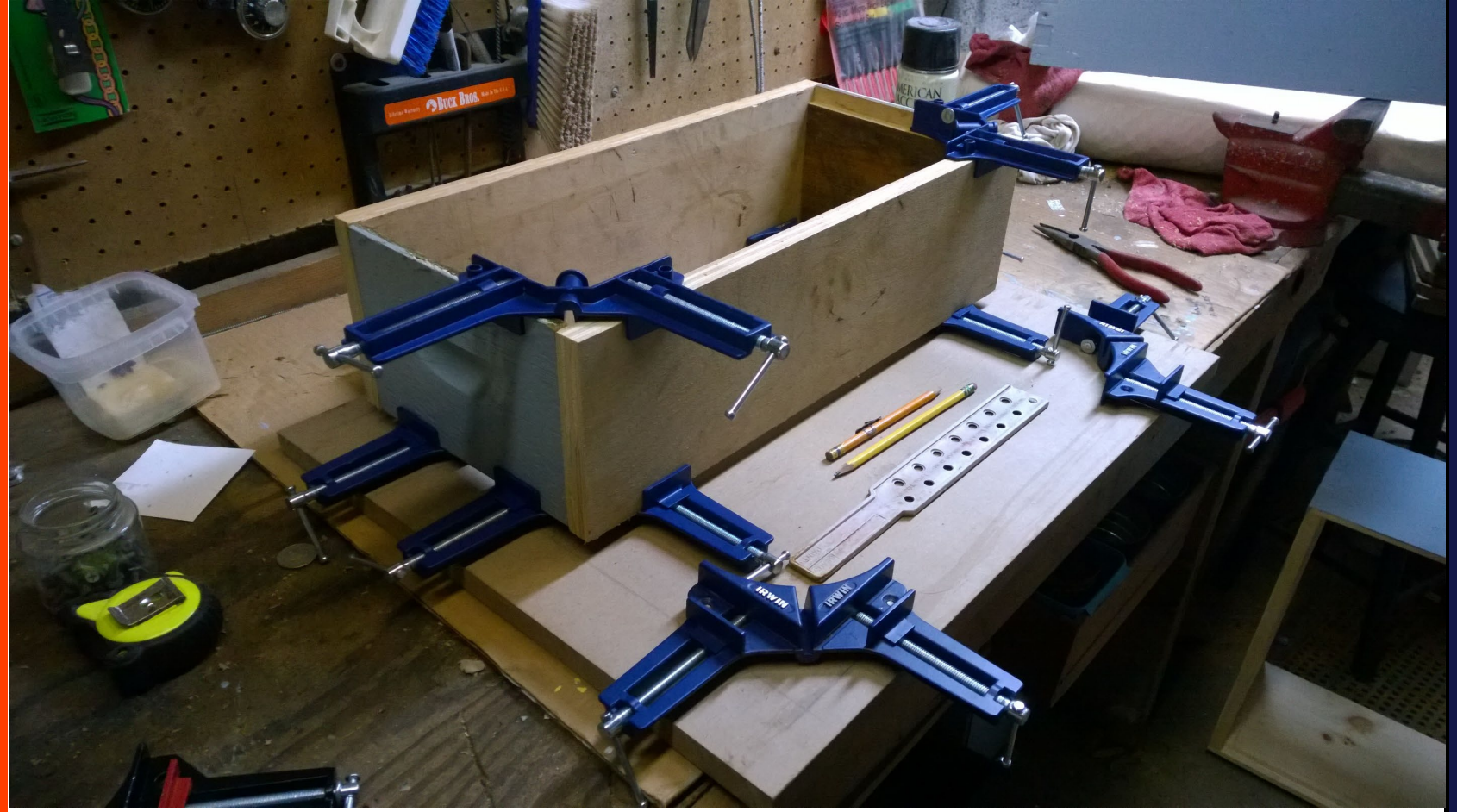

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Building Hive Equipment

Lesson | Beekeeping Box Assembly

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What is Covered in this Module

- Building Boxes
- Fabrication Workspace
- Glue and Nails
- Clamping Systems
- Assembly Walkthrough
- Frame Rests

Fabrication Workspace

❑ Workspace Basics

- *Pick a place where you can setup camp to fabricate, and paint*
  - Take into consideration your 'workbench', temperature, paint odors, and/or any other impacts while occupying the space.
  - **Mind the temperature when gluing and painting**. Comfortable room temperature is desired during these activities.
- *Prep the tools and adjuncts*
  - Clamps, Hammers, screwdrivers, rags, drop clothes, scrapers, sandpaper, nails, glue and other tools and hardware will be required. Gather what you need and organize your workspace.

Inspect the Woodenware – Dry Fit

❑ Woodenware run through

- *Inspect all of the pieces for problems ahead of time*
  - While uncommon, some kits could have flaws. Know ahead of time, by looking for cracks/splits, misaligned milling, problems with drilled holes, etc.
  - Do this ahead of time, and contact your provider if something is not quite right.
- *Dry Fit*
  - It helps to test the fit, and doing so also burnishes the wood.
  - It can help in final assembly, and may negate struggling when trying to assemble when pieces are glued.

Glue Application and Assembly

❑ Gluing

- *Apply an even layer of exterior based glue to surfaces that will be joined together during assembly*
  - Consider an aid to spread the glue in a uniform thin coat.
  - Mate pieces together while the glue is still *active* and *open* – **wet**…
- *Assemble*
  - Merge the box pieces together at the finger joints.
  - Wipe any glue that squeezes out with a slightly-damp towel
    - Don't use a cloth that is too wet, it could wash out or dilute the glue

Silicone Brushes

Silicone for Spreading

- *Consider using a silicone brush to apply the glue*
- *They work well for getting into the nooks and crannies of the finger joints and as you can tell, the clean up pretty well once the glue dries*
  - These brushes are common in cooking stores, and are used to baste meats and other foods during cooking.

Nails

Hive Boxes	
Hive Deep	(44) - 7D nails
Hive Medium	(27) - 7D nails

Each Frame (Wedge Style)	
Top Bar	(4) - 1 ¼" nails
Bottom Bar	(4) - ¾" nails
Side Nails	(2) - ⅝" nails

Nail Size and Formats

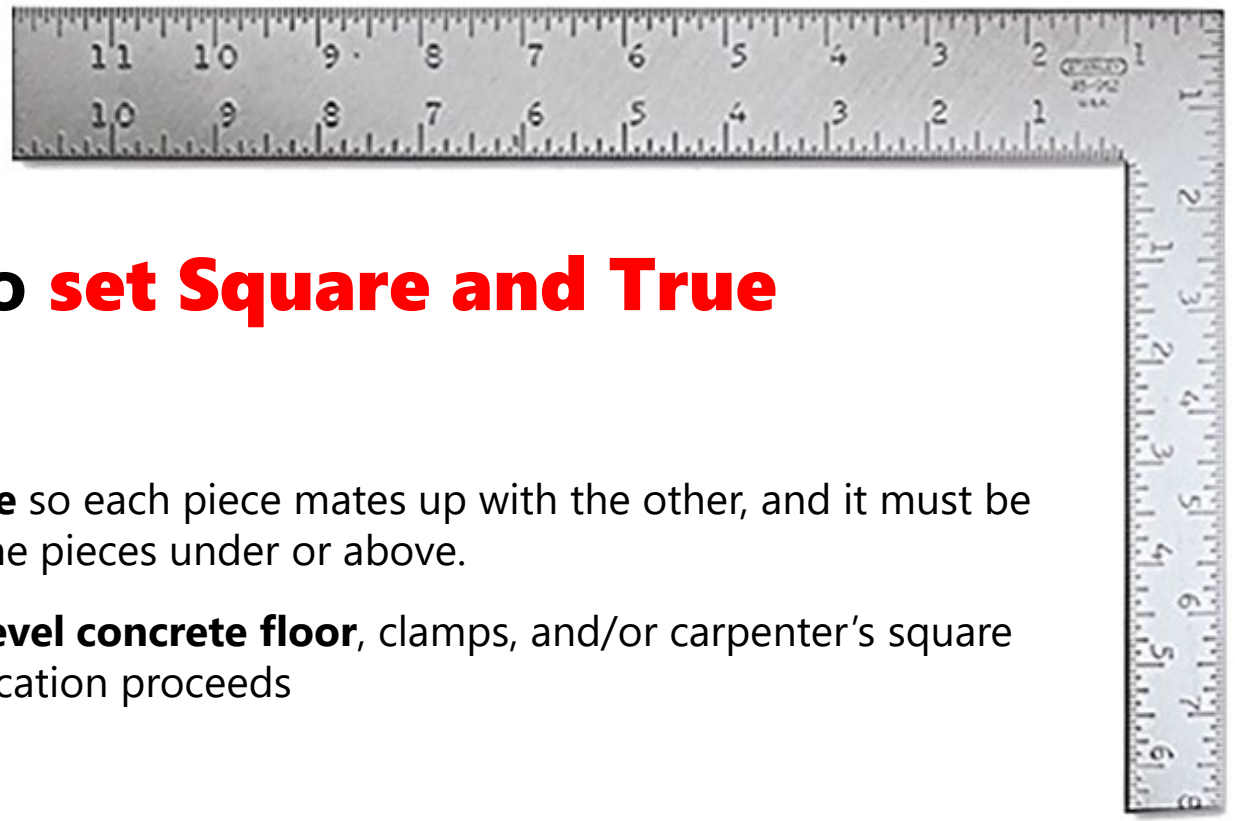
- *Hardware Differs but there are recommended sizes*
  - Boxes are typically built with a size 7D nail (2 ¼" by 12 ½ gauge).
  - If in doubt, order the nails where you buy your equipment.
- *Nail Types*
  - Use exterior grade nails, or ensure they are encapsulated by paint
    - A favorite is hot-dipped galvanized nails, and the upscale choice are stainless steel
    - Most beekeeping catalogs sell common box nails, and they must be encapsulated in the paint system.

Consider Clamping Systems

❑ Corner and Woodworking Clamp Benefits

- *Lock in Square and True, then drive the fasteners*
  - Consider the benefit of wet assembly with glue, and then clamping the box pieces.
  - Clamping can guarantee that a piece stays square and true. They also make it easier as they hold the piece, freeing up your ability to drive the fasteners
  - Clamping also applies force at the joints and this is suggested that the pressure at the joint glued surfaces results in a better bond.

Initial Fabrication



❑ Nail Procedure to set Square and True

- *Square and True*
  - A box has to be **square** so each piece mates up with the other, and it must be **true** so it sits flat on the pieces under or above.
  - A **flat surface**, like a **level concrete floor**, clamps, and/or carpenter's square help in testing as fabrication proceeds
- *Setting the nails*
  - Assemble the boxes – test square and true, and systematically drive the nails.
  - Test as you go along and adjust prior to any errors being locked in.

Handle Out, All 4 Sides!

- **Be Sure to Check**
  - *Before you drive your nails…*
  - *Make sure that the handles are facing out on all sides*
  - *It is hard to do, but it is possible… ask how we know!*

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Nailing Technique

❑ Set the nail softly, then drive them in

- *A recommended way to nail*
  - Tap the nail until it holds the piece in a few places
  - Test for square and true; proceed to drive the nails until set.
    - Medium blows with the hammer to start, soft focused blows for finally setting the nail.
    - Use care not to get to heavy handed, as you will possibly have errant strikes and damage the woodenware.
  - Slow your hammering down as the nail is close to being set
    - Focus on accuracy; this helps prevent 'dinging' the wood with the hammer head as you finish driving the nail.

Hammers & Rubber Mallets

❑ Tightening Joints and Nailing

- *After boxes are glued, use a rubber mallet and/or clamps as required.*
  - Slide the joints together, and clamp or tap the boxes to tighten up the joints
  - Clamping the boxes works better than using a mallet.
  - Soft Mallets do not mar the wood and leave dents.
- *Hammers*
  - **Moderate** sized hammers – *not to heavy, not to light*.
    - Provide the right force, and dexterity, while avoiding fatigue with heavy or light hammers

Troubleshooting – Errant Nails

❑ Dealing with Nails that do not set well

- ***Bent over nails***
  - If they are not fully driven, take the claw of a hammer and pull the nail
    - Sometimes you can twist it sideways instead of the conventional rocking manner
  - If the nails are fully flat, use an awl or screwdriver to pry it up; then extract
    - Use whatever tools need to extract the nail, while trying not to damage the wood. Often a pair of needle nosed pliers works here.
- *Protruding nails*
  - The best offense against this is a good defense.

Troubleshooting – Errant Nails

Avoid reusing bent nails, they often cause problems going being nailed a second time. Grab a fresh nail and discard the bent one.

❑ Dealing with Nails that do not set well

- ***Bent over nails***
  - There is another technique that employs a pair of **needle nose pliers** to extract the nail.
  - Place a thin piece of wood flat on the surface and lay your pliers on it;
    - This serves to protect the wood from marring as the metal of the pliers is harder than the soft wood and will leave marks if left unprotected
  - Grab the shaft of the nail with the pliers sitting flat on the wood. With a firm grip **twist the pliers against the wood** and turn the nail up out of the hole.
    - It might take a few times to reset the pliers against the wood and move the tip back closer to the wood as you twist.

Troubleshooting – Errant Nails

❑ Dealing with Nails that do not set well

- *Misguided - **Protruding nails***
  - Sometimes nails do not go in straight; they twist, they turn
    - The best offense against this is a good defense. Try to see this as it is happening and avoid driving the nail head flush. If you can get a hammer underneath, extract it the conventional way.
    - Recover the situation by **drilling a pilot hole that is straight and redrive the fastener**.
    - If you did drive it all the way in, hit the pointed end to make the nail head emerge so you can get purchase on it. Do not leave it this way, it will cause numerous problems later.
      - Sometimes you can put the flat head of a screwdriver against the tip of the nail and strike the screwdriver shaft if you find it hard to get a blow directly on the point of the nail to reverse it.

Troubleshooting – Split Wood

Dealing with a split

- *Errant Nails could cause wood to split.*
  - Most common on the finger joints
  - If wood does split – there are two paths
    - If you can – remove the piece and glue the split, clamping it before putting it back to nail.
    - If the piece cannot come apart (say with other nails fastened) consider pulling out the errant nail, and glue the seam.
      - Drill a pilot sideways across the split, and drive a temporary screw to hold the split closed – or just glue it the best you can. Then back the screw out and fill it with glue.
      - Once the split is mended, re-nail the offending area.

Nailing Process

One Corner to All Corners

- *How you nail is personal preference – and there are several ways*
  - One Corner
    - Set a few nails in the single corner, checking square. Then nail the remainder and lock in the corner until it is fully fastened. Then, when done, move on to the next corner.
  - Partial on All Corners
    - Set a few nails in one corner – and lock it in square (checking true as you go)
    - Set a few nails in another corner – and lock in square. Repeat this to all four corners.
    - Then once each of them is held square, and you have checked the box is true, go back to the first corner and finish the remaining nails.

Remember to test

❑ Test square as you go

- ***Each time you hammer*** *a fastener into the box,* ***check to see if the piece is square****.*
  - The simple act of hammering, often can make things go awry
    - Sometimes is not the hammering, but you leaning on the piece to hold it while hammering
    - Whatever the case, you will be well served if after each nail is set to check the square.
    - If it is found out of square, gently put it back in square and drive the next nail
    - Eventually you will have enough nails in the box that it will hold square each time you check it. Here you can go a little further between nails before keeping yourself honest and checking periodically until you are finished.

Or use clamps to hold it square and nail away

Frame Rests

Photo credit: BetterBee

❑ Protective Coverings

- *Suppliers sell metal strips that are nailed to the inside of the boxes.*
  - The metal strips provide protection from woodenware damage
  - Hive tools can slice or gouge woodenware when dislodging frames
    - Frame Rest also provide a hard surface to scrape against when periodically cleaning deposited propolis on the frame rests.
  - Buy the simple, smooth version of these.
    - Do not buy ones that have guides in them that help space the frames. They are very problematic to work with and create difficulties at times when working frames.

