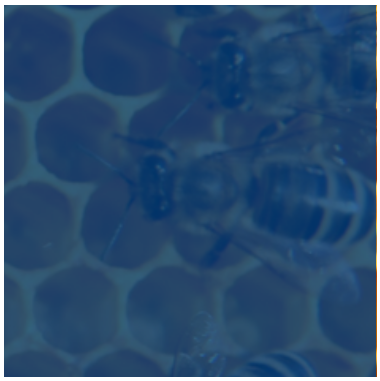
Executive Summary

Commercial Honey Bees

WHITE PAPER

On the Value of the California Commercial Beekeeping Industry and Related Challenges



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Beekeeping at a Crossroads:
Top Issues and Industry Outlook

Background and Purpose

In February 2025, Project Apis m. released a nationwide survey of 842 beekeepers representing an estimated 1.9 million colonies—approximately 72% of the managed honey bees in the United States. The findings revealed catastrophic losses across all sectors:

- Hobbyist beekeepers (1–49 colonies): 50% loss
- Sideliners (50–500 colonies): 54% loss
- Commercial operations (500+ colonies): 62% loss

These results mark a troubling reversal of historical trends, where commercial beekeepers typically experienced lower losses due to their expertise and resources. Industry experts warn that losses of this magnitude threaten the stability of U.S. agriculture, particularly pollination-dependent crops such as almonds, fruits, and vegetables.

The California State Beekeepers Association (CSBA) recognizes these findings as an urgent call to action. Despite widespread awareness and conservation efforts, U.S. beekeepers continue to lose up to half of their colonies annually. To ensure the availability of pollination services essential to national food security, there must be greater understanding and targeted support for the commercial beekeeping sector.

About the White Paper

To inform this discussion, CSBA asked Dr. Elina L. Niño, Professor of Cooperative Extension in Apiculture at the University of California, Davis to prepare a comprehensive White Paper on the current state of commercial beekeeping in California.

The White Paper seeks to:

- Define the economic and ecological importance of commercially managed honey bees;
- Provide a framework for informed dialogue among policymakers, regulators, and stakeholders; and
- Identify opportunities to strengthen and sustain the beekeeping industry for the future of U.S. agriculture.

Key Recommendations

Together with a number of issues highlighted in the White Paper, CSBA has identified the highest priority issues that address the immediate threats facing managed honey bee populations and ensure a stable pollination supply.

CSBA would like to highlight the following helpful, actionable items:

1. Improve Honey Bee Nutrition through Access to Forage

The overall health of honey bees relies on adequate nutrition. Bee nutrition could be significantly enhanced by increasing access to diverse forage on public and private lands.

Habitat loss, climate stress, and limited land access have severely restricted foraging opportunities for managed colonies. Federal and state agencies should adopt policies that:

- Allow managed bees to forage on designated public lands;
- Incentivize private landowners to plant pollinator-friendly vegetation; and
- Integrate pollinator forage planning into habitat and agricultural programs.

Such policies would provide immediate and measurable benefits to colony health and survivorship.

2. Expedite the Approval of New Miticides

Varroa destructor mites remain the leading cause of colony loss, yet the limited number of effective, approved miticides leaves beekeepers with few options. Regulatory delays in California have further constrained access to innovative products already authorized by the U.S. Environmental Protection Agency (EPA).

CSBA urges the California Department of Pesticide Regulation (CDPR) to streamline and accelerate the review of new miticide technologies—particularly those with lower toxicity or novel biological modes of action.

Recent approvals, including VarroxSan™ and Norroa™, demonstrate progress, but additional tools are urgently needed to implement robust Integrated Pest Management (IPM) programs.

3. Support the U.S. Honey Market

Commercial beekeepers in California tend to be small family-owned businesses who have been raising bees for generations. These operations are adept at caring for their bees, but rising costs for all agricultural operations in California is making it increasingly difficult for farmers of all sizes to remain profitable. Strengthening the domestic honey industry would allow commercial beekeepers to generate additional income to reinvest in caring for their bees.

Honey producers today face stiff competition from imported honey. Imported honey now represents **74% of all honey sold in the United States**, and adulteration remains a persistent problem.

Purchasing genuine domestic honey supports the economic viability of U.S. beekeepers, whose operations are essential to agricultural pollination.

Policymakers can assist by:

- Supporting enforcement of honey purity and labeling standards;
- Promoting “California Grown” and “Made in the U.S.A.” honey; and
- Encouraging public awareness of the link between domestic honey purchases and pollinator sustainability.

The public can help by purchasing genuine honey produced in the U.S.

Conclusion

Commercial beekeeping is an essential component of modern agriculture, providing the pollination services necessary for many of the nation’s most valuable crops. Sustaining this industry requires coordinated policy efforts that improve bee nutrition, enable timely access to pest management tools, and ensure the economic stability of domestic honey producers.

By implementing these actions, policymakers can help safeguard not only the beekeeping industry, but also the long-term productivity, resilience, and food security of U.S. agriculture.

executive summary

VALUE OF THE COMMERCIAL BEEKEEPING INDUSTRY

Honey Bee Overview

Humans have managed a variety of plant and animal species for the purpose of feeding themselves for thousands of years.

