Chapter 33

Temperature Measurements of Different Types of Beehives in Nepal

H. Pechhacker, E. Hüttinger*, K. Dippelreiter* and K.K. Shrestha***
* Institut fuer Bienenkunde, Lunz am See, Austria
** ICIMOD, Kathmandu, Nepal

It is important for bees to have beehives that are insulated against cold as well as heat. Badly insulated hives cause stress that result in disease, winter losses and absconding of bees. A well-insulated beehive supports the best environmental conditions for a bee colony and reduces stress, lowers food consumption and susceptibility to disease, and results in strong colonies.

Method

The temperature inside occupied hives and the air temperature outside the hives were measured in two locations (Jumla, northwest Nepal (2600 m) and Kathmandu (1500 m)). In Jumla, straw hives, Newton B hives, log hives and modified log hives (top-bar hives) were compared (Fig. 1). Temperature readings were taken inside the hive at the top and bottom every hour over 24 hours from five of each type (Fig. 2). In Kathmandu, temperatures at the top and bottom of the hive and inside the brood nest were recorded in straw hives and Newton B hives (Fig. 3). The measurements were made with an electronic system (calibrated feeler with ± 0.1°C accuracy).

Fig. 1. Test apiary in Jumla

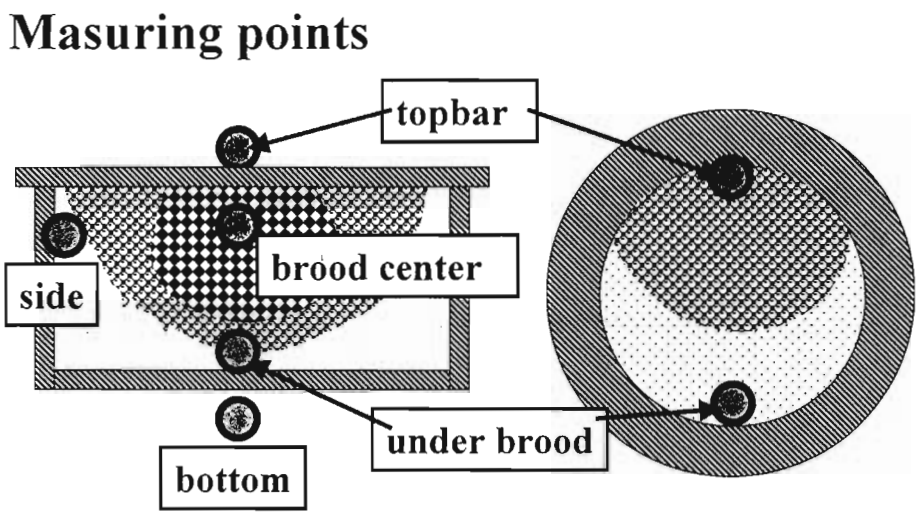

Fig. 2. Test apiary in Kathmandu (electronic measurement system is placed in the centre).

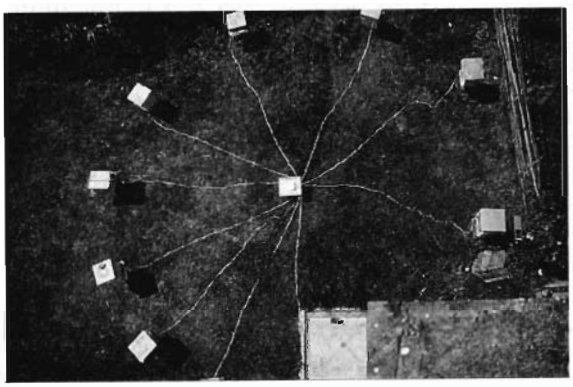

Fig. 3. Computing points inside the hive.

Results

In both Jumla and Kathmandu, the best insulation was provided by straw hives and the worst by Newton B hives (Figs. 4, 5 and 6). Even in the warm climate of Kathmandu large differences were found between outside temperatures and inside temperatures in straw hives and Newton B hives. The insulation of log hives and modified log hives is not as good as straw hives.

Discussion

A straw hive is the most insulated, and therefore the most comfortable, hive for bees. Work carried out by Partap et al. (1997) in Kathmandu showed that colonies in straw hives performed better than those in wooden hives. Therefore well-insulated hives increase the productivity of an apiary. The results also show that decreasing outside temperatures result in immediate heating activities by the bees. This may be one of the main reasons for stress within the colony.

Reference

Partap, U., Joshi, S.R., Verma, L.R. and Pechhacker H. 1997. Straw hive: an eco-friendly movable frame hive for *Apis cerana*. *Ecoviews* **4**: 12-15.