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Sourcing and Building Frames / Foundation

Lesson | Building Frames

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What is Covered in this Module

- Frame Primer
- Frame and Foundation Design
- Foundation
- Frame Fabrication
- Frame Jigs
- Frame Assembly
- Buying Pre-Manufactured
- Drone Brood Frames
- Foundationless Frames

Frame Primer

Understanding important details of frame construction

Frame Primer

- **Frames and Foundation are the core of the hive**
  - *They provide the base for the nest and storage*
  - *As such they are an important consideration in beekeeping*
  - *The design, and options for frames in the marketplace varies*
    - Frames come in different sizes for different box dimensions
    - They vary in design and construction material
    - Foundation choices also vary widely

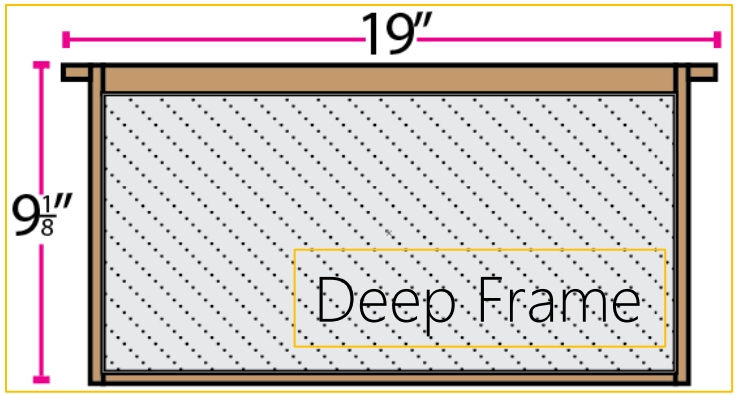
Frame Dimensions are "Standard"

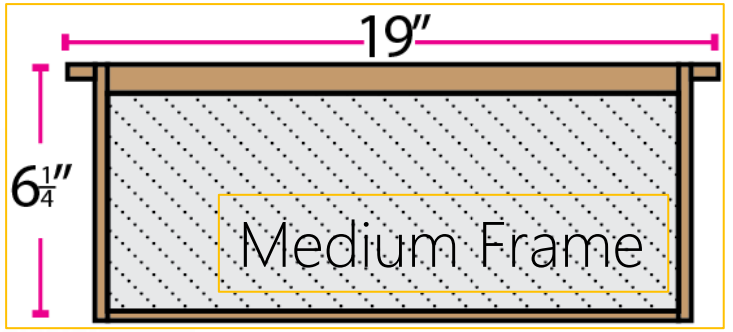
Langstroth Hive Dimensions

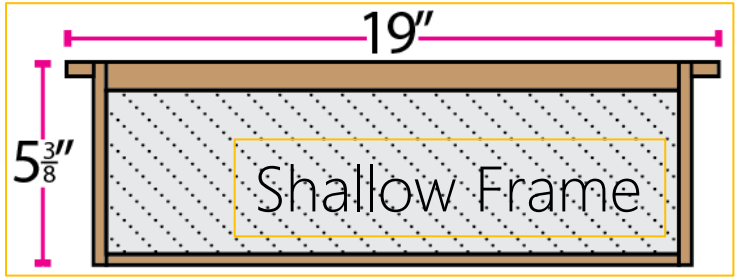
- *Deep* *19" x 9(1/8)"*
- *Medium* *19" x 6(1/4)"*
- *Shallow* *19" x 5(3/8)"*

Designs differ

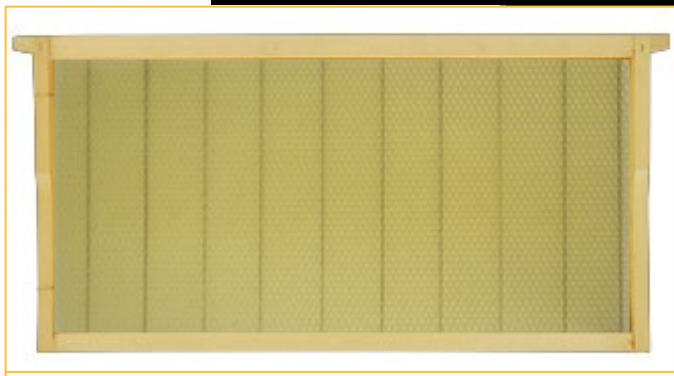
- *Each manufacturer has discretion on design of the frame components*







Two form factors dominate



❑ Wax and Plastic Foundation Styles

- *These are the two predominant forms sold today*
  - Wood Frame > Wax Foundation
    - The traditional frame setup is the more conventional way to go
      - Wax foundation is often enhanced by embedded wires which negates having to wire the frame manually.
  - Wooden Frame > Plastic Foundation
    - Very popular for ease of use, cost, assembly.
    - Comes with a plastic embossed sheet that is coated in wax.
      - The plastic is offered in a number of colors: white, black, various shades of yellow…

Frame Construction

Fully drawn plastic frame

❑ Frame Materials

- *Frames are traditionally made of wood with wax foundation*
- *Variations abound*
  - Frames can be made with Wood for the framing and plastic for the foundation
  - Frames can be purchased as fully plastic (frame and foundation) or metal (*not recommended*)
    - They can even be purchased as a single unit in plastic or metal (aluminum) fully drawn – meaning with fully developed cells, not just cell patterns.

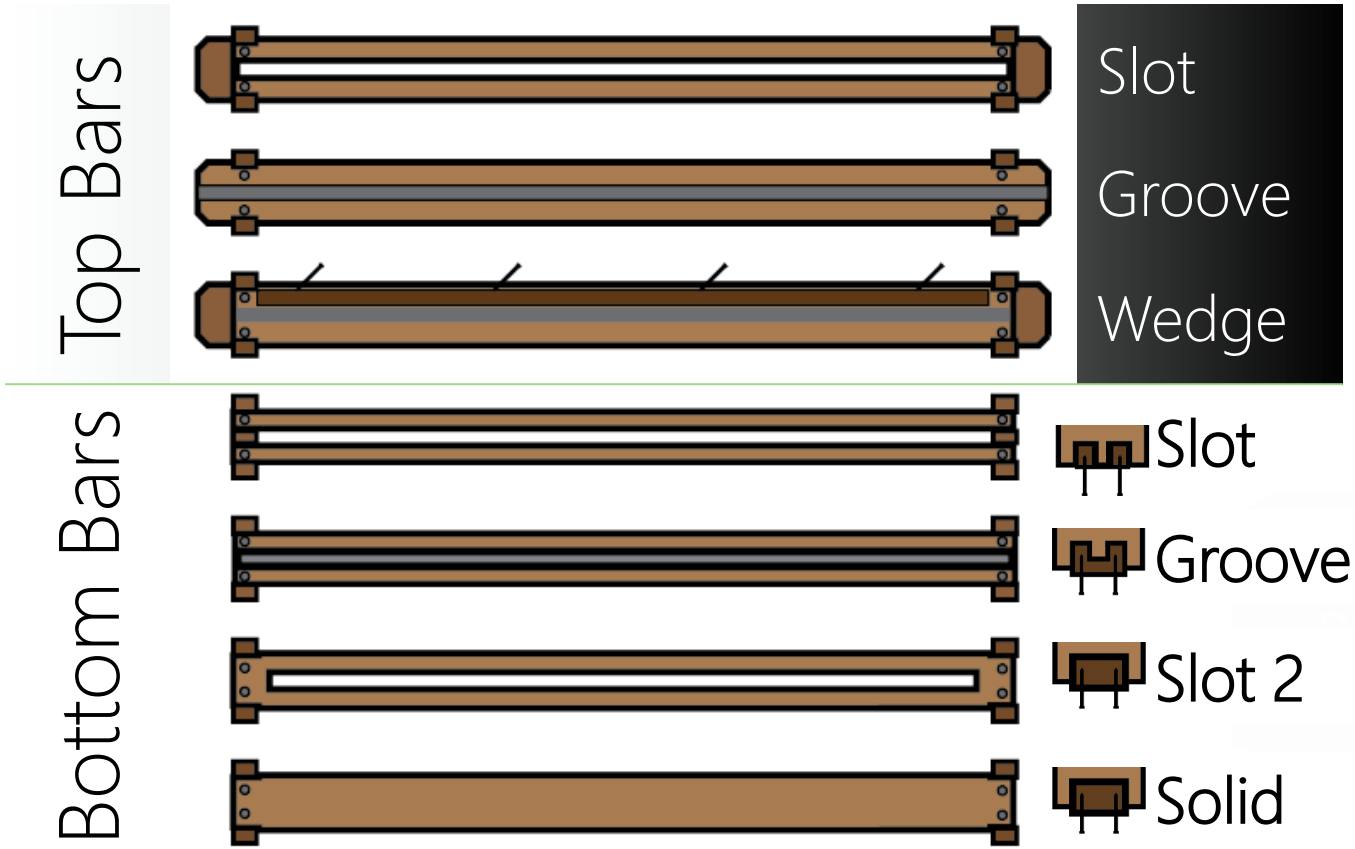
Flowhive Frame

Buy Plastic - Done

❑ Almost all new hive are sold with Plastic

- *This is the way of the world*
  - Many advantages for the seller and benefits for the buyer over traditional wax foundation sheets
- *How about your pros and cons?*
  - PRO: Durable for honey production, Easy to put into service, No Labor
  - CON: Building out wax can be hit and miss | Natural – not so much
  - CON: Often the wax coating is not well done
    - Get some wax, give it some additional coating

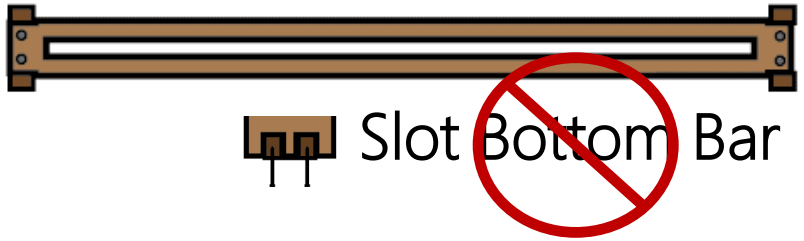
Frame Variations Abound



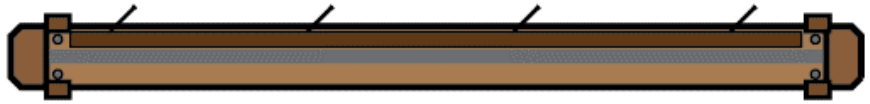
Pick a Style

- *Settle on wax vs. plastic*
  - Choose the frame style that corresponds to the foundation you are using.
- *Wax Foundation*
  - Conventional Wedge Style frames with crimp wire foundation are recommended.

Wax Foundation Expanded



Top Bar



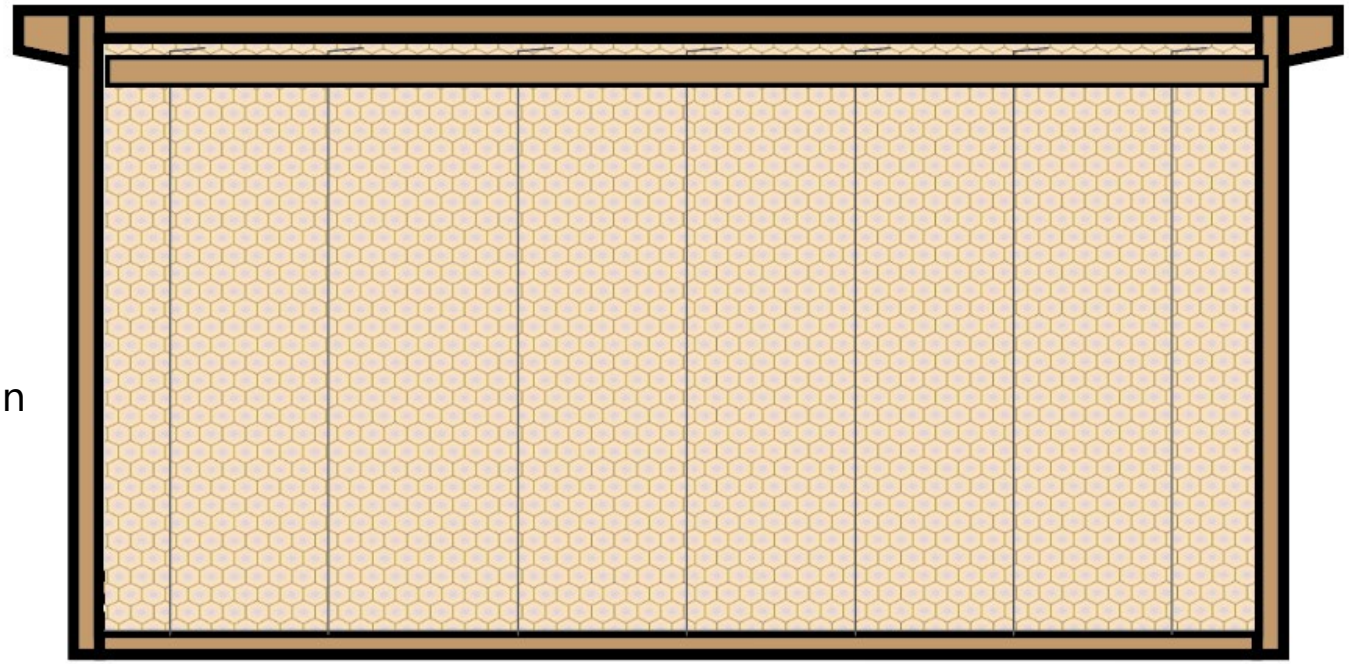
Wedge

Bottom Bars

Groove

Wedge Frames

- *Choose a Wedge Style Frame*
- *Pick a Groove Bottom Bar*
  - Smooth on the bottom, with a groove for the foundation to rest in



