

Two-queen colony management

C.L: Farrar, 1946

Instructions

A strong colony is first divided temporarily into two colony units for the purpose of introducing the second queen. The old queen is confined to the lower brood chamber with an excluder. This chamber should contain reserve honey and pollen, half the brood (mostly eggs and larvae), and approximately 40 percent of the population. Two supers of drawn comb are added above the excluder. The inner cover, with the escape hole screened, is placed above these supers and the upper brood nest placed on top. The upper brood chamber should contain approximately 60 percent of the original population. Some of the bees will drift back to the lower entrance, but this division tends to give a fairly equal balance to the two colony units. The more mature brood is used in the upper unit, because fewer bees will be required to protect this brood, and the division will be strengthened by emerging bees. A 1-inch auger hole just below the front handhold provides an entrance for the upper colony.

The young queen may be introduced by any of the customary methods. The rearing of a queen from queen cells in the division results in loss of valuable brood-rearing time. The new queen may be introduced by mailing-cage method, but the losses that usually result tend to offset the advantage of its simplicity. The direct introduction of laying queens from nuclei has proved the most successful method under all conditions.

From 7 to 10 days before the divisions are made, queens from the South should be sprayed into small nuclei to provide the laying queens. Three queens can be purchased with each 2-pound package, or the queens alone may be obtained and introduced to package bees shaken from the stronger overwintered colonies. [...] When uniting these bees to the nucleus in the absence of a honey flow, the operator should spray both units with sugar sirup.

When laying queens are available in nuclei, a queen with her brood and bees is united by the spray method to the upper unit when the colony is divided. Queen acceptance is nearly 100 percent, and both queens continue egg laying without interruption. The nuclei may be restocked to provide replacement queens. Queens that show up poorly in the nuclei should not be introduced to producing colonies.

As soon as the top queen has a well-established brood nest, usually 10 to 14 days after introduction, the screened inner cover can be removed. In this uniting of the two colonies, the bees in both brood nests should be sprayed with sirup. The upper queen may require a second set of brood combs at this time, thus making the colony five stories high. Both upper brood chambers should have augerhole entrances. The upper and lower brood nest must both have reserve honey and pollen even after uniting. Brood rearing may suffer or the bees may starve in one, even though the other has plenty of food.

As the colony populations increase and room is required for honey storage, the organisation diagrammed in figure 2c, should be maintained. Ten standard combs provide plenty of space for a good queen in the lower brood nest, as very little honey is stored here. Supers in position 2 and 3 should never be allowed to become more than half filled with honey. Too much honey here will cause the lower brood nest to become honey bound and the hive will operate as two separate colonies. When these supers become partially filled with honey, they should be raised above the upper brood nest and replaced by empty supers. The position of the two chambers used for the upper brood nest should be interchanged at each manipulation, the heaviest chamber and most of the immature brood being placed in the fourth position with the sealed and emerging brood in the

fifth.

Honey storage commences within and above the upper brood nest. The lower colony tends to supply bees to the upper one, where honey storage is dominant. Most of the colony's flight activity may be through the auger holes of the upper brood chambers. Frequent interchanging of the upper brood chambers permits the queen to expand her brood nest upward, where she can use the space made available by emerging bees. It also stimulates the removal of considerable honey surrounding the young brood put down, thus making more space available for the queen when the brood chambers are again interchanged. The movement of ripened honey from the brood nest hastens the finishing of the supers so they can be extracted and returned for refilling.

During a good honey flow the colony must be manipulated every 6 to 8 days to maintain the optimum organization as diagrammed in figure 2c. Supers with empty combs from which the honey has been extracted are placed between the two brood nests. Those containing some honey in positions 2 and 3 are placed above the upper brood nest for finishing. During heavy honey flows, especially when the nectar is thin, one or two additional supers may be needed above the upper brood nest to keep the supers in positions 2 and 3 comparatively free of honey.

Colonies should be united back to single-queen status approximately 4 weeks prior to the expected end of the flow. It is seldom necessary to locate the queens. The upper queen usually survives, but if the lower one does, it is likely that she is the better individual. With three brood chambers at the disposal of the surviving queen, manipulation is seldom necessary for the remainder of the season.