The Western honey bee (*Apis mellifera*) is one of the most significant and charismatic insects ever managed by humans.

Beekeeping has deep historical roots, with the earliest records tracing back to Ancient Egypt around 5000–3000 BC, where honey bees were primarily managed for honey production. Over time, the role of honey bees expanded to include their crucial function in pollinating crops essential for human consumption.

The development of modern beekeeping practices, particularly the use of Langstroth hives, revolutionized apiculture by enabling easier transport and optimizing honey production and pollination services.

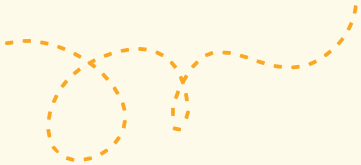
Historical Beekeeping Facts

1622 first honey bee colonies arrive in U.S.

5000 BC
earliest record of beekeeping

62%
avg. colony loss for commercial honey bees 2024/25

$22B
annual value of U.S. honey and pollination services



Number of Honey Bee Colonies

2.8M
in U.S. today

5.9M
in U.S. in the 1940s

Beyond honey, beekeepers now harvest various hive products, including royal jelly, propolis, pollen, and bee venom, all valued for their nutritional and medicinal properties.

Additionally, the production of packaged bees and queen bees has become a critical aspect of modern beekeeping, particularly in light of the significant need to replenish and replace bee colonies faced by the industry today.

Because of their remarkable value to humans, Western honey bees have been introduced to almost every continent except Antarctica. Although information regularly changes based on updates in the genomes and phylogenetic testing, it is currently believed that the Western honey bee is one of 11 recognized honey bee species, with *Apis mellifera* comprising 33 distinct subspecies.

The first colonies in the U.S. arrived in Virginia in 1622, brought by American settlers. Over centuries, the spread of honey bees paralleled human migration, reaching the West Coast by the mid-1800s.

Honey bees are the primary managed pollinators for over 130 agricultural crops worldwide. Their role extends beyond agricultural landscapes, as generalist pollinators, honey bees contribute significantly to natural ecosystems by supporting plant species that provide food and habitat for countless organisms.

THIS IS WHAT YOUR GROCERY PRODUCE DEPARTMENT WOULD LOOK LIKE WITHOUT BEES

In the U.S. alone honey bee pollination services and honey production contribute approximately $22 billion annually. Their contributions to the food supply and ecology are immeasurable.

Despite these invaluable contributions, the beekeeping industry faces unprecedented challenges, particularly in the United States, where beekeepers have experienced widespread colony losses. Since the 1940s, the number of managed colonies has declined from 5.9 million to approximately 2.8 million.

Starting with the occurrence of Colony Collapse Disorder in 2006-2007, beekeeper surveys have recorded annual colony losses of up to 50%, particularly during overwintering periods, creating substantial financial and logistical burdens.

A new survey conducted in early 2025, indicates losses for commercial beekeeping operations are averaging 62 percent.

To counteract losses, beekeepers commonly split existing colonies to make up for lost hives, a practice that reduces hive productivity. Alternatively, beekeepers may purchase replacement colonies, at a cost estimated in 2023 at $121 per colony. In addition to significant expense to replace hives, colony loss also leads to unrealized pollination revenue, further straining the industry.

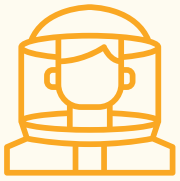
High loss rates and the associated costs have rendered beekeeping increasingly unsustainable, with broader societal implications, including rising prices for pollinated foods.

Managed Honey Bees and their Contribution to California Agriculture

California's beekeeping industry exemplifies the critical role of honey bees in supporting agriculture and the economy.

California has the largest beekeeping industry in the United States. Approximately 600,000 colonies of bees are operated by commercial beekeepers, defined as beekeepers who manage more than 500 colonies along with "sideliner" beekeepers, who manage between 50 and 500 colonies. Additionally there are hundreds of hobby beekeepers in California who generally operate fewer than 50 hives.

California Honey Bee and Agriculture



Total California Beekeepers
10,000

Number of Commercial Beekeepers in California
400

Number of Honeybee Colonies in California
600,000

Number of Hives Producing CA Honey:
310,000

Number of Hives Needed for CA Almond Production:
2 Million+

As noted previously, commercially managed honey bees contribute approximately $22 billion to U.S. agriculture annually and are responsible for pollinating over 100 crops. In California, apiary-related production ranks 15th among the state's top agricultural commodities. According to the 2022–2023 California Agricultural Statistics Review, apiary commodities were valued at $851.9 million.

Additionally, California is home to a significant number of backyard beekeepers. While there are an estimated 115,000 to 125,000 beekeepers across the United States, the number of beekeepers in California is estimated at more than 10,000. This number fluctuates due to changing interest in backyard beekeeping and colony losses caused by various stressors. It should be noted that hobbyist beekeepers throughout the U.S. are not typically providing pollination services to commercial farming operations.