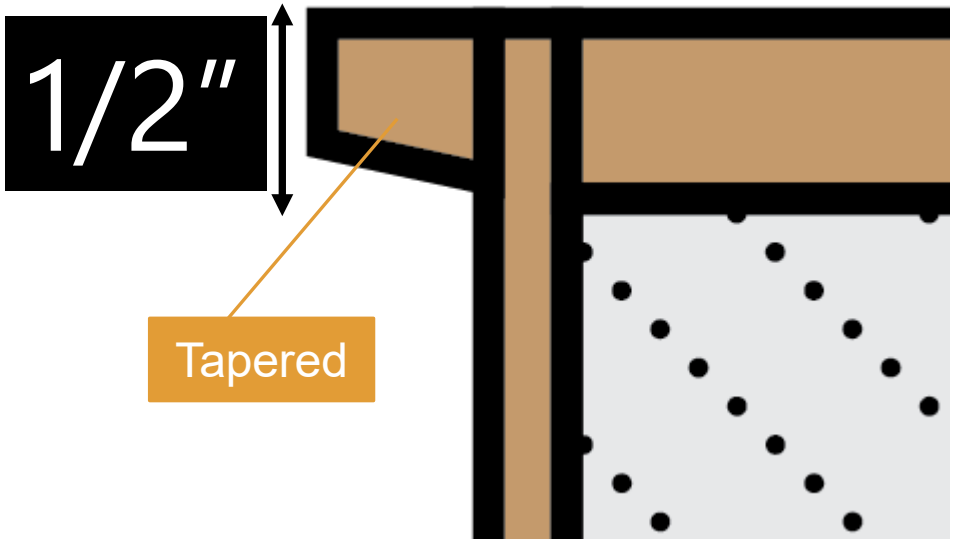
Slotted bottom bars lead to problems

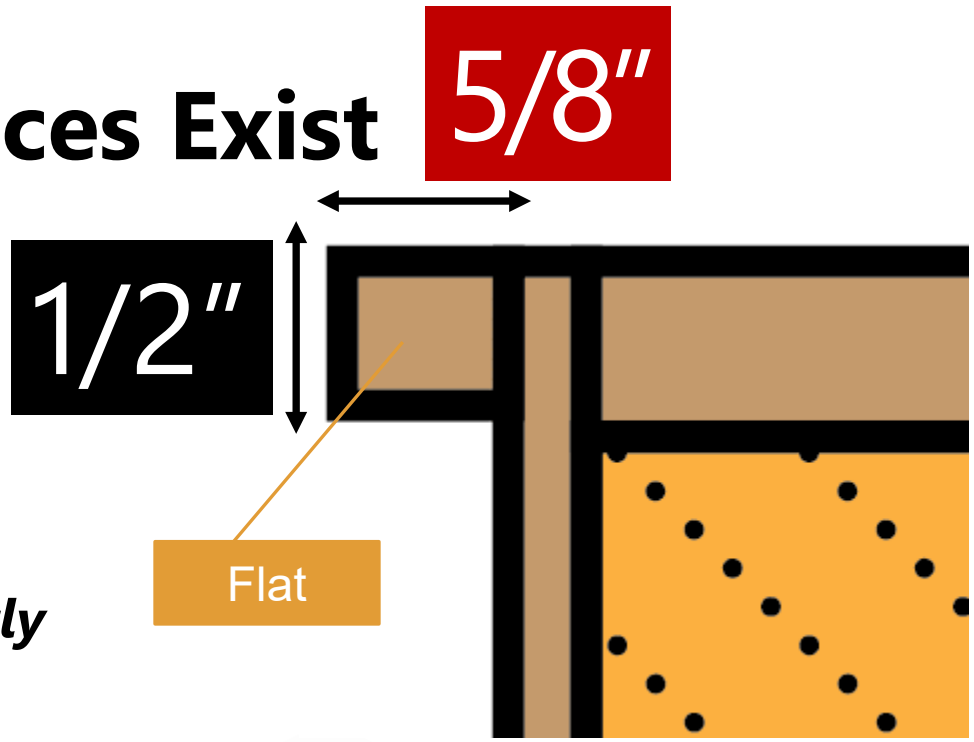
Frame Design Differences Exist

- "Standard" 1/2 Inch
  - *Sometimes tapered…*

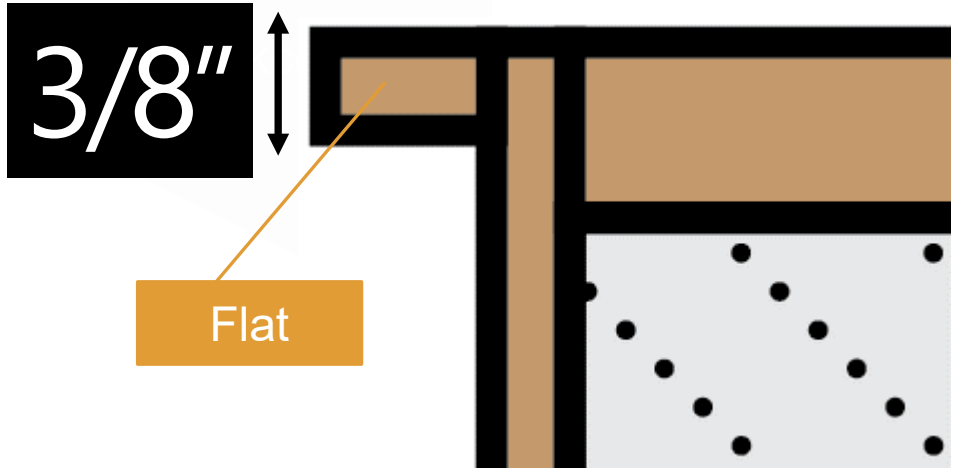
    Sometimes not…

Tapered frames rest differently





- "Standard?" 3/8ths

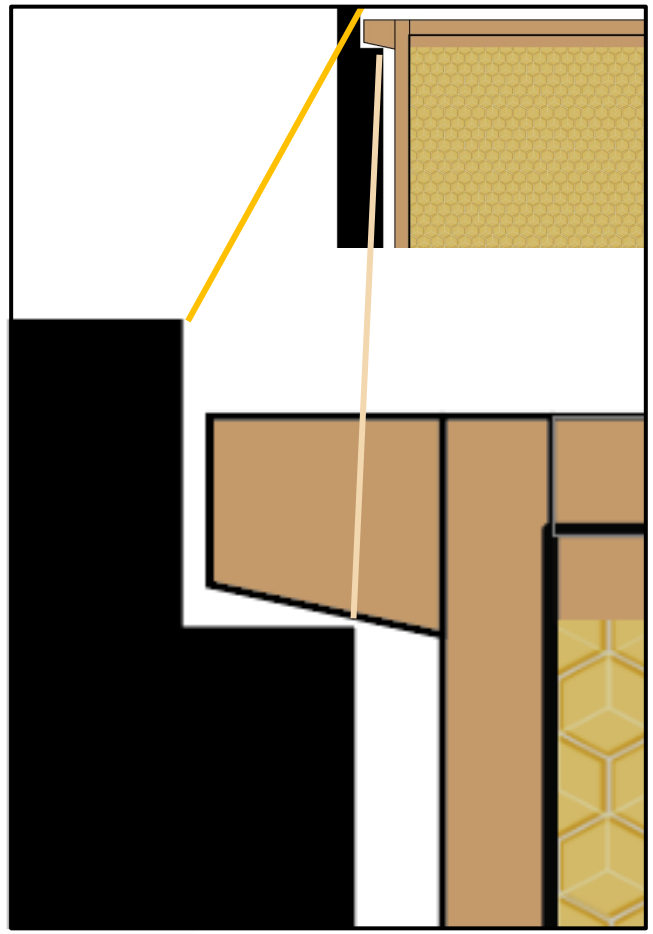


Frames Rest in a Rabbet Joint

Definition

Rabbet:

A step-shaped recess cut along the edge or in the face of a piece of wood, typically forming a match to the edge or tongue of another piece.



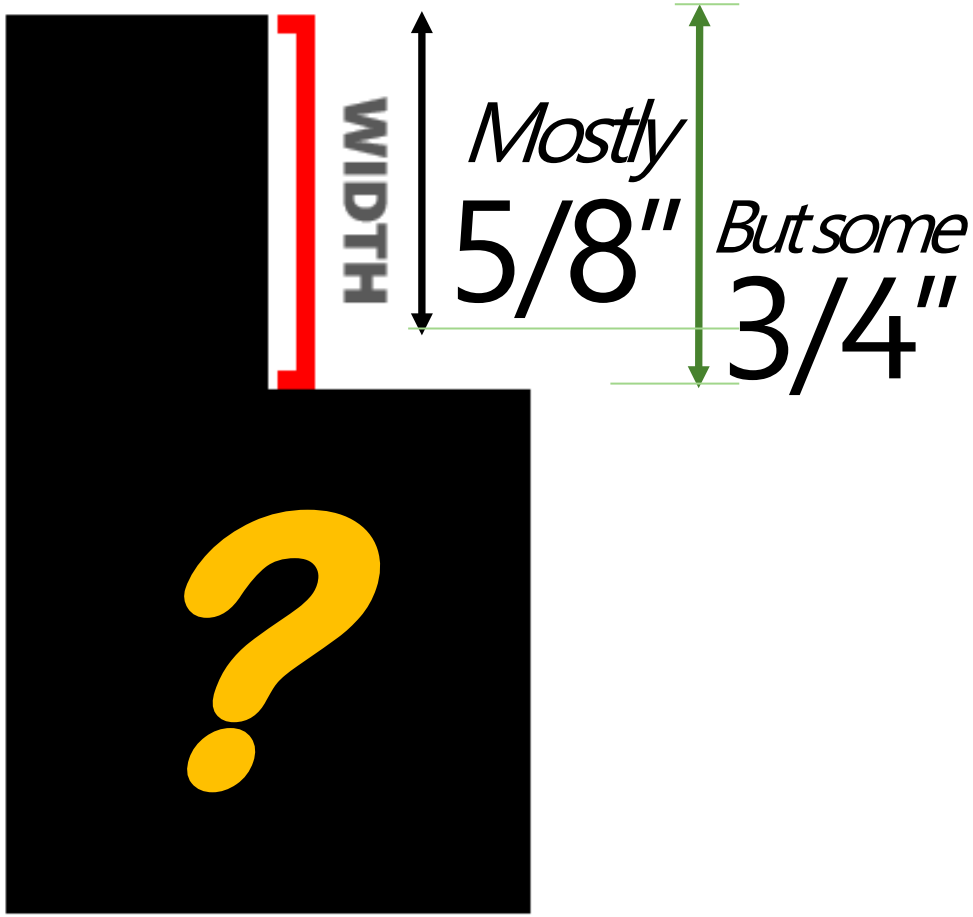
Rabbets Dimensions - Vary

❑ Widths are not universal

- *The dimensional width of a Rabbet can vary*

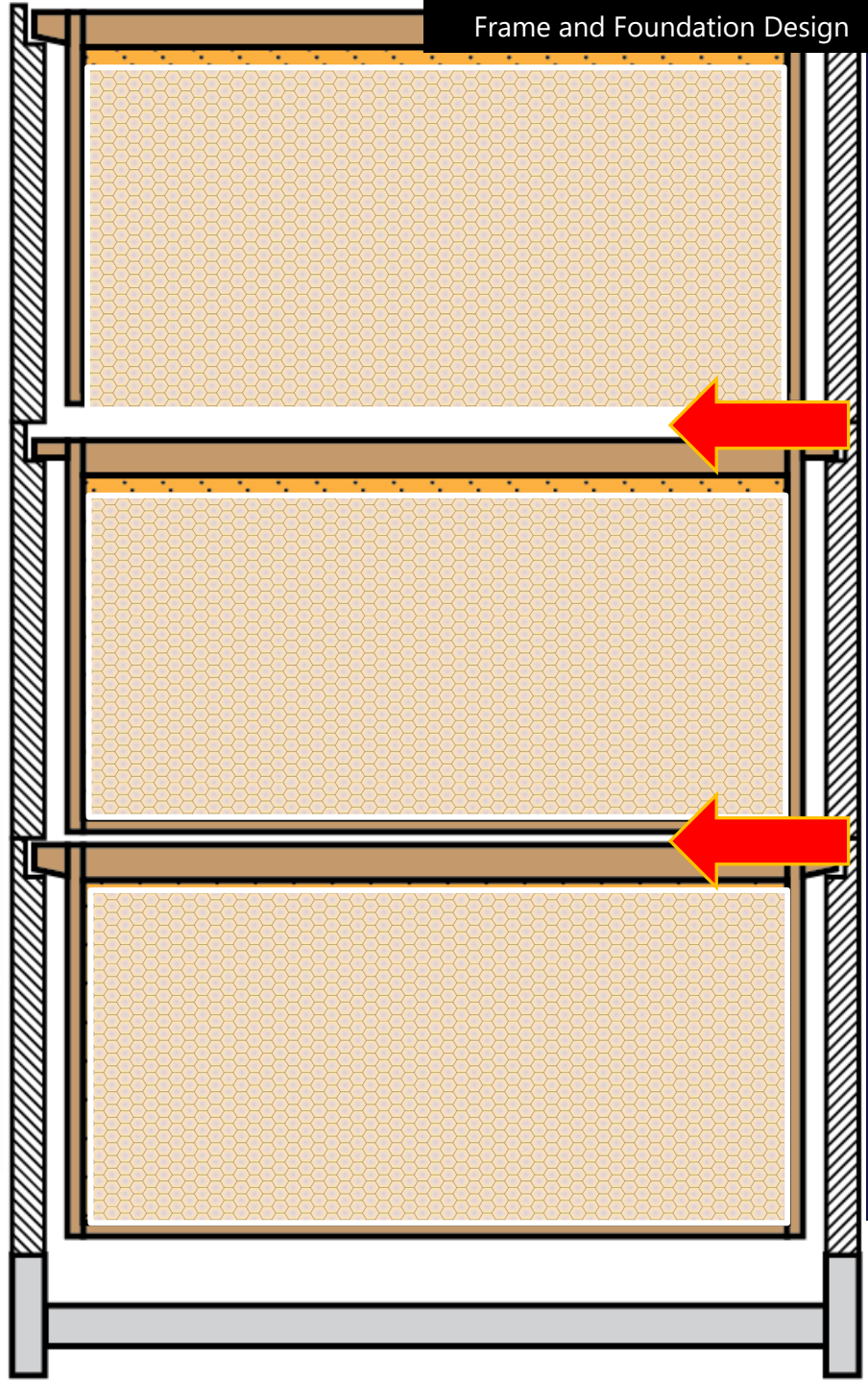
❑ Why this matters

- *Bee Space*
  - The design you choose will impact how the frames hang in the hive.
  - This can lead to space problems if the frame design and box hardware are not compatible and designed to work together.



Mismatches

- **Mismatches result in alignment problems**
  - *Box dimensions affect how frames occupy the boxes*
  - *Mix and matched frame rests and rabbet dimensions impact how the frame hangs in the box*
  - *Intermixing tab sizes and shapes cause gap differences.*



Source your Foundation (get the right size)

Buy Frames + foundation together

Foundation Size Varies!

Deep Size Examples

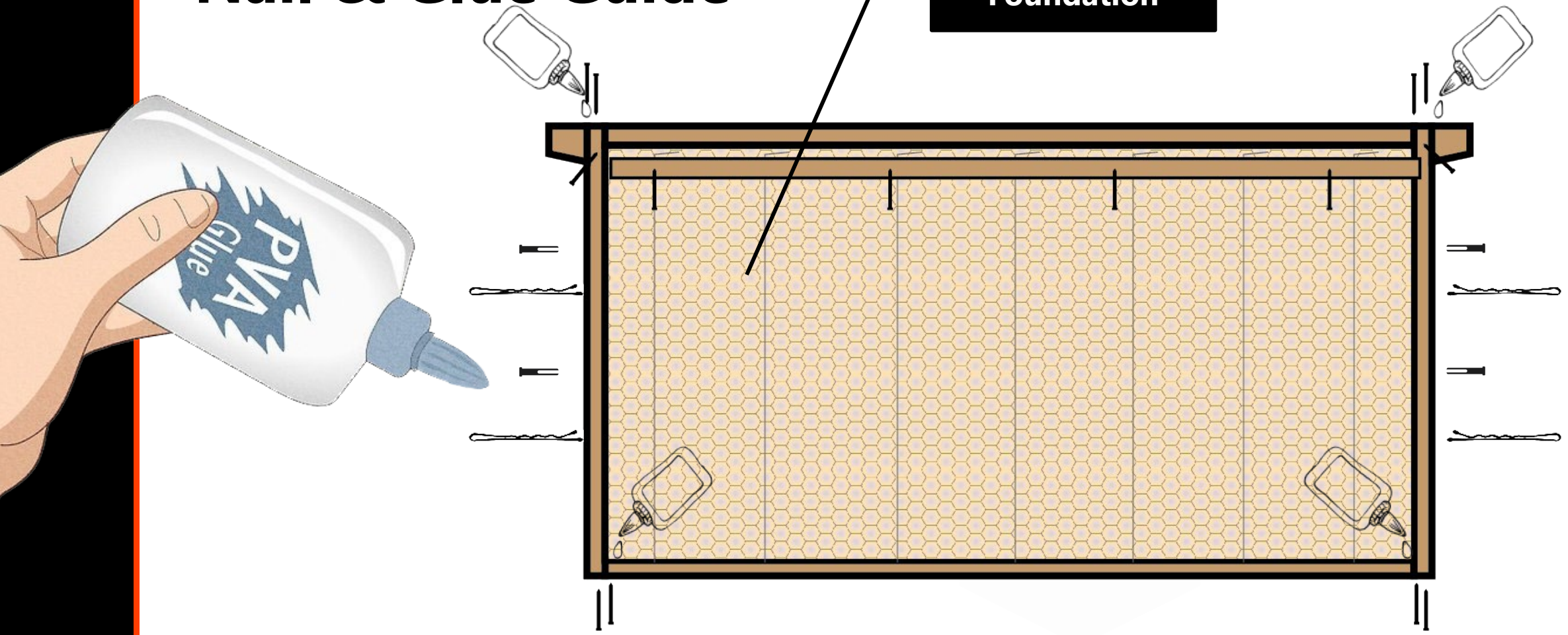
- **Wedge Bar – Divided Bottom**
  - *Uses wired 8 1/2" foundation with hooks*
- **Slotted Top Bar – Grooved Bottom**
  - *Uses wired 8 7/8" foundation with no hooks*
- **Wedge Bar – Solid Bottom**
  - *Uses wired 8 1/8" foundation with hooks*
- **Wedge Bar – Grooved Bottom**
  - *Uses wired 8 7/16" foundation with hooks*

Foundation Varies!

