

Master Beekeeping Part II: The Science and Art of Beekeeping

Course Project – Plan Your Upcoming Bee Year

It's early spring and the active beekeeping season is just beginning! Planning for the year ahead will help you focus on your goals and strategize how to achieve them.

Create a Calendar / Schedule for the year ahead that is unique to your goals, operation and region.

Beekeeping Planner

Region of Focus: Northeast, U.S.A.

Month	Pest Management	Inspection / Maintenance	Nutritional Requirements	Conditions and Notes
January	1) Monitor mite drop via screen bottom board or by using a white board slid over the bottom board behind the mouse guard 2) Collect dead bees and check for Nosema under the microscope	Inspect equipment for issues <ul style="list-style-type: none"> • Moisture in inner cover • Secure covers ➤ Remove Deadouts ➤ Clear entrances ➤ Order replacement bees if there are dead outs	To Do: Add dry sugar / fondant in upper shim area if needed (based on weight) near the cluster Blooming Sources: <ul style="list-style-type: none"> • Witch Hazel 	Colony: in a winter cluster. Cleansing flights on sunny days @ 50° F. Queen: may lay a few eggs warmed by the cluster
February	1) Monitor mite drop via screen bottom board or by using a white board slid over the bottom board behind the mouse guard 2) Collect dead bees and check for Nosema under the microscope	Inspect equipment for issues <ul style="list-style-type: none"> • Moisture in inner cover • Secure covers ➤ Remove Deadouts ➤ Clear entrances ➤ Order replacement bees if there are dead outs ➤ Order Northern Nucs to introduce new genetics <i>Note: Poline Nucs will be available for sale thru the beclub!!!!</i>	To Do: Add dry sugar / fondant and pollen in upper shim area if needed (based on weight) near the cluster. Blooming Sources: <ul style="list-style-type: none"> • Witch Hazel 	Colony: in a winter cluster and may have moved up to the top. If possible, move food stores closer to the cluster Cleansing flights on sunny days @ 50° F. Queen: lays a few eggs warmed by the cluster

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<p>March</p>	<p>1) Monitor mite drop via screen bottom board or by using a white board slid over the bottom board behind the mouse guard Use Oxalic Acid Vapor if threshold is above 2%</p> <p>2) Collect dead bees and check for Nosema / Varrimorpha under the microscope</p> <p>Mite population will start to rise with new brood; Order Varroa Miticide treatments based on IPM plan</p>	<p>Inspect equipment for issues</p> <ul style="list-style-type: none"> Moisture in inner cover Secure covers <p>➤ Remove Deadouts</p> <p>➤ Clear entrances</p> <p>Prepare equipment to be used next month</p> <ul style="list-style-type: none"> Nucs for splits Covers, Bottoms, hive boxes, etc. Replacement frames and foundation 	<p>To Do: Add dry sugar / fondant and pollen in upper shim area if needed (based on weight).</p> <p>Feed colonies destined for raising queens (see notes)</p> <p>Move frames of honey closer to the cluster</p> <p>Blooming Sources:</p> <ul style="list-style-type: none"> Crocus Pussy willow Red/Silver maple Skunk cabbage Sugar maple (late March) Witch Hazel 	<p>Colony: In a cluster towards the top and at minimum strength. If possible, move food stores closer to the cluster</p> <p>Queen: Laying eggs; Brood is being reared if pollen available</p> <p>Queen Rearing Notes</p> <p>Colony(s) destined to raise queens will need to be fed both fondant and pollen more-so</p> <p>Determine a VSH Queened colony (overwintered traits) as the source of the graft (or graftless) method. This will be the “Breeder Colony”. Feed as well.</p>
<p>April</p>	<p>MONITORING:</p> <p><i>When temperatures are above 60%, Do an alcohol wash or use Screened Bottom boards for Varroa mite counts.,.</i></p> <p>@2% threshold, use APIVAR (6-8 weeks) No honey Supers</p> <p>OA Dribble when installing packages</p>	<p>Install new packages + treat</p> <p>Inspect on warm days:</p> <ul style="list-style-type: none"> Clean bottom board Remove overwintering equipment Move bottom brood box to the top of the brood nest if empty. REPLACE 1 to 2 frames of Old Comb per colony with new frames of foundation. Check for Brood diseases and Queen health Record the date when “purple eyed” drones are observed Plan out Queen Rearing (if applicable this year) 	<p>To Do: Feed 1:1 syrup and pollen if needed (they need 3 to 4 frames of honey);</p> <p>Feed the colony(s) destined to raise queens and any packaged bees / nucs</p> <p>Plant native wildflower seeds bulbs intended for pollinators after frost.</p> <p>Blooming Sources:</p> <ul style="list-style-type: none"> Witch Hazel, Maples, Crocus, skunk cabbage Dandelions Deadnettle Eastern redbuds Elm trees Poplar trees Wild Strawberry Yellow rocket 	<p>Colony: Clustered on cold days, but bringing in pollen and nectar on warmer days.</p> <p>Queen: Laying eggs; Drones are being reared if the colony is strong enough and there are plentiful food stores</p>

