COMPARING QUEEN REARING METHODS

METHOD: THE RUN-AWAY SPLIT

Our study found that hives containing medium population density, newer comb, and mostly open larvae are important variables in the successful rearing of a mated queen. In summary of our findings (see below), we propose starting a new hive in the Northeast in the following way:

Once the bees are filling their box with worker and drone brood and demonstrating wall-to-wall population growth, it's time to make the split.

1. Move the hive to a new position in the yard. It can be close to the original spot, i.e. on the same pallet, but with the entrance facing a new direction.
2. Set up a new, empty, similar box with the same entrance orientation.
3. Remove and move back one NEWER comb of MOSTLY LARVAE with adhering bees and one comb of food (nectar/pollen) with adhering bees to the original location. If the queen is seen, leave her in the new position.
4. Replace the combs with foundation or empty bars.
5. Put the brood and food with bees in the new box, away from the entrance, place in foundation or empty bars, cover with a lid, and you're done.

Shaking in more bees should not be necessary. The field bees will join this queenless hive and help build a new brood nest. Check the hive in four weeks for eggs, larvae, and the first capped brood from the new queen. If nothing is present, or if laying workers are laying multiple eggs per cell, the hive can be shaken out or combined with a different split.

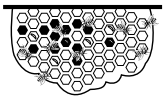
This project correlated with past results of SARE ONE19-326, which showed that bees' choice queens have the potential to be of very high reproductive quality. A multimedia Queen Rearing Guide based on these results can be found here.

RUN AWAY SPLIT RECIPE:

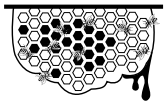
See a video here.

BEFORE

- Move the whole hive to a new spot in the yard.
- Place an empty box where the hive was.
- Move back:

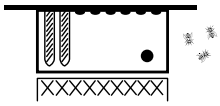


A comb of larvae with adhering bees. No queen.



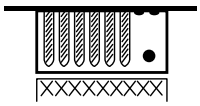
A comb of nectar with adhering bees. No queen.

AFTER



- ***You can now:*** Run away.

  Later: In 4 weeks, check for a laying queen.



- ***Now:*** Remove the old queen.
  OR
  Later: Split again.
  OR
  Expand for honey.