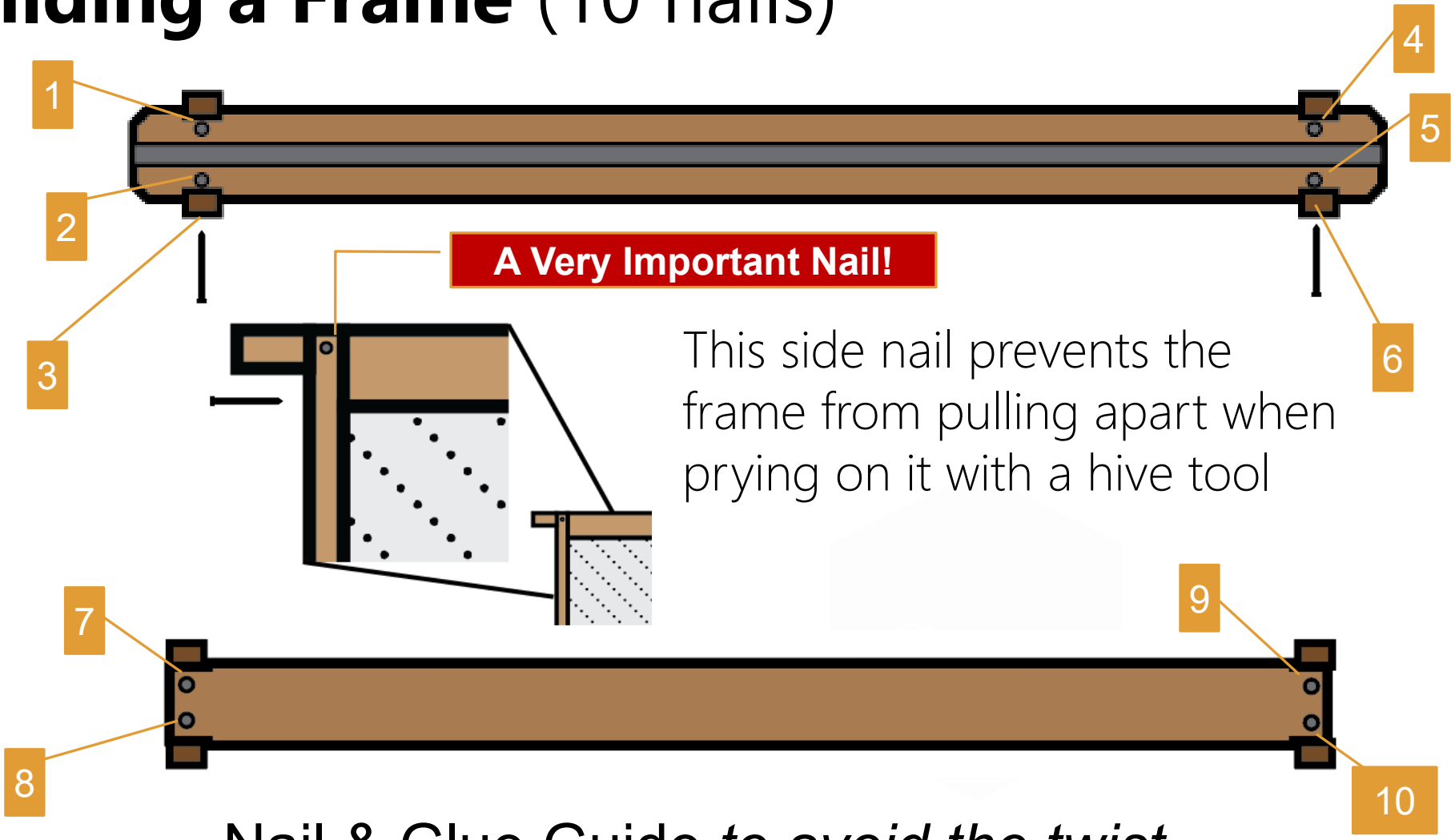
Put the wrong size in
You get banana comb

This is extreme for illustrative purposes, but it is not uncommon to see mismatches.

Nail & Glue Guide

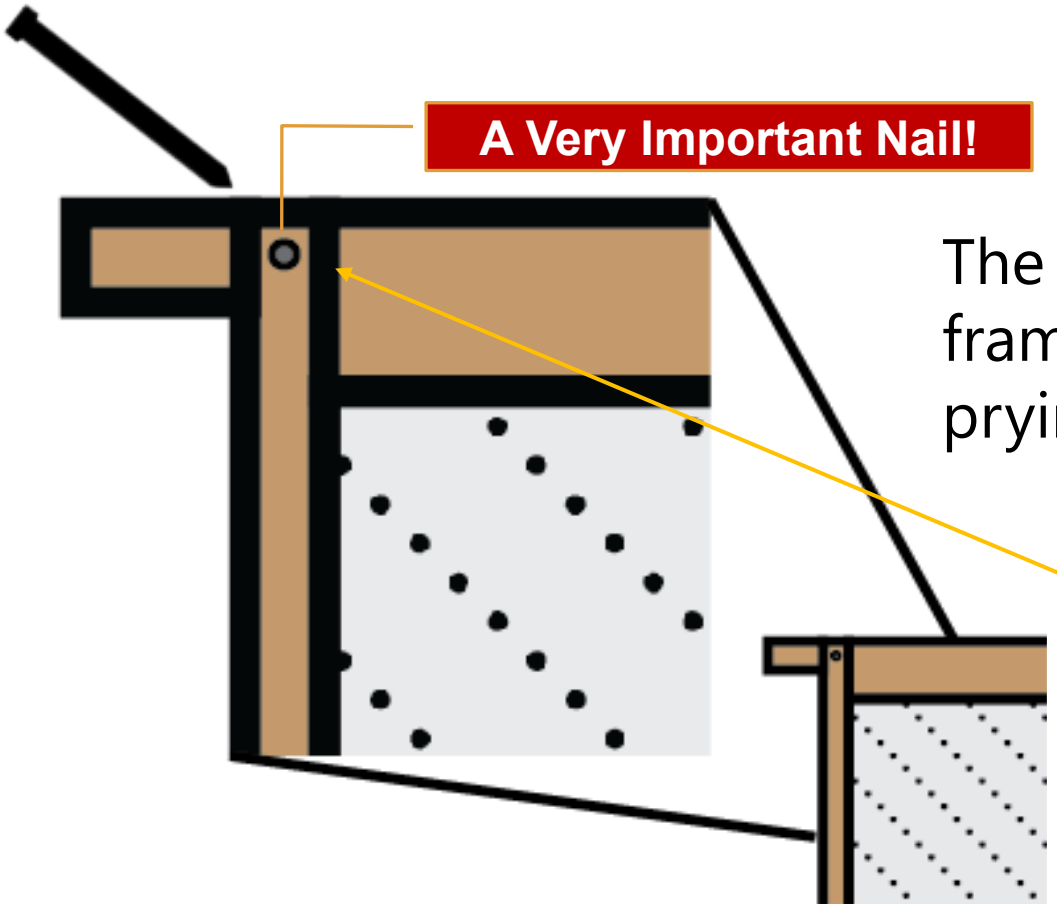


Building a Frame (10 nails)



Nail & Glue Guide *to avoid the twist*

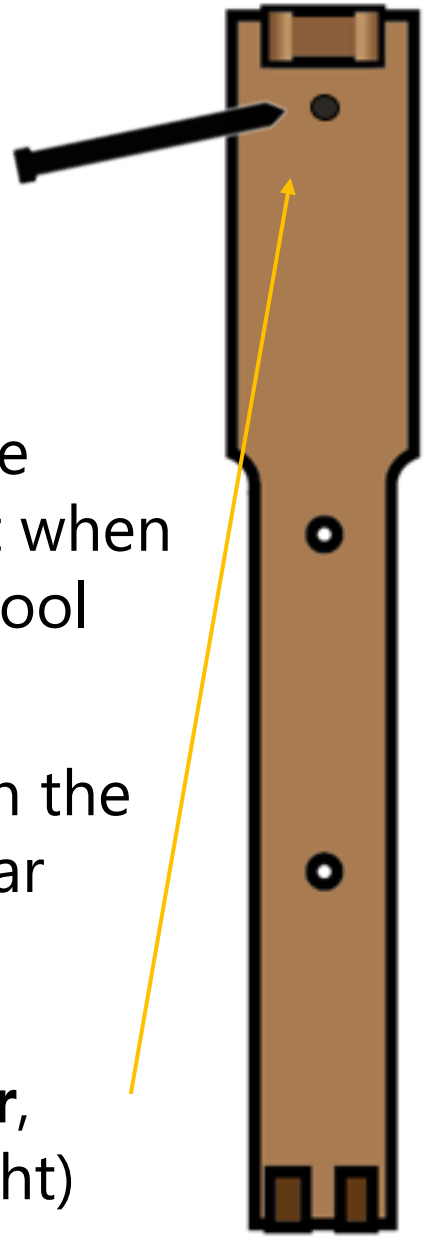
Side Nail Expanded



The side nail prevents the frame from pulling apart when prying on it with a hive tool

It can be placed in the ears of the side bar (left),

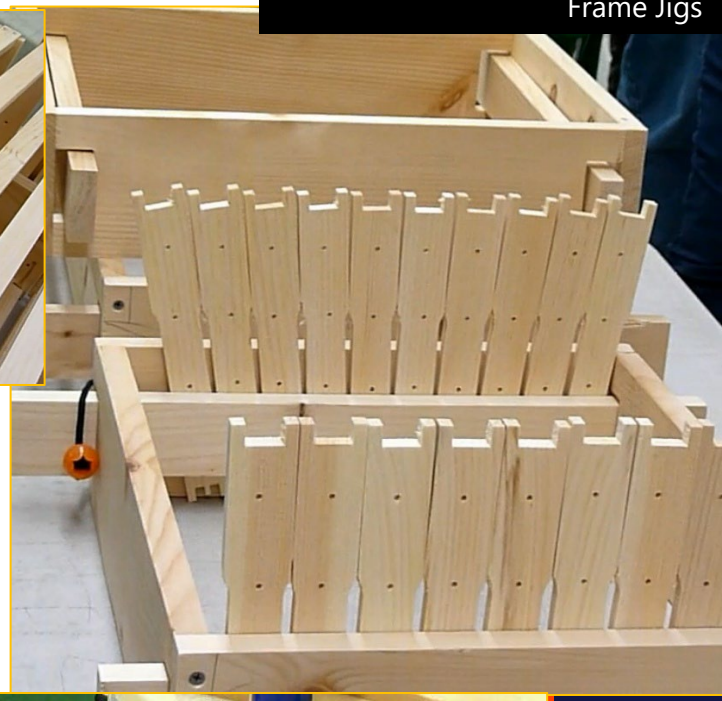
Or in the end bar, under the ear (right)



Air Guns – Nails/Staples

- **Nail Guns and Fastening Staples are an option**
  - *Pneumatic air guns and staples are another option*
    - Many do not have this kind of setup, but if you do, it is a viable way to go
      - Be sure to calibrate the pressure for driving the staples

USE A JIG!



- **Frames out of square can also cause space problems**
  - *Twists cause distortion gaps and raised bottom bars*
- **Source a Frame Jig**
  - *They are really a good way to go*
  - *Available in most catalogs these days*

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Glue the Top Bar

- **Glue the inside edge**
  - *Ensure the glue covers each of the surfaces that meet up between the side bars*
    - Glue both the top and bottom of the side bars

Insert the Top Bar

- **Insert the top bars in all of the frames**
  - *Set the top bars down into the glue.*

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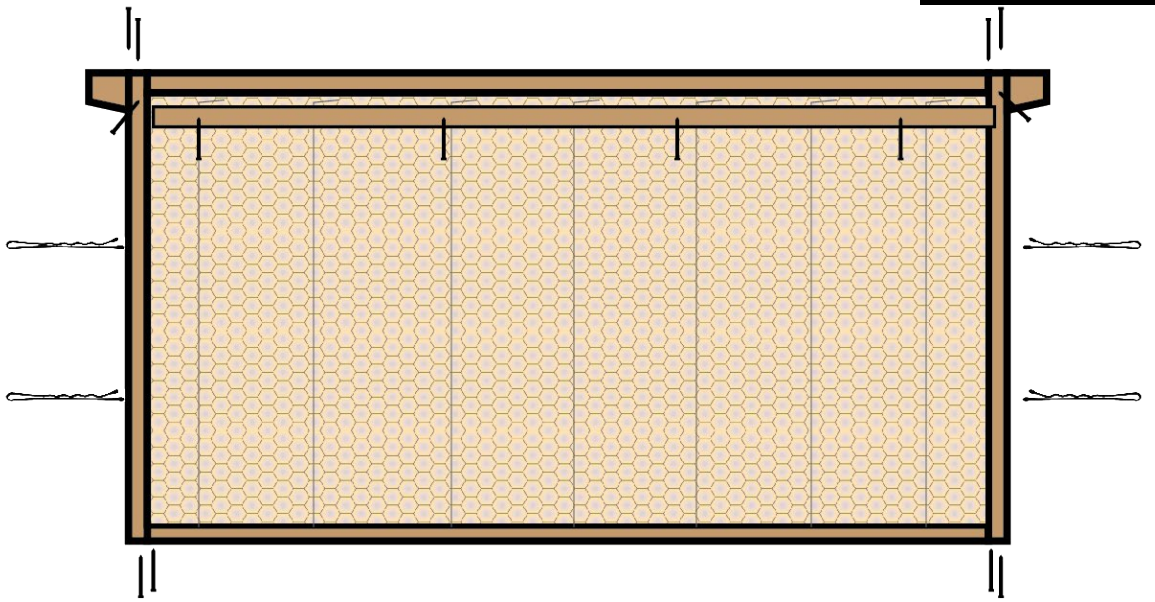
Nails



❑ Nail Size and Formats

- *Nail Types*
  - The size of the nail is dependent up on the design of the frame
    - The sizes shown here are considered conventional
    - Manufacturers can choose how 'beefy' their top bars are, how thick the side bars are, the design of the bottom bars; all of the dimensions will have influence what nail you will need
    - If in doubt, source the nails from the manufacturer where you buy your frames.

Each Frame (Wedge Style)	
Top Bar	(4) - 1 ¼" nails
Bottom Bar	(4) - ¾" nails
Side Nails	(2) - ⅝" nails
Wedge Nails	(3) – finishing nails

Nailing Technique & Hammering

❑ Set the nail softly, then drive them in

- *A recommended way to nail*
  - Tap the nail until it holds the piece in a few places
  - Test for square and true; proceed to drive the nails until set.
    - Medium blows with the hammer to start, soft focused blows for finally setting the nail.
- *Hammer*
  - **Light** sized hammers for frame building
    - Provide the right force, and dexterity, for the smaller nails used for frames
    - Rubber band on pliers can help hold the nail


Pre-Setting the Nails is another way to go.

Insert Bottom Bar

- **Two nails, each side**
  - *Turn the Jig over*
  - ***Glue the joint***
  - *Insert the bottom bar*
  - *Drive two nails on each side*
    - Through the bottom bar and up into the sidebars
    - Again, Take your time to get the nails straight

Nail the Side Nail

- **Two nails, each side**
  - *Nail the side nail through the ear of the sidebar and through the top bar.*
    - *As noted earlier….* You could alternatively nail this through the sidebar and into the top bar from each end

Pre-Built

❑ Consider Pre-Built

- *Once in your life it would be beneficial to build frames*
  - It helps you understand their qualities and design
- *You can buy pre-built frames from vendors*
  - We recognize that it is a time-consuming task to build frames
    - □ Keep in mind – 10 frames for each box, usually 4 boxes for a single stack (2 deeps [20], and 2 mediums [20])
    - □ Save labor, but consider that there are shipping costs
    - □ Manufactures often assemble with staples – not a concern, but it is a difference.

Nail the Side Nail

- **Two nails, each side**
  - ***Even for pre-built frames!***
    - We recommend this as pre-built frames may fail in time
    - Wood expansion/contraction + Prying with hive tool will yield failure in seasons to come
    - The long staples can pull out after a few seasons, and it is really complicated to get them to go back in
    - By doing this….A little insurance to start pays off in the end

Mark your Frames

❑ Manufacturer and Year

- *Consider using a sharpie to mark your frame tops*
  - In this case BM was the Manufacturer (Brushy Mountain) and the 14 was the year (2014)
  - It is helpful to keep frames from a single manufacturer in a box (in case you did not follow the guidance to use only one manufacturer)
  - It also provides a reference from where to reorder your foundation in the future
    - □ It is recommended that you switch out your wax every once in a while for healthier colonies. For this you install replacement foundation

Tip: When you build your frames, put the manufacturer *and* year on them.

