

A STUDY ON ASSESSMENT OF DURATION OF DEARTH PERIOD FOR HONEY BEES IN HARYANA, INDIA

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ABSTRACT: Good beekeeping management requires complete knowledge of available bee flora (floral calendar) round the year in a particular area (apiary). In the present study, honey bee colonies were checked for their performance during summer dearth periods. It was observed that the values for all the selected colony parameters: Egg laying, unsealed and sealed brood, honey and pollen stores, were maximum during April when sufficient food stores were available in bee hive. These values started decreasing drastically in the subsequent months i.e. May and June when there was scarcity of nectar and pollen. No any sealed brood, pollen stores and honey stores were observed in June month when dearth period was on its peak. An increase was observed in various colony parameters from July onwards, and it was noticed that by the mid of September, bee colonies started recovering from the losses occurred during pollen dearth periods.

KEY WORDS: *Apis mellifera*, dearth period, brood, pollen.

Due to shortage of bee flora, particularly during summer & monsoon seasons (April to September), the task of beekeeping becomes difficult and troublesome. The reserve stores of honey and pollen are rapidly consumed by bees during this period and overall activities of honey bees including foraging, egg laying, brood rearing are reduced. Further, bee coverage area & bee population are also reduced. The colonies become prone to face drastic effects of sun stroke, heat waves, shortage of water and attacks of enemies like black ants, wasps and wild bees etc. Heavy bee mortality may occur in some of the colonies resulting in absconding, quick dwindling and even perishing of bee colonies. In order to save the colonies, colony migration to a safer place having optimum bee flora, is performed that requires lot of time, labour and money, even then success is not guaranteed. Provision of supplementary feeding can also be made. This also requires a lot of knowledge and understanding on the part of beekeeper that what and how much to be fed. In addition to migration (based on bee floral calendar of the respective area), information data based on the study of colony parameters during dearth period may help in variety of ways in successful beekeeping management. This study may help in calculating the severity of dearth period and amount of pollen substitute to be provided to bee colonies during different time intervals of the dearth period. Mishra (1995) reported the dearth of bee flora from May to September and emphasized the necessity of feeding artificial diets to bee colonies during this period to strengthen their stores. The present study was conducted to assess the severity of dearth period during summer season so that arrangements can be done for proper management of bee colonies.

MATERIAL AND METHODS

The experiment was conducted in the Apiary maintained at Panchkula, Haryana (India) during summer 2008-09 following randomized block design. The colonies of *Apis mellifera* of almost similar strength were selected and checked for the presence of any disease or infection. Egg laying area, unsealed and sealed brood area, pollen and honey stores in the colonies was measured after every 21 days interval with the help of wire grid measuring frame consisting of squares of the size of one inch² (Seeley & Mikheyev, 2003; Amir & Peveling, 2004) (Figure 1). This value denotes the area in inch² which was then converted into cm² by multiplying with a factor of 6.45.

RESULTS AND DISCUSSION

Egg laying area was observed to be 823 cm² per colony in April month which decreased significantly to 166.7 cm² per colony in May followed by 43.0 cm² per colony in late May. No any egg laying was observed in the June month. Fresh egg laying was observed in July and after that it started increasing. Non-significant differences were observed in the egg laying area during July (26.0 cm² per colony) and first half of August (128.0 cm² per colony). Egg laying area was increased to the level of 198.7 cm² per colony in September (Figure II). The unsealed brood area was recorded to be maximum (552.3 cm² per colony) in April month followed by 155.0, 36.7 cm² per colony in First and last half of May. No any unsealed brood was observed in the colonies in June and July months. After that, an increase was noticed in the unsealed brood area as 176.7 and 190.3 cm² per colony in August and September months. Sealed brood area was observed maximum 1421.7 cm² per colony in April month which decreased to 0.0 as no any sealed brood was observed in July month. After that sealed brood area started increasing and reached to a level of 165.0 cm² per colony in September (Figure II).

Sufficient pollen stores were observed in the colonies during April month when enough natural bee flora was available. The pollen stores were observed to be 417.0 cm² per colony in April followed by 380.7, 112.0 cm² per colony in May month. No pollen stores were observed in June and July month. After that with the fresh showers of monsoon, flora reappeared and fresh pollen was observed in the colonies September month (123.0 cm² per colony) (Figure III). Observations recorded in case of honey storage area revealed that no honey stores were found in the colonies in June & July months. Fresh honey (46.0 cm² per colony) was observed in August which increased to 97.7 cm² per colony in September month (Figure III).

