NEBEEC
The Beekeeper's Digest

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Welcome to the NEBEEC Beekeeper's Digest!

NEBEEC (Northeast Beekeepers Education Collaborative) brings beekeepers the best available and most current knowledge for practical beekeeping success. This monthly newsletter provides summaries and highlights of:

- Presentations to local bee clubs
- Journal articles
- YouTube videos
- Podcasts
- Research updates

NEBEEC also has an opt-in, collaborative Slack-based community for members to interact in. This community also has an embedded and customized AI chatbot for answering members beekeeping questions.

Forward this newsletter to other beekeepers you know! Spread the word.

We have recently revamped our website. Check it out! You will also find previous digest issues there and can request to join the NEBEEC Slack community — visit nebeec.org

Suggestions or feedback? Write us at nebeec@gmail.com

Russ Holden — Reporting

Beekeeping Nuggets

We run unpaid advertisements for any interested bee or bee equipment supplier. We believe that a healthy beekeeping ecosystem requires a strong set of local suppliers — people you not only buy from but have relationships with. So, please shop local whenever possible — it helps us all! If there are other suppliers who would like to be included in future editions, please send your ad as a graphic of any kind to nebeec@gmail.com.

Honey Bee Health Coalition will be publishing their 9th edition of their Varroa Management Guide. This will be the first update since 2022 and per Dr. Caron, will have a major and important update to varroa treatment thresholds.

Massachusetts Department of Agriculture Resources (MDAR) is finalizing a **Tropilaelaps response plan** which will be the work of a large multi-disciplinary group. This looks destined to be the first such plan in the country and could be critical both for Massachusetts and for other jurisdictions which seem likely to leverage it. We will let you know when it is available.

MDAR will also be publishing an **identification guide for Yellow-Legged Hornets** very soon. Unfortunately, it didn't quite make our publication deadline, but we will send it out as soon as it is available.

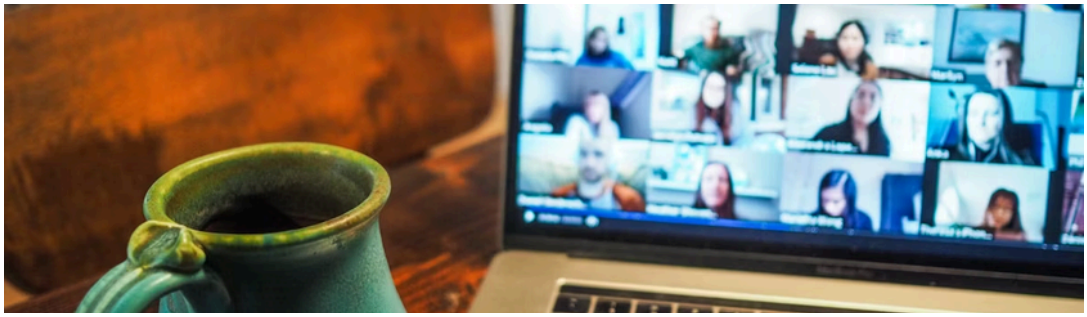
Kamen Reynolds has announced dates for the 2027 North American Honey Bee Expo. It will be January 7-9, 2027, in Louisville at the same venue as last year. I attended it for the first time in 2026 and highly recommend it. See https://www.nahbexpo.com/. I'm registered!

The 2026 Eastern Apicultural Society conference will be in Shepherdsville Kentucky (just a bit south of Louisville) from July 26-31st. I will be making my first attempt at the EAS Master Beekeeper Exams there. Send good thoughts!

MassBee is having their summer field day in Amherst MA on June 13th. I will be presenting twice and on two different topics. Registration is at https://www.massbee.org/event-6614530.

A bit of apology for the relative brevity of this month's edition. With the season in full swing and many more colonies than I have run in the past along with trying to help mentees and preparing for my EAS exams I'm feeling a bit overwhelmed.

