

*"You have no idea about presents or what they mean. The last present you gave me was a stick."*

*'You wanted a weapon.'*

*'It was a stick.'*

*'It had a bow on it.'*

*'It was a stick.'*

*'I thought you liked the stick. You laughed.'"*

— Derek Landy, *Kingdom of the Wicked*

We have often noted that beekeepers love gadgets and other bits of equipment (see "[Gadgets, Gizmos and Got-to-Haves](#)" for some interesting examples). What makes my standard Beginning Beekeeper Equipment Presentation so much fun is separating out the things that people think are necessary from the ones that aren't. A bee brush is one example: they come with beginner kits and seem so vital, yet I haven't used one in 20 years. If I find that I need something like a brush, I use what I was taught by an Apiary Inspector many years ago: a clump of nearby grass. That's one less piece of equipment to buy and keep up with, as well as one less item to potentially carry disease from one hive to another. Plus, it is very rare that I need to brush my bees; smoke typically serves the same purpose.

On the other hand, there are items that are uniquely useful that aren't given much thought. I hold up one of these in my Equipment Presentation and ask, "Can anyone tell me what this is?" When I don't get any responses, I tell them, "It is a stick. We beekeepers are typically very descriptive with the names of things, so we call it an entrance reducer. But the plain fact is that it is a just a stick."

For something that is really pretty useful and important despite being ordinary-looking, entrance reducers don't get much respect. They are only given brief and non-instructive mention in [The Hive and the Honey Bee](#) (2015 edition) and are, in my opinion, inappropriately described as mouse guards in [The Beekeeper's Handbook](#) (5<sup>th</sup> edition). (See "[A Few More Wintering Tips](#)" for information on genuine mouse guards.) Costing only a buck or two, they come with Beginner Kits and are often given



The humble Entrance Reducer (green) is just a stick with a notch cut in it. It doesn't get the respect it deserves, until now.

Photo: the author

away as promotional items by supply houses. But I have never seen an instructional guide for them. It is no wonder that my beginner students always ask, "When do I switch my entrance reducer to the next larger size?"; nobody has bothered to fully explain either the purpose or the operation of the device.

### Description

A standard entrance reducer is a piece of lumber  $\frac{3}{4}$  inch by  $\frac{3}{4}$  inch square (to fit snugly within the height of the entrance to a standard Langstroth hive) and as wide as the entrance opening. The width differs for nucs, 8-frame and 10-frame boxes. The entrance reducer typically has two cut-out sections of different widths ("small" [typically  $\frac{3}{4}$  inch wide] and "medium" [width varies, often 2-1/2 to 4 inches]) half the height of the lumber. These openings are oriented 90° from each other so that when one is in the "open" position, the other is "closed".

I sometimes paint entrance reducers, although paint can increase the thickness enough to hinder easily sliding them into and out of the hive entrance. They are so cheap, so functionally robust and used for such a short time on a hive that painting isn't strictly necessary.

## Purpose

The purpose of an entrance reducer is simply to reduce the size of the entrance to a hive. We want to do that when our colony is small and therefore vulnerable to robbing by other honey bee colonies or other honey- or bee-eaters in the area. This is particularly critical during dearths, when robbing is more productive than foraging.

Note that the standard size of the entrance to a Langstroth hive is a function of the width of the lumber used to make the hive and has absolutely nothing to do with honey bee biology. The full-open entrance is difficult to defend against an aggressive assault unless the defending colony population is full strength, but a small entrance is easily defended by just a few guards.

If small entrances are so strategically beneficial, why not make them small all of the time? There are several reasons, including:

1. Honey bees are very fastidious creatures who keep their living space as clean as possible. A tiny entrance greatly impedes the removal of trash, including corpses of dead bees, which must be physically removed by housekeeping bees to maintain a healthy environment.
2. As with the old saying, "Make hay while the sun shines," nectar collection must be top priority while the main flow is under way. Nectar that is not collected is nectar that is never turned into honey. If our bees have a crowded entrance and are unable to quickly come and go to offload their collected nectar and return to the field, we decrease our honey harvest. Beekeepers owe it to themselves to help the bees have as efficient a production process as possible, to the extent that we can do anything that really helps. Removing impediments to the traffic flow is one factor that we can control.
3. When using solid bottom boards, it would be easy to suffocate a large

colony by overly restricting the size of the entrance and thereby inhibiting air flow.