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<p style="text-align: center;">May</p>	<p>MONITORING:</p> <ul style="list-style-type: none"> • Screened B Board • Powdered Sugar Shake or Alcohol Wash <p>@ 2% Threshold Apiguard® (4-6 week treatment) <i>No honey supers</i></p> <p>Use Drone Comb to attract mites; Remove & freeze every 2 weeks</p> <p>Queen replacement if needed</p> <p>Brood Breaks (splits)</p>	<p>INSPECT</p> <ul style="list-style-type: none"> ➤ <u>Queen Cells:</u> <ul style="list-style-type: none"> • Make Splits • Move Queen Cells to a nuc → Use Jester Nuc boxes if selling ➤ Brood diseases ➤ Queen Health – eggs (presence), brood pattern ➤ Inspect new colonies (nuc, package) 2 weeks after installment <p>PROBLEMS? Requeen</p> <p>Remove any over-wintering wraps, mouseguards and insulation.</p> <p>ADD SUPERS over Queen Excluder if brood chambers are full and the nectar flow is on</p> <p>Add new comb to be drawn out</p> <p>Raise Queens if needed</p> <p>NUC swap for genetic diversity (<i>if possible</i>)</p>	<p>To Do: Feed 1:1 syrup and pollen if necessary.</p> <p>Feed any nucs or packaged bees and any colony(s) destined to raise queens</p> <p>Plant native wildflower seeds bulbs intended for pollinators.</p> <p>Blooming Sources:</p> <ul style="list-style-type: none"> • Dandelion, Deadnettle, Honeysuckle, Maple, Oak, Poplar, Wild Strawberry, Yellow Rocket • Blackberries, Blueberries, Fruit trees, raspberries • Autumn olive, Black locust, Clover, Hawthorn, mustard, tulip poplar 	<p>Queen is laying a high level of eggs and the brood chamber is expanding. Overcrowded conditions lead to swarming. In this case:</p> <ul style="list-style-type: none"> • Perform Splits • Add Supers
<p style="text-align: center;">JUNE</p>	<p>MONITORING:</p> <ul style="list-style-type: none"> • Screened B Board • Powdered Sugar Shake or Alcohol Wash <p>@ 2% Threshold Mite-Away-Quick Strips® (7 day treatment) or Formic-Pro (14 day treatment)</p> <p>Use Drone Comb to attract mites; Remove & freeze every 2 weeks</p> <p>Queen replacement with Grafted VSH Queen Cells</p> <p>Brood Breaks (splits)</p>	<p>INSPECT</p> <ul style="list-style-type: none"> <u>Queen Cells:</u> <ul style="list-style-type: none"> • Make Splits • Move Queen Cells to a nuc → Use Jester Nuc boxes if selling Brood diseases Queen Health – eggs (presence), brood pattern <p>>> PROBLEMS? Requeen</p> <p>PULL supers and Extract</p> <p>ADD SUPERS (extracted or new) over Queen Excluder if brood chambers are full and the nectar flow is on</p> <p>Prepare the “Breeding Colony” for grafts again if desired</p>	<p>To Do: Feed nucs or packaged bees and any colony(s) destined to raise queens</p> <p>Blooming Sources: Apple, alfalfa, Autumn olive, Berries, Birdsfoot, Black locust, Catalpa trees, Cherry, Chicory, Clover, dandelion, deadnettle, grape, hawthorns, honeysuckle, knapweed, Linden, Milkweed, Oak, Pear, Plum, purple loosestrife, Russian olive, sumac, trefoil, tulip poplar, vetch, willow, yellow</p>	<p>The colony is at maximum population (average 40,000 to 60,000 +)</p> <p>Foundation will be drawn out during the honey flow</p> <p>If there are swarming concerns, set up bait hives.</p> <p>Queen Rearing Notes</p> <p>Follow the QR Calendar plan again towards the end of the month (change the dates) if ready to add more queens.</p>