Super space should be provided generously. These double colonies may make daily gain 20 to 30 pounds under flows that permit single-queen colonies to gain 8 to 12 pounds. Plenty of space is needed for this incoming nectar in addition to that required for storing honey. Combs should be extracted and the super returned for refilling as soon as they are finished. The use of shallow equipment hastens the finishing of supers so that space can be provided when and where it is most needed.

When colonies are united to a single-queen status, they build up pollen reserves rapidly if pollen is available in the field. They have the population of two colonies and the brood of only one queen. For the same reason honey storage is at the most efficient level for the number of bees in the colony.

When the supers are removed at the close of the season, the colony should be left in three stories for overwintering. The three story colony should contain 80 or more pounds of honey and as much pollen as possible. In standard equipment such a colony should have a gross weight of at least 175 pounds. Colonies may not use all of the reserve honey, but this practice provides the best insurance that the colonies will be ready for the next honey flow. Honey that is not consumed will add to the next year's honey crop by reducing the amount required to build up the reserve.

The mechanics of two-queen colony manipulation

It is essential that the hive stands be level and situated on firm ground. The bottom boards should be close to the ground. Two-queen colonies can be manipulated more easily if two men work together. After the bees at the entrances have been smoked and the metal cover has been removed, the hive, supported by a man on each side, can be tipped over backwards and worked in a horizontal position. The propolis will prevent the hive bodies from slipping, even while the heavy seven- to nine-story hives are lowered to the ground.

The top brood nest should immediately be separated from the supers above and below it to prevent the queen from leaving the brood chambers. To reassemble the hive, the bottom board is placed on the hive stand. A glance beneath the lower brood nest before it is put in place is usually sufficient to see whether everything is normal. If the intervening supers contain considerable honey, one or two empty supers should be added before placing the heaviest brood chamber from the upper brood nest. This should have considerable unsealed brood in five to six frames. The upper brood chamber

must provide room for the queen to lay, either empty comb or frames of emerging brood. The first two supers above the upper brood nest should not be more than one-third to one-half full. When necessary to provide additional room, an empty super should be added on top.

Working the hives in a horizontal position does not eliminate the necessity of lifting the hive bodies back into position. However, it does reduce the labor of manipulation. The upper queen is less likely to run into the supers, and the bees are more gentle. The returning field bees are confused and offer little resistance. Those in the top hive bodies are not driven down into the lower part of the hive, where they would later be disturbed under a disorganised and congested condition. Ill-tempered bees are usually encountered in the lower part of the hive when working from the top down.

The use of queen excluders and foundation

A queen excluder over the lower brood nest is a necessity. Another queen excluder below the upper brood nest will prevent the upper queen from running down into the intervening supers when the colony is manipulated. Its use saves time in hive manipulation because the operator knows the location of the upper queen. A third excluder over the upper brood nest may be used to advantage under some conditions, but it tends to force more honey into the brood nest.

The upper queen can be maintained in her proper position without excluders by the timely rotation of the brood chambers. Most of the mature brood is placed above to provide space for the queen to expand her brood nest normally upward.

Two-queen colonies can be handled most satisfactorily when drawn combs are available for both brood chambers and supers. During the main honey flow, foundation can be drawn between the two brood nests. Only the lower queen should be restricted with an excluder when the supers contain foundation. The use of foundation sometimes forces so much honey into the upper brood nest that empty combs must be substituted for those filled with honey in order to give the queen room.

Queen supersedure, replacements, swarming and increase

The problem of supersedure is no greater in two-queen than in single-queen colonies except that, when one queen is poor and queen cells are started, cells usually will be built in the other brood nest.

When a new queen is introduced to either brood nest, the two nests must be completely separated, as when the original division is made. After all queen cells have been removed, a nucleus with a good laying queen may be united by the spray method. If there is a honey flow, the screened inner cover can be exchanged for a queen excluder at the next manipulation without spraying the bees.

