foraging bee population at all the times.
∴ Bee colonies used for pollination shud have 8-9 frames in each colony.

→(3) Number of colonies :—
3 beehives of A. mellifera / hectare &
5 " " A. indica / hectare are sufficient to pollinate many crops.
However, unattractive crops; few wild bees, poor weather, many compeling weeds etc demands more hives / hectare.

→(4) Location & placement of hive :—
Though, bee can visit upto a radius of 1-2km yet they prefer to work within 300 feet of hive.
∴ by placing hives at 500 feet intervals in a field, we can place the whole field in ordinary bee foraging range.
Place hives in ample sunlight & as much as possible away from farm workers, pedestrians & livestock.

→(5) Increase the attractiveness of crops :—
Spraying sugar / honey solution attracts more forage bees on unattractive crops.
Forage on target crops can be increased by incorporating odour of target crop into colonies food sources.

→ Bees have long potential hours as they commence ~~flying~~ foraging early in the morning & ~~stop~~ in the evening.
→ Are mass reared for commercial purpose
→ Honey bee colonies are mobile. They can be moved to locations where there aren't enough pollinators to adequately pollinate a specific crop.

Management of artificial/modern Bee-hives for pollination :—

Honey bee colonies have to be properly managed before & at the time of flowering to produce qualitative & quantitative yield of crops.

→ (1) Suitable time for placing the colonies :—
Bee colonies should be placed in fields when 5-10% crop is in bloom. If placed early bees will forage on weeds / wild plants present in the vicinity & if late bees ignore the blooming.

→ (2) A good pollinating hive :— (strong colony).
A strong colony i.e large population are superior pollinators as it has greater

classmate
Date
Page

Unit V

Modern methods in employing artificial Beehives for Cross pollination

Cross pollination :- Transfer of pollens b/w trees/flowers of different varieties.

or

[pollination of a flower or a plant from pollen from some other flower or plant

This requires a carrier/vector (insects are very effective)

Pollination by insects → Entomophily. pollinators

No. of insects such as Bees, wasps, Butterflies, flies, beetles, etc.

Honeybees are the most efficient & important pollinators of agricultural crops →

Qualities of bees as effective pollinators

→ Bees r extremely hairy • which makes it highly effective at catching pollens.

→ Floral fidelity makes them as good pollinators.

→ Don't injure the plants & pollinate a wide variety of crop.

→ Adapted for diff. climates & diapause (resting period) is lacking.

→ Have highly developed sense of smell & vision.

→ (10) Bees & pesticides :-

Most bee poisonings occur when bees visit flowers treated ~ insecticide. Fast acting toxins kill bees there in the field. Slower-acting toxins r more hazardous as bees survive long-enough to return to hive ~ contaminated food that kill young bees.

∴ never spray a plant that is flowering. or look out for products ~ low bee toxicity.

→ (6) Increase the Number of pollen collector bees :-
pollen collector bees are good pollinators than honey collectors. To inc. their no., remove pollen storey from hive at regular intervals.

→ (7) Water sources near the hive :- If no natural water like a spring/pond is there, provide water near hive.

→ (8) Avoid Division of colonies just before the pollination :-
as new colonies will not be able to pollinate the target crop as efficiently as established ones.

→ (9) Chemical attractants :-
Growers sometimes spray chemical attractants to inc. the no. of bees visiting their crop containing synthetic queen pheromone or masonor pheromone. for eg: it may be impossible for a beekeeper to unload hives in centre of a large, muddy field, grower may apply attractant to inc. bee visits.