Course code: ENT304, Industrial Entomology 2(1+1)

Dividing and Uniting Colony

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A. Dividing a Colony

Introduction

- Colony division is a method of multiplying bee colonies, i.e., producing two or more colonies from a mother colony. Colony division is used to control swarming, as well as in commercial beekeeping to increase the number of colonies. The colonies can be used to increase the number of colonies in the apiary for honey production or sold for income. Colony division during the honey flow season can reduce honey production and it is necessary to decide whether division or honey production should have priority.

Points to Consider

Time/Season

- Usually the best time for colony division is during the honey flow season.
- According to geographical location, colony division can be performed twice a year.
- For example, in foothill and plains areas, first between mid February and mid April and again between early October and early November.
- In the high hills of Nepal, it can be performed once between April and August. Commercial beekeepers can carry out artificial queen rearing and use the queens for colony division as needed.

Weather

- Colony division should not be performed in rainy or cold periods.
- The best days are reasonably sunny and warm.

Colony status

- The mother colony selected for division should be strong and healthy. A strong colony means 10 frames covered with bees of which 6 contain brood, and sufficient stored food (honey and pollen).
- The colony should have drones and queen cells.

Colony characteristics

- Only the best colonies should be selected for multiplying. Selection should be based on the following characteristics:
- Egg laying capacity of the queen
- Honey and pollen collection capacity of the colony
- Good defensive behaviour and resistance to pests and disease
- Low tendency to swarm or abscond
- Capacity for rapid recovery of the population during the onset of honey flow, and able to maintain the population during the off season

Planning for Colony Division

- Before dividing a colony, the mother colony should be selected, a decision taken on the time and season of division, and all the required materials collected together and prepared.

Equipment and Materials

- Empty hive including a dummy board
- A strong mother colony
- A frame fitted with comb foundation and empty comb
- Feeder/sugar
- Colony inspection equipment

Methods for Colony Division

Natural division using queen cells developed during swarming

- The presence of multiple queen cells in a colony during the swarming season indicates a need for division.
- Dividing such colonies and using the queen cells in new daughter colonies can help control swarming.
- However, although it solves the immediate problem of swarming it does not help improve the genetic traits.

Colony division from queen production

- Select the best colony based on the selection criteria given above.
- Produce queens from this colony before the onset of honey flow. These queens can be used to replace the old queen and to start new daughter colonies.
- The mother colony can be multiplied into several nucleus colonies (Figure) but each should have at least 2 brood combs and 3–4 combs with food (nectar and pollen).
- The prepared colonies can then be sold or migrated according to need.

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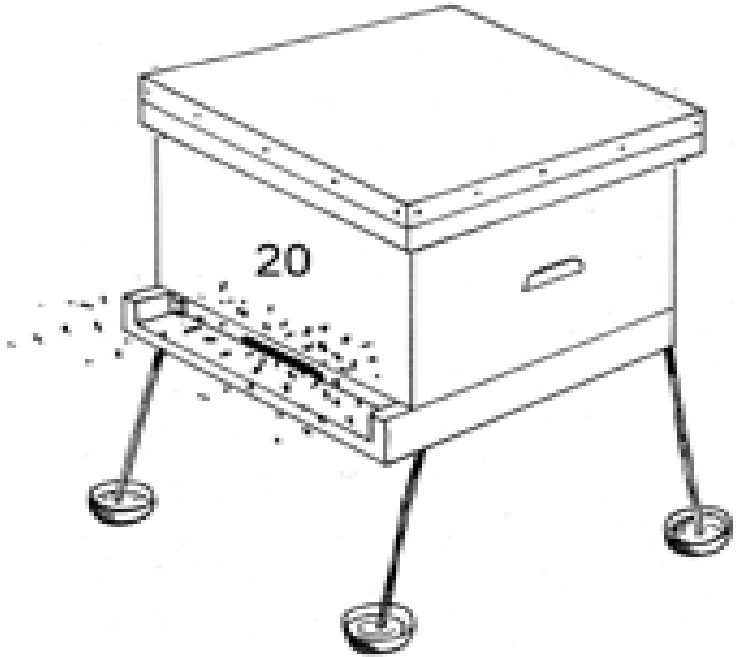
The steps are as follows

