# How to Overwinter Small Hives Successfully

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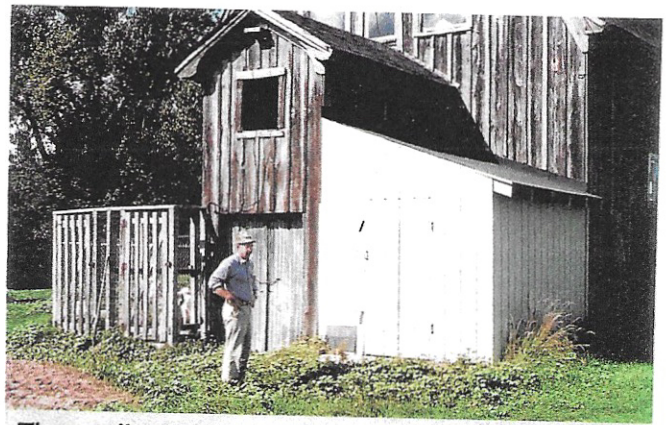
*Michigan beekeeper Jess Steed found out in the early 1990's that it was not only possible to overwinter small hives indoors in Michigan, to make up his own winter losses and to sell to other beekeepers, but it was also very profitable.*

Jess Steed in bee yard in mid-September with some of the 115 one-story hives he'll be overwintering indoors.



The small addition, painted white, on the right side of Steed's shop, will hold 40 one-story hives for overwintering, all elevated 8 to 10 inches off the floor.

He overwintered 115 small, one-story hives indoors for six years, until a bad back forced him into retirement from the beekeeping he loved. Because Steed was a careful beekeeper who gave close attention to details, during most of those six years, his own winter losses were only 10 to 15%. After replacing his losses, he had over 100 small hives to sell many years, which brought in welcome spring income.

Not many Michigan beekeepers who have not trucked their bees south have their own nucs to sell in April! The beekeepers who bought Steed's small hives liked his quality. Some of his indoor-wintered small hives built up quickly enough to be used for pollination. "I could have sold 2000 of them a year," Steed commented.

"Any northern beekeeper could do this. You don't need a building. It wouldn't take much work to convert an old truck body into an indoor overwintering storage for small hives. Just close all the cracks that let light in, and put some vents in for air circulation. It wouldn't be hard to do."

Steed got the idea from an *American Bee Journal* article about Kurt Webster of Vermont, who was also successfully overwintering small hives. "It took me two years to perfect my method," Steed explained. "The first year, I overwintered six-frame nucs. I found, though, that although I had a good survival rate, the hives were too small to give a good, strong cluster that could take the early spring cold."

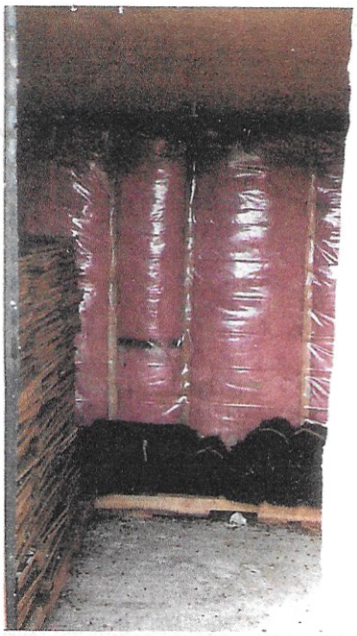
That same year, Steed also tried, quite successfully, to winter some small hives outdoors, on top of some of his full-sized hives. (More on this later.)

The second year, Steed tried overwintering his small hives in one deep hive body with nine-frames, which gave the queens more room to lay, resulting in larger populations come spring. Also, the second year and all subsequent years, he overwintered all 115 small hives indoors. "Indoor wintering is easier and more certain," he commented, "because indoors it's dry, and you can maintain a constant temperature."

Steed's method was surprisingly low-tech. Here's how he did it.

### The Method

"By late May, or June 10 at the latest," he said, "I put two frames of sealed brood with bees attached, and one frame of honey, into a good, bee-tight deep hive body, with a tight bottom board and top." The honey was necessary because, in



The interior of the addition shown in photo #2. The overwintering room is insulated with six inches of fiberglass throughout.

Steed's area, there is very little honey flow in June. (Beekeepers in other areas would need to experiment with dates for making their splits to produce a sufficiently built-up small hive by late fall under their local conditions.)

Steed put a caged queen in with the split right away. His reason? "With small populations of bees," he explained, "the bees know right away that they are queenless. I used to put in the queens the next day, but half the hives would already be drawing queen cells. So now I put in the queen right away."

"The splits were then moved to another yard, so that the bees wouldn't drift back to the hives from which they came," he continued.

Steed also immediately put on entrance reducers. "For entrance reducers," he explained, "I liked to use the standard metal mouse guards from Dadant that screw onto the front of the hive.