4. A healthy, robust, fully-populated colony simply does not need a tiny entrance. They can defend against whatever or whoever is foolish enough to covet their supplies. If you require proof, I'll let you disassemble one of my hives in mid-August, without smoke and wearing only shorts, a t-shirt and a good pair of running shoes.

## Usage

There are 3 configurations of a standard entrance reducer: small opening, medium opening and fully open/removed. The small opening is intended to provide a more-defensible opening for tiny package-sized colonies. When we install a package, the population is going to decline until the new queen lays eggs and that brood matures and ecloses. If honey bees live 5 weeks in spring/summer (35 days) and their ages are perfectly distributed, then a colony will lose 1/35 of their original bees per day. It takes 21 days to make a worker bee from scratch, so if the queen begins laying on Day 1 (which she doesn't), by the time there are any new bees the colony will potentially have lost  $21 \times 1/35$  of the original population. If we start with 10,000 bees, roughly the size of a typical 3-pound package, that means we'll lose 286 bees per day, and by day 21 we will have lost up to 6,000 bees. (Note that the age of package bees is NOT perfectly distributed – by the nature of how they are prepared, it is weighted more toward young house bees than older forager bees, so there will be fewer losses than otherwise in the short run. But we won't overly complicate a good story.) If a queen lays 1,500 eggs a day, there will be 7,500 new bees that have matured and eclosed between Day 21 and Day 26, minus the demise of 1,430 more of the old original bees. That is a net growth of 70 bees beyond what we started with, assuming that my math is not too terribly incorrect (see "[Bee Math](#)" for more on this topic). So in this example, *the colony does*

***not begin to grow in size for nearly a month after the package is installed.***

All that to say that in the interest of assisting a small population as it defends the entrance, it is counterproductive to make the entrance larger before a month has passed because until then, the defensive population is smaller and smaller, not larger and larger.

Bees aren't all that great at math, though, so my rule of thumb is that I increase the size of the entrance when the population has grown to be so large that the bees have to take turns going in and out. That is a clear sign that the smaller size is hindering instead of helping.

Note that the medium size will likely be bee-friendly even for a heavily-populated colony. It is roughly the opening size that a colony prefers when searching for a new home.

### Up or Down?

Once the appropriate size is selected, the next question is whether the entrance reducer should be placed so that the opening is on the upper side or the lower side of the stick. The controversy here is not unlike the heated debates leading to fistfights and generational feuds that can occur over whether queen cages should be installed with the candy end facing up, down or otherwise, and whether the notch in the inner cover should face forward or backward. In practice, I'm convinced that the orientation doesn't really matter but to be able to vehemently take part in bee club disagreements, everyone should pick a side and vigorously defend it. The rationale for each option is:

1. **Facing down:** allows the housekeeping bees to more easily removal debris and bee corpses from the bottom board.
2. **Facing up:** the aforementioned debris and bee corpses can accumulate enough to clog the entrance, which can lead to suffocation, starvation, or other untimely demise of the colony. With the entrance facing up, the bees can simply walk over the top of the debris to enter/exit.



### Further protection

Entrance reducers typically include a small entrance that is 3/4 inch wide and 3/8 inch high, more than adequate for small-colony traffic. The medium-sized entrance varies but is probably expansive enough to accommodate the coming and going of a large colony. Photo: the author

As noted, entrance reducers are a tool to aid our bees as they attempt to repel robbers. If robbing does become an issue in a bee yard, another useful device is a robbing screen. See "[Robbin' the Hood](#)" for a description and usage tips. In my opinion, to specifically protect small package colonies, robbing screens can be used in addition to entrance reducers but I wouldn't use them prophylactically instead of entrance reducers. The reason is that over time, robbing screens can lose their effectiveness as the footprint pheromone path to the "secret" entrance becomes obvious to robbers.

### More?

There is much more that can be opined about entrance reducers but they are, after all, just a stick. A stick that should be used with the appropriate wisdom and respect that it deserves.

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