Caliifornia's Population Needs

Crops heavily reliant on honey bee pollination include fruits, tree nuts, vegetables, culinary herbs nursery plants and seed, many of which are exported globally. The almond industry alone depends on the pollination services of nearly 70% of the nation's managed honey bee population during its annual bloom.

CALIFORNIA CROPS THAT RELY ON COMMERCIAL HONEY BEES

ASPARAGUS	APPLE	AVOCADO	BLUBERRY
ALMONDS	KIWIFRUIT	CHERRY	DRAGON FRUIT
PRUNES	PUMPKIN	CORRIANDER	HONEYDEW
CANTALOUPE	QUINCE	WATERMELON	SQUASH
RASPBERRY	APRICOTS	SUNFLOWER	BLACKBERRY
PLUM	PLUOT	ALFALFA AND CLOVER SEEDS	VEGETABLE SEED CROPS

Almonds bloom for approximately six weeks, starting in early to mid-February. Almond farmers typically rent honey bees and hives are placed in orchards during the pollination season.

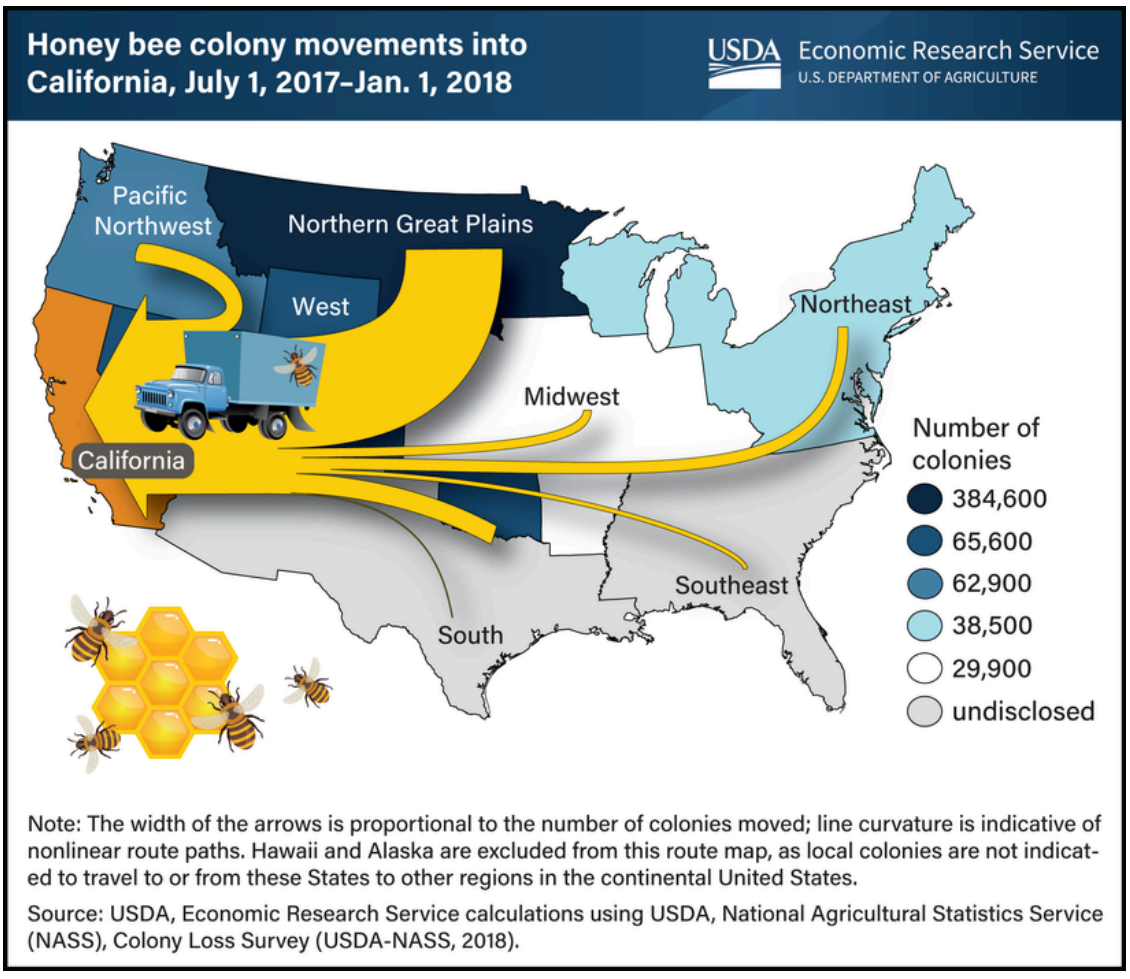
Increased almond acreage in recent years has resulted in higher demand for commercially managed bees to provide pollination service. This, coupled with high annual colony losses and the early-season nature of almond pollination, has caused hive rental costs to rise. Hives currently rent for an average price of $190 to $240. Recommendations call for 2 hives per acre for conventional almond varieties to ensure adequate pollination. It should be noted that in order to achieve pollination, almond growers

require colonies with adequate strength. Ensuring hive strength and vigor necessitates higher economic inputs from beekeepers to cover the costs of feed, pest and disease treatments, labor and transportation costs.

