



Honey Bee Best Management Practices in California Almonds

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Almond Board of California
February 2015

Almond Board of California Resources

“Honey Bee Best Management Practices for California Almonds” Comprehensive Guide



General/Decision Maker Quick Guide

HONEY BEE BEST MANAGEMENT PRACTICES QUICK GUIDE FOR ALMONDS

All parties involved in honey bee pollination of California Almonds and/or applying pesticides should follow these precautions to ensure both honey bee hive health and the best possible pollination of the almond crop¹:

- 1. Communication should occur between all pollination stakeholders about pest control decisions.** These stakeholders, as illustrated in the “Honey Bee BMP Communication Chain for California Almonds” on the reverse, can include beekeeper, bee broker, county agricultural commissioner, grower (owner/lessee), farm manager, pest control adviser (PCA) and pesticide applicator.
- 2. Agreements should include a pesticide plan that outlines which pest control materials may be used.** Grower and beekeeper should agree on which products may be applied if a treatment is deemed necessary. If deemed necessary, growers should give beekeepers 48-hour notice before treatment.
- 3. If applying pesticides, contact your local county agricultural commissioner** as specified in “Honey Bee BMP Communication Chain for California Almonds” on the reverse to give advance notification to beekeepers with nearby managed hives.
- 4. Avoid applying insecticides during almond bloom until more is known,** particularly about their impact on bee brood (young developing bees in the hives). If treatment is necessary, only apply fungicides and **avoid tank-mixing insecticides with fungicides.**
- 5. Any fungicide application deemed necessary during bloom should occur in the late afternoon or evening, when bees and pollen are not present.** This timing avoids contaminating pollen with spray materials.
- 6. Provide clean water for the bees to drink.** This will ensure that they spend more time pollinating the crop than searching for water. Either cover or remove water sources before a pest control treatment, or empty and refill water after a treatment is made. Check water levels throughout bloom and refresh as necessary.
- 7. Do not directly spray hives with any pesticide spray application.** Ensure that the spray-rig driver turns off nozzles when near hives. Spray applications that come in contact with bee hives could adversely affect bee health and the pollination of the crop.
- 8. Do not hit flying bees with any spray application materials.** Bees that come in contact with agricultural sprays will not be able to fly because of the weight of spray droplets on their wings.
- 9. Report suspected pesticide-related bee incidents** to the county agricultural commissioner’s office. Bee health concerns cannot be addressed without the data from these incidents. See “Honey Bee BMP Communication Chain for California Almonds” on the reverse for reporting detail.
- 10. Beekeeper and grower should agree on hive removal timing.** The University of California recommends bee removal when 90% of the flowers on the latest blooming variety are at petal fall. Past this point, no pollination is taking place, and bees that forage outside the orchard (up to 4 miles) seeking alternate food sources and water will have a higher risk of coming in contact with insecticide-treated drops.

¹Curtis, Rob, Gabriele Ludwig and Danielle Veerolls, eds. 2014. Honey bee best management practices for California almonds. Almond Board of California.



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APPLICATOR/DRIVER HONEY BEE BEST MANAGEMENT PRACTICES QUICK GUIDE FOR ALMONDS

Pesticide applicators should follow these precautions to ensure both honey bee hive health and the best possible pollination of the California Almond crop¹:

- 1. Read labels carefully and follow directions.** Do not use pesticides at bloom with label cautions that read “highly toxic to bees,” “toxic to bees,” “residual times” or “extended residual toxicity.”
- 2. Before applying pesticides at any time of year, contact the county agricultural commissioner to notify beekeepers with nearby managed hives.** This is mandatory for pesticide products with “toxic to bees” label statements² and recommended for all other applications, particularly during almond bloom.
- 3. Water should either be covered or removed before a pest control treatment is made, or emptied and refilled after the treatment is made.** Providing clean water for bees to drink will ensure that they spend more time pollinating the crop than searching for water.
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²When a pesticide to be applied bears “toxic to bees” statements on its label, beekeepers with hives within 1 mile of the application must be notified (if they have requested notification) by the applicator at least 48 hours before the planned application.

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Why should all pollination stakeholders care?

