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## **Comparison of economic efficiency of different types of honey bee hive insulators in Ardebil province**

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### **Abstract**

To carry out this project, 35 bee colonies were divided into 5 treatments with 7 hives. These treatments include: 1- Uncoated hives as control 2- Barzant insulated hives 3- Insulated hives with plastic material 4- Ionolite-insulated hives 5- Double-walled plastic hive. Prior to the start of the main phase, numbering operations, population homogenization, food storage, disease pest control, and the establishment of sister queens were performed in all hives. The results showed that, hive insulation had a beneficial effect on wintering performance, so that the population started in the spring in the non-insulated method and Ionolite-insulated hives were statistically lower than double-walled hives. The amount of honey storage from winter was the lowest in the control treatment without hive insulation and the highest in Barzant insulated hives and double-walled hive ( $P < 0.05$ ). The income from saving honey in the winter, in double-walled and insulated hive treatments with barzant were more than others ( $P < 0.05$ ). The lowest wintering index observed in the control treatment and the highest index in the double-walled hive, and other was moderate ( $P < 0.05$ ). The population was affected by different treatments during the months of May, June and July, so that in May, the highest population was seen in double-walled hive (7.71) and the lowest in control (5.33), in June in all treatments was more than the treatment of non-insulating control ( $P < 0.05$ ). The final results showed that economically, various materials such as Barzants could be used to insulate the hives due to the easy of installation, market price and strength, if the double hives were not accessible during the winter in cold regions.

**Key Words:** Wintering - Insulation – Honey Bee - Performance