Although California is home to the most commercially managed bees in the U.S., its beekeeping industry is not large enough to meet the pollination demands of the state's almond industry. As a result, between 1.5 and 2 million additional bee colonies from around the U.S. are transported into California as early as October each year.

Because almond growers are so reliant on honey bees, the almond industry has a vested interest in improving honey bee health. The Almond Board of California, in collaboration with industry stakeholders, have invested heavily in programs to protect and sustain honey bees including the development of Honey Bee Best Management Practices, the Seeds for Bees program and the Pollinator Partnership.

After almond pollination, many beekeepers remain in California to engage in other activities, including pollinating other crops, honey production and the production of packaged bees and queens. But it is the income derived from pollinating almond crops that allow most beekeepers from across the U.S. to survive economically.



Note: The width of the arrows is proportional to the number of colonies moved; line curvature is indicative of nonlinear route paths. Hawaii and Alaska are excluded from this route map, as local colonies are not indicated to travel to or from these States to other regions in the continental United States.

Source: USDA, Economic Research Service calculations using USDA, National Agricultural Statistics Service (NASS), Colony Loss Survey (USDA-NASS, 2018).

California Regulations Concerning Honeybees

Beekeeping activities in California are highly regulated. Regulations are defined by the Apiary Protection Act, outlined in the California Food and Agricultural Code (CDFA), Division 13, Chapter 1, Sections 29000-29322. (The full text is available at https://www.cdfa.ca.gov/plant/pollinators/ApiaryProtection.html.)

This code provides CDFA with the authority to regulate activities that ensure the vitality of the apiary industry while protecting the welfare of California residents and the agricultural crops reliant on pollination.

CDFA appoints a State Apiary Inspector, and nearly every county has its own County Apiary Inspector. The Apiary Board, composed of six California beekeepers and an optional public member, functions as an advisory body to the CDFA, making recommendations on beekeeping-related issues.

Under a mandatory program in California known as BeeWhere, all beekeepers operating colonies in California are required to register their hives annually with the local County Agricultural Commissioner's Office. This includes out-of-state beekeepers who bring colonies into California for pollination. Registration not only ensures oversight for safe and healthy apiary operations, but also allows beekeepers to receive notifications about pesticide applications that could affect their colonies.

To prevent the spread of pests and disease, semi-truck loads of bees entering California must undergo initial inspections at California Border Protection stations. A more detailed inspection is also conducted upon reaching their destinations. Apiary Inspectors, who operate through the County Agricultural Commissioners office, are trained to provide inspections of honey bees to verify hive strength and detect pests and disease.