Swarming is not a problem when good queens are maintained in both brood nests, and space for brood expansion and honey storage is provided by timely manipulations. Since the two-queen may 25 to 30 pounds of bees, a great loss will result if the colony is allowed to swarm. The wings of both queens should be clipped. If the colony attempts a swarm, both queens may be found in the lower brood nest. One of the queens may be returned to the upper brood nest when the conditions that caused swarming have been corrected. However, when the queens are shrunken, the drastic treatment of making a "shook-swarm" with one of the queens on a new set of combs probably is best. The other queen, with all the brood and adhering bees, can be set to one side to allow many of the bees to drift back to the original hive location. When both queens are laying normally, the hives can be recombined in a manner suitable to the honey flow.

Increase from two-queen colonies is not generally recommended, because the advantage of large pollen reserves for wintering strong colonies may be lost. If other single-queen colonies are storing large pollen reserves, the two-queen organisation can be retained until the end of the honey flow instead of uniting back to a single-queen status. They may be wintered as double colonies by

removing the lower queen excluder and placing a super of honey in dark combs above the lower brood nest. A moving screen is placed above this, and the upper brood nest set on the screen. The double colony is wintered in four bodies, with the lower half given a reduced bottomboard entrance and the upper half only the auger-hole entrance in the top chamber. A commercial operation who has used this plan successfully during several seasons believes that less honey is required than when the colonies are maintained separately. His bees have had abundant pollen reserves, and both the upper and lower colonies have wintered strong.

Weak colonies in the spring may be set above good colonies in the manner used to organise two-colonies by division. An excluder is used beneath the weak colony in place of the inner cover. The bees of both colonies should be sprayed with sugar sirup when they are set together. If the weak colony has a good queen, the bees that move up from the lower colony will enable her to expand brood rearing. If it has a poor queen, nothing is lost as would be the case where the brood or bees from a good colony are taken to strengthen a weak one.

Summary

Two-queen management is based upon the principle that the production per unit number of bees increases as the population is increased. Two-queen colonies have two chances of remaining queen-right, which under commercial management practically eliminates all non-producing colonies due to queen failure. Colonies are overwintered with young queens and the beekeepers' attention is focused on queen quality at all times. The larger pollen reserves accumulated after the colonies have been reduced to a single-queen status make it possible to overwinter strong colonies for the next season.

Less equipment is used in producing a given crop of honey than is customary under single-queen management. However, there are some limitations to the use of standard hive equipment for two-queen colonies.

The height of fully equipped two-queen colonies, requires two operators for their efficient management. Approximately 50 percent more labor is required per colony but less labor per pound of honey produced. Close timing of manipulations is essential to meet the two-queen colony requirements, but this is equally important for the efficient management of any colonies.

