

POLLINATION BASICS GUIDE



INTRODUCTION

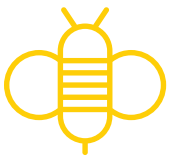
Whether you're new to renting bees for pollination or you've done it for years, this guide breaks down the fundamentals of honeybee pollination, addresses the most common questions growers have when it comes to renting bees and walks through key information to know prior to renting hives for pollination. No matter if you consider yourself a grower, farmer, rancher or something else — **if you rent bees, this guide will help you gain an advantage.**



BEEKEEPING BASICS

All beekeepers share one thing in common: a completely unique approach to hive management.

No two beekeepers will agree on how to manage their hives. We've even seen father and son beekeepers butt heads on what's best for the business they jointly own. But we're not here to argue over the nuances of hive management, so let's cut through the noise and highlight the things that matter to you.



Colony size/hive strength

Refers to the number of bees within a hive. This is the most important factor a grower should understand to achieve optimal pollination. Colony size is measured in terms of frames. Weak colonies (4 frames or less) provide little to no pollination value. Stronger colonies send out more foraging bees to pollinate your blooms.



Hive grading/frame count

To evaluate colony strength, growers hire a third party to grade the hives. Grading hives is essential — it's the only way to determine whether you'll receive effective pollination and ensure you're getting what you paid for. The traditional method for grading hives is known as a frame count: an inspector opens each hive and makes an eyeball estimate of how many frames are covered by bees

Most beekeepers are going to feel uneasy about the idea of a stranger going through their hives. Not because they're worried about what they'll find, but because they're anxious about how it might impact the bees. We offer an alternative to manual hive grading. Using infrared (IR) imaging, Verifli accurately measures colony strength without disrupting the bees. Growers who hire manual inspectors will only receive average frame count. The Verifli dashboard provides you more data: users can filter results by different sites and beekeepers, create and print custom reports and pinpoint the exact location of weak hives with our interactive mapping tool.

MANUAL FRAME COUNTS

VERIFLI IR HIVE GRADING

Disruptive to bee activity	Yes	No
Accuracy	Subjective	Objective
Report turnaround time	3 - 7 days	Within 48 hours
Report detail	Average frames by field	Average frames by field, hive drop and beekeeper Customize and print reports
Mapping tool	None	Bird's-eye-view of your fields showing average frame count at each hive drop Pinpoint location of weak hives

See our [Ultimate Hive Grading Playbook](#) for more tips on getting the most out of hive grading.

Hive box/hive equipment

Beekeepers run a wide variety of hive box setups. What's inside the boxes is more important than the boxes themselves, but you should familiarize yourself with the equipment varieties so you don't get short-changed.

- 2 widths: 10-frame or 8-frame
- 3 heights: deep, medium or shallow
- 2 pallet sizes: 4-way or 6-way

Box size (width)

10-frame boxes are more common, but many beekeepers find that 8-frame boxes are easier to manage. 8-frame boxes are a few inches narrower and a few pounds lighter than a 10-frame box. Bees can thrive in either setup, just be aware that 8-frame boxes have 20% less capacity.

Box size (height)

Hives used for pollination are usually made up of 2 or more boxes stacked on top of each other. Regardless of how many boxes are stacked, there's only one colony inside. The box setups that are used most commonly for pollination are double deep (2 deep boxes) and the story and a half (1 deep and 1 shallow or medium). **In most cases, hives smaller than a story and a half are less likely to provide adequate pollination.** Though colonies in a single box can contain 10 full frames of bees, the colony will send fewer foragers to pollinate your blooms if they don't have room to grow. **Don't be fooled into thinking you need the biggest hive box setup to maximize pollination!** Though a 10-frame double-deep can contain about 12,000 more bees than an 8-frame story and a half, you can get optimal pollination from either setup.