Upcoming Events



MDAR Honey Bee Education Days — May 8, 2026, Spring Management, 1-3pm. This event will be happening concurrently in 2 locations: University of Massachusetts Agricultural Learning Center Farm, 911 North Pleasant St, Amherst MA and Bristol County Agricultural High School, Standish House Admin Building, 28 Center St, Dighton MA.

COLOSS North America 2026 — **Nutrition, Landscape Change and Honey Bee Health, June 6-12** https://bees.wsu.edu/event/coloss-north-america-2026/. This is an in-person international conference of bee researchers hosted in the US for the first time by Washington State University. There is a rough agenda on the website though individual sessions haven't been announced yet. On-line attendance is $50.

Connecticut Beekeepers Association — June 11, 2026, 6:30-8:00pm EDT. Bill Hesbach leads the CBA monthly Q&A for members on Zoom on the 2nd Thursday of each month. https://www.ctbees.org/upcoming-events. These meetings are also recorded and are available for replay via the CBA website and (currently) made public on their YouTube channel.

MDAR Honey Bee Education Day — June 12, 2026, 1-3pm. "Summer Management", Bristol County Agricultural High School, Standish House Administration Building, 28 Center St, Dighton, MA

MassBee Field Day — June 13, 2026, 9am-3:45pm. University of Massachusetts Agricultural Learning Center Farm, 911 North Pleasant St, Amherst MA. Register at https://www.massbee.org/event-6614530.

At Home Beekeeping Series — June 30, 2026, 7:30-8:30pm EDT, Dr. Juliana Rangel, Texas A&M University will be presenting on "Queen Management Essentials". See https://www.aces.edu/blog/topics/bees-pollinators/at-home-beekeeping-series/

Connecticut Beekeepers Association - July 9, 2026, 6:30-8:00pm EDT. Bill Hesbach leads the CBA monthly Q&A for members on Zoom on the 2nd Thursday of each month. https://www.ctbees.org/upcoming-events. These meetings are also recorded and are available for replay via the CBA website and (currently) made public on their YouTube channel.

MDAR Northeast USA Honey Bee Update Lunch & Learn Series — August 7, 2026, 12-1:30pm. This excellent series is back for 2026. It brings together apiary inspectors across the northeast to talk about the state of bees and beekeeping in the region. Registration required. https://us06web.zoom.us/webinar/register/WN_y5hKOVHyTuep7N7BoovQvA

Notes From Recent Live Events

At Home Beekeeping Series — May 26, 2026, Dr Alexander McMenamin, Postdoctoral Researcher USDA Baton Rouge. ***"Overview of bee viruses and research efforts to combat them"***. This talk focused on means other than mite control to reduce the threat of viruses to our colonies. There is an increasing amount of work in these areas and, hopefully, we will see commercially available products in the next few years to neutralize or eliminate viruses directly.

Takeaways:

- Viruses pose a major threat to individual bees and entire colonies and are closely linked to colony losses.
- **Most infections are asymptomatic but still reduce bee vitality and longevity.**
- Deformed Wing Virus (DWV) and Varroa mites have a mutually reinforcing relationship: DWV suppresses bee immunity which aids mite reproduction and mites efficiently spread DWV.
- DWV causes shorter bee lifespan, impaired learning and navigation, and colony death, especially during winter.
- Pinacidil has been demonstrated to increase bee survival against some viruses in lab and field studies.
- Limitations of Pinacidil include cost, accessibility, and potential off-target effects such as impacts on bee heart tissue.
- *Spirulina (algae)* is nutritious and can be engineered to deliver antiviral molecules like RNAi.
- Engineered algae can deliver dsRNA targeting DWV, reducing deformities and viral loads. Advantages include targeted action, nutritional benefits, and sustainable production.
- Selection experiments have identified bee lines with natural resistance or tolerance to DWV.
- Resistance heritability may be influenced by environment and rearing conditions.
- Resistance to one virus may not confer resistance to others; monitoring for off-target effects is necessary.