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JULY	<p>MONITORING:</p> <ul style="list-style-type: none"> • Screened B Board • Alcohol Wash <p>@ 2% Threshold HopGuard® (30 day treatment)</p> <p>Use Drone Comb to attract mites; Remove & freeze every 2 weeks</p> <p>Queen replacement with Grafted VSH Queen Cells</p> <p>Brood Breaks</p> <ul style="list-style-type: none"> • Cage the queen for 3 weeks • Splits 	<p>INSPECT</p> <p><u>Queen Cells:</u></p> <ul style="list-style-type: none"> • Make Splits • Move Queen Cells to a nuc → Use Jester Nuc boxes if selling <p>Brood diseases</p> <p>Queen Health – eggs, brood pattern</p> <p>>> PROBLEMS? Requeen</p> <p>Dearth Condition?</p> <ul style="list-style-type: none"> • Monitor food stores • robbing screens • Provide a water source in a drought <p>Nectar Flow?</p> <ul style="list-style-type: none"> • Add supers where needed • Remove capped honey when flow is has stopped 	<p>To Do: Monitor food stores and feed if a dearth occurs</p> <p>Blooming Sources: Alfalfa, asters, birdsfoot trefoil, Blackberry, buttonbush, buckwheat, chicory, clovers, common jewelweed, corn, dogbane, elderberry, goldenrod, grape, hairy and purple vetch, Japanese knotweed, Joe-Pye weed, knapweed, Milkweed, mint, Pear, purple loosestrife, raspberry, Russian olive, sumac, summersweet, tulip poplar, viper's bugloss, yellow rocket</p>	<p>The colony population settles in mid-July</p> <p>In the heat, Bees will ventilate the hive and beard outside. Make sure that the ventilation in the hive is cleared</p>
August	<p>MONITORING:</p> <ul style="list-style-type: none"> • Screened B Board • Alcohol Wash <p>@ 3% Threshold Mite-Away-Quick Strips® (7 day treatment) or Formic-Pro (14 day treatment)</p> <p>Use Drone Comb to attract mites; Remove & freeze every 2 weeks</p> <p>Queen replacement with Grafted VSH Queen Cells</p> <p>Robbing Screens</p>	<p>INSPECT</p> <p><u>Queen Cells:</u></p> <ul style="list-style-type: none"> • Remove • Use a Snelgrove board to stop the swarming instinct <p>Brood diseases</p> <p>Queen Health – eggs, brood pattern</p> <p>>> PROBLEMS? Requeen</p> <p>Check for Honey bound conditions; The queen needs room for winter bees</p> <p>Dearth Condition?</p> <ul style="list-style-type: none"> • Monitor food stores • robbing screens • Provide a water source in a drought <p>Fall Honey Flow?</p> <ul style="list-style-type: none"> • Add supers where needed • Remove capped honey when flow is has stopped IF the colony has a surplus <p>Weak Colonies: Feed these colonies 2:1 syrup and make a plan to merge them with another colony if there are no disease issues</p>	<p>To Do: Monitor food stores; If feeding is required, use 2:1 ratio syrup;</p> <p>Supply pollen if supplies are low</p> <p>Blooming Sources: Alfalfa, asters, birdsfoot trefoil, buttonbush, buckwheat, Chicory, clovers, common jewelweed, Japanese knotweed, Joe-Pye weed, knapweed, Milkweed, mint, pumpkin, purple looseleaf, squash, sumac, Summersweet, Thistle, vetch, viper's bugloss,</p>	<p>August is the start of winter preparation.</p> <p>The bee population is slowing down. Winter bees are emerging at the end of August.</p> <p>This is the peak of Varroa mite population (thru September).</p> <p>In the heat, Bees will ventilate the hive and beard outside. Make sure that the ventilation in the hive is cleared</p>

