

hives do not send out a single bee. Take a concrete case: At the writer's home in Victoria, in the spring of 1914, the first pollen was carried in on February 11th, and on the 22nd he found brood-raising well under way in a strong colony that had been left all winter without protection. On that date the hive was set inside a case and the vacant space of 2 inches all round was packed with grain-bags and an equal thickness placed above the frames. The weather remained delightful, but the packed colony did not send out a single bee for three weeks, though the thermometer in the shade frequently rose to 53 degrees. From all other hives the bees were flying freely.

At the same time he was carrying out other wintering experiments, the most interesting of which was one whose essential feature was a dead-air space all round the hive. This particular combination had been in active service for several years, during which time the writer had learned some of its merits. Its highest recommendation to his mind is this: that it prevents its bees flying until the atmospheric temperature outside is at least 50 degrees, and there is therefore very little chance of its inmates being tempted outside when there is risk of them being chilled, so that they cannot fly home. Right here let the writer say he has found several apiaries in his territory where the hives are really standing in a sort of cold frame, being surrounded on all sides by high fences, trees, or houses, and as a consequence, when the sun shines brightly on a cool still day, the apiary warms up, the bees fly out, but the moment they get above the level of the surrounding shelter they are chilled by the cold air-currents and at once drop to the ground, to rise no more. Every bee lost in early spring means a shortage of a hundred in the time of the honey-flow. Need it be said that in such apiaries the most noticeable feature is the slow building-up of the colonies in the spring months; in fact, it is not until near the end of June that the hives show brood right across the frames. As a contrast to this, in one protected apiary he has seen brood in eight frames in practically every hive in the first week of April.

The next fact learned about winter protection was that the bees in them consumed just half the stores necessary for those unprotected. In an average winter the writer's bees consume 10 lb. of honey between the middle of September and the middle of March when housed in unprotected hives; those protected use less than 10 lb.

There is no need to enlarge further on the advantages of suitable hive-protection during the months of winter and spring, say from October 1st to April 30th. Any one of the reasons when duly considered will show that it pays annually the whole cost of the original outlay, but the one fact that we get strong colonies early is enough in itself to justify even greater outlay. The writer has no hesitation in saying that more than half the colonies he examines can fairly be described as "off-schedule" bees; that, broadly speaking, their strength at any date during the season of flight is what it should have been about two months previously. They were weak at the end of winter, struggled along in desperate straits all spring, had not nearly enough bees to carry in the crop when the honey flow was on in July, but the queen then struck a big laying streak such as was due in May, with the natural consequence that the hive became full of young bees in August, when the flow was over; so there resulted the unhappy condition of many thousands of consumers with a small amount of stores for the winter. Brood-raising stops early, the August bees die off, so the colony faces the cold season weak in bees and stores. If it survives until March it repeats the dreary round of the previous year, and the series may be prolonged indefinitely until a severe winter puts an end to its existence. When the bee-keepers of British Columbia keep their bees right—that is, have them strong all the year round—the honey production of the average apiary will easily be quadrupled, and that without the addition of a single colony to those now in existence. The standard of efficiency should be: "Brood in eight frames by May 1st"; it is possible to get this condition even earlier than that.