

of holes only three-eighths of an inch in diameter. It has been found that the aspect of the entrance makes little or no difference to results. It may face north, south, east or west. No drifting of bees from one hive to another to matter has taken place provided flight holes have been a reasonable distance apart, say 18 inches. Indeed, a smaller distance has been found satisfactory if a stake is driven into the ground between the two entrances. So far, extra thick packing has not been found particularly advantageous.

The bees should be packed in the winter cases in September, preferably before the fall feeding is done. To avoid loss of bees, the hives, if standing in rows, should be gradually brought together during the late summer so as to occupy nearly the same position and face the same way as they will in the case. A less satisfactory plan, advisable only when the honey flow ends early, is to delay moving the hives and packing them in the cases until the bees have been confined to the hives by chilly weather for two or three weeks. In placing the hives in the case, the covers may be removed in order to bring the hives close together, but in a cold region, it is advisable to leave over the combs a board or oilcloth quilt to prevent the escape of too much heat and moisture. Passages for the bees over the combs may be provided by placing sticks under the quilt. In order to prevent the passage between the hive entrance and flight holes in the case becoming choked with dead bees in winter it should be at least five-eighths inch deep.

It is not necessary to remove the snow surrounding the cases during the winter, because the bees are not likely to smother even if buried deeply in it. In some places, however, it is an advantage to remove the snow towards the end of March.

The bees should not be removed from the cases until spring is well advanced. The extra good protection afforded in spring by the packing, especially during the first few weeks of breeding, is one of the main advantages of outside wintering. It is a good practice to leave the hives in the case until the cases become inconvenient for tiering supers (there is usually room for the first super). This may not be until June.

Experiments covering seven years at Ottawa have shown that colonies wintered outside in the four-colony cases begin breeding earlier and average stronger by the end of May than those wintered in the cellar, but that they are more liable to die in the winter, especially if it is a hard winter and if they have not been prepared in the best manner. On the whole the advantage is slightly in favour of wintering outside.

These remarks are based on the use of the Langstroth hive, which has combs in frames  $9\frac{1}{4}$  inches deep and a space of five-eighths of an inch between the bottom bar of the frames and the floor of the hive. In wintering outside there is some advantage in having the combs somewhat deeper in order to give each section of the cluster a larger available food supply, and in having more space under the combs, especially towards the entrance. These features can be provided in the regular Langstroth hive by placing over the brood chamber a shallow super containing combs of honey, and by slipping a thin wedge between the brood chamber and floor on each side. The additional stores and room supplied in the second chamber are particularly useful for stimulating breeding in spring. It must be remembered, however, that in a cold region it is not so easy for the bees to keep warm in a large hive as in a small one.

#### WINTERING IN THE CELLAR.

In a good bee cellar, the temperature keeps steady between  $45^{\circ}$  and  $50^{\circ}$ F., the air is fairly dry and not unventilated, and light is excluded. Two of these conditions,