Pallet size

Most commercial beekeepers run hives on pallets for easy transportation. Pallets hold either 4 or 6 hives. It's important to know if your beekeeper runs 4-ways or 6-ways so you can determine how many pallets to place at each drop. If your beekeeper doesn't run hives on pallets, they probably don't specialize in pollination.

This is the equipment most commonly used by commercial beekeepers in the US. There are several other variations of hive equipment used by beekeepers around the globe.



Shallow frames can hold about 900 bees



Medium frames can hold about 1,085 bees



Deep frames can hold about 1,700 bees



4-way pallet



6-way pallet

THINGS YOU DON'T NEED TO WORRY ABOUT

Monitoring hive traffic

Bee flight is not a reliable indicator of hive strength. If bloom hasn't begun quite yet, or the weather is bad, a perfectly strong hive might not send out many foraging bees. Conversely, a hive with a flurry of bee activity might actually be dead — neighboring hives will flock to a dead hive to rob it of its resources, which can trick an untrained eye into thinking a strong colony is inside.

Honeybee subspecies

Sometimes we get asked whether different genetic profiles of bees are more desirable for pollination. Some of the most common honey bee subspecies managed by US beekeepers include Italian, Russian and Carniolan. Their traits vary slightly, but there's no significant difference in terms of pollination effectiveness.

Honey production

Depending on the crop, some beekeepers may harvest honey during pollination. Beekeepers harvest honey to prevent swarming and maintain productive hives. The logistics of harvesting can be costly, so don't knock your beekeeper for "double-dipping" by producing honey while pollinating your crop.

THE HIVE RENTAL CHECKLIST



3 to 6 months before bloom

Hive stocking rate & placement

For each field, determine the number of hives you'll need and how they'll be distributed. Hive stocking rate (how many hives to rent) will vary based on the crop you grow. Use maps of each field to plot out hive drop locations. Drops of 20-40 hives should be distributed evenly along the perimeter of the field, roughly 100 yards from the next closest drop. Select drop locations carefully: drops should be easy to access, on mostly flat land and away from blind corners, leaving enough space for trucks or machinery to pass.



3 to 6 months before bloom

Call beekeeper

Once you've decided how many hives to rent and when you need them, reach out to your beekeeper to communicate these details. During this call, you'll also want to discuss price per hive and set expectations around hive strength, including:

- **Desired average strength:** An 8-frame average is standard for most pollination contracts. If you request a higher average strength, you should expect to pay more per hive.
- **Hive grading details:** Tell your beekeeper who will perform the grading, when it'll take place and how many hives you plan to grade.
- **Minimum acceptable strength:** Subtract any hives below this threshold (usually 4 frames or less) from the final invoice unless the beekeeper promptly replaces them.
- **Guidelines for replacing weak hives:** Give your beekeeper a deadline to replace any hives below your minimum acceptable strength discovered during grading.



3 to 6 months before bloom

Draft & sign contract

After this call, begin drafting a contract that captures all the details and expectations you discussed with your beekeeper. Check out our [Pollination Contracts Best Practices](#) guide for more tips and a sample pollination contract.





2 to 3 weeks before earliest bloom

Arrival

You'll want to give yourself a cushion so you have time to replace weak hives or rent additional hives before bloom. For certain crops, it's also important to remove hives promptly once pollination is complete, otherwise the bees will strip valuable nutrients from your blooms and negatively impact your yield.

Your beekeeper will arrive at dusk and work through the night to distribute hives while the bees are inactive. It can be disorienting to navigate unfamiliar fields in the dark, so here are some steps you can take to make sure everything goes smoothly:

- Send beekeeper maps with hive drop locations and access points highlighted.
- Place physical markers in the field (for example reflectors or ribbons) to indicate hive drops.
- Provide keys or combinations if fields have locked gates.
- Remove obstacles from fields like machinery or piles of clutter.
- Notify neighbors to expect nighttime activity on your field, also kindly ask them not to spray chemicals known to harm bees until the hives have left.
- Set out water buckets for the bees with a piece of burlap or something that floats so they can climb out (not essential but your beekeeper will appreciate it).



