Teabe- ja õppepäeva korraldamist toetab Euroopa Liit Eesti riikliku mesindusprogrammi 2010 – 2013 raames

The principles and some useful practices for queen rearing

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The general requisites

- simulation of swarming conditions
- the bees must be in good physiological condition and of the right age
- the colony must have both carbohydrates and pollen of good quality, preferably from various sources
- the amount of bees must be sufficient
- the colony must be healthy (normally)


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The basic variations of methods

- Queenless starter, queenright cell builder
- Queenless cell builder
- Queenright cell builder
- Production of queens in the mating nucs


queenless starter, queenright cell builder

Production of queens in mating nucs

The effect of a queen on cell building

- A queenless unit accepts larvae even in suboptimal conditions
- If in doubt it is safest to use a queenright unit
- A queenright colony accepts started cells even in suboptimal conditions

Grafting or transfer of eggs

For grafting:

- metal tool
- hen's feather
- Chinese grafting tool: no starter necessary

Egg transfer:

- Jenter and Nicot systems
- DIY Jenter cage

The DIY Chinese grafting tool

Grafting, equipment

- Wax or plastic cell cups? Which plastic cups? Some can be reused easily
- Commercial and DIY equipment for cell bars and emerging cages

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DIY cell bar and JzsBZs narrow base cell cups

Cell frame with grips made of hydraulic tube

DIY emerging cage made of film jar

Grafting, conditions

- Dry or wet grafting?
- There is a difference between fresh and stored, diluted jelly
- Double grafting
- Conditions before, during and after grafting
  - Humidity, no UV radiation
  - Larvae can be stored in a refrigerator
  - Larvae and eggs can be mailed and transported easily

Control of the queen cells

- Against light: the pupa must be detached from the cell wall = moving when tilted.
- The pupa must be seen.
- A plastic cell cup: the cell can be opened and closed carefully, or even if a wax cell cup
- Proper age of the pupa
- Proper size of the pupa
- Proper colour of the pupa: no white lines on tergite edges

Quality control of virgin queens

- Size and weight of the queen
  - Gunpowder balance or similar
  - Amount of royal jelly in the cell cup
    - OK if some is left
- Shape and size of the cell
  - Straight, thick walls, not slender

The amount of jelly left in the cup

Queen cells of variable quality

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A queen or a worker?!

Worker, “queen” and a queen

Quality control of the mated queens

- Legs: tarsi must be intact, white tarsal pads
- Wings: pointing backwards normally
- Hair: intact
- Brood pattern etc.

Queen with injured legs

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Other factors affecting queen quality

- Number and condition of drones.
  - Mites and miticides
  - Seasonal variation
  - Affects mating success as well
- Size of the mating nuc
- Number and age of bees and brood in the mating nuc
  - Migration of spermatozoa, queen feeding and maturation

Even more factors affecting queen quality

- Transport and caging of queens in induces stress and causes injuries and promotes infections
- Nosema infection of the queen can be checked

Management of mating nucs

- Preferably 4m apart
- Apideas in groups of 2
  - 85% or better mating success should be expected
    - Abundance of drones, neighbouring nucs at the same developmental stage, appropriate number of bees, different colours of nucs, entrance porches, timely use of entrance excluders, instrumental insemination, prevention of ants etc.
    - Special trick to boost production: the next queen can be introduced when the previous one is still present. Difficult, often bad results.

Placement of Apidea mating nucs

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1/6 mating nucs with porches

The importance of drones

- Scarcity of drones → low mating success, low number of spermatozoa
- Drones can be maintained in queenless units but this does not keep the drones young
- The availability of drones determines the schedule of queen rearing

Selection of breeders

- Queens: production, egg laying capacity, brood pattern, resistance against diseases, not so much docility
- Drones: docility, resistance to disease
  - Haploid genome allows for effective selection
  - An excess of drones can be produced and selected individually, for example for resistance against brood diseases
- The bees remain docile even if only drones are selected for docility