Podcasts

Beekeeping Today Podcast — ***Queen Series: Ang Roell on Queen Breeding and Hygienic Genetics*****,** May 18, 2026. Ang Roell and They Keep Bees are among a relatively small number of serious queen breeders in the north so their practices are something to pay attention to. I have queens from They Keep Bees in some of my colonies — it's a nice drive out to Montague Massachusetts from where I live. https://www.beekeepingtodaypodcast.com/385-queen-breeding-genetics/

Takeaways:

- Raising queens requires precise timing, skill (grafting, timing, weather management), and genetic planning.
- Ang has 13 years of beekeeping experience; professional for 10 years. They Keep Bees was founded in 2019. Initially operated migratory beekeeping in Massachusetts and Florida, now based full-time in Western Massachusetts. They shifted from migratory to stationary operations to focus on advanced breeding and genetic work.
- They Keep Bees focuses on Varroa-sensitive hygienic stock using Harbo assays and mite washes.
- They now use instrumental insemination to control genetics and improve stock.
- They work with Carniolan lines suited to the Northeast climate.
- Mating yards and drone yards should be within 2 miles to influence queen mating.
- Complete genetic control is difficult at small scales due to open mating with local drones.
- Saturating the drone pool with selected genetics increases the chance of desired matings.
- Early queen production is no longer feasible after moving operations north.
- Local customers can adjust management to accommodate later queen availability.
- They are also teaching customers about using queen cells and virgin queens for splits and requeening — something that is quite rare in the Northeast:
  - Queen cells are cheaper, allow genetic mixing, but involve risks (e.g., successful mating, predation).
  - Virgin queens: Must be introduced quickly — more challenging than mated queens.
- Commercially, queen cells and virgins are common for early splits and expansion.
- Push-in and Scalvini cages can be used for introducing mated or inseminated queens.
- Timing and hive preparation are crucial for successful queen acceptance.
- Ang emphasizes continual experimentation and data collection (e.g., SARE grant studies). Recent research includes walkaway split success rates and heritability of Varroa-sensitive hygiene.

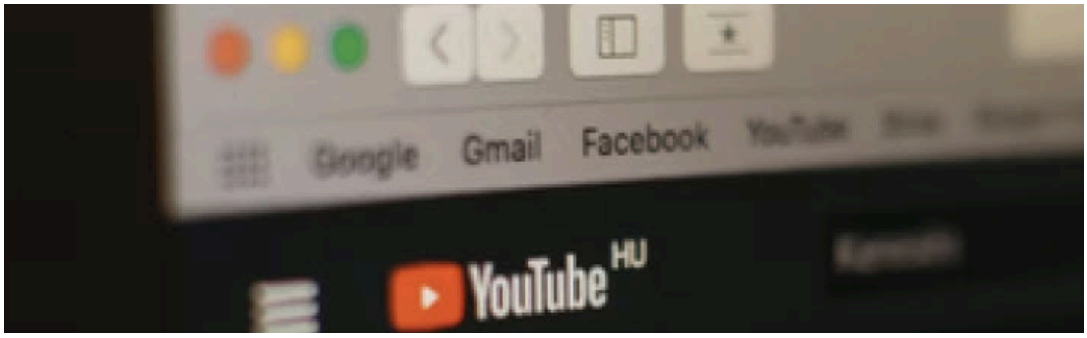
Beekeeping Today Podcast — ***Queen Series: Randy & Eric Oliver on Selective Breeding and Varroa-Resistant Bees*****,** May 11, 2026. This is a discussion of the evolution of one of the popular lines of varroa hygienic bees — Golden West. https://www.beekeepingtodaypodcast.com/384-selective-breeding-varroa-resistant-bees/

Takeaways:

- Eric Oliver took over the family beekeeping business from Randy after the 2008 housing crash, now manages 1,200+ hives and focuses on nuc production.
- Randy Oliver holds degrees in biology and entomology, runs the Scientific Beekeeping website, and is a leading advocate for mite-resistant stock.
- Breeding honey bees is like breeding for desired traits in any livestock or plant—select for specific characteristics (e.g. gentleness, honey production, mite resistance).
- In 2015, discovered a colony with zero mite count, sparking a focused breeding program.
- Mite wash all colonies, select and breed only from those maintaining low or zero mite counts throughout the season.
- Mite washing saves money by reducing unnecessary treatments. Custom tools and data tracking have made the process manageable even at their scale.
- Partnered with Oliveras Bees to scale up queen production, providing isolated mating yards to control genetics. They are using a 50,000-acre ranch to saturate the drone pool with Golden West genetics.
- Drone Management: Maintaining a robust drone population is labor-intensive but essential for genetic control.
- Selective breeding has led to colonies that are more productive, gentle, and require less protective gear. Their beekeepers now often work hives in shorts and t-shirts due to improved bee temperament.
- The Oliver operation has not used synthetic miticides since 2001, relying on genetics for mite control.
- Golden West queens perform well in diverse climates, including cold northern regions and the rainy Pacific Northwest. But they were optimized for the timing of almond pollination so build up very early for some climates.
- Effective selective breeding requires many hives and control over the drone pool; small backyard operations cannot achieve the same results.
- Mixing different bee lines leads to unpredictable results ("Frankenbees").

Two Bees in a Podcast — *Understanding Norroa with Adam Pachl*, May 27, 2026. https://www.youtube.com/watch?v=C2M-a5pYJYg. I'm not going to review this specifically because we have done a lot of material on Norroa including our own presentation from Adam Pachl. But, if you need a primer on Norroa, this is an excellent episode to watch.

YouTube Channels



BetterBee — "How to Use Api-Bioxal RTU (Ready to Use)" — https://www.youtube.com/watch?v=AihTk85OzN4. This is a very short video but useful for anyone interested in oxalic acid dribble for varroa control and want to a simpler path to it.

Takeaways:

- Api-Bioxal RTU is a pre-mixed glycerin-based solution of oxalic acid.
- By using glycerin rather than sugar, the solution isn't consumed by bees and results in greater effectiveness in mite control.
- It has twice the OA concentration of what is allowed on the label for home mixed solutions.
- There is no maximum dosage per hive as there is with the homemade solutions — it can be used at 5ml per seam of bees at any size of hive.
- The applicator bottle that comes with the product and is shown in the video makes treatments extremely fast. Probably about 30 seconds per box.

It can be reapplied as needed — BetterBee recommends 4 applications at 1-week intervals when there is brood. This is consistent with research showing that repeated OA applications, whether dribble or vaporization, can be very effective even when brood is present.

Recent Journal Articles of Note

Bee Culture, June 2026 — *"Glyphosate Disrupts Human and Bee Health — So Why Is It So Widely Supported"*, Dr. Dewey Carron, pages 45-47. The war against glyphosate continues to go badly. Dr. Caron reminds us why this fight is so important.

Takeaways:

- Glyphosate is a dominant herbicide in U.S. agriculture and used on major crops such as soybeans, corn, wheat almonds and cotton as well as in many home gardens.
- Bees are exposed to glyphosate via foraging on treated crops and contaminated water, accumulating residues in their colonies.
- A 2021 review found glyphosate, even at recommended doses, negatively impacts bee survival, development, and behavior.
  - Disrupts gut microbiomes
  - Impairs bee navigation, immune systems, and cognitive functions.
  - Delays larval growth, reduces adult weight, and mats bee body hair, leading to death.
  - Example: Bees exposed to Roundup products showed impaired temperature regulation and learning ability.
- Some studies show stronger effects than others, but the overall trend indicates increased bee mortality and colony disruption.
- Glyphosate is linked to non-Hodgkin lymphoma and over 200,000 lawsuits have been filed against Bayer.