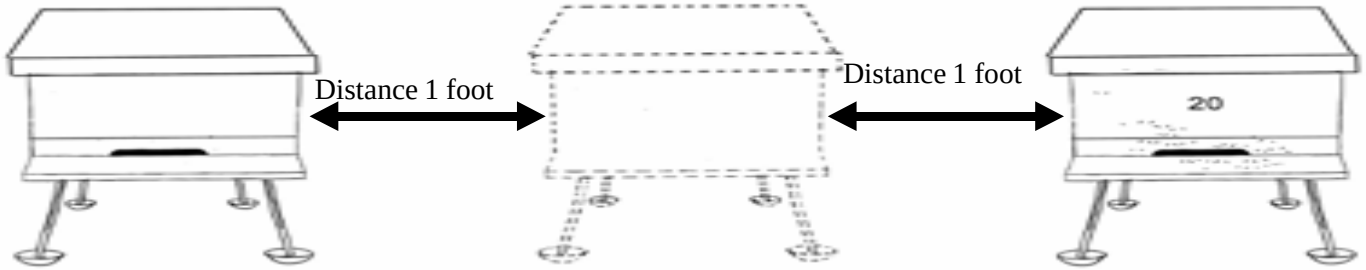
- Select the most appropriate mother colony.
- Move the hive about 1 foot (30 cm) to the left of the existing location.
- Place an empty hive about 1 foot (30 cm) to the right of the previous location, leaving the old location empty.
- Take 3 to 4 brood combs from the mother colony together with the existing queen and place in the empty hive.
- Keep 1 mature queen cell with 3 to 4 brood combs in the mother colony.
- Divide the combs with food stores equally between the hives. Remove any remaining queen cells.
- Divide the adult bees equally between the hives.
- Check whether the incoming foragers are entering both hives equally.
- If more foragers are entering one of the hives, move it further from the previous location and move the other hive closer to the previous location. Continue to adjust until equal numbers of foragers are entering both hives. Add frames with empty combs or comb foundation to the colony with the queen after colony division.

- Close and cover the hives.
- Divided colonies can be moved to the desired position by increasing the distance from the old position at a rate of 1 to 1.5 feet (30 to 45 cm) per day in the evening after the bees have stopped foraging.
- Divided colonies should be fed with sugar syrup in the evening for 3 days after division and comb foundation added as necessary.