Prevent Spread of Pests and Disease

Mandatory Hive Registration

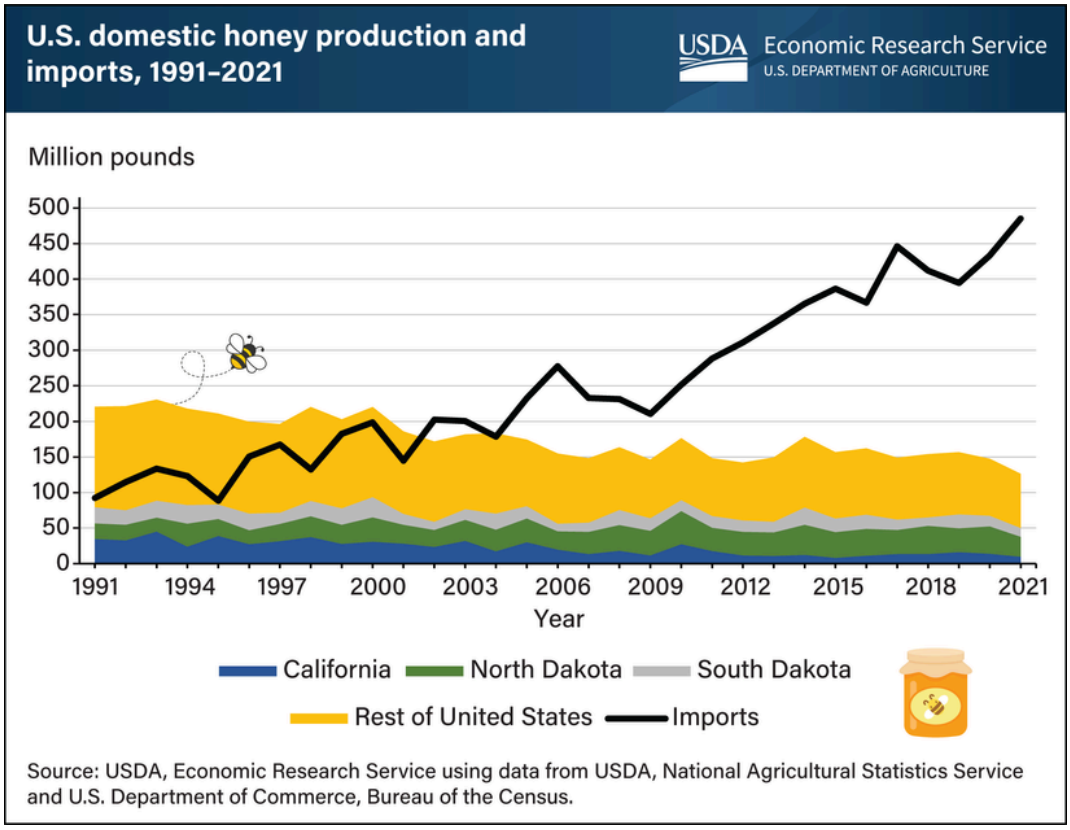

Honey Production

In 2023, the economic value of U.S. honey production was estimated at $349.2 million. Top producing honey states include North Dakota, South Dakota, California, Florida and Texas. Honey production fluctuates yearly, influenced by factors such as colony losses, drought conditions affecting nectar plants and market prices.

Unfortunately, US beekeepers have to continuously fight against importation of fraudulent/adulterated honey created by using cheaper sugar sources such as rice, corn and beet syrups. Efforts throughout the United States' honey industry are attempting to help ensure the integrity of U.S. produced honey and the safety of the product.

The Honey Integrity Act (or HIVE Act) is proposed legislation, currently in the U.S. Congress, designed to protect U.S. honey producers from counterfeit and adulterated honey by establishing a standard of identity for honey, improving country-of-origin labeling, and creating a program to enforce these regulations through collaboration between the U.S. Food and Drug Administration, Department of Agriculture and Customs and Border Protection. The bill aims to level the playing field for honest beekeepers and ensure consumers are confident that what they buy as "honey" is actually pure honey.

One of the most important ways the public can support the US beekeeping industry is to buy local or US honey.



Over the last 30 years, U.S. honey production has declined by around 1.4 percent per year while honey imports have grown by 7.6 percent per year, filling the domestic supply deficit. Imports have exceeded domestic honey production since 2005 and accounted for 74 percent of total U.S. honey supplies in 2021. The top three foreign suppliers—India, Vietnam, and Argentina—supply more than 71 percent of imported honey.

Queen Breeding

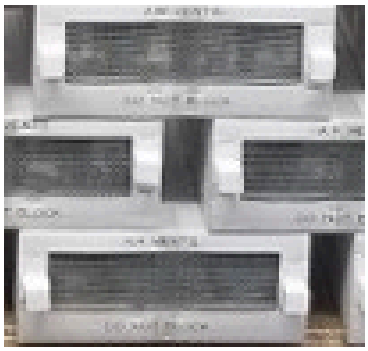
In addition to pollination and honey production, the apiary industry supports the production of package/nucleus bees and queen bees that are exported to other U.S. states and Canada. Northern California leads the nation in queen production, producing more than 1 million queens each year.

Early spring marks increased colony growth and reproduction, during which bees naturally swarm to establish new nests. Beekeepers use these natural processes to produce queens and nucleus colonies, which are essential for starting new colonies and replacing those that are lost each year.

Beekeepers purchase “packaged bees” sold with or without a queen, at an average price of $90. Starter nucleus colonies, containing adult bees, developing brood and a queen, average $120. Purchasing new queens and bee nucleus colonies represents a significant production costs for commercial beekeepers. When colony losses are high, costs to replace bees also grow.

1M
Queens Produced in CA each year

California Leads the Nation in Queen Production



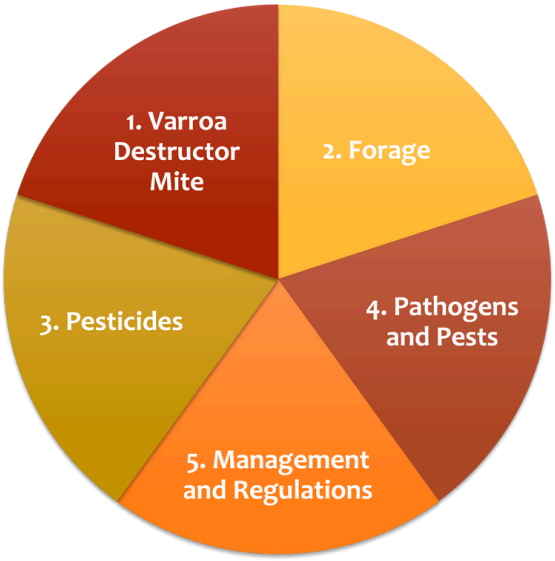
Stressors Impacting Colony Health

The unexpected emergence of Colony Collapse Disorder (CCD) in 2006 brought the plight of honey bees to global attention, highlighting numerous challenges faced by beekeepers.

While scientists and beekeepers now agree that CCD was caused by a combination of environmental and biological factors and is no longer a primary cause of colony loss, the issue of high colony losses persists worldwide. It is not uncommon for the national average honey bee colony loss to reach 50%, with the most recent reports citing losses up to 70% over the 2024-2025 season.