Drone Brood Frames

Integrated Pest Management

- *Drone brood frames are part of an integrated pest management program*
  - The frames are typically a single piece, and are often green in color
    - You use two per hive – swapping one out when the other is capped
  - The cell sizes are bigger, drone size, which results in bees building solid drone comb on these
    - When cells are capped, you pull the frame and cull the bees. This discards the drones as well as the mites inside the cells
    - Mites prefer drones – and this is a proven way to lower the mite counts in your hive.

Bettercomb

❑ Fully Drawn Wax Foundation

- *These frames come from the factory with perfectly drawn honeycomb.*
  - The wax is not from bees, but from a proprietary manufacturing process.
  - The purpose here is for use in emergency, or to get ahead.

Bettercomb

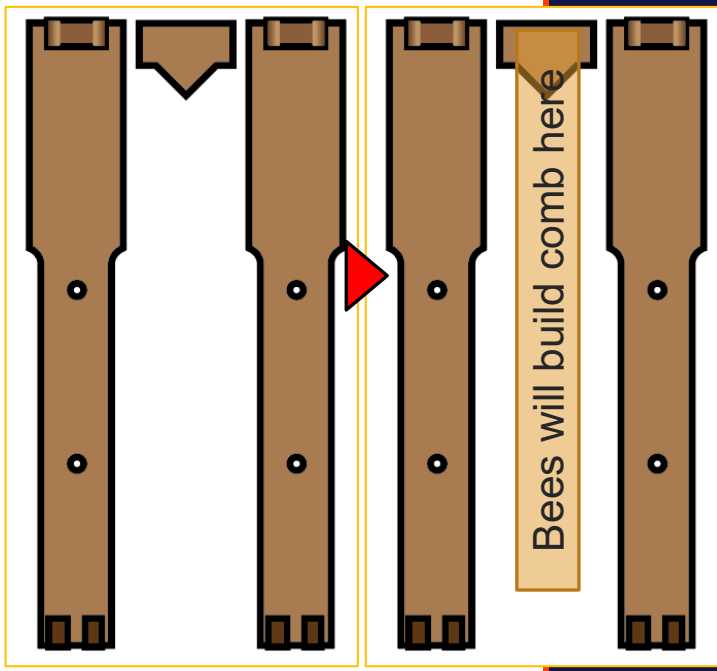
❑ Fully Drawn Wax Foundation

- *Mixed Reviews and some controversy*
  - It has been said that the bees take to it well
  - We have seen that in some instances, the wax does not hold up, and sags under weight and in the heat of the interior of the hive. They are working on tweaking the formulations to resolve this.
  - Some do not like that this wax is in with honey and food products
    - Bees recycle wax in the hive for whatever use they have, They may take some from one area and move it to another for whatever needs they have.
    - Consider that they can take this wax from say a brood frame, and use it to cap the honey in the honey box above.
    - This also has an implication for harvesting wax for *pure* wax candles.

Foundationless Frames

❑ Popularized by Kelley Beekeeping

- *These frames provide a guide for bees*
  - They use the guide to affix the comb with no foundation
    - The benefit is pure comb, 100% built by bees. No recycled wax, sourced by manufactures, that could have contaminants in it given it is used.
- *In use – provide drawn comb as a guide*
  - A foundationless frame is nestled between two drawn frames
    - This prevents the bees from building errant comb.
- *Other Choices Exist – Frames with guides and starter strips*



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Managed Mentoring

Painting Hive Equipment

Lesson | Hive Paint Systems

What is Covered in this Module

- Preparations – Set up the Space & Tools
- Paint, Brushes and Rollers
- Paint Prep Work
- Painting Process
- Assembled vs. Unassembled
- Suspending Boxes for Painting

Painting Equipment

Instructions, Guidance, and Tips for Building Woodenware

A word about painting

- **Some love to do this, and some loathe it**
  - *Painting can be a fastidious tedious task*
  - *If you have ever watched someone that was good at it, do it, it is a thing to behold*
  - *It is one skill that will server you a lifetime and with a little patience and knowhow it can yield great results*
    - Open your mind to the lesson and make your way to becoming a good painter

Why Paint?

- **Wood degrades quickly when left unprotected**
  - *Unpainted wood will develop surface flaws, be subject to absorbing moisture leading to rot, and flat surfaces will often warp and become misshapen*
  - *Adding a protective layer of primer and paint works to avoid these issues for much longer than bare wood alone can manage.*
    - Primer serves as the binder to seal the wood and create a surface that the paint will better adhere to

Hive Equipment Painting Workspace

❑ Muster and Setup

- *Collect or assemble your tools and equipment*
  - Source, Gather and organize your painting tools – paint brushes, rollers, stirrers, etc.
  - Clamps, Hammers, screwdrivers, rags, drop clothes, scrapers, sandpaper, nails, glue and other tools and hardware can be considered.
- *Choose your painting space*
  - Pick a place that is clean, and large enough to paint and set pieces to dry where they will not be subject to foot traffic that could stir up dust
  - Choose a place that is temperature controlled, will not cause problems from paint odors, and be subject to any other impacts while occupying the space.

Workspace Hygiene

Say in the garage where the vehicles track in dirt each time they come in off the road.

❑ Workspace Basics

- *Vacuum and Sweep, Wait > then Wipe down Surfaces*
  - If you are working in a place that could be considered dusty, or just for good hygiene, consider a quick clean up to take contaminants out of the space
    - Vacuum or sweep the space, then leave the air to settle.
    - Once things settle, use a damp cloth to wipe down the surfaces of any dust that deposited due to being disturbed from vacuuming and/or sweeping….
  - This extra step often is the difference between a paint job that that a smooth admirable finish or one that has a disappointing dust appearance in the finished product

Temperatures and Ventilation

- **For best Results, Paint within temperature ranges**
  - *Each product will spell out the functional temperature range for painting.*
    - Most times, room temperature is a good rule of thumb (70°F)
- **Air Movement**
  - *Ventilation, but not drafty*
    - It is beneficial to have some ventilation to allow vapors to dissipate, but you would want to avoid drafty conditions that move dust around and cause uneven drying.

Stir Your Primers and Paint

❑ Keep Stirring, Continuously

- *Even if you just got it home from the store, and they had shaken the cans from you, stir it just before painting*
- *Periodically stir your paints and primers throughout the process.*
  - This ensures the best protection and finish for your painted equipment.
    - When a paint (or primer) is thoroughly stirred, the paint additives within are thoroughly distributed throughout the paint at all times
    - This gives you the best performance of the paints in both coverage ability and adhesion.
    - How long? Stir just a little bit longer than you think you need to so it is fully mixed.

Source your Primer & Paint

When buying paint, peek at the 'return' section of your box store

❑ Common House Exterior Paints and Primer

- *Paint Systems*
  - Most common house paints sold in box stores or at your local hardware center do just fine. In our testing, we like **Benjamin Moore** paints for longevity, but Behr, Glidden, and other common brands are more than suitable for the job.
  - Primers: You can buy the primer systems for the brand you choose (Glidden Primer with Glidden Paints for example) or you can choose dedicated brands for primers. We like **Zinser 1-2-3** brand, and **KILZ Exterior** primers for example.
  - If in doubt talk to the person at the counter and tell them what you are doing, and they can make recommendations.

Paint + Primer Products?

We prefer Primer/paint systems for coverage and durability

❑ What of Paint and Primer, all in one products?

- *We are not a fan, but if you want you can give it a try*
  - The rigors of environment for a hive box are two-fold.
    - You have the exposure to the elements from the outside
    - And the assault of moisture coming through the wood from the atmosphere of the bees via the inside.
  - It is our experience that a two-part system is a superior package
    - There are however plenty of accounts of beekeepers who saved money by going with an all-in-one product and the allure is compelling.
    - Call us old school, but we have success with primer/paint systems and suggest that you are better off going this way, especially for an exterior facing paint solution.

Brush and Roller System

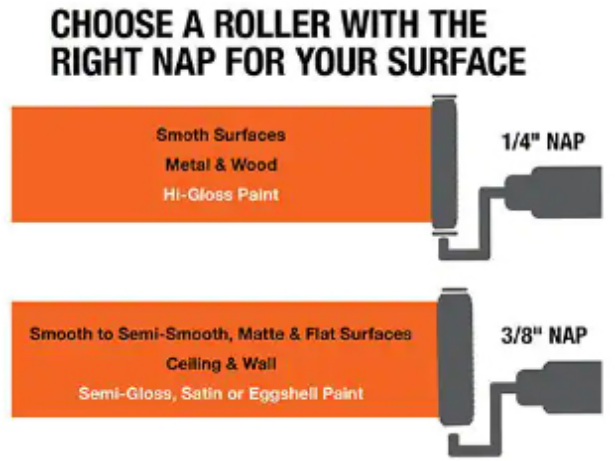
❑ Painting with a Brush, and or, a Brush + Roller

- *You can paint the whole kit with a handheld paintbrush.*
  - But for speed, and for a better finish, especially for anyone unaccustomed to painting, a brush and roller might be a better choice
  - If using both, the brush is used to paint the intricate areas (handholds, finger joint areas, and such). The roller provides fast work for flat surfaces and does a very good job at distributing the paint evenly.
- *Work in small batches*
  - If using a brush + roller, work in small batches. This ensures the brush remains 'wet' enough to keep coming back to. Only do a few pieces at a time.

Brush and Roller Recommendations

❑ 4-inch roller – 1 to 2-inch brush

- *Painting is personal preference*
  - A brush that is wide enough to cover panels
  - But small enough for detail is best.
- *Short-nap synthetic rollers do a good job*
  - They clean out well, are reusable, and provide a good finish
  - Stay with a nap that is not too deep
  - Use a roller with a matched painting tray



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Foam Brushes

❑ Foam Brushes

- *These are an 'ok' choice*
  - They are inexpensive, and they are disposable, so they simplify clean up
- *Disparity Quality*
  - The quality of these brushes vary in the marketplace.
  - Primarily where they differ is in the quality of the foam.
    - Cheap version have open matrix of cells, are stiff, and are not very easy to paint with
    - Better ones have a **tighter foam matrix** and a softer surface

Show – *Walk through only*

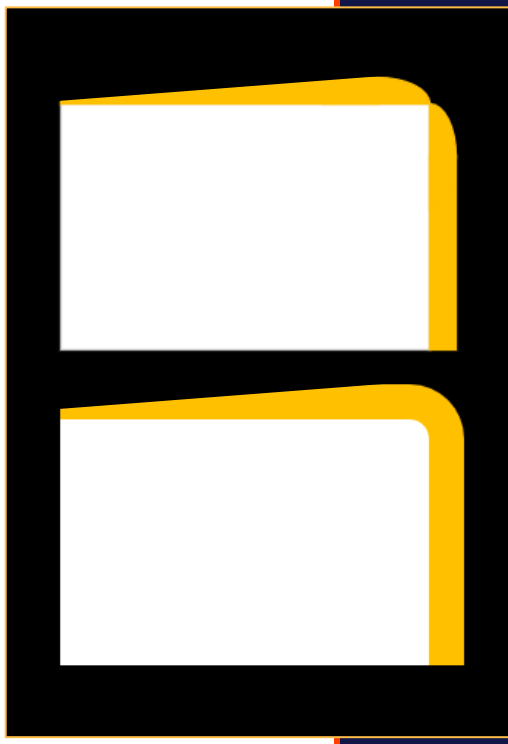
- **This next section is for later**
  - *I am going to preview what is here*
  - *You should look at it WHEN YOU ARE GEARING UP TO PAINT*
  - *It has details that will make a difference in a quality pain job*
  - *It is too detailed to cover now, and you will forget it by then*
  - *But when it comes time to do the paint job – Read it and follow the guidance for a better outcome*

Preparation

Prep is short for Preparation

- *When painting, one word that is synonymous with the practice is **prep**.*
- *Prep work comes in a few forms and can be thought of as the steps to 'make ready'*
  - Sometimes this means to assure the piece is ready for a paint application – cleaning off errant shavings, dulling sharp corners, etc.
  - Other times it is the simple process of final prep to clean a surface off before laying down a coat of primer or paint
  - Whatever the use, it is without question one of the most important steps and should always be executed with utmost diligence

Prep the Blank Corners



❑ Round off the sharp edges

- *An optional step, but recommended*
  - Before painting, and as a last step of fabrication, consider ‘knocking off’ the sharp edges of woodenware with a piece of sandpaper affixed to a sanding block or small scrap of wood.
  - Rounding off sharp edges allows for paint to flow contiguously from one plain on the wood to another
    - Naturally, when corners are left sharp, they present thin spots in the wood that can be marred and open areas where water can get behind the paint and challenge its hold over time.
    - This comes into play for roofs, bottom boards, and hive body pieces if you want to give them a light touch.

Prepping the Surface directions

❑ Wipe in a linear fashion

- *How you wipe the panel is important*
  - Start at the top and wipe in one direction.
  - Wipe across left to right, right to left, it does not matter, as long as you are not using a repeating pattern
    - What that means is do not wipe an area over and over again.
    - Wipe one section of the piece in one direction and do not wipe back over it.
      - Re-Wiping redeposits what you wiped off.
  - Wipe the dried surface down between coats with a dry rag. Consider a damp cloth wipe if they sit for a while (say if you took a long break, or stopped- then restarted the next day)

Prepping the Surface directions

❑ Wipe dry, then wet

- *Wipe dry to get loose particles off. Then wipe wet (damp) to dislodge surface contaminants and stubborn debris*
  - Wipe dry with a clean cloth, or tack rag (aka Tack Cloth)
    - Tack cloths are optional. They can be purchased at a store.
    - They are probably overkill here as you are working with new lumber.
  - Wipe with a dampened rag
    - The wet wipe, with a rag wet with water and rung out thoroughly, will remove stubborn dirt and remove contamination from the surface – such as **oils from your hands**
    - Wipe the dried surface down between coats with a dry rag. Consider a damp cloth wipe if they sit for a while (say if you took a long break, or stopped- then restarted the next day)

Definition

Tack Cloth: A tack cloth or tack rag is a lint-free material—often gauze-like—impregnated with a tacky substance used to remove dust and dirt from wood prior to finishing/

The Brush and Roller Process

- **Paint the Intricates first, then paint the panels**
  - *'Cut in' the handholds and intricate areas with the brush.*
    - Painting with the brush is not dab, dab, dab, dab.
    - Keep the brush moving and sweep it along the surface.
    - Dab if needed to get all the complicated hard to reach places, but use a sweeping motion in to finish.
  - *Once you have the brush areas complete, roll the flat surfaces*
    - Roll across the flat planes of the panels, blending in any areas that were painted with the brush.
    - Sweep the brush for long thin areas where a roller cannot go; roofs for example

Loading the Brush and Roller

❑ Charging the Brush and Roller with Paint

- *'Dip the brush only half way*
  - Don't sink the brush past half of its depth.
    - Dipping half way loads the paint into the base of the paint, without overloading it
    - Overloading paint causes a mess and leads to drips and runs
- *Tap Tip*
  - Do a 'tap' on the inside of the can to set the paint and avoid drips
    - Tap the tip of the brush on the inside of the can, or on the can lip. This motion tip was recommended as a way to drop off excess paint and lock the paint in the brush while you carry it from the can to the piece.

Loading the Tray and Roller

❑ Adding Paint to the tray, and loading the roller

- *Avoid pouring the paint out of the can,*
  - This results in spilled paint, paint in the rim of the can, and other undesirables
- *Hold the tray over the can, and use a paint stirrer to add paint*
  - Dip the stirrer, pull it up over the can, slide the tray under, and let the paint fall into the tray. It is somewhat tedious to do this, but you'll the hang of this.
  - Don't flood the tray
- *Lightly load the roller*
  - Place the roller in the paint, and pull it up to the flat, rolling it to load.
    - Repeat this as necessary until the roller is charged, but not saturated.