- Bayer proposed a $7.25 billion settlement, with variable payouts based on exposure and illness severity.
- EPA-approved labels for Roundup do not warn of cancer risk, relying on a since-retracted, Monsanto-funded study.
- The retracted study was criticized for excluding independent research and using only unpublished Monsanto data.
- U.S. Supreme Court is considering whether Monsanto had a duty to warn about cancer risks.
- Farm groups argue glyphosate is essential for agriculture, warning that restrictions would push farmers to foreign suppliers.
- An executive order from February 2026 pushes to increase production of glyphosate-based herbicides.
- Glyphosate is banned in organic farming. Switching to organic diets can reduce glyphosate exposure by up to 70% for both adults and children.
- Due to lawsuits, Bayer has withdrawn glyphosate from residential lawn and garden markets in the U.S., but it remains in agricultural use.
- Major reductions in glyphosate use are unlikely unless human health impacts—especially cancer risks—force regulatory changes.

American Bee Journal, June 2026 — *"Africanized bees in the United States Part 2: How far will they go?"*, Dr. Dewey Carron, pages 637-641. Yes — Dr. Carron is everywhere! This is part 2 of a 4 part series on Africanized Bees and focused on the potential geographic spread within the United States.

Takeaways:

- First Africanized Honey Bee (AHB) swarm captured in Hidalgo, Texas in 1990.
- By June 1991 59 swarms/colonies had been captured in southeastern Texas.
- In 1985 mixed African/European bee colony found in Lost Hills, CA, possibly introduced via equipment from Venezuela or as a local variant.
- By 2006, AHB detected in 163 of 254 Texas counties.
- Detection in New Mexico & Arizona in 1993.
- California: First detection in 1994; by late 1990s, up to 25% of captured bees were Africanized.
- Fatalities and aggressive bee incidents continued in various states.
- Taylor & Spivak study from 1984 predicted that AHB would be limited to southern U.S. regions.
- Alternative models predicted a wider potential range.
- AHB genes have been found throughout the U.S. via beekeeper transport, pollination services, and accidental movement, but persistent feral colonies are mainly in warmer areas.
- Feral AHB colonies common in at least 13 states, concentrated in the Southwest and parts of the Gulf Coast.
- AHB are widespread in Florida especially in central/southern counties, originating from swarms entering via ports.
- "So-Cal bees" (feral hybrids) have about 40% AHB genetic content, lower than Mexican or Panamanian hybrids.
- Northward spread reached Mariposa County by 2006 and as of 2015, northernmost AHB detection was about 40 km south of Sacramento.
- Other states:
  - Utah: Feral colonies in 8 southern counties by 2017.
  - Colorado: One aggressive colony in 2014, likely imported; few subsequent reports.
  - Oklahoma/Arkansas: Widespread in Oklahoma and expanding in Arkansas since 2005.
  - Tennessee: Sporadic incidents; minimal establishment.
  - Georgia: Officially AHB-free, but genetic analysis found 20% of samples with AHB genes.
- A study by UC Davis in 2020 suggests that AHB expansion has stalled.

- Winter precipitation and minimum temperatures limit AHB survival in northern regions.
- AHB traits come with metabolic costs, reducing survival in temperate climates.
- U.S. has more feral European bees than South America, limiting AHB dominance.
- Southern and Southwestern residents have adapted to living with defensive bees, but danger remains, especially with new incursions or for the unprepared.
- Several human fatalities in Texas, Arizona, and other states due to AHB attacks.

Research Updates

Brettell L, Ferreira C, Villalobos Ethel, Schroeder Declan C., Martin Stephen J. — ***Coevolution stabilizes the honey bee-Varroa destructor-virus system on islands*** — Trends in Parasitology, 2026; 42, 538-548. https://www.cell.com/trends/parasitology/fulltext/S1471-4922(26)00099-1. This is an interesting paper discussing how parts of Hawaii have become treatment-free naturally.