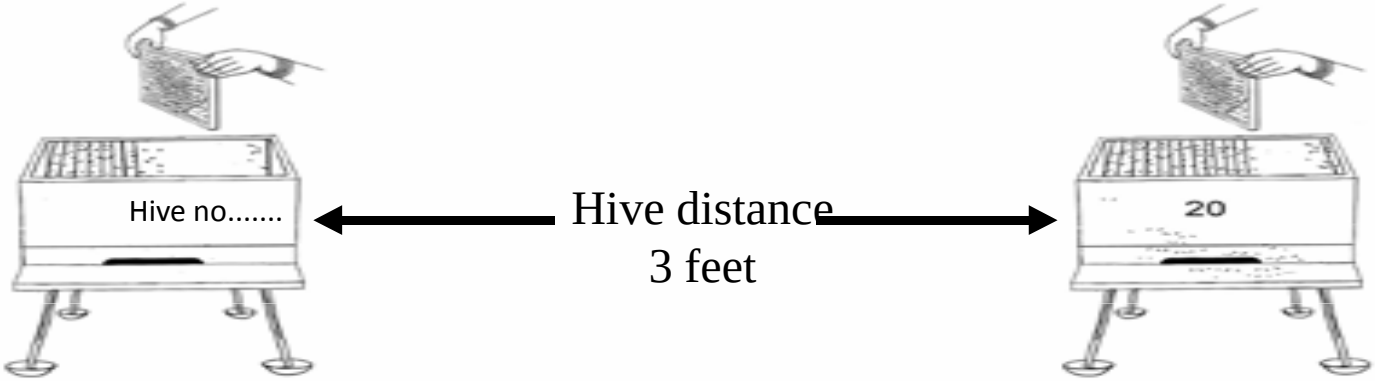


Step 1: Inspect the colonies

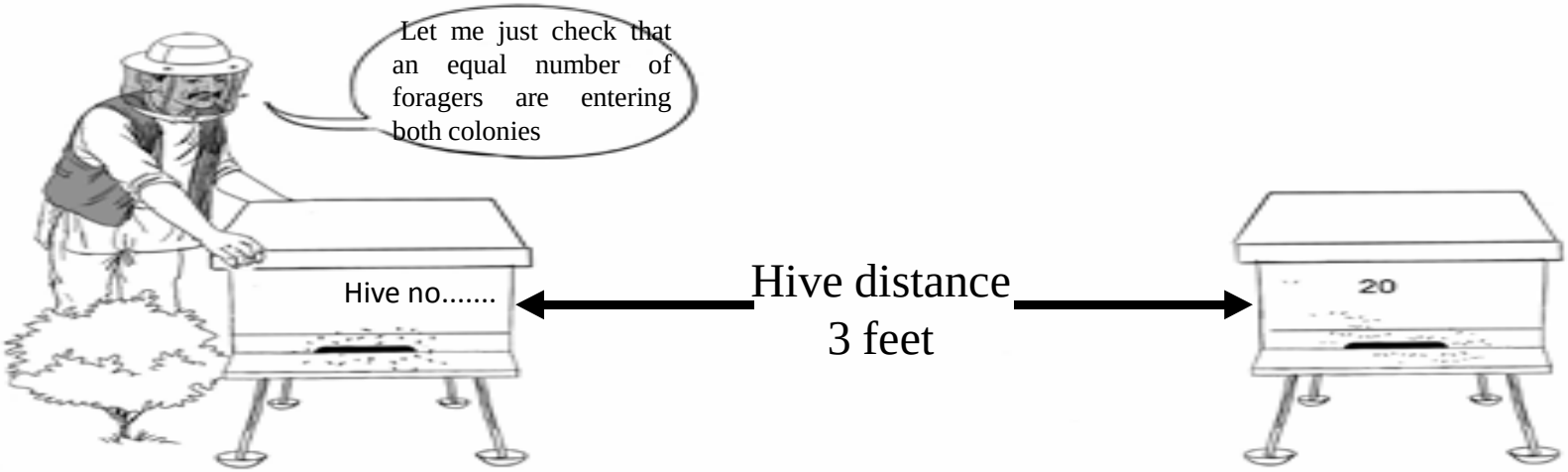
Step 2: Select the best mother colony



Step 3: Move the mother colony 1 ft (30 cm) to the left and place an empty hive 1 ft (30 cm) to the right of the previous mother colony position. The hives are a hive width plus 2 feet apart



Step 4: Put 4 to 5 brood frames with the queen in the new hive



Step 5: Check the colony division is balanced and close the hives with the covers

B. Uniting a Colony

Introduction

- Colonies are united to make a strong healthy colony from two (or more) weak colonies, or one weak and one strong colony, according to the needs of the beekeeper. Uniting the pheromones of two weak colonies results in the development over time of a new and single pheromone for the united, strong, and healthy colony.

- The reasons for uniting colonies include the following:

  - Weaker colonies: uniting weak colonies results in a single strong colony.
  - Queenless colony or weak queen: If the colony doesn't have a queen, and no possibility of producing a new queen (no fertilized eggs or queen cells in the colony), the queenless colony should be united with a colony with a good queen (a 'queen-right colony').
  - Worker laying: Sometimes worker bees may lay eggs if the time without fertilized eggs or a queen is too long. The laying workers should be removed as soon as they start egg laying and the remainder of the bees united with a queen-right colony.

- Inability of the queen to lay fertilized eggs: Occasionally a queen may not lay, or may lay only unfertilized eggs which become drones. This can happen under unfavourable weather conditions or when the colony has an emergency queen. Under such circumstances, the non-performing queen can be removed and the colony united with a queen-right colony.
- Increasing honey production: Two or more colonies can be united at the onset of the honey flow season to increase colony strength and maximize honey production.