Initial Primer

❑ Initial coat application

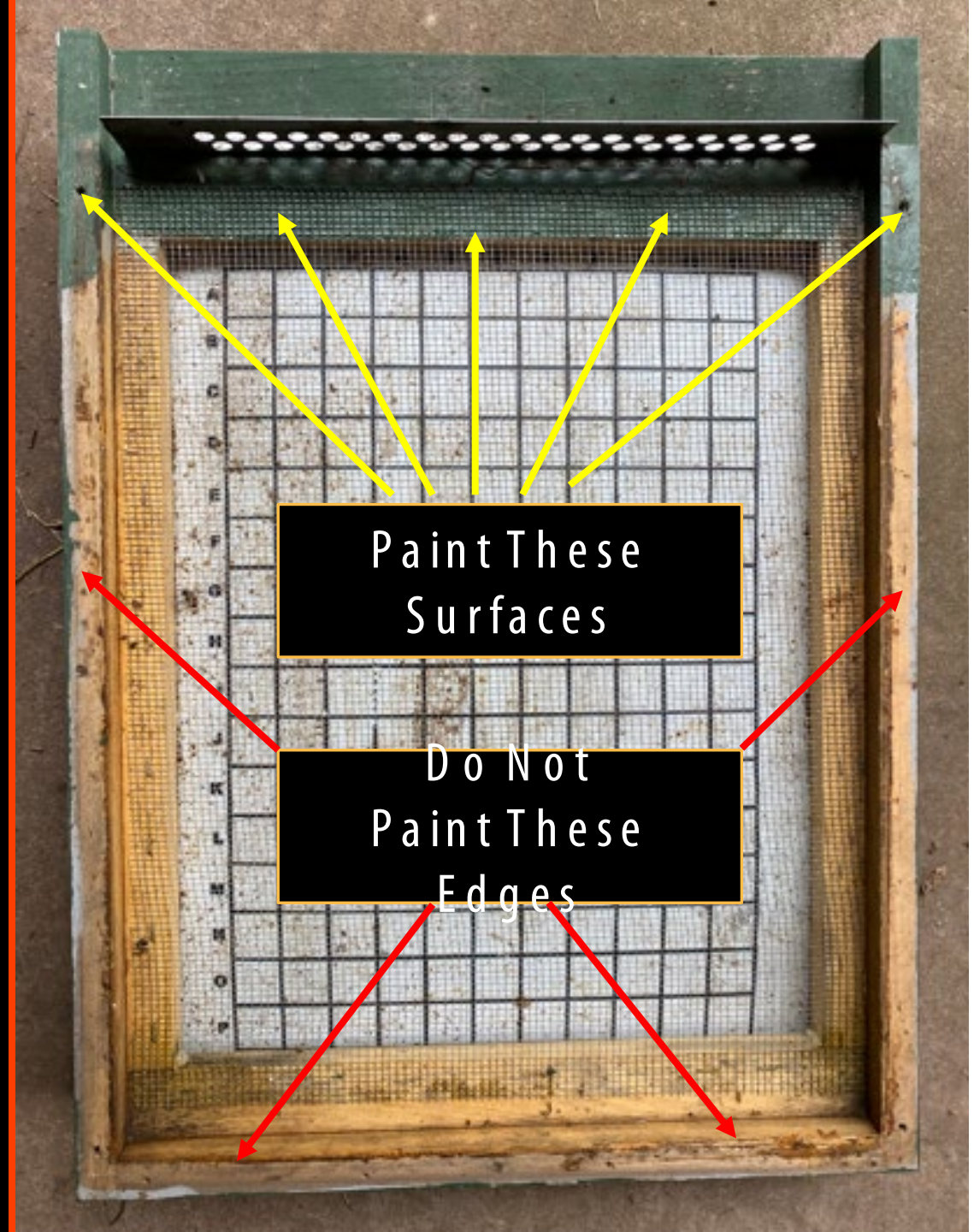
- *Prime intricate places first with a brush, then roll the flat surfaces with a roller to distribute the paint evently*
- *We recommend two thin coats*
  - Thin coats distribute the paint additives and allow them to set up quickly.
    - □ Like paint can separate in the can if left still, painting in thick coats may allow the additives (the oils, the binders, the resins) in the paint to separate on the surface prior to your primer/paint fully drying.
  - Pay attention to the finger joint ends. They are often porous and will absorb more. They may require three coats of paint to seal off with primer.

What gets painted?

- **Anything that is externally facing**
  - *Think about the board faces, and what is going to be out in the open air. The underside of the roof edges for example*
    - Not to be confused the roof interior; but the edges that will hang over the boxes.
  - *Painting the bottom board.*
    - Paint the landing, paint the edges that stick out of the front, and the underside
    - The bottom of the bottom board will not be out in the weather, but it will be subject to moisture and will benefit from being painted.

Things you do not paint

- **Some surfaces / equipment does not get painted**
  - *Do not paint the inner cover and the metal part of the outer roof*
  - *Do not paint the box top or bottom edges*
    - Some argue this point, but if you do happen to paint them, and the paint is not chemically dry, they can stick together when the surfaces come together when placing one box on another. Our guidance, Skip it.
  - *Bottom Boards*
    - Do not paint the top edges of the bottom board where the hive boxes rest
    - Do not pain the screen, of a screened bottom board.



Bottom Board

- **Visual of what to paint**
  - *Paint the landing*
  - *And parts that extend out past where the box will sit on the top edges of the bottom board rim*
  - *Paint the full underside too*

What you don't want to paint - protect

❑ Blue Painter's Tape and/or "Frog Tape"

- *Liberally make use of blue painters tape to mask off anything you don't want to get paint on.*
  - One common thing to mask is the metal of the outer cover.
- *Use clean dry low lint rags to remove paint where it does not belong*
  - A clean rag, pressed with force, in one direction – this will often remove any errant paint that you might have deposited in a place you did not want it.
  - If what you want to wipe away has dried, use a damp cloth to wipe it away.

Inspect before Final Topcoat

- **Look for any problems and correct**
  - *Drips, runs, errors*
    - If you had any drip, runs in the paint, errors, fix them before starting the top coat.
    - Some can be wiped away and lightly sanded, some require a knife to scrape off and you will have to patch the spot with primer.
      - When you cut off a drip with a knife, you sometimes find that it was wet underneath. Wipe the drip spot with a damp cloth to wash off errant paint and soften any ridges before patching.
    - Correct these problems as you go…. You will not be able to correct them once the final topcoat is applied.

TopCoat

❑ Two Coats of Topcoat paint

- *Again, Apply two thin coats*
  - Monitor for drips and runs. Comb out any brush marks with long sweeping strokes.

❑ Paint Drying

- *Leave enough time for paint to fully dry before putting into service*
  - Bees may be in impacted by the fumes of the paint drying.
    - The bees are super sensitive to the odor paints give off while drying.
  - Ideally the painting will be done in time to allow the paint to cure fully.

What of Spray Systems?

❑ Yes, if you know how

- *You can use spray systems to paint beehives,*
  - Very rarely do people have this equipment, and the expertise of how to use it, so it is not covered here
  - Incidentally, spray can paint is not going to work, so do not use that method
- *If you have the know how, go ahead.*
  - Just be sure that you get the right coverage when spraying out and we would recommend that you shoot multiple coats, just as if you were painting with a brush. Low volume procedures are recommended.

Assembled vs. Unassembled

You can paint unassembled

- *There is no rule that says you must assemble your equipment before painting*
  - If you think through the process, you can paint pieces unassembled, then fabricate (with some touchups required to seal the nails after fabrication)
  - A benefit to this choices is each piece can be laid flat on the work surface which makes it a little easier to paint for some.
    - You do have to come back with a paintbrush and touch up any nail heads
    - They must be encapsulated with paint to prevent corrosion and rust from forming after exposure to the weather.
  - Most beekeepers choose to assemble boxes, and then paint.

Rail System

- Suspend the boxes on a rail. This lets you rotate the hive boxes, painting each side as you go. It also takes up less space.

External Graphics

Sure, go ahead

- *Beekeepers are a creative bunch and many do some amazing art on the exterior of their hives*
- *Have fun with this…*
  - Ensure you use paints and techniques that are suitable for exterior exposures.
  - Keep in mind while doing this that some management practices call for rearranging the boxes and you end up moving frames to keep boxes depicting scenes intact
  - Consider graphics where rearranging the hive boxes have no impact on the aesthetic.

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Keeping Bees where you live

Lesson | Beekeeping is Local

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What is Covered in this Lesson

- The Concept of Local
- The Influence of Weather
- Local Climates
- Cultural Influences

The concept of Local

Definition

Local: belonging or relating to a particular area or neighborhood

Every situation is different

- *In beekeeping there are typical ways of doing so many things.*
- *Many factors make each beekeepers situation unique…. literally the yard the bees are kept in.*
- *Learn early that no two beekeeping operations are alike.*

Factors in Locality

Influencing a beekeeper's approach

- Potential differences in an operation that could influence unique ways in managing bees:

- **Weather Patterns**
- **Amount of Sunlight**
- **Elevation – Slope of Land**
- **Soil Conditions**
- **Humidity**
- **Forage Availability**
- **Number of Hives present**
- **Wind**
- **Precipitation Patterns**
- **Temperature Variation**
- **Water Availability**
- **Storm Prevalence**
- **Building Density**
- **Cultural Practices**

One Big Equation

- **Understanding your LOCAL situation**
  - Factoring differences, it becomes evident that each location is uniquely different
- **Variation in Factors**
  - Some are important, others are mere considerations
  - There are a few that are unlike the others – cultural differences for example, that will be unpacked in a moment.
  - This calls out that it is not just weather related, and each beekeeper has to decide what is right for them.

Why does any of this matter?

- **Instruction is not universal**
  - This program has its origins for the Mid-Atlantic area of the United States
  - As such, much of the instruction applies to beekeepers in the northeast.
    - *That being said, if someone comes upon these instructions from Texas as an example, they will find that these instructions are often unsuitable due to the distinct different of location.*
    - *Pragmatically, this rings true for some of the instructions for those nearby, even within the Mid-Atlantic.*
      - Those in the mountains of Pennsylvania may have to adjust instruction to accommodate for some differences.

So which factors matters?

- **Primarily Weather**
  - When it comes to bees, beekeepers need to understand their local climate.
    - *Our local weather, in Central NJ, is 5°F different from the broadcasts coming out of New York City.*
      - We know that because we follow local weather stations
  - Follow the biology and behavior of the bees
    - *Bees will generally operate at certain temperatures*
      - Meaning for example that they will go out and forage once the temperature exceeds a certain range.
      - The difference of a few degrees might factor in what you are doing for the day.
  - **Temperature** is a leading factor for locality

Weather Patterns

- **Rain, snow, sun, clouds, storms, etc.**
  - Each location has norms about what occurs there.
    - *Going back to the Mid-Atlantic, the weather is somewhat consistent for the region but a snowstorm, rainstorm, or other weather pattern, might impact the whole region or part of it.*
  - Beekeepers need to pay attention to the **forecasted weather patterns**.
    - *This seems patently obvious right!?*
    - *In this day of Facebook and other far-reaching outlets,* ***beekeepers are constantly bombarded*** *with other beekeeper reports in real time.*
      - Some manage based on what they see others doing and do not take a proper account of what is outside their window.

Keep Attuned to locality

- **Understanding ‘constants’ that are differences for you**
  - A beekeeper needs to take stock of certain conditions that are consistent, but unique to the location.
    - *A beekeeper that lives in a valley has a different, but constant, difference when contrasted against someone who lives at a higher elevation.*
    - *Consider your unique situation and keep that in mind while considering how to conduct operations.*

Follow the biology

- **Learning Colony Dynamics**
  - In time, and with experience, you will come to know more about how the bees operate
  - We will coach you to be **biology-driven beekeeper**
    - *We will teach you different things about the bees as a superorganism*
    - *When you grasp the ins and outs of how a colony operates, you can apply that to your planned interactions*
    - *Fundamentally this is a key difference from a 'bee-haver' and a beekeeper*

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Bringing Bees into the Community

Lesson | Adherence to Regulations

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What is Covered in this Module

- Adherence to Regulations
- Proximity to Others
- Education & Registration Requirement
- NJ Cottage Law
- Right of Inspection
- Management Requirements
- Beekeeper Responsibilities
- Resource Links

Own It

- **The responsibility is Yours**
  - It is incumbent upon the beekeeper to learn and adhere to laws and regulations. Better to do this up front, and not get into uncomfortable situations
- **Strive to be defensible**
  - If you do not follow rules, you cannot count on allies to help you.

Comb Examination

Modern, Moveable, Frame Hives

- **Hives must permit inspection**
  - This is commonplace in the U.S.
    - *It is customary that hives must allow for thorough inspection of every comb.*
  - Primarily…. Inspection is for detection of, and determination of the presence of bee diseases.

Since we recommend you start with Langstroth Style hives. This will mean all hives are compliant.

Hive Density

Number of hives on the property

This is shared to demonstrate that there should be common sense about how many colonies you host

- **Starting out, you should only have two hives**
  - We recommend you start with two and will explain why as we go along
- **It is common that regulations dictate how many hives one can have on a property**
  - In NJ there is a regulation that stipulates colony density:
    - *1/4 acre or less – No more than 3 colonies*
    - *1/2 acre or less – No more than 6 colonies*
    - *3/4 acres or less – No more than 9 hives*
    - *1 acre or less – No more than 12 hives and so on….*

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The guidance to follow comes from this Ordinance Document

An Ordinance Regulating the Keeping of Honey Bees

Be it ordained by the City of Boston, as follows:

SECTION 1.

The City of Boston Code, Ordinances, Chapter 16, Section 1.27, shall be created as follows;

16-1.27 Honey bees

a. Purpose

i. The purpose of this ordinance shall be for the regulation and enforcement of keeping honey bees.

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a. Purpose
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b. Definitions
i. Hive - a manufactured receptacle or container prepared for the use of Honey bees that includes movable frames, combs and substances deposited into the Hives by honey bees.
ii. Honey bee - a subset of bees in the genus Apis, primarily distinguished by the production and storage of honey and the construction of perennial, colonial nests out of wax.
iii. Colony - means a natural group of honey bees having a queen or queens.

c. Registration; Fee
i. Keeping of honey bees shall require registration with the Inspectional Services Department pursuant to the regulations set forth in Section 16-1.27(d).
ii. The application fee shall be twenty-five ($25.00) dollars.

d. Regulations
i. The maximum number of Hives on any given lot or roof shall be five (5).
ii. No Hive shall exceed six (6) feet in height and twentyfour (24) cubic feet in size on any lot or roof. No Hive will be placed on a roof that is not designed, intended and permitted by ISD for access and occupancy.
iii. Where there is a wall, fence or similar barrier between the subject property and adjacent property, no setback from the property line is required. Where there is no wall, fence or similar barrier between subject property and adjacent property, Hives shall be set back five (5) feet from the property line.
iv. Hives shall not be located in the front yard or in a side yard that abuts a street in all residential and commercial zoning districts and subdistricts.
v. No Hive shall be located closer than ten (10) feet from a public sidewalk.
vi. For any ground level Hive that is within twenty (20) feet of the doors and/or windows of the principal building on an abutting Lot, either of the following conditions must exist:
1. The Hive opening must face away from doors and/or windows; or
2. A flyway of at least six (6) feet in height comprising of a lattice fence, dense hedge or similar barrier must be established in front of the opening of the Hive such that the honey bees fly upward and away from neighboring properties. The flyway shall be located within three (3) feet

Hive Density
Boston

- **The maximum number of Hives on any given lot or roof shall be five (5).**
  - No Hive shall exceed six feet in height and twenty-four cubic feet in size on any lot or roof.
  - No Hive will be placed on a roof that is not designed, intended and permitted by ISD for access and occupancy.
  - Hives shall be set back six feet from the edge of the roof.

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Setbacks
Boston

- **Setback Stipulations**
  - **Where there is a wall**, fence or similar barrier between the subject property and adjacent property, no setback from the property line is required.
  - **Where there is no wall**, fence or similar barrier between subject property and adjacent property, Hives shall be set back five feet from the property line.

Property Placement Boston

- **Property Placement**
  - Hives shall not be located in the front yard or in a side yard that abuts a street in all residential and commercial zoning districts and subdistricts.
  - No hive shall be located closer than ten feet from a public sidewalk.

