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Sacred Soil, Sweet Harvest: Bee Forage Plants of Amritsar

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Amritsar boasts having fertile soils along with having traditional agriculture methods, many forages exist in Amritsar, supporting the process of apiculture along with enhancing crop yields. In this research paper, we gain an understanding of diverse types of plants, including crops, trees, weeds, and ornamental plants existing in Amritsar. Major forage plants found in Amritsar include mustard, sunflower, eucalyptus, berseem, and fruit trees, hence making for a continuous supply of flowering sources throughout the year. Since the religious importance of farming processes and little use of chemicals makes sure to have healthy bees with honey of good quality in Amritsar, other than playing a vital part in pollinating flowers, these bees help in raising farm incomes through honey products.

Introduction

Bee forage is the group of flowering plants that produce nectar and/or pollen. Nectar is what honey bee's (and other pollinators) use as an energy source for flight and maintaining their colony; pollen is a major source of protein, vitamins, and minerals required for the development of brood (young bees) and the health of the colony.

The availability, diversity, and quality of bee forage will directly impact honey production as well as populations of bees and the efficiency of pollination. Bee forage plants include agronomic crops, wild plants, trees, and flowers. The most notable examples of bee forage plants include mustard, sunflower, clover, eucalyptus, neem and various types of fruits. These plants will have different flowering periods that can provide a continual food supply to bees when properly managed. Seasonal fluctuations in forage supply are a major factor of honey production in beekeeping. If forage is restrictive for a period of time, the result will be weakened colonies and reduced honey production.

In Amritsar, the combination of fertile soils and diverse crop systems allows for a wide variety of bee forage throughout the entire year. For example, mustard and berseem crops flower in winter while you would have flowering resources throughout the summer and monsoon seasons from trees and from wild plant species. Quality of forage is improved with implementing sustainable agricultural practices and reducing the use of pesticides.

Climate and geography of Amritsar supporting bee forage

Located in Punjab, Amritsar is situated in the Indo-Gangetic plains, which makes the area suitable for farming and beekeeping. This is because the geographical location has flat topography, fertile soils, and proper irrigation that favors plant growth, which creates natural vegetation that acts as a foraging ground for the bees.

Amritsar has a sub-tropical climate with distinct seasons that influence the foraging activity of the bees. During winter, which falls between November and February, there are low temperatures, making it favorable for flowers like mustard and berseem that provide abundant nectar and pollen. In spring, which falls between March and April, there is an

abundance of fruit tree flowers and field crop flowers that serve as adequate bee forage. Summer, which takes place between May and June, involves hot weather and drought, making it unfavorable for flowers. However, there are some flowers growing from trees like neem and eucalyptus that provide forage for the bees. Finally, monsoon, which falls between July and September, involves moderate rainfall that leads to the growth of wild flowers and weeds that form additional foraging ground for the bees.

The total rainfall in Amritsar is 500 mm – 700 mm and occurs during monsoon.

Major bee flora

S.No.	Name of Flora	Source	Flowering Time	Image
1.	Chrysanthemum *Chrysanthemum morifolium* Asteraceae	n+p	Sep.-Oct	
2.	Apple *Malus domestica* Rosaceae	n+p	Feb.-April	
3.	Pear *Pyrus communis* Rosaceae	n+p	Feb.-April	
4.	Fenugreek *Trigonella foenumgraecum* Fabaceae	n+p	Nov.-Jan.	
5.	Marigold *Tagetes sp.* Asteraceae	n+p	Jan.-Feb.	
6.	Pea *Pisum sativum* Fabaceae	p	Feb.-March	
7.	Linseed *Linum usitatissimum* Linaceae	n+p	Jan.-Feb.	

8.	Barley *Hordeum vulgare* Poaceae	p	February	
9.	Mustard *Brassica campestris* Brassicaceae	n+p	Jan-March	
10.	Hollyhock *Alcea rosea* Malvaceae	n+p	Dec.-March	
11.	Oriental Poppy *Papaver orientale* Papaveraceae	p	Mar.-April	

***n=source of nectar, p=source of pollen**

Conclusion

Bee forage is an important aspect that helps maintain healthy bee populations and promote honey production. Bee forage refers to a range of different flowering plants that provide bees with pollen and nectar. The availability of such plants depends on seasonal changes, climatic conditions, and agricultural activities. Effective management of bee forage can help improve its quality. Apart from promoting apiculture and honey production, adequate forage is essential for pollinating agricultural crops. Consequently, there is a need to maintain healthy bee forage for ecological and agricultural reasons.

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