Points to Consider

- All the foragers should have returned to the hive before colonies are united, thus it is best to unite them in the evening.
- One of the colonies selected for uniting should be made queenless before uniting it with a queen-right colony.
- Be careful not to lose bees from the queenless weaker colony while placing the hive on the paper barrier on top of the brood chamber of the strong queen containing colony (see method).
- Remove any laying workers from the queenless or weak colony.
- The paper placed between the two colonies should be perforated but able to prevent bees from passing through.
- A diseased colony should not be united with a healthy colony unless fully treated and recovered.

Uniting colonies

Preparation

- Identify the colonies to be united.
- Bring distantly placed colonies closer before uniting. A weak colony can be brought close to the stronger, queen-right colony by moving at a rate of about 2 feet (60 cm) per day.
- Feed the colonies continuously with sugar syrup for 3 days before uniting if food stores are insufficient.
- Remove the queen of the weaker colony 24 to 48 hours prior to uniting.
- Remove all the empty combs and super/s from the colonies to be united during daytime. If laying workers need to be removed, the colony should be taken about 200 m away from its existing location and all the bees shaken off the comb before the hive is replaced in its original location. Only the bees that return to the original location should be united.
- Remove combs with worker eggs from worker laying colonies before uniting.

Method

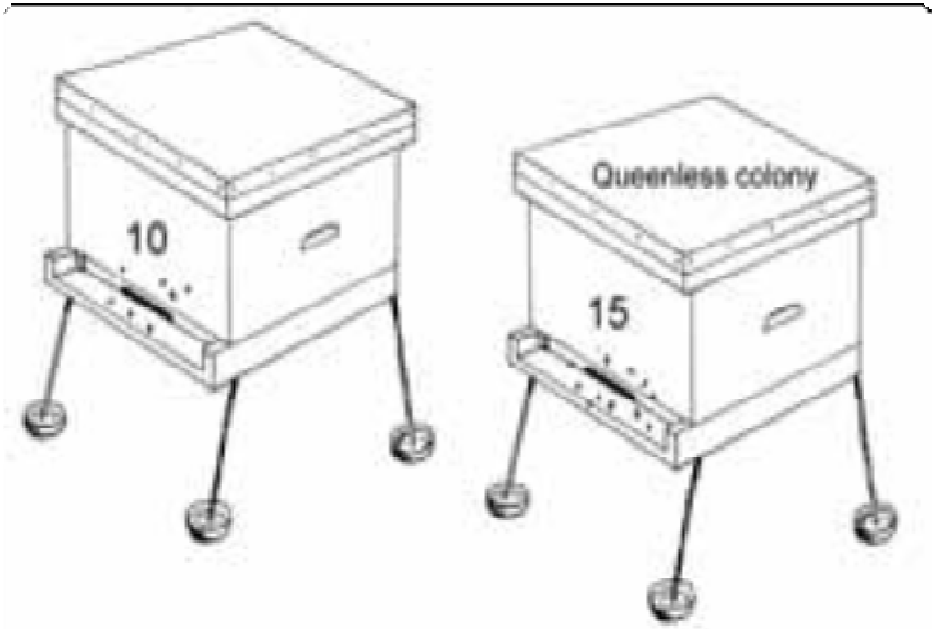
- The paper barrier method is the safest way of uniting colonies (Figure 50). A perforated paper is placed between the two hives (colonies) to be united. This allows mixing of the pheromones of the two colonies, resulting in a single united colony. Always unite the weak colony with the strong colony, not the strong with the weak.