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<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">September</div>	<p>MONITORING:</p> <ul style="list-style-type: none"> • Screened B Board • Alcohol Wash <p>@ 3% Threshold Mite-Away-Quick Strips ® (7 day treatment) or Formic-Pro (14 day treatment) or HopGuard ® (30 day treatment)</p> <p><u>Queen replacement with Grafted VSH Queen Cells</u></p> <p><u>Robbing Screens</u></p>	<p>FINAL INSPECTIONS</p> <p><u>Queen Cells:</u></p> <ul style="list-style-type: none"> • Remove • Use a Snelgrove board to stop the swarming instinct <p>Brood diseases</p> <p><u>Queen Health</u> – eggs (lessened), brood pattern</p> <p>>> PROBLEMS? Requeen</p> <p><u>Dearth Condition?</u></p> <ul style="list-style-type: none"> • Monitor food stores • robbing screens • Provide a water source in a drought <p>Weigh the colony</p> <p>Condense the colony (see notes)</p> <p>Add feeding shims under the outer cover</p> <p>Combine weak (non-diseased) colonies and nucs</p> <p><u>Fall Honey Flow?</u></p> <ul style="list-style-type: none"> • Add supers where needed • Remove capped honey when flow is has stopped IF the colony has a surplus <p>Weak Colonies: Feed these colonies 2:1 syrup and make a plan to merge them with another colony if there are no disease issues</p>	<p>To Do: Monitor food stores; Full sized colonies should have 70 to 90 pounds of stored honey; If feeding is required, use 2:1 ratio syrup;</p> <p>Feed the “Finishing Colony” for preparation in next year’s queen rearing</p> <p>Supply pollen if supplies are low</p> <p><u>Blooming Sources:</u></p> <p>Asters, Buckwheat, Clovers, Goldenrod, Japanese knotweed, knapweed, purple loosestrife, sweet pepperbush, Thistle</p>	<p>Queen slows down egg laying.</p> <p>Drone brood diminishes</p> <p>NOTES:</p> <p>Condense the colony – Bees are no longer making wax as efficiently. Empty frames should be removed. If there are 10+, remove the hive box. Otherwise, replace with these frames with drawn out comb</p>
October	<p>1) Monitor mite drop via screen bottom board or by using a white board slid over the bottom board behind the mouse guard *</p> <p>Use Oxalic Acid Vapor if threshold is above 3%</p>	<p><u>Winter preparation</u></p> <p>INSTALL:</p> <ul style="list-style-type: none"> • Mouse Guard • R12 Foam board inserted under the hive cover to prevent condensation • Wrap hive boxes with black tar paper (leave vent holes open) • Put up wind breaks <p>WEIGH colonies; Combine weak colonies</p>	<p>To Do: Full sized colonies should have 70 to 90 pounds of stored honey; If feeding is required, use 2:1 ratio syrup;</p> <p>Plant wildflower seeds bulbs intended for pollinators.</p> <p><u>Blooming Sources:</u></p> <p>Asters</p>	<p>Egg laying has mostly stopped</p> <p>Drones are forced out of the colony</p> <p>Winter cluster is formed when temps are 50°F</p>