DAY 0: egg laid by origin queen

DAY 2: beekeeper removes origin queen from mating nuc

DAY 8: worker bees cap the queen cells

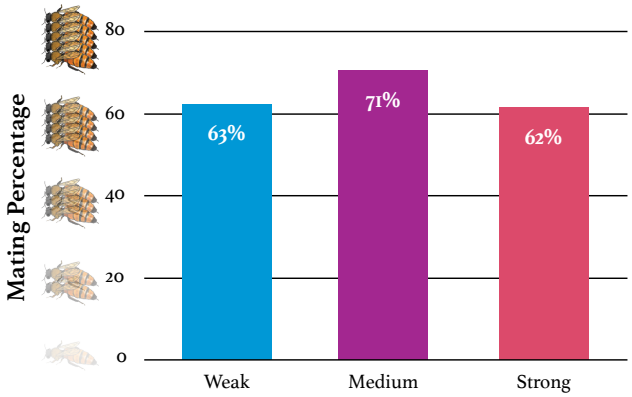
DAY 15: queen emerges

DAY 16-29: queen matures and goes on mating flights

DAY 30+: beekeeper checks mating nuc for laying queen

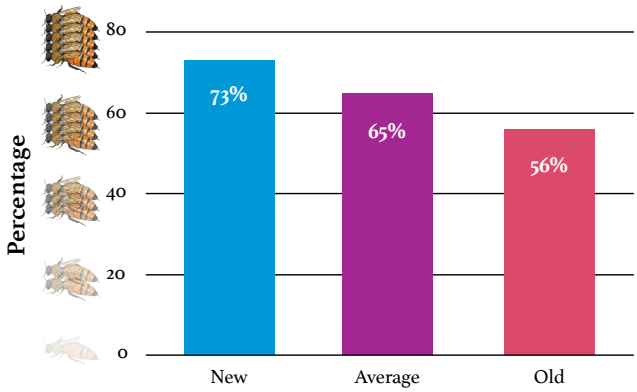
COMPARING QUEEN REARING METHODS

RESULTS OF THE FIELD DATA



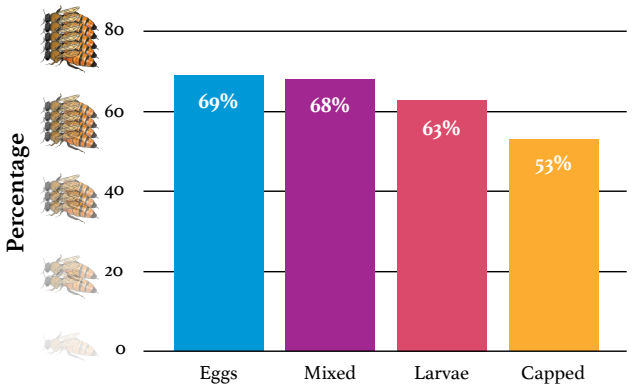
Density

The most successful splits had a medium density of bees (71%). This trend was consistent in most hive types. This all merits further study to understand how and why bee density contributes to mating percentage. Hives with weak density demonstrated weaker mating success (63%). Hives with strong density demonstrated weaker mating success (62%).



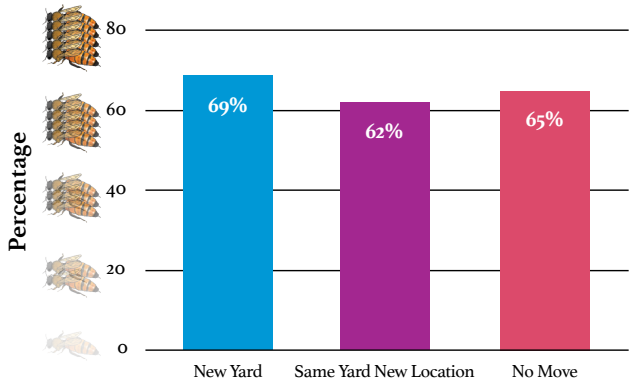
Mating Success Based on Comb Age

Splits with new comb had the greatest mating success (73%), average age comb had the second highest mating success rate (65%), and older comb had the lowest mating success (56%). For bees' choice queen rearing, additional management may be necessary to grow new brood comb in a hive prior to splitting/dequeening.



Mating Success Based on Brood Age

We found there was less success in splits started with predominantly capped brood (53%). We believe that this may be due to the ability of open brood (69%, 68%, 63%) pheromone to retain adhering worker bees and maintain "morale" despite disturbances to the hive.



Moving Splits Success

Results showed that nucs dequeened in place (65%) were comparable to splits moved in the same yard (62%). Splits moved to a new yard fared slightly better (69%) than the two alternative approaches.

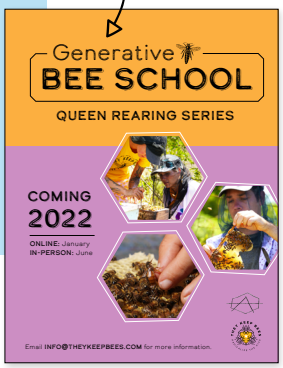
More Bee Downloads:

Beekeeping Survival Guide

SUMMARY OF FINDINGS

In this study we investigated potential methods of producing the highest number of quality queens with the least amount of time, resources, and specialized knowledge. Our study found that a medium density of bees, mostly open brood, newer comb, and moving to a new yard to be significant factors in the rearing and mating of a new queen bee. The "run-away split" method" utilizes the first 3 findings. Using this method beekeepers could become backyard "micro-breeders." This work could significantly aid in the development of acclimatized, pest-resistant stock, by simply splitting survivor hives in Darwinian fashion. Plus, any beekeeper can do it.

WHAT'S COMING NEXT?



Acknowledgements: Research completed by Sam Comfort of Anarchy Apiaries and Ang Roell & Bi Kline of They Keep Bees; Research funded by Northeast SARE; Design by Jae Southerland; Illustrations by Hang Tran.