The steps are as follows:

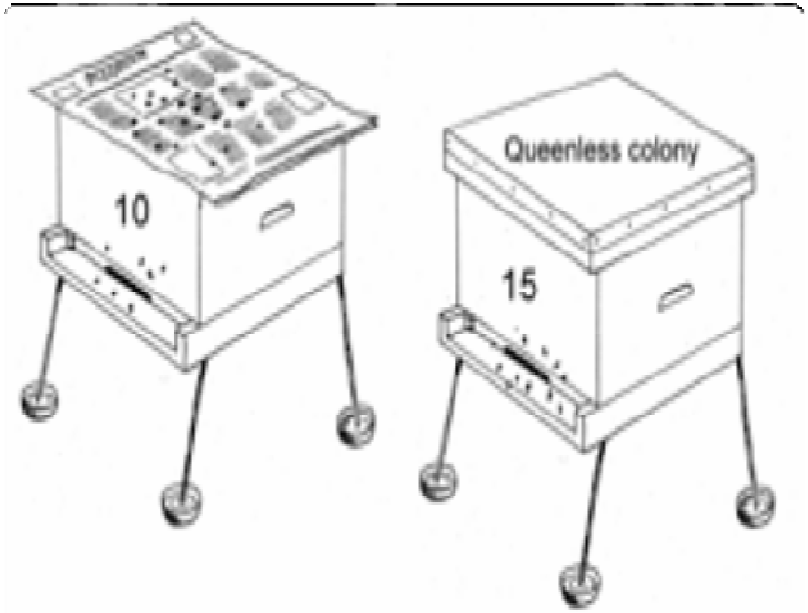
- The colonies to be united should already have been moved close to each other (see above).
- Give a light puff of smoke at the entrances of the colonies.
- Remove the (outer and inner covers) of the queen-right (strong) colony and place a perforated paper over the frames to fully cover the brood chamber.
- Spread honey or 2:1 sugar syrup lightly on the paper
- Remove the bottom board of the queenless colony and place the hive on the perforated paper on top of the brood chamber of the queen-right colony. (The smoke will have encouraged the bees to withdraw to the combs so that there are no bees left on the bottom board.)

Management

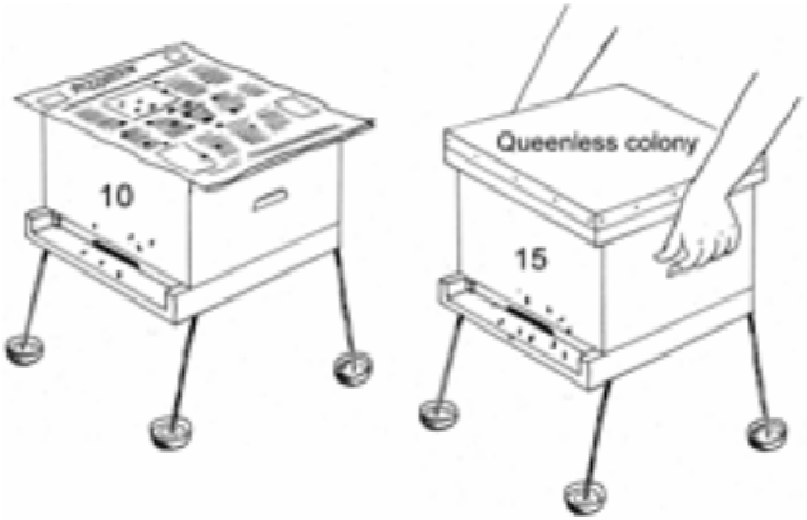
- Honeybees from the colonies are united when the pheromones of the two colonies are thoroughly mixed by diffusion through the perforated paper.
- The bees will chew the paper from both sides; it will disintegrate within 48 hours and the bees will mix.
- The hive should then be opened and the bees and frames from the upper chamber transferred to the lower chamber so that all the bees are in one chamber.
- The united colony should be fed with artificial food for 3 days after removing the paper.
- If required, a super can be added after some days once the brood chamber is full and the united colony fully active, particularly during the honey flow season