Pests, Pathogens and Disease

Colony losses stem from a multitude of causes. Honey bees are subject to a wide range of pests, pathogens, viruses and bacteria. But the parasitic Varroa mite (*Varroa destructor*) remains the most significant challenge for beekeepers.



This mite feeds on the fat bodies of both developing and adult bees, suppressing their immune response and making them more susceptible to other stressors.

Furthermore, Varroa mites are vectors for pathogens, particularly viruses, with over 40 identified as being associated with honey bees. The Varroa-vectored Deformed Wing Virus is particularly devastating, leading to significant colony losses worldwide. This virus causes wing deformities in bees, preventing them from performing essential tasks like foraging.

Beekeepers often rely on miticides to manage Varroa infestations. However, resistance to the few available miticides is rapidly developing, exacerbating the problem. In response, researchers and beekeepers are working together to develop sustainable solutions, including novel miticides and delivery systems, temperature manipulation and breeding programs for Varroa-resistant or tolerant honey bees.

Honey bee colonies can also harbor other pests, such as **small hive beetle** and **wax moth**.

Bacterial diseases of honey bees include **American Foulbrood** and **European Foulbrood**. To prevent antibiotic resistance, the U.S. Food and Drug Administration requires beekeepers to obtain veterinary prescriptions or veterinary feed directives. This requirement has complicated rapid disease management, as it necessitates a veterinarian-patient relationship.

Veterinary education in the U.S. rarely includes apiculture training, leaving few professionals equipped to provide these services. Universities are now developing programs to train veterinarians in bee biology and beekeeping practices.

Parasitic microsporidia from the genus Nosema spp. (*Vairimorpha*) also impact honey bee health, attacking gut cells and reducing nutrient uptake. This infection leads to the eventual death of individual bees and, potentially, entire colonies.

Preliminary testing among California beekeepers indicates low levels of **Nosema** infection, but larger-scale studies are needed to understand its epidemiology better.

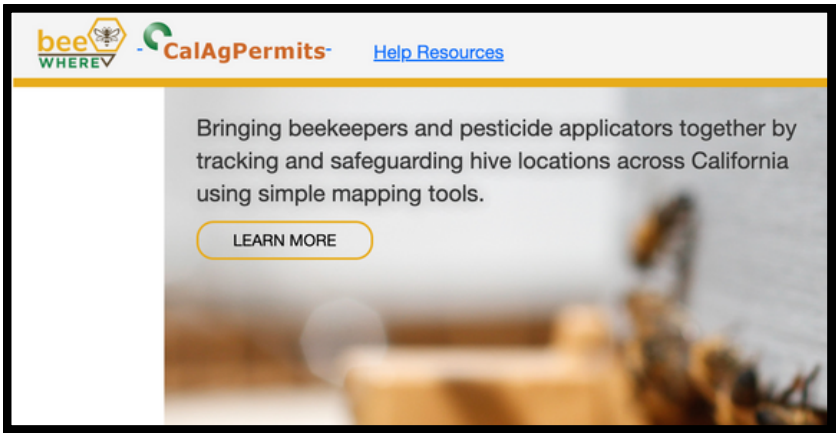
Fungal diseases like **chalkbrood** (*Ascosphaera apis*) often arise in stressful conditions, such as increased humidity or poor nutrition. With no effective treatments available, management focuses on prevention and sanitation.

The beekeeping industry also faces constant risks from emerging threats due to global mobility. One such threat is the **Tropilaelaps mite** (*Tropilaelaps spp.*), currently found in Asia and Eastern Europe but spreading to the Middle East, Africa, and Papua New Guinea. Like Varroa mites, Tropilaelaps mites have the potential to devastate beekeeping unless proactive measures are taken. Research is urgently needed to study dispersal patterns, biology, and management, as well as to implement rigorous monitoring programs.

Pesticides

Pesticide use poses additional challenges. Over 120 pesticides and their metabolites have been detected in hive matrices, raising concerns about their impact on honey bee health.

Neonicotinoids, a controversial pesticide class, have faced provisional bans in the UK and European Union and scrutiny in the U.S. and Canada. The Environmental Protection Agency (EPA) is reevaluating neonicotinoid pesticides while California's Department of Pesticide Regulation (CDPR) has developed pollinator protection measures and eliminated many uses of neonicotinoids particularly when bloom is present in crops.



The EPA has improved its methods for assessing pesticide risks to bees and the California Department Pesticide Regulation published a Pollinator Protection Plan in 2018. The University of California IPM Bee Precaution Pesticide Ratings database helps stakeholders select less harmful pesticides.

In California, a program known as BeeWhere, requires all beekeepers providing pollination services in the state to register and plot the location of their beehives using a GPS tracking system. This allows beekeepers to receive timely notifications whenever a pesticide application is scheduled to take place within a one-mile radius of their hives.

Bear Predation and Hive Theft

Bears can devastate apiaries while searching for food, particularly during droughts that limit natural forage. Incidents have increased despite protective measures like exclusion fences. Securing predation permits has become increasingly challenging for beekeepers.