"To use these as entrance reducers, I put them on upside down, after cutting a 1/2 x 3/8-inch entrance in the center of the guard. Then, I put the guard in the 'closed' position. As the hive populations built through the summer, I raised the mouse guards to give a larger entrance. "One week after making the splits," Steed continued, "I checked for queen acceptance. It would typically be 95%. Then, by mid to late July, when the entrances were fully open, I checked to see that the hives were not getting too crowded." No additional space was given to the growing hives. The hives were deliberately kept small, and in one hive body only, to restrict the queen's laying space.

"I've had some late summer swarms when the hives become too crowded," said Steed. So, after those experiences, if a queen seemed short on space, he removed one or two frames of honey, and replaced them with foundation or drawn comb. The

Steed is careful to give all his 500-plus full-sized hives an upper entrance for better wintering.

Note Steed's conversion of a Dadant screw-on metal mouse guard to a dependable entrance reducer. Steed has cut a 1/2 by 3/8 inch entrance in the mouse guard, which is initially put on in the 'closed' position, to allow bees in a newly made split to defend their hive against robbers from larger, stronger hives.

This photo shows the strength of one of Steed's one-story hives for overwintering, in mid-September, on a day warm enough for some bee flight. About 4 1/2 frames are covered with bees. In Steed's area, there will be very little brood, or no brood at all, in the hive in mid-September. The queens will have stopped laying awhile back.

A bee-tight lid and bottom board are a 'must' when splits are placed in the same yard with full-sized hives. Note that the mouse guard Steed used initially as an entrance reducer is raised, now that the hive has built up, allowing a full entrance.

Smoking one of the hives to be overwintered indoors, before inspecting it for strength.

frames of honey he removed were stored and used to feed other hives in the spring.

When we visited Steed in mid-September to take a look at the hives he planned to overwinter (See photo), he told us, "Around here, the queens really slow down for the fall. If I'd pull frames right now, we'd probably find not a square inch of capped brood. The hives would appear to be queenless, but you can find the queen. She has just stopped laying."

### Indoor Wintering Easier and More Certain

Although Steed experimented with wintering some small hives outdoors, he found that he preferred indoor wintering, because hives were kept dry, and the temperature could be controlled.

To winter the small hives indoors, Steed built a modest addition onto his shop, measuring 7 feet by 10 feet, by 9 feet high, and insulated it all around with 6 inches of fiberglass.

"This storage chamber for the small hives, when it's closed up, must be completely dark," he added. In this small area, Steed could store 35 to 40 singles.

"I brought the singles in as soon as daytime temperatures were consistently cool— in the 30's or 40's. The first row of hives was elevated eight to ten inches off the floor. Then, the hives were stacked four high," he continued.

The rest of his 115 small hives were similarly stacked in the earthen-floored basement of the same building, which had at one time been used for potato storage. "This basement was ideal," commented Steed. "It held a temperature of 28 degrees, which was perfect, because at that temperature, the bees consume the least food."

To bring fresh air into both the small addition and the basement, Steed used two inexpensive 50 cfm. bathroom ceiling fans, attached to a timer. "Even in the coldest weather," Steed continued, "the fans ran twice a day. It's important that the exhaust vent not allow light to enter. The room needs to be in complete darkness," he stressed again.

"At normal Michigan temperatures of 0 to 20 degrees outside, the fans ran about 1/2 hour twice a day. If outside temperatures rose, the fans needed to run longer." The small insulated addition that held about 40 hives had a southern exposure. "This was an advantage," Steed added, "when it was really cold. But in March, when things started to thaw, I had to run the fan in there continuously.

"It's good to have an indoor/outdoor thermometer, so you can monitor the temperature inside without having to open the door, because it's important not to let light into the bee storage area."

### Little Attention Needed

Steed's overwintering small hives required remarkably little attention. "If the outdoor temperatures remained fairly constant, I only needed to check the temperature of the storage a couple of times a week," he explained. "But when outdoor temperatures changed suddenly, I would check the storage temperature more often, and reset the timer. The above-ground storage with the southern exposure required the most attention, as you would expect," he added.

The small hives were stored with entrances open, although, of course, in total darkness, the bees don't fly. "Dead bees should be swept off the floor every month," added Steed.

Steed had about 2 to 3% losses in his small hives wintered indoors. They were mostly to hives that showed signs of dysentery. "I put the hives in separate cubes," Steed explained. "If I saw a colony with signs of dysentery, I took it outside. It made sense to me not to leave a source of infection in my bee storage."

### Quick Hive Build-up in Spring

By March, Steed's indoor-wintered small hives would have two frames of honey left, and an average of five frames of bees, with the queen laying on a couple of frames. "By the end of April," he continued, "they would have six to seven frames of bees, with a good three frames covered with brood."