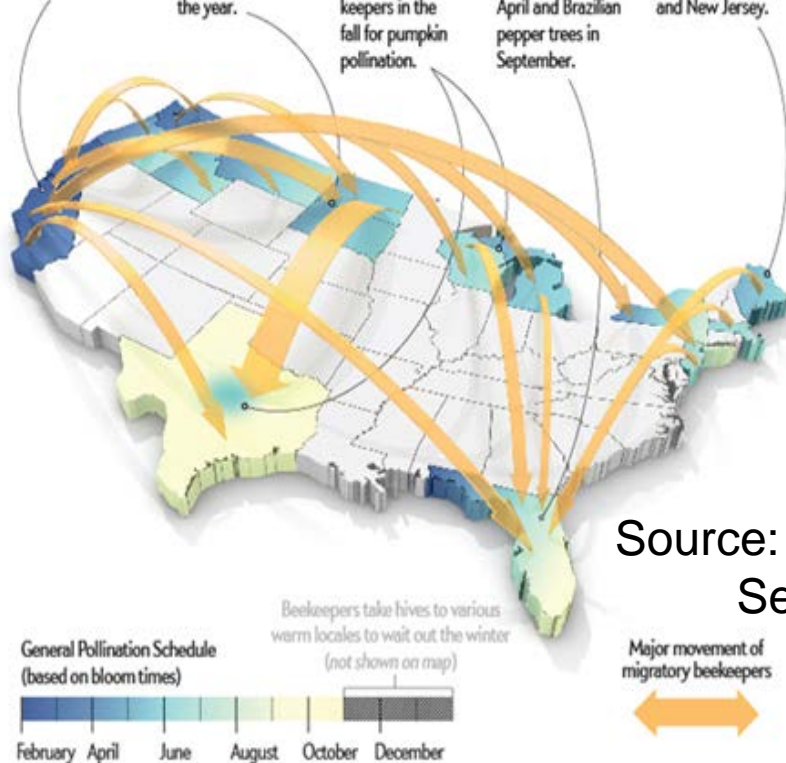
Each February most migratory beekeepers converge in the Central Valley to pollinate more than 800,000 acres of almonds. Apples, plums and cherries in California and nearby states require honeybee pollination, too.

In summer months, many commercial beekeepers head to North and South Dakota, where they allow their bees to gorge on fields of alfalfa, clover and sunflowers and to produce the bulk of their honey for the year.

In the spring and summer, some beekeepers travel to blooming blueberry fields in Michigan and cranberry bogs in Wisconsin. Others opt for watermelons, cantaloupes and cucumbers in Texas, which also draws beekeepers in the fall for pumpkin pollination.

Because Florida's climate varies from subtropical to tropical, some plant or other is always flowering in the Sunshine State. Florida depends on honeybees to pollinate blueberries as early as February, tupelos and gallberries in April and Brazilian pepper trees in September.

Migratory beekeepers travel up and down the East Coast year-round as well, visiting apples, cherries, pumpkins, blueberries, cranberries, lettuces, and various veggies in Maine, Pennsylvania, Massachusetts, New York and New Jersey.



