

REARING EFFICIENCY, FORAGING BEHAVIOR AND DEARTH PERIOD MANAGEMENT OF HONEY BEE (*Apis mellifera*)

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Extended Summary

A study was undertaken in the SAU campus during August 2015 to December 2015 to determine the effect of artificial nectar and pollen supplement at different concentration on honey bee population in the dearth period. Four treatments consisted of the substitute of nectar in the form of sugar: water applied in the ratios of 2 : 1, 1.5 : 1 and 1 : 1 plus mungbean flour as pollen supplement. The study was replicated 3 times following RCBD. From each of the colonies six frames were selected to maintain the homogeneity of honey bee population. Several management practices like sanitation of the colony, fumigation of the colony by tobacco leaf and Sevin powder were placed at the bottom of the stand to prevent the ant infestation in the colony. Data were collected at seven days intervals on frame space (cm²) covered by eggs, larvae and pupae of the comb, number of workers/4cm² area, number of drone per frame in the different colonies from August to December 2015.

Due to artificial food supplements at different concentration encouraged queen fecundity and stimulated to lay healthy egg and subsequently increased the production of larva and pupa in the colony. Artificial nectar and pollen supplements at different concentrations affected different parameters viz., eggs, larvae, pupae, workers, drone etc. of honey bee. In the month of August frame space covered by egg, larva and pupae were 120.6 cm², 221.6 cm² and 310 cm² respectively and number of worker per 4 cm² area was 3.238 and drone per frame was 1.913 found in the colony treated with nectar substitute with sugar and water in the ratio of 2:1 plus pollen alternative with mungbean flour. All other treatments with lower concentrations of food supplements showed significantly lower performance. In the month of September, October, November and December the colonies treated with nectar and pollen substitutes with that higher ratio (2:1) showed the highest spaces of 145.33, 284, 300 and 397 cm² covered by eggs, respectively. With same substitute the highest space cm² covered by larvae and pupae were 300, 286, 298 and 306 cm² and 321, 288, 315 and 400 cm² and highest number of worker per 4 cm² was 3.79, 3.895, 4.566 and 5.083 and maximum number of drone per frame was 2.026, 2.40, 2.52 and 3.26 in the month of September, October, November and December, respectively. In the study of foraging behavior of honey bee during dearth period, number of worker bee ingress

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per minute into the colony with pollen was counted. Highest number of worker bee was counted 3.344, 10.40, 20.494, 20.056 and 29.944 in the month of August, September, October, November and December respectively in the colonies treated by nectar substitute with sugar and water in the ratio of 2:1 and pollen alternative with mungbean flour.

The overall results of the present study indicate that for the management of *Apis mellifera* during dearth period from August to December 2015 artificial nectar and pollen supplements at various ratios (2:1, 1.5:1, 1:1) influenced the eggs, larvae, pupae, number of workers and drone, fecundity of the bee colony. Space (cm^2) covered by eggs, larvae, pupae, number of workers per 4 cm^2 area and drone per frame was statistically higher in the colonies fed with nectar (Sugar : water=2:1) & pollen (mungbean flour) compared to those colonies treated with nectar and pollen supplements at the ratios of 1.50:1 and 1:1. The worker bees egressed from the hive in response to the availability of pollen and nectar yielding plants. Number of egress of worker bee increased with progress of month and highest number of worker bees egress from the colony which treated with (Sugar:water=2:1) and pollen (mungbean flour) compare to those colonies treated with nectar and pollen supplements at lower concentrations.