The inferences drawn from this study are comparable to the observations of Standifer et al. (1973b), Doull (1980a), and Mishra (1995) who reported the dearth of bee flora from May to September and emphasized the necessity of feeding artificial diets to bee colonies during this period to strengthen their stores. It was also observed that the colony parameters (egg laying, unsealed and sealed brood) started improving with the first showers of monsoon (July onwards). The observations were in accordance with that of Singh (1943b); Thakar & Shende (1962); Shah & Shah (1976) who reported an increase in the rate of egg laying by queen bee and brood rearing with the first income of pollen after dearth period.

At the end of study, it can be concluded that intensive care and heavy feeding of bee colonies is required only during May, June and July months as when the dearth period was on its peak.

The study on control colonies was of prime significance in calculating the severity of dearth period for honey bees so that proper management of bee colonies can be done to have maximum profit in next honey flow season. Also, the study was helpful in determining the amount of pollen substitute to be provided to bee colonies during different time intervals of the dearth period. Right decision at right time by the beekeeper can lead to successful beekeeping and prevent colony losses during lean periods.

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Figure I. Frame sized wire grid used to measure various colony parameters.

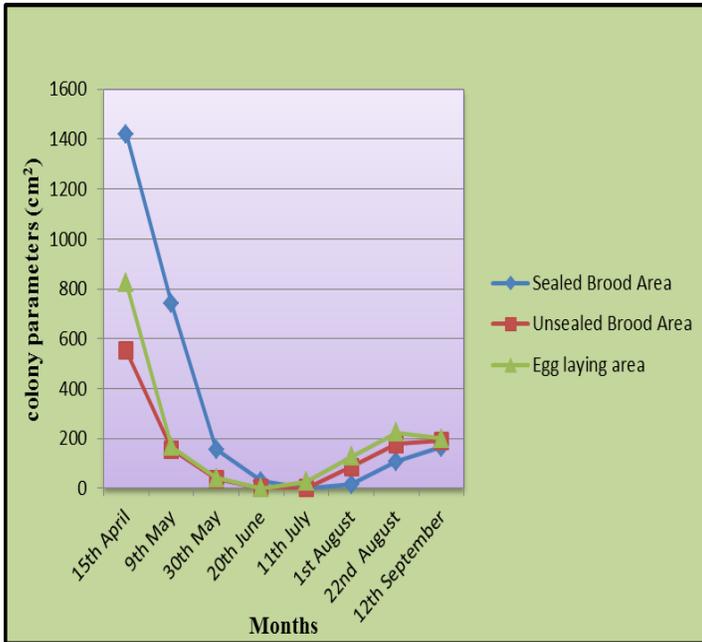


Figure II. Showing variation trend in various colony (egg laying, unsealed & sealed brood area) parameters during summer dearth period.

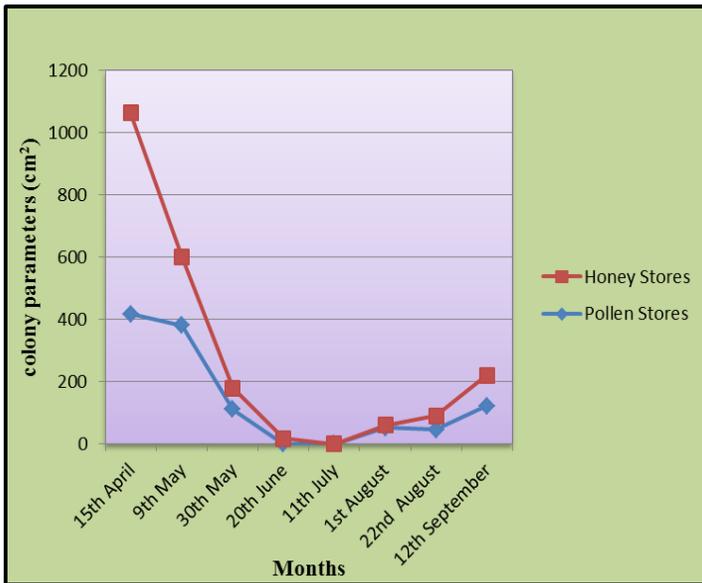


Figure III. Showing variation trend in various colony parameters (honey & pollen storage area) during summer dearth period.