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November	1) Monitor mite drop via screen bottom board or by using a white board slid over the bottom board behind the mouse guard Use Oxalic Acid Vapor if threshold is above 3% 2) Collect dead bees and check for Nosema under the microscope	Check for equipment issues in the apiary (cover not secure, hive wrap torn) Equipment to be stored must be cleaned and “Mouse” & “Wax moth” proofed Take inventory for next year’s adventures Add frames and foundation to continue to replace old comb	<u>N/A</u>	Bees are in a winter cluster Make a wish list of equipment for next year, along with new frames and foundation. Do this before “Black Friday” sales to save money.
December	MONITORING: 1) Monitor mite drop via screen bottom board or by using a white board slid over the bottom board behind the mouse guard 2) Collect dead bees and check for Nosema under the microscope	➤ Check for equipment issues (cover not secure, hive wrap torn) ➤ Remove Deadouts ➤ Clear entrances	<u>N/A</u>	Bees are in a winter cluster

***Undertaker Drawer*:** This is a piece of equipment used in all my colonies (Langstroth Hive or NUC boxes) during the winter and is something that my bee squad team at **Wetlands Apiary** came up with. It is a piece of (*white*) aluminum that slides over the bottom board. The front is bent at a 90° angle and contains a few 3/8” holes that allow honeybees to travel in and out of the colony, and keeps the mice out (it’s a mouse guard). Once the weather is no longer suitable for a screened bottom board and before the threat of mice looking for winter homes starts, the Undertaker Drawer is installed. During the colder months, the drawer can be pulled out temporarily and the dead bees can be removed from the colony (instead of using a stick). These dead bees are collected and analyzed for Nosema spores. Varroa mite counts can also be done (and OA vapor treatments done if needed in October and November) along with observations of other debris. And based on the fallen chewed wax, you can get an approximate location of the colony.

NOTES for Varroa Mite Pest Management

Test for mites at least once a month. The threshold is a mite load of 2 to 3% (2 to 3 mites per 100 bees). Resource: Honey Bee Health Coalition, Tools for Varroa Management

Replace failing queens with those with VSH traits from the Queen Rearing program. This can be done ideally after a brood break.

Consider a brood break to slow down mite reproduction.

- 1. Remove the existing queen**
- 2. Make splits on colonies (swarming prevention, downsize large colonies) where needed**
- 3. After 21 days, there should be a brood break.**
- 4. Replace 1 or 2 frames filled with old comb in each colony with frames of foundation.**

5. Treat with oxalic acid vaporization in colonies testing high with mites (threshold 2%).
6. Install queens with VSH traits

At a time when drone comb is being built out, consider using the green drone frames to attract mites. Remove the frame after 2 weeks once the drones are capped and before they emerge (24 days) and freeze kill. If green drone frames are not practical, then remove the drone comb where you can. Drone comb is attractive to mites and removing it can help bring the mite population down.

In April, treat colonies that have a high mite load with Apiguard®. This is a 4 to 6 week treatment and supers can be added after the treatment ends.

From late June (to early August), plan to treat when mite loads are high with Mite-Away-Quick-Strips® (7 days) when there is capped brood or HopGuard III® (30 days) when there is less brood.

Reduce robbing and drift by rotating hive entrances or use robbing screens.

References:

Cornell University Master Beekeeping Program: Beekeeping Calendar for the Northeast

Cornell University Master Beekeeping Part III: Managing Pests and Diseases, Varroa Sensitive Hygienic

eCornell Varroa treatment Guide, "*Chemical treatments for managing Varroa mites*"

Honey Bee Health Coalition, Tools for Varroa Management

https://honeybeehealthcoalition.org/wp-content/uploads/2015/08/HBHC-Guide_Varroa-Interactive-PDF.pdf

Marla Spivok 2006 "*Minnesota researcher helps an invasion of mites*"

<https://www.mprnews.org/story/2006/09/15/beemites>

Jennifer Berry, Bee Culture (August 2018), "Use Methods For Controlling Varroa That Are Tested, Legal and Work"