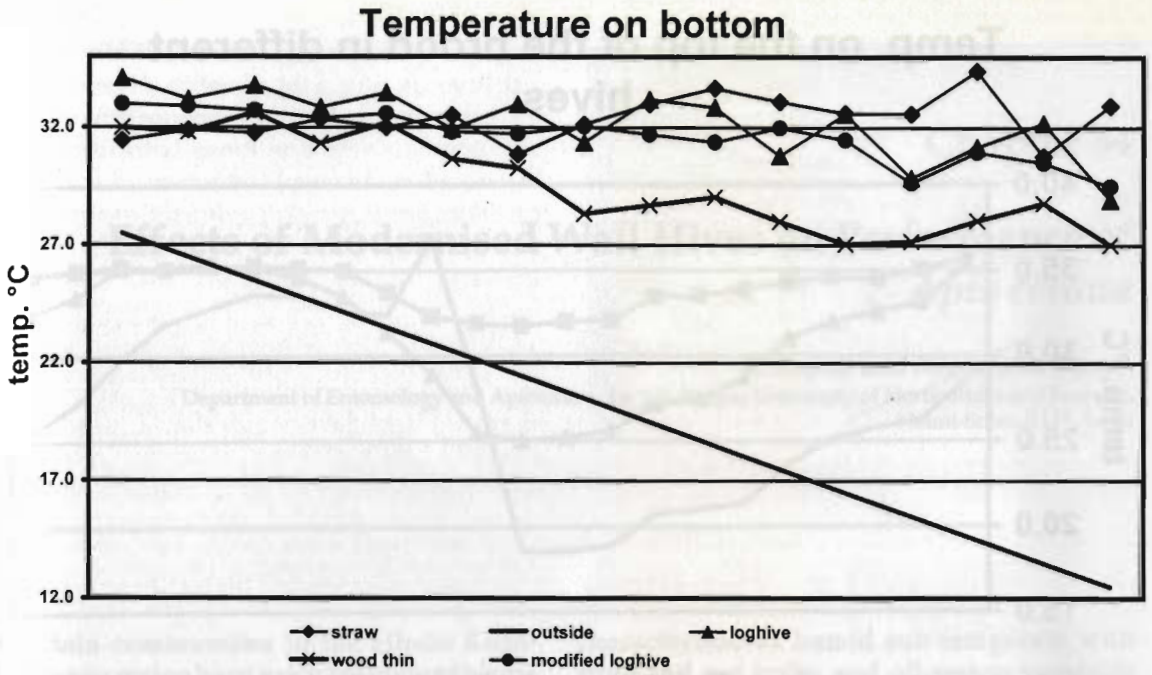

Fig. 4. Results for the measurements in Jumla

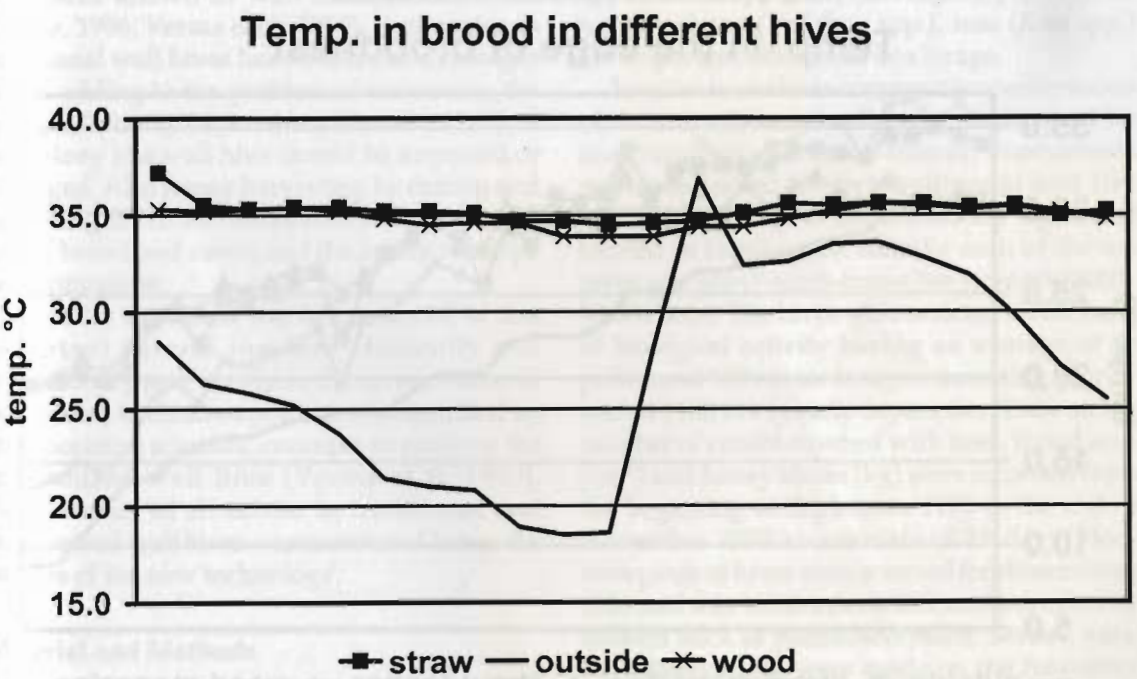

Fig. 5a. Results of temperature measurement in the brood nest in different types of beehives

