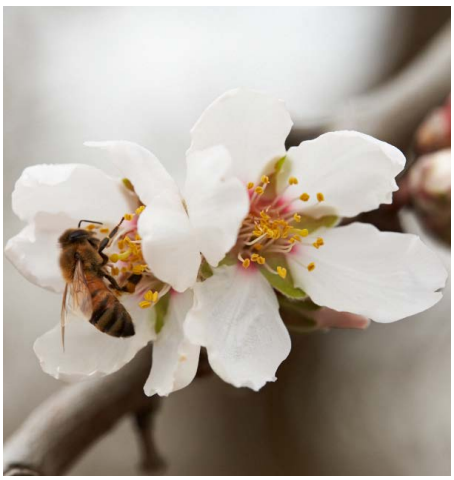
POLLINATORS AND FOOD PRODUCTION



THE PARTNERSHIP BETWEEN BEES AND ALMONDS

Honey bees play a vital role in our food supply, pollinating over 90 crops grown in the U.S.[1] Almonds are one of those crops. Between February and March each year, almond trees bloom with millions of pink and white flowers in preparation for pollination. As the trees blossom, honey bees forage for pollen and nectar in the orchard, moving from tree to tree. In doing so, they pollinate almond blossoms along the way, causing each fertilized flower to grow into an almond. Every almond you eat exists because a honey bee pollinated an almond blossom. And every honey bee that visits an almond orchard gets their first natural food source of the year there, supporting a healthy start to their pollination season.[2]

Every year, almond growers contract with beekeepers or bee brokers to deliver an average of two strong hives for each acre of orchards. In return, almond pollen provides abundant protein for bee nutrition. It is a partnership with mutual benefits:

- Honeybee colonies employed in almond pollination are almost twice the size after bloom compared to colonies not involved with almonds.
- For U.S. beekeepers, almond pollination also provides an estimated one third of their total revenue.[3]

CHALLENGES FACING BEES

Annual honey bee colony losses began to spike more than a decade ago, from a historic rate of 10-15% of overwintering losses to now nearly 40% nationally.[4] The complex variety of factors that have led to honey bee health decline and colony losses include:

- Pests and diseases, notably the invasive parasite, varroa mite;
- Lack of forage for adequate nutrition: bees need both abundant and diverse pollen for good nutrition. Declining wild spaces limits food sources for both honey bees and other pollinators;
- Exposure to pesticides and other crop protection products; and
- Reduced genetic diversity of honey bees due to hive management and queen breeding

With annual hive losses remaining high, beekeepers must spend more money on supplemental food, mite treatments, replacing lost bees, and travel to find locations with forage to store their hives. The strain on the profitability of beekeeping has been compounded by low honey prices.

For almond growers this has also meant increased costs. Pollination fees skyrocketed in the early 2000s when almond acreage expanded faster than the supply of honey bees. While beekeepers responded by increasing their hives, with the number of U.S. honey bee hives now at a 20-year high, the continued high level of losses every year has meant the price of pollination services continues to rise every year. This year, almond growers will pay on average almost $200 per hive, or an average of $380 per acre.

COMMITMENT TO HONEY BEE HEALTH

Honey bee health is a matter that is close to our hearts. Because of honey bees' essential role in almond pollination, the California almond industry has funded more honey bee research than any other crop, with 125 research projects since 1995. These address the full range of bee health challenges, including:

- New methods for varroa mite control and disease management
- Research to understand the impact of pesticide, fungicides and adjuvants on the full life cycle of bees
- Understanding bee nutrition and development of supplemental foods
- Management and benefits of planting pollinator forage in and around orchards
- Lack of genetic diversity

[1] World Atlas. March 2019.
[2] USDA-ERS. Land Use, Land Cover and Pollinator Health: A Review and Trend Analysis. July 2017.
[3] USDA-ERS. Land Use, Land Cover and Pollinator Health: A Review and Trend Analysis. July 2017.
[4] Bee Informed Partnership. Loss and Management Survey. 2019.

california almonds®
Almond Board of California

This research underpins recommendations to almond growers and industry service providers to protect the health of bees and pollinators during the brief time they are in our orchards. The Almond Board's *Honey Bee Best Management Practices* provide comprehensive recommendations and were developed in collaboration with researchers, government regulators, chemical registrants and beekeepers. Beekeepers credit the Almond Board's extensive outreach across the industry and farmer adoption of those practices for providing one of the healthiest crop environments for bees.

In readiness for the new bloom season in 2020, a new partnership was announced between ABC and the world's largest non-profit dedicated exclusively to the protection and promotion of pollinators and their ecosystems, the *Pollinator Partnership*. Known for their local and regional initiatives, like National Pollinator Week, the Pollinator Partnership's *Bee Friendly Farming* program engages growers in the promotion of pollinator health on their lands. Growers who meet six specific criteria can then be certified as "bee friendly."

Under this new partnership, ABC is working with Pollinator Partnership to integrate the Bee Friendly Farming program with the *California Almond Sustainability Program's (CASP)* bee health module.

Partnerships such as these are critical to ensure we improve bee health not only within almond orchards, but across the nation where honey bees and native pollinators spend time across natural and working lands. We support leading national organizations to achieve these goals:

- *Bee Informed Partnership* is the leading source of data on bee health and provides technical support teams to beekeepers.
- *Project Apis m.* funds and directs research to enhance the health of honey bees, also administering the Seeds for Bees program to cost-share on-farm planting of pollinator forage.
- *Honey Bee Health Coalition* is a diverse alliance funding research and outreach to policy makers to support bee health.
- *BeeWhere*, a new digital tool developed by a diverse coalition of agricultural and bee industry stakeholders to make it easy for beekeepers and pesticide applicators to communicate, an essential step to reducing risks to bees.

CONTINUOUS IMPROVEMENT

Many almond growers are following best management practices to improve bee health:

- Over 90% of growers in CASP communicate with beekeepers before pesticide application.
- Data from the California Department of Pesticide Registration shows that use of chemical insecticides during bloom, when bees are present, has decreased 68%.
- Over half of growers in CASP intentionally grow cover crops, and of these, almost 90% use plants recommended as forage for pollinators.

WHAT'S NEXT

Looking beyond the partnership between almonds and honey bees, we recognize that our orchards are part of the landscape that provides habitat to other pollinators and biodiversity. While 34 percent of almond growers who participate in CASP plant hedgerows of flowering shrubs to provide forage and habitats to native pollinators and animals, expanding the role of working lands as part of sustainable ecosystems offers opportunities to continue to build on this foundation or progress.

As an industry, our commitment to investing in honey bee health research and partnerships will also continue.