Hive theft has also become more prevalent, particularly during almond pollination season. Over the past decade, more than 10,000 hives have been stolen in California, with an estimated value of $3.5 million

Thieves often steal hives at night, place them in orchards, and collect payment without returning for the hives. Beekeepers combat theft by branding equipment and using GPS trackers.

Forage and Nutrition

Much like for humans, optimal nutrition is imperative for maintaining healthy and productive honey bee colonies.

Honey bees gather pollen and nectar from flowering plants, which supply essential nutrients necessary for sustaining life.

Habitat loss and decreasing access to natural forage have become significant stressors for honey bee health. The scarcity of abundant forage is a critical issue that both researchers and beekeepers are actively addressing.

Within the honey bee pollination and honey production cycle, almonds are the first major crop to bloom, providing nutrients during the crucial early-season growth of honey bee colonies.

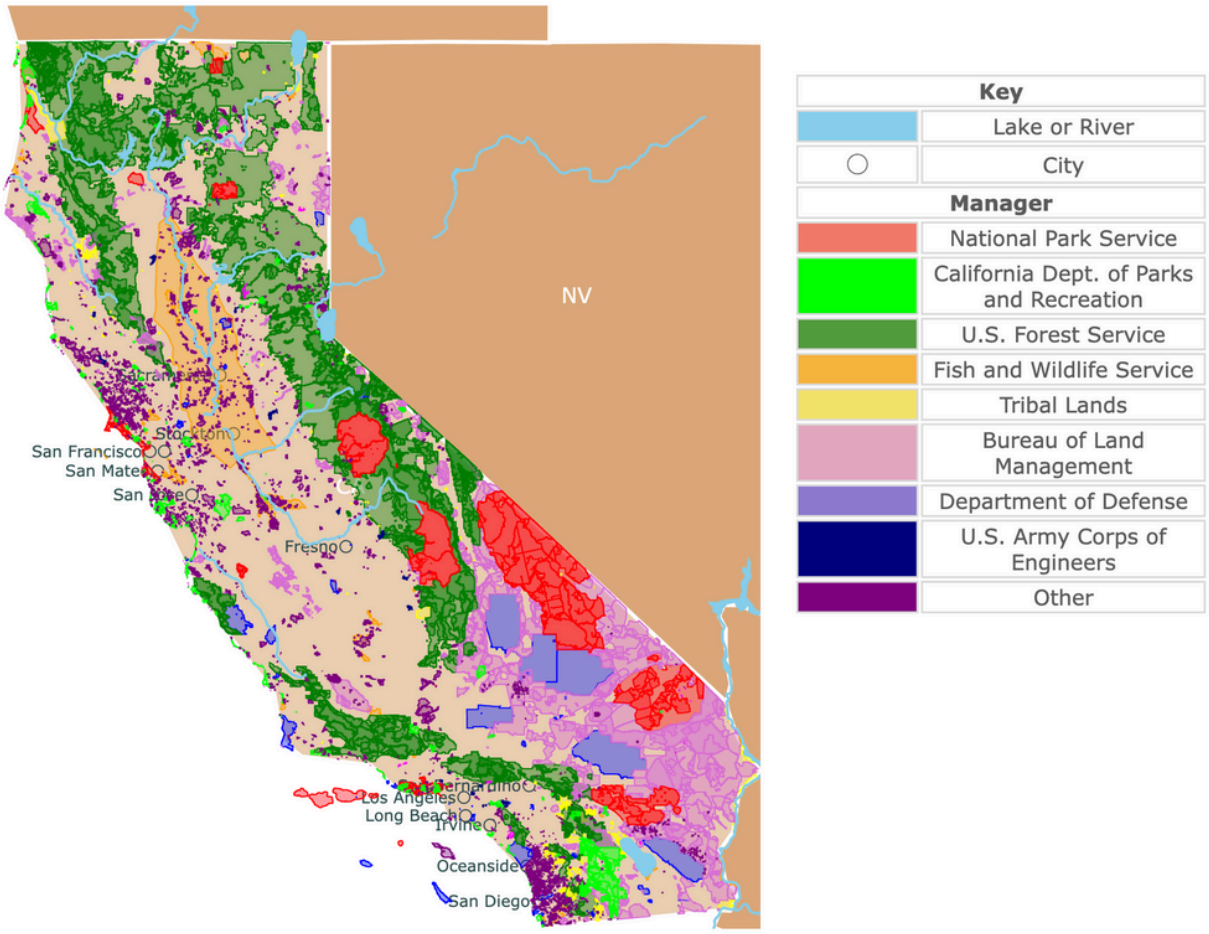
Almond pollen itself is nutrient-dense, but a varied diet benefits honeybees. Through the efforts of the Almond Board of California and the Project Apis m. Seeds for Bees program, almond growers are being encouraged to provide supplemental forage alongside almond crops. A common concern among growers is that supplemental forage might divert bees from their target crops and negatively impact pollination of the almond crop; however, research has shown that even during almond bloom, bees benefit from access to additional floral resources. Colonies with supplemental forage demonstrate stronger brood production and higher foraging activity, benefits that persist well beyond the almond pollination period.