After bees arrive

Grade hives

You'll want to grade hives as soon as possible after they arrive. The sooner you can identify a hive strength problem, the more time you have to resolve the issue before it's too late. Whether your beekeeper replaces weak hives or you find another beekeeper to supplement what you have, it will take a few days to make arrangements. If you grade too close to the start of bloom, you might miss your window of opportunity.



After bloom

Pay promptly

Everyone appreciates being paid on time, beekeepers are no different. They incur a lot of expenses to deliver bees for pollination, and they depend on your check to pay their bills.

DO'S AND DON'TS OF WORKING WITH BEEKEEPERS

It's OK to...

Ask to shadow beekeeper while they work hives. This is one of the best ways to get in a beekeeper's good graces. Beekeepers are passionate about what they do and they're usually proud to show off their bees.

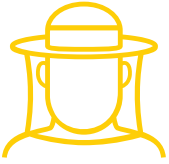
Ask about their methods. Demonstrating interest in how they work hives is another great way to get your beekeeper to warm up to you. Even if you choose not to tag along in the field, most beekeepers will be happy to answer any questions about how they manage their bees and what it takes to deliver pollination.

It's not OK to...

Open hives without beekeeper permission. Even though the hives are on your property, it's best to keep your distance from the hives unless you get permission from your beekeeper.

Spray fields when bees are flying. When it comes to pollination, exposure to harmful chemicals is a beekeeper's number one concern. While the bees are on your property, you're responsible for protecting them from harmful chemicals.





A BEEKEEPER'S PERSPECTIVE

From an outsider's point of view, pollination may seem like a no-brainer for a beekeeper. They simply drop off the hives, let the bees handle the hard work and go back home with a big check in their pocket, right? Truth is — it's much more complicated than that. There are a host of reasons why a beekeeper might choose not to offer pollination.

There's the human element: the skills required to be a good beekeeper don't necessarily overlap with the skills of a good service provider. **For many beekeepers, pollination is a crash course in customer service.** As someone who's more experienced with managing bees than people, it can be quite a shock to get a late-night call from a grower who's anxious because he didn't see very many bees flying that day. The beekeeper might assume he's checked all the boxes by delivering his best hives on time, but by offering pollination services, he's also responsible for customer satisfaction.

CLOSING THOUGHTS

There are lots of small details that go into bee keeping, and sometimes, millions of bees to keep track of. As long as you have these fundamentals down and stick to a guide, your pollination season can go a lot smoother. A strategic plan can give you time to focus on saving money and producing the best yield.

GLOSSARY

Colony: Refers to the bees within the hive box (interchangeable with "hive").

Hive: Refers to the wooden hive boxes; also refers to the bees within the boxes (interchangeable with "colony").

Hive box: usually refers to a single wooden hive box.

Colony size/hive strength/frame count: Refers to a measure of the bee population within the hive boxes (each used interchangeably).

Hive grade/inspection: The process of determining colony size.

Frame: Refers to the removable parts within the hive where bees build comb; Also refers to a measurement of colony size (e.g.: "this hive has 9 frames of bees").

Foragers/foraging bees: These are the bees that leave the hive to pollinate your blooms. Each bee is assigned a role in the colony, and the oldest bees are placed on foraging duty. Most of the bees in a colony are assigned to tasks inside the hive.

Hive drop: Refers to a group of hives placed in the same spot on a field. Hive drops should be dispersed evenly throughout the field, with no more than 40 hives at each drop.

At The Bee Corp, we are passionate about driving industry research and data standards in the bee and pollination industry. To find more bee related resources and how you can increase your ROI this pollination season, visit our blog thebeecorp.com/thebeeword.



Call us at **(559) 314-2030** or visit **thebeecorp.com** today.