Takeaways:

- Deformed Wing Virus (DWV) became highly virulent due to mite-mediated transmission, causing reduced bee longevity and colony collapse.
- Varroa are present only on Oahu and Big Island; other islands serve as controls.
- Hawaii's year-round bee and mite reproduction accelerates evolutionary processes.
- **Timeline of Events in Hawaii (2007–2024)**
  - 2007–2008: Varroa detected on Oahu and Big Island; massive colony losses (65%).
  - 2010–2011: Widespread miticide use reduced losses but did not eliminate the problem.
  - 2014–2015: Feral colonies on Oahu began to recover without treatment.
  - 2019–2024: Documented emergence of mite resistance in Oahu's feral bee population.
  - 2024: Most Oahu beekeepers stopped using miticides; colony losses remained low (<20%).
- Primary resistance mechanism is increased uncapping and removal of mite-infested brood cells. Oahu bees showed 81% recapping accuracy and removed 67% of infested cells (vs. 17% in controls).
- These behaviors mirror those in Apis cerana and other resistant Apis mellifera populations and results in lower mite fertility and reproductive success in resistant colonies.
- Critically, the resistance trait is heritable via queens.
- Recombinant DWV (combinations of A and B) strains are now widespread globally in mite-infested colonies.
- On Hawaii's mite-free islands, DWV prevalence remains low.
- Coevolution on Oahu led to a new stable state: resistant bees, reduced DWV prevalence, and less reliance on chemical treatments.
- Similar resistance mechanisms have evolved independently in other regions (e.g., Norway, Sweden, Cuba, South Africa).

- On Big Island, continued miticide use has not prevented the rise of resistant mites or virulent DWV recombinants.
- Natural selection in free-living, untreated populations can lead to sustainable varroa resistance.
- Treatment-free beekeeping is feasible where resistant bees are established.
- Reliance on miticides is unsustainable due to resistance development.
- Transferring resistance traits to managed colonies is challenging due to practical and economic constraints.

Dwarka, Aditya Kumar Sharma, Anand Milan, Nisha Chadar, Abhishek Yadav, Shivendra Kasaudhan, Shobharam Thakur and Manoj Kumar Ahirwar, ***"Advances in Honey Bee Vaccines and Their Applied Aspects in Entomology: A Review"***, https://www.researchgate.net/profile/Aditya-Sharma-267/publication/405023953_Advances_in_Honey_Bee_Vaccines_and_Their_Applied_Aspects_in_Entomology_A_Review/links/6a0ca6c7ffeb2910364bcdfe/Advances-in-Honey-Bee-Vaccines-and-Their-Applied-Aspects-in-Entomology-A-Review.pdf

Takeaways:

- Honey bees have no adaptive immune system (that is, no antibodies) but do have robust innate defenses.
- Allogrooming, hygienic behavior, antimicrobial substances like propolis and royal jelly) are all key parts of honey bee colony health.
- Previous pathogen exposure enhances subsequent immune responses via upregulation of innate pathways.
- Queens can transfer immune protection to offspring through vitellogenin, boosting larval immunity.
- Royal jelly is a key medium for transfer of immune molecules among colony members.
- Exposure of some individuals can lead to colony-wide immunity via trophallaxis and queen-mediated mechanisms.
- RNAi vaccines are very promising — sequence-specific gene silencing via dsRNA can target specific viruses such as DWV and IAPV.
- RNAi can be highly targeted, environmentally friendly, have low resistance risk and can be scaled.
- Oral vaccines: Delivered via worker bee food, processed into royal jelly, consumed by queen and larvae.
- Queen-mediated: Queen internalizes immune factors, transfers them to eggs, conferring heritable immunity.
- Vaccines may reduce dependence on antibiotics and chemicals, improve colony health and pollination. Vaccines complement hygienic bee strains, sanitation, and other IPM strategies.
- First commercial honey bee vaccine (in 2023 for American Foulbood) demonstrates real-world feasibility.

Initial development costs and regulatory hurdles are higher, but long-term benefits are substantial.

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