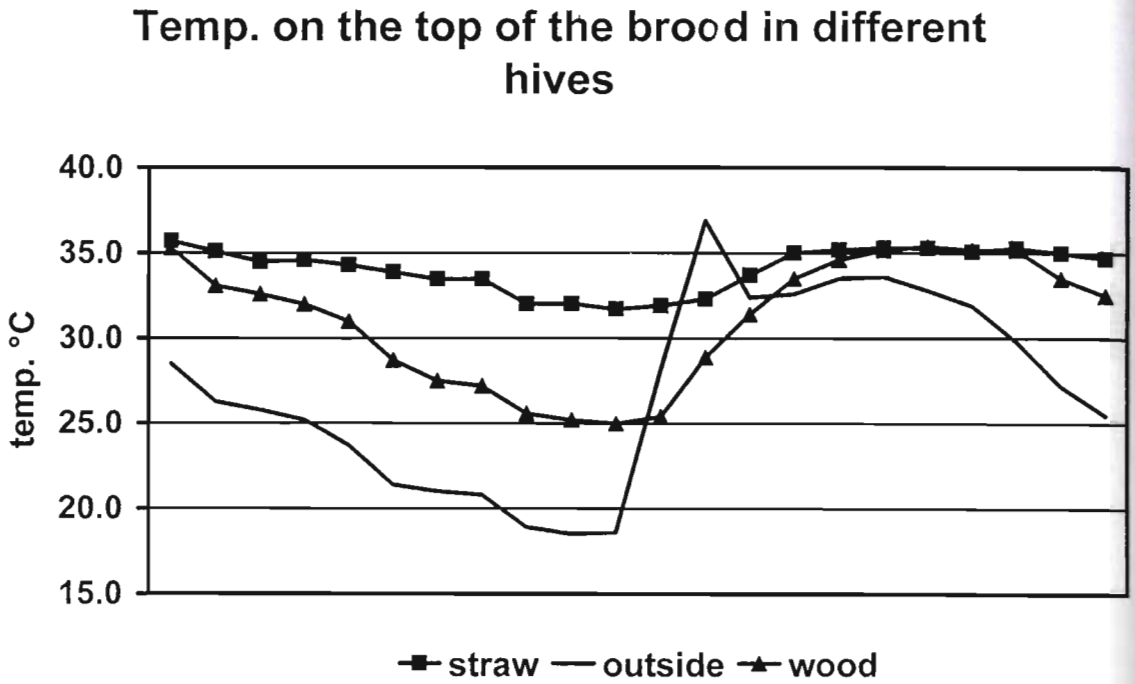

Fig. 5. Results of the measurements in Kathmandu

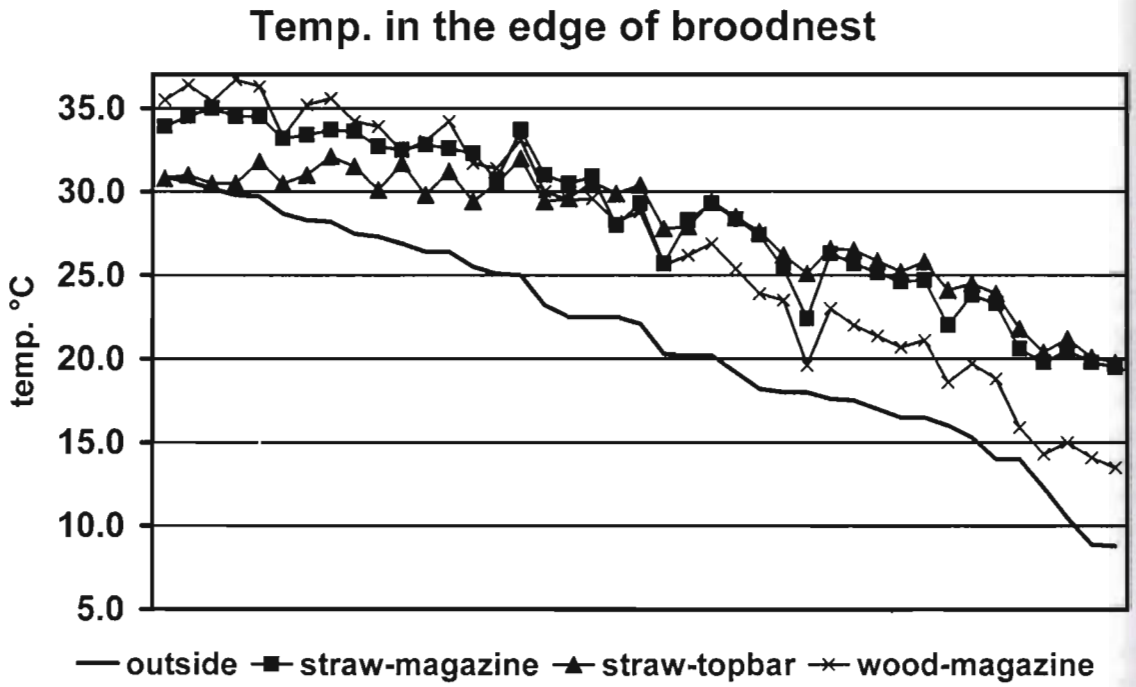

Fig. 6. Correlation between decreasing outside temperature and the temperature on the edge of the brood nest (Kathmandu).