Ground Level Placement Boston

- **Ground Level Placement**
  - For any **ground level hive** that is within twenty feet of the doors and/or windows of the principal building on an abutting Lot, either of the following conditions must exist:
    - *The Hive opening must face away from doors and/or windows;*
    - *Or a flyway of at least six feet in height must be established in front of the opening of the jive such that the honeybees fly upward and away from neighboring properties.*

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Roof Placement Boston

- **Roof Placement**
  - For any **roof level hive** within twenty feet of the doors and/or windows of the principal building on an abutting lot, either of the following conditions must exist:
    - *The Hive opening must face away from doors and/or windows;*
    - *Or a flyway of at least six feet in height must be established in front of the hive so the honeybees fly upward, and away from neighboring properties, and safely secured.*

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Ground & Roof Flyways Boston

- **Flyway Placement**
  - The flyway shall be located within <u>three feet</u> of the entrance to the Hive
  - It shall extend at least <u>two feet</u> in width on either side of the Hive opening.
  - It will be comprised of a lattice fence, dense hedge or similar barrier

Terminology

Flyway: Typically, this refers to some form of barrier placed in front of the hive entrance

The premise of a flyway is that the bees will have to fly up and over the barrier

Note: Bees once up at a certain height, of remain that high as they fly away from the hive

Beekeeping Practices
Boston

- **Beekeepers shall adhere to appropriate beekeeping practices including:**
  1. Maintaining bee colonies in hives that are kept in good working condition.
  2. Ensure a constant and adequate **water** source.
  3. Responding and taking immediate action as to any bee swarms
  4. Seeking to remediate any nuisance conditions.

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Applicable Laws
Boston

- **All beekeeping shall comply with applicable State laws and regulations.**
  - Nothing about this ordinance is intended to waive or amend the requirements of CBC 9-9.13 Regulating Access to Roof Areas of Buildings with Residential Units.
  - To the extent the provisions of this ordinance conflict, CBC 9-9.13 shall control.

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General Adherence to Regulations and Laws Massachusetts

- **Be Defensible – Know the applicable regulations**
  - No matter where you are, Boston, or any of the surrounding area, know the applicable regulations
  - Know before you start
    - *Consider seeking guidance from State and Local associations first*
      - *Knowledge of experience often shows that…*
        - Asking municipal officials is often an exercise in frustration and can lead to complicated situations when they are forced to address questions, questions they do not have answers to
      - The Boston Rules are enforced by the **Boston Zoning Commission,** and they can be sought for clarity on stipulations

Community Density

- **Consider the Neighborhood**
  - Supporting hives peppered around the community
    - *One might be surprised, at the number of hives tucked in and around properties these days*
    - *Consider the hive density of beekeepers keeping bees in the neighborhood, in the context of forage available.*
  - Be considerate of established Commercial Yards
    - *Commercial operators often prefer that local beekeepers not crowd their established apiaries.*
- **Common Sense**
  - If a situation seems forced, consider other options.

Apiary Registration

- **Yards registrations are typical**
  - Initial, and then Annual renewal is often required
  - MASS bee registration is voluntary, but ‘highly recommended’.
    - *The City of Boston is adopting a hive registration process*
    - *It is important that you know the information and adhere to it*

Apiary and Colony Registration Form | Mass.gov

https://www.mass.gov/forms/apiary-and-colony-registration-form

Adherence to Cottage Laws

- **Cottage Laws**
  - Many locations have Cottage Law legislation that impacts beekeepers
    - *Mass Cottage laws* ***do not apply to unprocessed honey***
      - Additives to honey will likely be subject to cottage (aka Retail Food Sale) laws and oversight
      - Example, mixing in nuts, garlic, spices (like cinnamon, etc.), fruits, seeds, flavorings – *these are all likely subject to cottage law rules*
    - *If you venture into* ***production of, and sale of, products*** *of the hive you could be subject to oversight by the state's cottage law.*
      - Recommend you do some research – starting with your local beekeeper's association

Education Requirement

- **Some areas have education requirement**
  - For Example, state law in New Jersey requires you take training within one year of hosting bees
    - *Training will consist of a beginner/general beekeeping course from an accredited college or university, the State Apiarist, or a local beekeeping club*
  - Review your local area stipulations to see if there is a requirement and if you meet it
    - *Chances are this course will fit the bill*

Right of Inspection

- **Apiary Inspectors can inspect (laws vary)**
  - Laws are in place to allow apiary inspectors permission to access apiaries for inspections.
    - *Often the officer or agent can come on your property to inspect – they do not need permission.*
      - It could be illegal for you to interfere with their duties.
  - Additionally, they often have the right to ask you to provide necessary paperwork and enforce laws for conduct in the operation.
    - *Marked hives, recordkeeping, training, etc.*

Other Requisites

Colony Oversight

- **In all there are stipulations for oversight of colonies beyond the Boston Ordinance**
  - You must address colonies that are shown to have American Foul Brood
    - *It is a requirement to report the colonies if AFB is found*
  - There are stipulations for management during transport, especially across state lines and for bees that are sold
  - In some places colonies must be adorned with an ownership tag or mark so if something comes up the owner can be contacted

Bee Sale Certificates

- **Sellers of bees likely have rules**
  - It would address shipping bees, raising bees, etc.
  - This is more germane for you **as a purchaser**

When purchasing bees, know that:

- *Many states have laws that require the seller to hold a certificate if they are selling you bees*
  - The certificate ensures that they have been inspected
  - It also assures that the operation was free of disease at the time of inspection.

https://www.mass.gov/forms/shipment-notification-of-honey-bees-and-beekeeping-equipment

Beekeeper Responsibility

- **It is on the beekeeper to comply**
  - It is incumbent upon the individual to learn and follow applicable rules.
    - *This module was not meant to be comprehensive; it was designed to be illustrative to the more common laws and regulations that one will find.*
    - *Before getting started, **and periodically**, one should invest the time to become familiar with applicable laws.*

Your local beekeeping association and state apiarists are good resources for consultation and clarification.

Laws

Regulations

Mass Beekeepers Assoc.

Honey Bee Health Coalition

Massachusetts Resources

- There are no state laws or regulations that permit or prohibit beekeeping
- There are state **laws** and **regulations** that pertain to honeybees and beekeeping – *See QR codes to the left*
- There may be local rules or ordinances for your town/city that pertain to honey beekeeping so inquire with your local government office to learn more.
- To learn more about the basics of apiary establishment, check out these Best Management guides from the **Massachusetts Beekeepers Association** and the **Honey Bee Health Coalition**. *See QR Codes to the left*

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More Resources

- **USA State and Territory Laws and Regs**
  - The Apiary inspector of America provide a web page with links to each state's laws

Web Address:

https://apiaryinspectors.org/state-laws

MASS Apiary Program Page Resources:

https://www.mass.gov/apiary-program-honey-bees

Q&A

- **Questions**

BABA Beekeepers School

Bringing Bees into the Community

Lesson | Being Good Neighbors

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What is Covered in this Lesson

- Placing Bees
- Respecting Setbacks
- Adherence to Regulations
- Avoiding Contentious Situations
- Planning Colony Flight
- Being Neighborly
- Alternative Hosting Options

"Bee" a Good Neighbor

Placing Bees

Taking a moment to consider the impact of bringing bees into a place where they were not.

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Placing Bees

Honeybees are everywhere we live

- **Bringing Bees into a property is a conscious decision**
  - *When you make the choice, you introduce something into the landscape in a scale that was not there before.*
  - *This requires some consideration / evaluation*
    - Bees are not domesticated, and part of their existence is to seek resources, to forage.
      - They will not be constrained to your property
    - As such, it is wise to stop and consider how they will impact the ecosystem around you.

Placing Bees Requires Consideration

❑ Colonies are anchored to a location

- *Considering Honeybee Orientation before considering apiary location*
  - As bees establish their colony, **they orient to the exact spot where their home is located**. *Exact translates to inches and feet*
- *Give consideration when placing bees*
  - You cannot simply relocate a hive to another part of your property because they might look better or be out of the way, if you move them from the side yard to back yard. It does not work that way
  - Bees will always fly back to the exact spot once they have established a location
- *Its 3 yards or 3 miles to move a hive*

Respecting Boundaries

- **Ensure a safe space**
  - Common sense dictates that you keep your bees at a distance from others
    - *You are choosing some risk when keeping insects that sting; neighbors and bystanders are not.*
  - Follow setbacks or simply institute buffers
    - *We covered that regulations dictate a minimum boundary or setback.*
    - *Place apiary (bee yard) in the middle of the space and exceed the recommended barriers*

Plan for Flight Paths

- **Route your bees in the best way**
  - Part of being neighborly is understanding where your bees will fly
  - Consider the adage: **Out of sight, out of mind**.
  - Bees often fly toward the sun or open sky
    - *Think of where they will fly…*
      - Will they fly over your neighbor's pool or patio?
      - Will they be flying over a nearby sidewalk?
      - Will they be flying over, and pooping on automobiles
      - Employ barriers (Flyway fences) to direct bees up and over, if applicable.
  - Be neighborly and do not force a situation.

Considering your neighbor relationships

- **Relationships vary**
  - The first thing to consider is that people have different notions about bees; and that they are stinging insects
    - *Some who may be the most rational individuals you interact with react negatively when it comes to phobias about bees.*
  - Make a disclosure decision: open, moderate, or closed
    - *You can decide if it is right to openly share your plan to keep bees on the property*
    - *No matter what your plan is however; safety comes first and if there is a risk to family or neighbors, the right thing to do is to take the high road.*

Considering your neighbor relationships

- **Discretion**
  - Reactions to news of a neighbor deciding to keep bees runs the gamut.
    - *Some are thrilled and welcome the prospect.*
    - *And some truly feel threatened and disdain the presence.*
    - *You should weigh the perceptions on a case-by-case basis.*
- **You are within your rights but consider:**
  - **A bad neighbor relationship does not get better with added friction**.
    - *Bad situations sometimes blow up, causing scrutiny on local/municipal levels for other beekeepers.*

Alternative Hosting Situations

- **When the situation is not ideal**
  - Some relationships can be tempered with education, and/or time without incident.
    - *Be aware of the risk and that at any time some event could rekindle concerns. Will you have a plan for this?*
  - **Consider an out yard, co-op or other arrangement**
    - *If your neighbor situation is not a good one, alternatives exist.*
      - Many property owners are willing hosts to hives and word of mouth often yield results with little effort.
    - *Adopt a hive option.*
- **Last word, Strive to be a good neighbor**
  - Often honey and fellowship go a long way.

Being Neighborly

- **Final comments**
  - Being a good steward of bees, especially as it relates to your neighborhood is about awareness
    - *Consider the impacts and make the right choices.*
    - *Educate yourself on the biology of the livestock in your care and learn the behaviors and patterns of bees in a location*
    - *Follow recommended practices, adhere to guidelines, and take the high road when it comes to your choices.*
  - Use the opportunity to promote beekeeping and pollinators
    - *In time it will be likely that you will become known as the resident expert in the neighborhood*

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Beekeepers School

BABA Beekeepers School 2025

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Apiary Design

Lesson | Designing the Apiary Space

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What is Covered in this Lesson

- Anchored Colonies
- 3-Yards or 3-Miles Concept
- Choosing a Permanent Location
- Suitable for Humans
- Suitable for Bees
- Placement Recommendations
- Alternative Placement Options
- Water Source

Apiary Design

Setting up the space for hosting the bees

Honeybee Orientation

❑ Orientation

- *Forager Orientation*
  - Forager Bees orient to their home upon first flight.
- *Orientation is done in several steps.*
  - They view the world from the hive entrance
  - They take a short flight from the entrance and stay within sight of the hive.
  - In time they will fly further, reviewing the landscape elements and familiarizing themselves with their surrounding while flying farther from the hive on subsequent days

Visualizing orientations

A bee will leave the entrance and fly in circular motions around the hive.

- They are taking in the location of the sun, the location of hive, and the landscape features.
- They will fly close to the hive down low, up high, and on late mornings or early afternoons you can see bees flying circles around the hives.
- The physical spot, within inches, is imprinted in the forager's memory.

Orientation Video: YouTube Link
https://youtu.be/WFD5h57IDC8?t=43

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3-Yards or 3-Miles

Recall bees orient to the exact spot of the hive

- **The adage: Moving bees, move them 3-yards or 3-miles > Why?**
  - *The 3-yard concept*
    - If you move a colony on a hive stand more than three yards, any bees that have oriented to that spot will physically come back to the original spot, even if the hive is nearby.
      - They will fly to the spot, hover above the space, and sometimes they will land and gather together on the ground.
      - Other times they will simply fly away and look for some suitable new home (not necessarily the hive)
    - If it is still within 3-yard however, the belief is they will be able to discern their original hive and eventually will fly to it and go inside.

3-Yards or 3-Miles (cont.)

- **The adage: Moving bees, move them 3-yards or 3-miles > Why?**
  - *The 3 mile concept*
    - Normal foragers will fly miles from the original hive for forage if necessary
      - As part of this activity they log landscape features so they can find their way bak,
    - If you move less than three miles, you risk that they recognize features
      - If you move them and they are still see things they know, they will likely use those clues to go back to the original location
    - More than 3-miles and you should be ok that they realize they have a new home, and they will re-orient to that site and reset

Fooling the Bees

❑ Ignore 3-Mile Rule

- *There is a common belief that you do not have to move hives 3 miles*
  - Move the hive to a new location, with an entrance modification
    - The wisdom is that you can move a hive to another location in proximity where it was
    - Simply move the hive and then create some barrier at the entrance that the bees have to deal with
      - The premise came from – what happens when a tree falls in the woods, how do the bee adapt?
    - When the bees deal with the obstruction, they realize things have changed and reorient
  - How does it work?
    - Sometimes it works but, in our experience, often it fails. Follow the 3-mile rule to be trouble free

Scoping out a Permanent Location

Analysis

- *Knowing about orientation anchoring a colony, the selection of a site is an important decision.*
  - Selecting a location usually falls into two categories:
    - What is suitable for the beekeepers
      - Consider access to the bees and other facets to make a workable apiary
    - What is suitable for the bees
      - Taking into consideration what the bees need – what is optimal for them.

Access and Landscape Features

You need access and the ability to work

- *Access*
  - Access by Car is optimal. Access by Cart or equivalent is mandatory
- *Features*
  - Dry, Level or slightly sloped ground that has exemplary drainage
  - An area that will *never* flood, ever, no matter what nature throws at you.
    - Consider the worse case scenario before choosing a spot
  - Away from foot traffic (humans). Not near porches, backyard patios, or other places where people walk through or congregate.