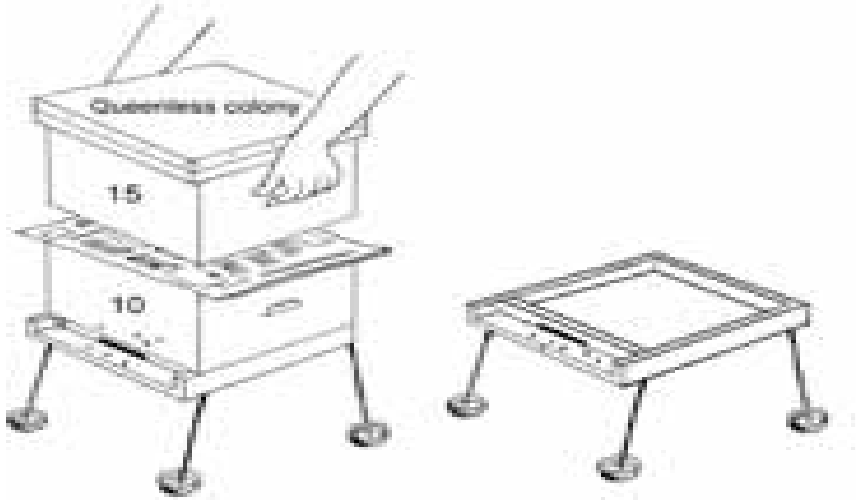
Step 1: Queen-right and queenless colonies moved close together



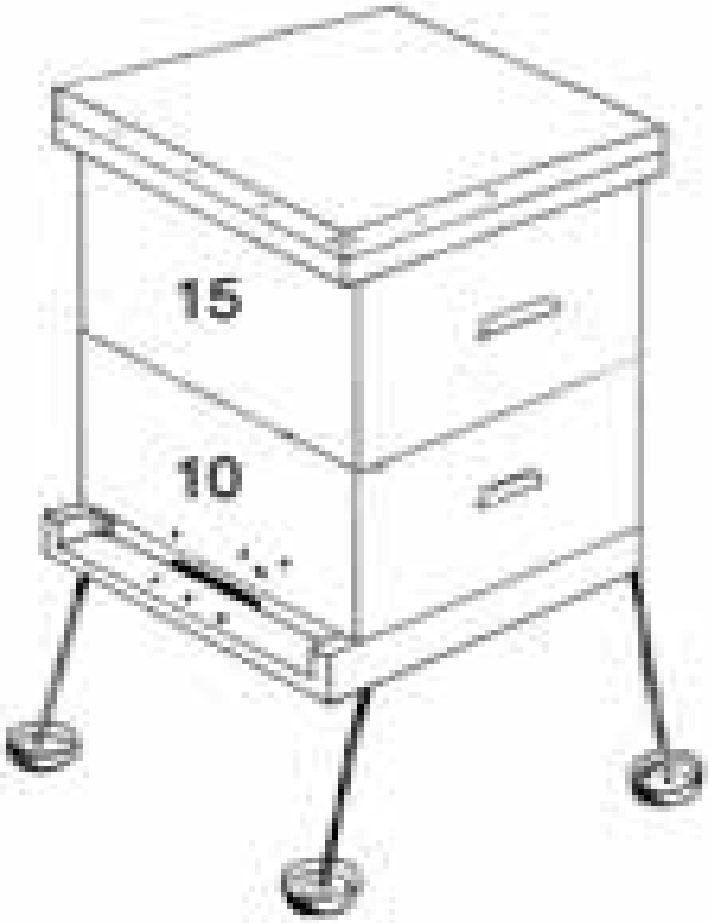
Step 2: Covers of queen-right colony removed and replaced with a sheet of perforated paper smeared with syrup or honey