Source: *Scientific American*,
September 2013

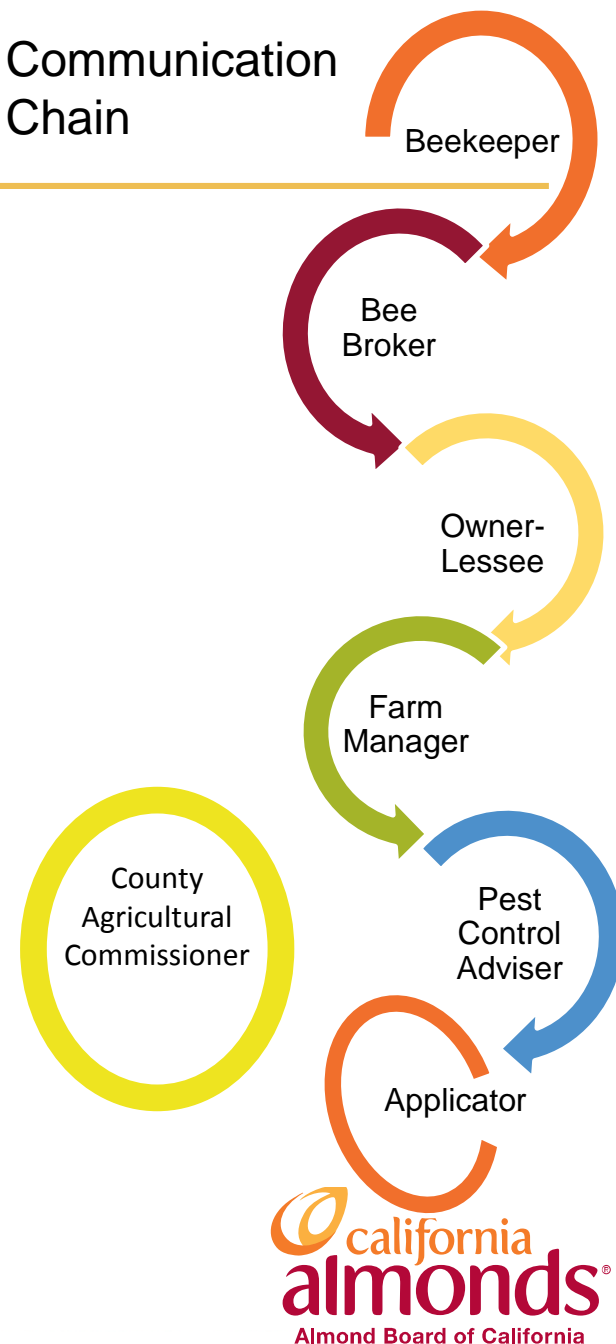
A *Pollination Partnership*

- Almonds need honey bees and honey bees benefit from almonds
- Bees are a valuable resource and almond production input
- The time bees spend in almonds impacts hive health throughout the year until they return the next season

Key BMPs: Communication

- Communication should occur between all pollination stakeholders along the communication chain about pest control decisions during bloom
- Agreements/contracts should include a pesticide plan that outlines which pest control materials may be used
- If treatment is deemed necessary, growers/PCAs/applicators should contact their beekeepers as well as contact county ag commissioners so that beekeepers with near by managed hives are notified 48 hours in advance
- As well, beekeepers should register their hives with county agricultural commissioner offices and request notifications for pesticide applications
- Report suspected pesticide related incidences to county ag commissioners. Bee health concerns cannot be addressed without data from potential incidents

Communication Chain



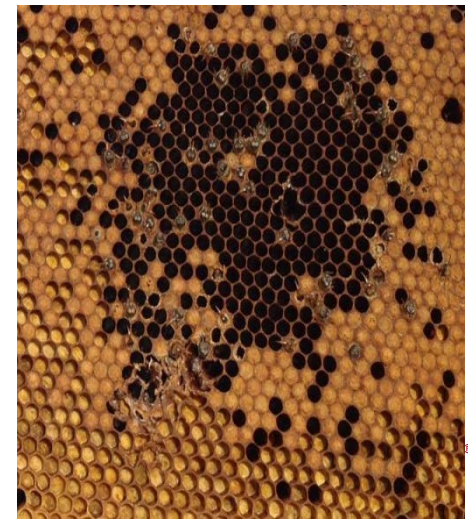
Key BMP: Honey Bees and Insecticides

- Avoid applying insecticides at bloom until more is known, particularly about their impact on bee brood (immature bees) and avoid tank mixing insecticides with fungicides
 - Bee losses have occurred as a result of tank mixing insecticides with bloom time fungicides.
 - The term ‘insecticide’ includes insect growth regulators, also known as IGRs
 - Currently most bee label warnings are only based on acute adult toxicity
- There are alternative IPM insecticide timings
 - See <http://www.ipm.ucdavis.edu/> > Agricultural Pests > Almond



Impact on immature bees

Newly emerged, wingless bees pulled from the combs by other bees, and empty cells of brood that failed in their attempts to emerge as adults



Key BMP: Honey Bees and Fungicides

- Any fungicide application deemed necessary during bloom should occur in the late afternoon and evening when bees and pollen are not present
 - This avoids contaminating pollen with spray materials
 - But, don't spray so late that fungicides do not have time to dry before bees begin foraging
 - Spraying while bees are foraging can degrade floral scent chemicals that the bees "home in on"
 - Bees that come in contact with ag sprays cannot fly until spray dries



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Key Objective:

Assure almonds continue to be a good and safe place for bees

Honey Bee – Almond BMP Video