Spacing and Resource Protection

Space

- *Enough room to operate. Preferably where you can space the hives out*
  - Spacing allows for you to groom the area and mow around the colonies
  - Spacing is also good for the bees (covered later)
- *Away from property lines and valuable resources*
  - Hives have to be set back from property lines. Do not set against property lines
  - Away from places where bee poop is not going to cause damage
    - Bees fly out front of their hives when doing cleansing flights. Anything in front of the hive (cars, furniture, etc.) are subject to being covered with droppings

Individual Pad vs. Rail Placement

- **Individual Pad Recommended**

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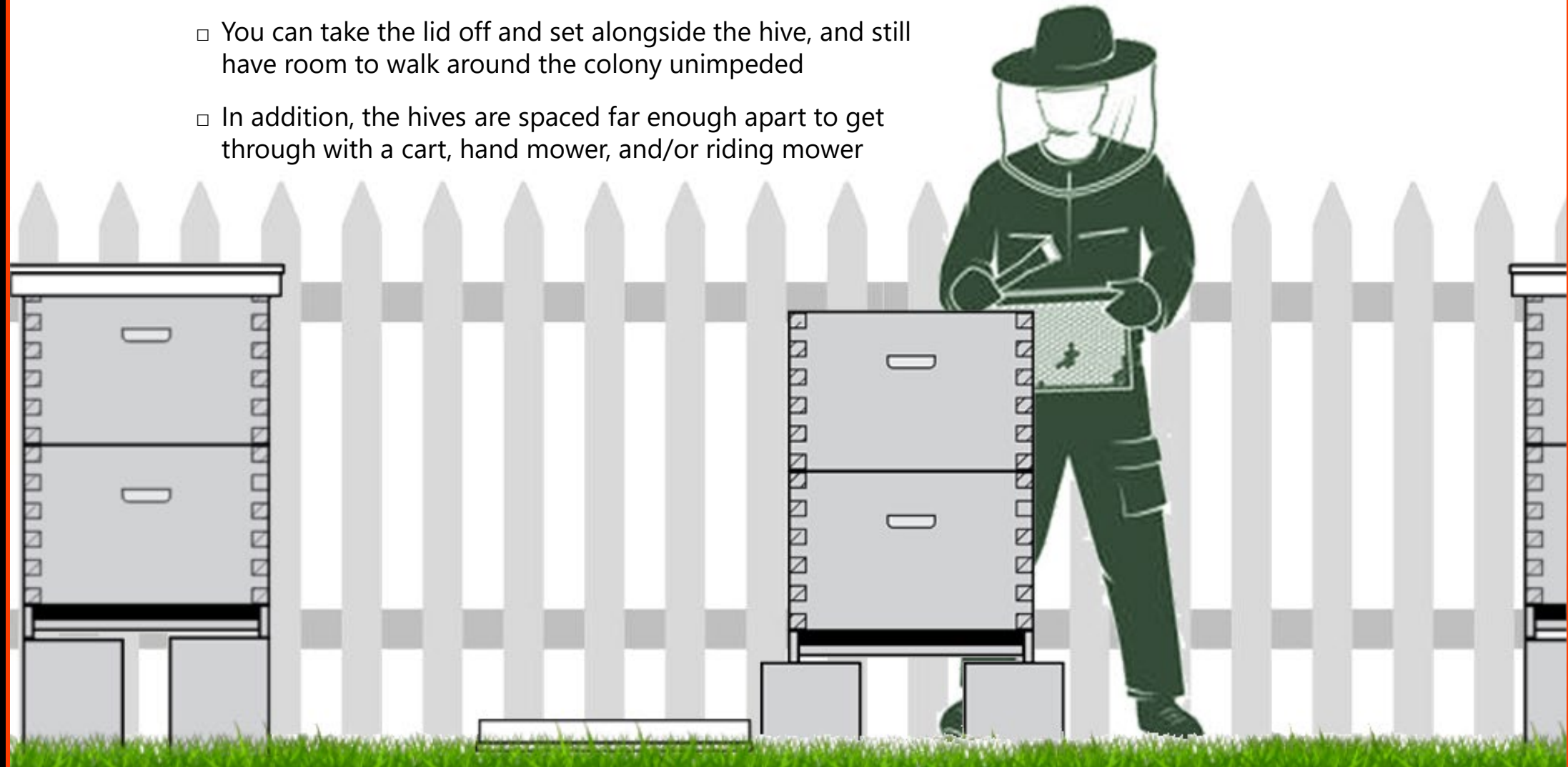
Individual Hive Stands

❑ Space (continued)

- *Individual Hive Stands*
  - Making a pitch for single hive stands
    - □ Many apiaries provide a 'rail system' that lines up multiple hives on one rail
      - One aside is when you work one hive any movement translates down the rail to the other hives.
      - Rails limit your ability to truly get alongside
    - □ Opinion: Single Hive Stands are Superior
      - Given your access you can work the hives better – lifting, placing boxes down, placing boxes back on the stack, and **this is better for your back**. Less awkward reaches and twists like a rail system.
      - They let you work all sides. They usually let you space the hives farther away from each other if you want. They also let you face each hive in a different direction.

Space around the pad

- *Space to work*
  - Ideally you will have the space to work around the hive – left or right side, *as well as the back*.
    - You can take the lid off and set alongside the hive, and still have room to walk around the colony unimpeded
    - In addition, the hives are spaced far enough apart to get through with a cart, hand mower, and/or riding mower



Gentle Bees & Proximity

Conservative Suggestions

- *When you are new, error on the side of caution*
- *Get to know your bees and learn your tolerances*
- *When you are more familiar, you can consider taking more risks based on your experience*
- *Making changeovers from season to season affords opportunities to make placement decisions and is a good play once you have a season or two under your belt.*

Placement Do's and Don'ts for Bees

❑ Recommendations and Suggestions

- *Every situation is unique.*
  - When placing bees, there are many recommendations, and some may or may not apply in your situation.
  - The next set of slides will run through several topics for consideration
    - Some are best practices and others are along the line of suggestions.
  - Keep in mind that bees can be kept on properties that have several acres, on city lots, rooftops, and in other situations
    - If your situation is unique, make an inquiry
    - If your situation is not conducive to host bees, there will be a recommendation

Locating the Apiary

❑ Full Sun Preferred

- *Full Sun, or as much sun as can be supplied*
  - Sun is beneficial for bees. Hotter environments are less conducive for honeybee pests
    - Bees can be kept on wooded lots. This is not ideal, but it can be done if there is no other recourse. The takeaway is full sun is optimal.

❑ Proximity to Forage

- *Ideally there will be forage preferably within ½ mile and up to 3 flight miles*
  - Cities and Urban landscapes are quite suitable

Location Features

❑ Water Source / Feature close by

- *Water is a necessity. Within a ¼ mile at minimum.*
  - The closer the water source, the better for the bees. Less round-trip time for bees fetching water equals less work and more productivity for the colony
  - **You should supply water for the bees**, and that will be covered later in this module

❑ Airflow and surface drainage

- *Hives require air exchange in the apiary. Stagnant air is not optimal*
  - Especially avoid low-lying damp areas, and ensure the site has excellent drainage
  - Air flow is desirable. Areas with high wind (not common) are not optimal

Place away from other features

❑ Fencing, Trees, and other Items

- *Keep the hives far enough away from any items that are adjacent to where you have placed your hives.*
  - Keep them far enough away from fences, nearby trees, overhanging limbs, buildings, shrubs, brush piles, undergrowth, and other objects.
- *Predator Spacing*
  - If you are in bear territory, distance the hives back from the bear fence
    - Keep them far enough that they cannot reach through, drop down over the fence
  - Keep low fencing for racoons, skunks, and other predators if this is a concern

Room to Grow

❑ Provide for Expansion

- *Pick a spot that can expand, or have an alternate ready*
  - Sometime expansion comes on purpose (making splits) and other times it comes unexpectedly (captured swarms)
  - Whether you plan to have more hives or not, give some consideration for either permanent or temporary space to hive additional hives.
  - Keep in mind setbacks and property lines while planning for expansion

Hives in Snow

❑ Access

- *Be sure you can get to hives in snow to care for them… and that you have access*
- *Consider sun for melting the snow from the entrances*

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Level Side to Side, Slight Tilt Forward

- **Hive should sit level side to side**
  - *Get this wrong and the bees will not build the comb properly*
    - Bees hang from one another (called festooning) when placing wax deposits to build comb. If the hive is off (tilted) they will not be able to build proper comb
- **Slight tilt forward**
  - *Water that falls on the landing will run off the front; not into the hive*

Location Features Ground

❑ Firm Ground

- *Rocky ground is ideal, Sandy Soil is not*
  - Some pests of the honeybee leave the hive and burrow into the ground below the colony. If they encounter hard rocks, this thwarts their success. They do very well in sandy soil

❑ Snow Melt

- *Choose the area where the snow melts quickly*
  - Avoid any area where the snow melts slowly on your property.
  - Damp and cold conditions are detrimental for bees, especially in winter.

Location Features Roof

- **High Barriers**
  - *Ideally there will be walls around the roof that mask the hives and provide protection from weather and wind*
- **Firmly Anchored**
  - *Cinder Block Bases*
  - *Strong Straps*

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Location Features Roof

Secure Extra Equipment

- *Never leave loose beekeeping equipment around the hives in a rooftop setting*

Security

- *Ensure you have a good working relationship with the building maintenance team*

Location Features Roof

Rooftop Infrastructure

- *Know what you are placing your hives next to*
  - Ensure the bees do not interfere with maintenance
  - Also ensure that anything on the roof is not going to be harmful to your bees
- *Consider storage*
  - A place to keep equipment
    - It is not always easy to move equipment up to a roof apiary

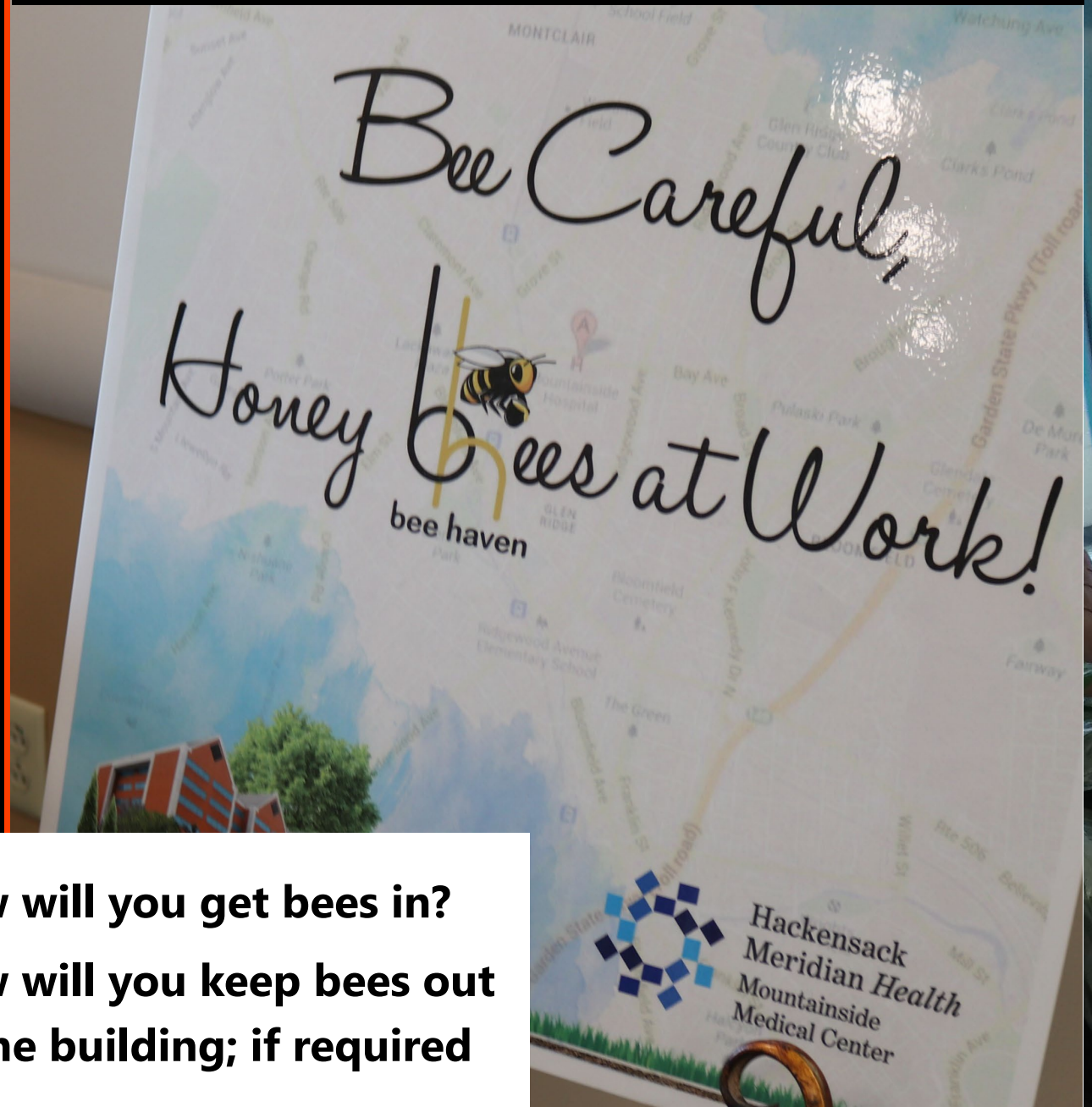
Location Features Roof

- **Consider Height**

  Bees can only be so high from the ground

Placement Recommendations

Consider Rooftop Access



- How will you get bees in?
- How will you keep bees out of the building; if required

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Away from Live Beings

❑ Away from Predators, Livestock, and Pets

- *Away from Predators*
  - In Open Space - Away from havens for Predators
    - Keep away from brush piles, and dense brush which provide shelter for predators
      - Keep brush cut back right in the apiary to negate **ants**, mice, moles, voles, and other pests
  - Away from known predator water sources
    - Locate away from known bear territories, or paths that are conducive for bears to travel
- *Away from Livestock*
    - Place away from animal holding areas (horses, cows, sheep, chickens, dog coops, etc.)

Considerations: Theft & Security

- **In some areas this is a problem**
  - *If it is a concern, consider your circumstances*
    - Plan for security: Secure Enclosure, Identifiers in and on hive
    - Camera Solutions
    - Strapping hives with locking straps and tamperproof enclosures
  - *Consider your safety*
    - Will you need to work bees in isolation? At Night? Alone?
    - Is the location conducive to any situations that might arise?

Orientation

❑ Face the hives toward the morning sun

- *The hives should face south or southeast*
  - Point them as close as possible to where the sun rises in the spring
    - Morning sun heats the hives and provides light and warmth; bees work earlier. Hives that do not face the morning sun are ok, but they tend to be less productive

❑ Wind Barriers > Prevailing Side of Apiary

- *Review your location and learn prevailing winds patterns*
  - Employ wind breaks or a barrier to prevent gusty winds from blowing through the apiary
  - Do not locate your hive at the base of a hill or places where the dampness collects

Broader Concerns

❑ Away from other Beekeepers

- *If there are beekeepers nearby, consider the pressure on the space*
  - It might be prudent not to add to the burden and choose an alternate location
- *Away from Agricultural, Industrial, and Chemical Threats*
  - Do not locate your apiary near a site where the bees will encounter undesirable elements
    - Some farms use pesticides that will kill bees. The same can be true for golf courses.
      - Consider the area and do not locate your operation where there is the possibility of pesticide and pest control exposures; especially if they are there already. It is a recipe for conflict.

Alternative Situations

❑ Lack of Space and Proximity Concerns

- *Sometimes you can make this work with some proper adjustments*
  - Bees close to humans – Build a fly way barrier
    - If you place a tall fence or barrier next to the hives, the bees will fly up and over them to get to their destination
      - Once a bee is at height, they tend to stay up there and you might walk on the other side of a fence where bees are present and not even detect they are there.
  - Proximity to Neighbors
    - Out of sight, out of mind. We encourage good communication with neighbors but sometimes selective screening around an apiary can make the operation a little more discreet.

Alternative Placements

Consider that, bad situations rarely get better with bees.

Don't force an issue or expect that masking is an end all solution

❑ Out Yards

- *Sometimes the best answer is > somewhere else*
  - If your property does not work, other options are out there. Farms, other landowners, corporations – if you work at it, there are alternatives to place bees

❑ Community Gardens

- *With the right setup, many successful community apiaries exist*
  - This takes some communication and/or planning but can yield good results

The **West Seattle Bee Garden** is one of our Favorite Examples (Google It!)

Water – *A Key Ingredient*

❑ Reiterating! Establish a Water Source

- *Don't impact your neighbors…*
  - Bees are unaware that it is your neighbors pool, birdbath, hummingbird feeder, or kiddy pool. You cannot break them of a selection.
- *Water Feature Advice*
  - Between your bees and your neighbor's pool

❑ Bees cannot survive without water

- *Processing food, Keeping the hive cool, Other activities….*

Giving Bees Water

Around your property

- **Water is critical for bees**
  - Provide water
    - *We recommend a bucket with holes and floaties*
    - *Place in 30 yards or so from the hive.*
  - Scent and Salt the water
    - *Add a drop of Anise Extract, or lemongrass oil, to the water as an attractant*
    - *Salt the water – this also makes the water more attractive to the bees - Enough salt so that the water has just a touch of salty taste to you.*

Giving Bees Water

Right at the entrance of a hive

- **Water is critical for bees**
  - Feed water at the entrance
    - *You can provide water at the entrance*
    - *A suitable use for a Boardman Style feeder (the name for the feeder shown)*
  - Early has an added benefit
    - *Do this early and bees will come to your water source, not your neighbors water sources*

BOSTON AREA BEEKEEPERS ASSOCIATION