Some of the hives built up quickly enough to be used for pollination. When the indoor-wintered, one-story hives went to the orchard in May, Steed gave them an empty deep on top. "By the time they came out of the orchard," he remembers, "they were populous enough to split."

Why did the small hives take off so well? "Because," said Steed, "they had a young, vibrant queen that had only been laying for four months, and had been restricted in laying space."

### Wintering Small Hives Outdoors

Steed had also experimented with wintering his small hives outdoors. To do this, when temperatures were consistently cold, he took the small, single-story hives to another yard, where he stacked them on top of full-sized hives, which were palletized.

"I stacked the small hives three-high on top of the full-sized hives," he explained. Steed used no double screens. "Even without the screens," he continued, "the small hives benefitted from the warmth rising from the full-sized hives below them.

"Then I put 15 pound Weyerhaeuser roofing paper around all 12 of the single-story hives on the top of each pallet. I attached the roofing paper with strips of lath," he added, "so the hive's bodies didn't get full of staples.

"The roofing paper cut the wind, and formed an insulated air space inside and around the hives. I also insulated the top of each stack of three small hives with Celotex or fiberglass.

"In this area, it used to be that hives were covered with snow. Unfortunately, that is no longer usually the case," he continued, "and the lack of snow left the hives susceptible to wind and wind chill, as well as the intense cold."

When Steed had used the outdoor wintering method mentioned above with his small hives, his survival rate had never been less than 80%, and in some yards, it has been as high as 100%. But his preference is for indoor wintering.

Removing the inner cover to check on a hive for indoor overwintering.

### Queens

During the first year's experiment, Steed raised his own queens for the nucs. That winter, he went to California to spend some time with beekeepers there who raised their own queens.

However, in future years, Steed opted to buy his queens. "I decided I was much farther ahead to buy good queens than to raise and transplant cells," he said. With Michigan's short summers, and the time it took for mating, raising his own queen cells to transplant to the nucs was a somewhat chancy proposition.

"Also," he added, "I couldn't afford to ignore my main source of income — my other 500 plus colonies."

At that time, Steed purchased Italian queens from Glenn Apiaries in Fallbrook, California.

### Extra Spring Income

Since, in all but one year, when he had 30% hive losses to mites, Steed's own hives wintered well, he sold his indoor-wintered small hives to other beekeepers, with frames exchanged. Although he knew they were worth more, he sold them at package prices.

"I know it was a heck of a good deal," he commented, "but I wanted to make sure the purchasers didn't feel cheated in any way."

### Enthusiastic Customers

The purchasers were uniformly enthusiastic about the quality of the indoor-wintered one-story hives. In fact, two beekeepers to whom he sold some of his extra small hives for a few years were so impressed with the strength of the hives and their rapid buildup that they, too, were planning to try Steed's method.

When we spoke with Steed and took the photos for this article, he had developed back problems. His son helped with pollination and honey harvesting, and Steed had learned some ways to adapt.

When he had to take off hive bodies, for instance, he had learned to set an empty deep on the ground. He then set the heavy hive body on that, avoiding deep bending. But he realized he would soon be forced to give up beekeeping.

Steed has since retired from beekeeping in 1999, but his method of overwintering small hives indoors made it possible for him to keep his hives in Michigan over the winter, even during the worst years of the mite problems, and still produce his own nucs, both to replace his dead-outs, and to sell. (His wife had a full-time job locally, working as a registered nurse, and Steed didn't want to leave her for long stretches each year to take his bees to Florida.)

"I had contemplated building a larger bee-storage facility in the side of a hill, where half of it would be banked with earth," he said. "This would give the benefit of a more unchanging temperature." In such a facility, he could have overwintered a much larger number of small hives. "I could have easily sold them," he commented.

"If I had been a younger man, I would have done it. But by the winter of 1990-91, I knew my back problems were bad enough that I was just staying in beekeeping year by year— that my time in commercial beekeeping was limited."

Today, Steed still enjoys taking care of the 12 hives he kept when he sold the rest of his outfit.

### An Interesting Concept!

It's an interesting concept— having your own nucs to sell in northern Michigan in April, without trucking your bees south!

### Temperatures for Overwintering Indoors Can Be Warmer Than 28 F.

Even though, as Steed found, the bees use the least food at 28 degrees, they do not have to be kept that cold for successful indoor wintering, if your climate is a bit warmer.

A government facility for overwintering bees indoors in the eastern part of the country, for example, used a well-ventilated, prefab, walk-in cooler to house their hives. With the walk-in cooler, they were able to set and hold any temperature they wanted to choose. They opted to set a temperature of 42 degrees F. for the winter, and the bees did fine. The precise temperature used in overwintering bees indoors is less important than keeping the interior of the bee storage area *completely* dark, so that the bees do not try to fly.