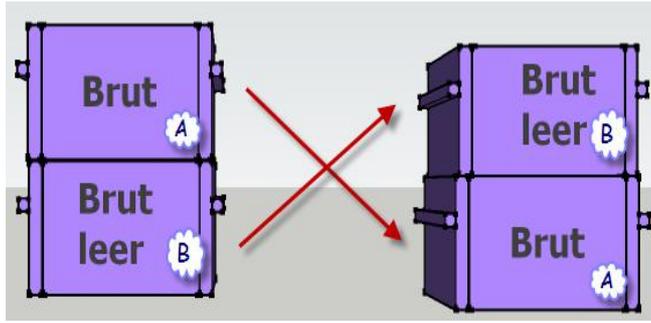


Abbildung 1: Zargenwechsel im Frühjahr

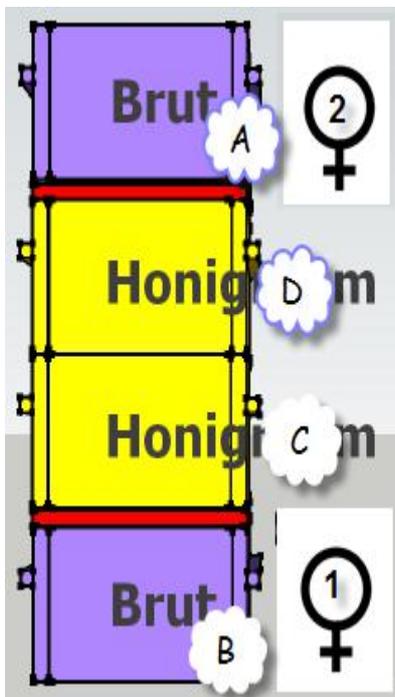


Abbildung 4: Teilung der Brutzarge, Einsetzen der 2. Königin

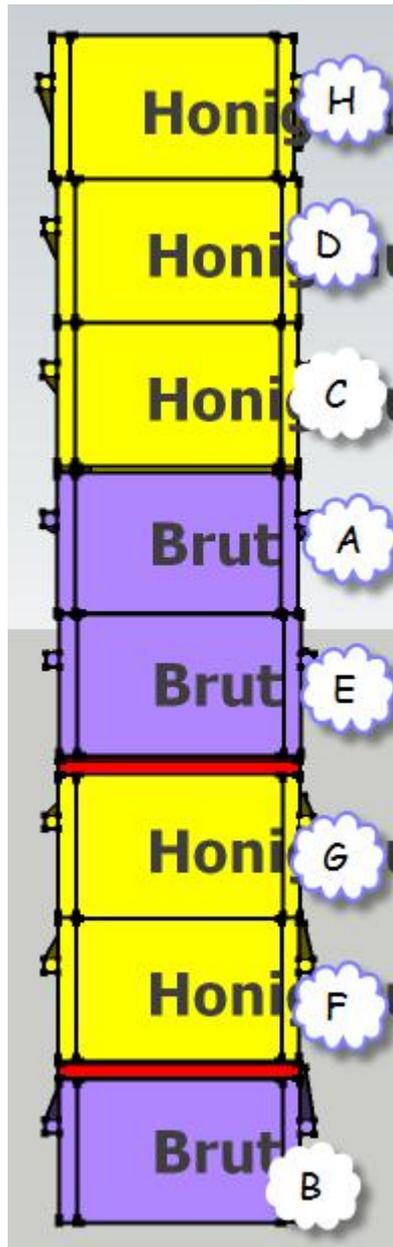


Abbildung 3: Anordnung der zwei Königinnen vor und während der Honigracht/der Saison

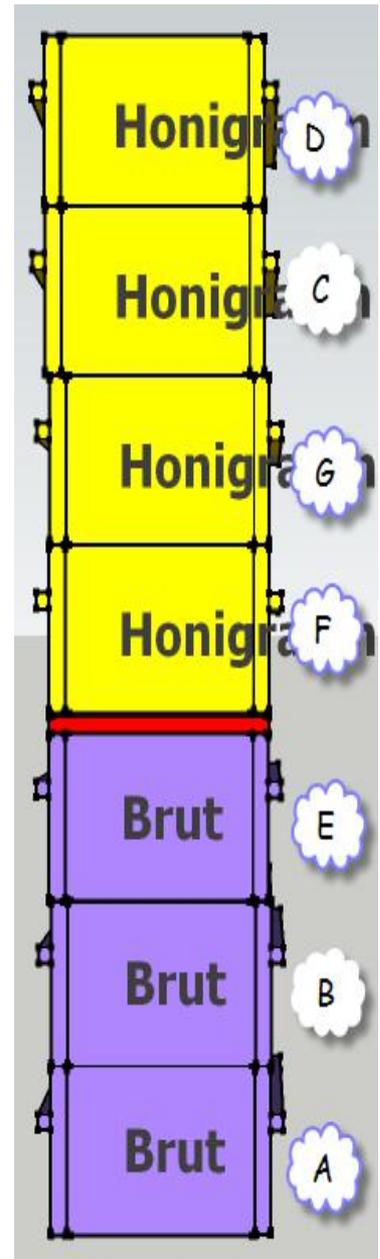


Abbildung 2: Reduzierung auf eine Königin in den letzten 4 Wochen der Honigracht/Saison