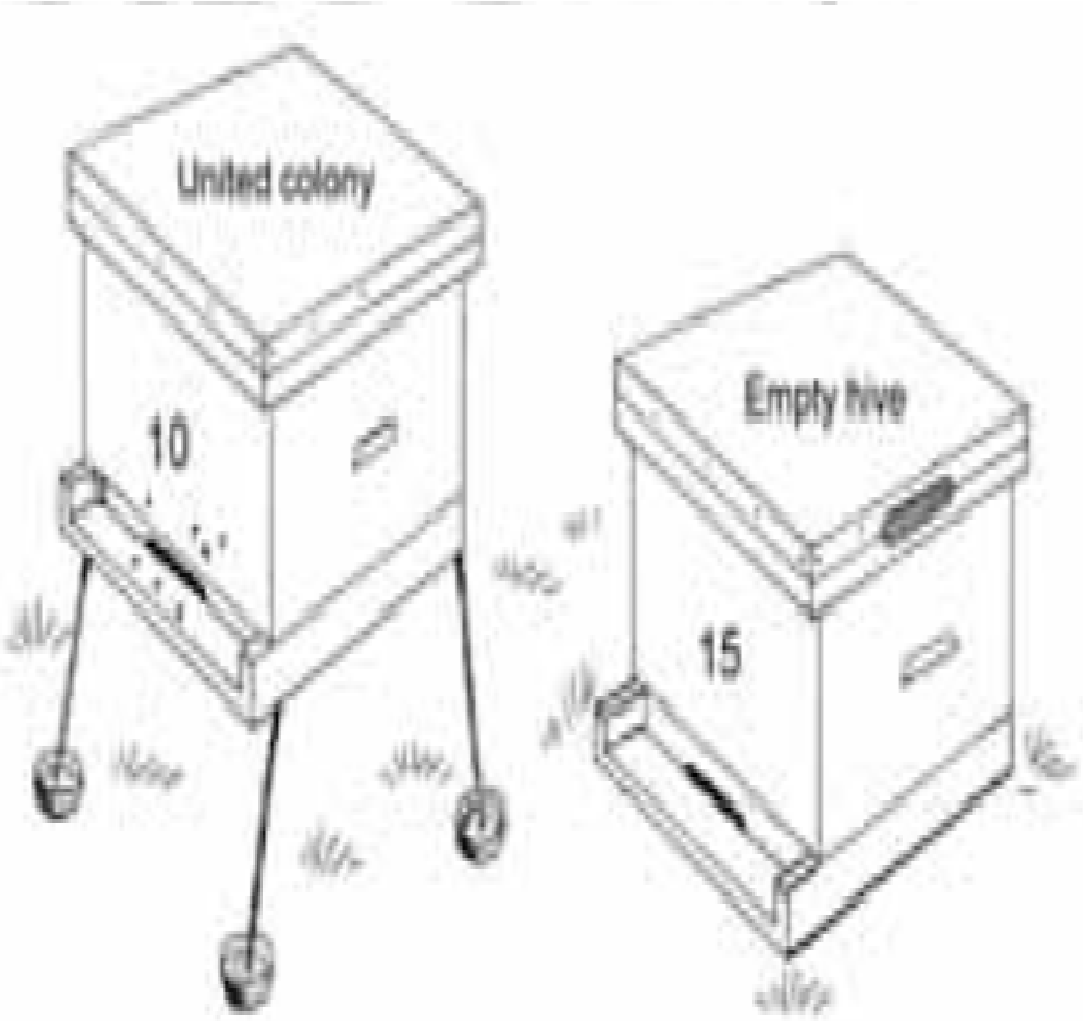
Step 3: Queenless colony lifted from bottom board



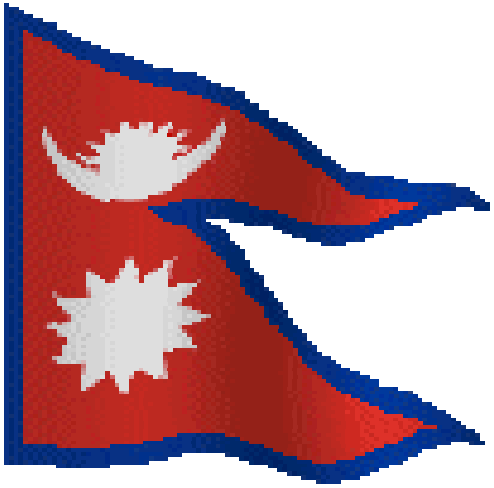
Step 4: Queenless colony placed on sheet of paper above queen-right colony



Step 5: Pheromones of colonies allowed to unite while bees chew the paper



Step 6: After 2 days bees and frames from upper chamber transferred to lower chamber and covers replaced on the united colony



Thank you
for your attention