When honey bees are not pollinating almond crops – which is for the majority of the year – access to adequate forage and nutritional sources is becoming increasingly challenging for beekeepers.

While natural forage is ideal, factors such as climate change, prolonged droughts, increasing wildfires, and restricted access to public lands make it increasingly difficult for beekeepers to rely solely on natural forage year-round.

Access to both public and private lands is particularly problematic. Concerns about the impact of commercial honeybees on local hobby beekeeping operations and native bee species are growing. Commercial beekeepers are finding they are restricted from foraging bees on public lands by local, state and federal governments.

MAP OF PUBLIC LANDS IN CALIFORNIA



Consequently, most beekeepers must provide supplemental diets at least part of the year. Beekeepers either create their own recipes, or purchase commercially available supplements. Developing an optimal bee diet is complicated by factors such as seasonality and varying environmental conditions that influence a hive's specific nutritional needs.

The critical need for better honey bee nutrition could be improved significantly by increasing forage opportunities and expanding access to existing public lands year-round.

Research indicates that since nutrition is vital for the health of all pollinators, not just honey bees, allowing more access to lands by commercial honeybees would benefit broader pollinator communities.

Coexistance of Managed and Wild Bees

The coexistence of managed honey bees and native bee species is a subject of ongoing research and debate, reflecting both ecological complexities and management challenges. While honey bees are critical for global agricultural production, native bees provide indispensable ecosystem services that sustain biodiversity, natural habitats, and long-term agricultural resilience. Both groups face similar pressures, including parasites, pathogens, pesticides, climate change and habitat loss. Understanding

how these two groups interact is essential for balancing agricultural demands with biodiversity conservation.

Researchers are working to detangle the impact of honey bees on wild bees and the results are not always clear cut, and can vary from study to study dependent on a number of factors including bee diversity, environment, stocking rates, etc. A brief summary of a balanced subset of research studies examining the various impact of commercial honey bees on native pollinators is provided in the full version of this white paper.

Of particular interest is a recent study conducted by Dr. Diana Cox-Foster, Research Leader and Entomologist at USDA-ARS Pollinating Insects Research Unit in Logan, Utah. The study, which is pending publication, indicates the presence of managed honey bee apiaries did not adversely affect wild bee reproduction and colony growth, provided environmental carrying capacity was not exceeded. Since nutrition is vital for the health of all pollinators, not just honey bees, these initiatives would benefit broader pollinator communities.

Cox-Foster did not find evidence of honey bees excluding non-Apis bees from flowers or any abnormal health declines among wild bees. Pathogen transfer was minimal and no spillover of viruses from honey bees to other species was detected.

As more is learned on this topic, balancing agricultural productivity with conservation efforts is essential for sustaining healthy ecosystems and sustainable agriculture.

New Technologies

To address increasing labor costs, meet the demand for improved access to nutrition and reduce colony losses from various stressors, researchers, beekeepers and growers have partnered to explore novel technologies.

These technological advancements have facilitated the growth and exploration of innovative solutions, such as robotic housing for multiple hives, in-hive sensor technology, hive cameras, and bee counters. Additionally, feedants designed to enhance pollination efficiency and systems for therapeutic delivery are being developed.

The latest advancements in artificial intelligence (AI) have sparked interest in developing tools for rapid diagnostics of parasites and pathogens. When perfected, these tools could significantly simplify the identification of in-hive problems, allowing beekeepers to take immediate corrective actions.

A word of caution, these technologies are still in development and are often not third party-tested, Ongoing research into the potential benefits and limitations of these innovations is necessary to provide insights into their cost-efficiency and practical utility for beekeepers.

ACKNOWLEDGEMENTS

- The full version of this white paper on The Value of the California Commercial Beekeeping Industry and Related Challenges is available on the website of the California State Beekeepers Association along with all footnotes and references sited in the report. The white paper was originally developed in November of 2025. The document will be updated periodically to ensure timeliness and accuracy.

- The primary author of the white paper is Dr. Elina L. Niño, professor of cooperative extension, apiculture in the Department of Entomology and Nematology, University of California, Davis. Niño is the director of the Harry H. Laidlaw Jr. Bee Research Facility at UC Davis. She is responsible for providing professional support and education to California's beekeepers, growers, pesticide applicators and other stakeholder groups. Additionally, Niño is teacher to numerous beginner, intermediate and advanced beekeepers and the creator of first ever California Master Beekeeper Program serving beekeepers of California and neighboring states.

- The Executive Summary was prepared by Farmers Communication Exchange, a public relations and issues. management firm based in Sacramento, CA. This firm is conducting outreach to share information contained in the report. Interested media should contact them for additional resources at hello@farmerscommunication.exchange.

- The California State Beekeepers Association is an organization comprised of commercial and hobby beekeepers, which exists to support professional beekeepers and California's pollination needs. Additional information about CSBA or this report is available by contacting the organization's management staff at calstatebeekeepers@agamsi.com.

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