

Importance Of Quality Queens

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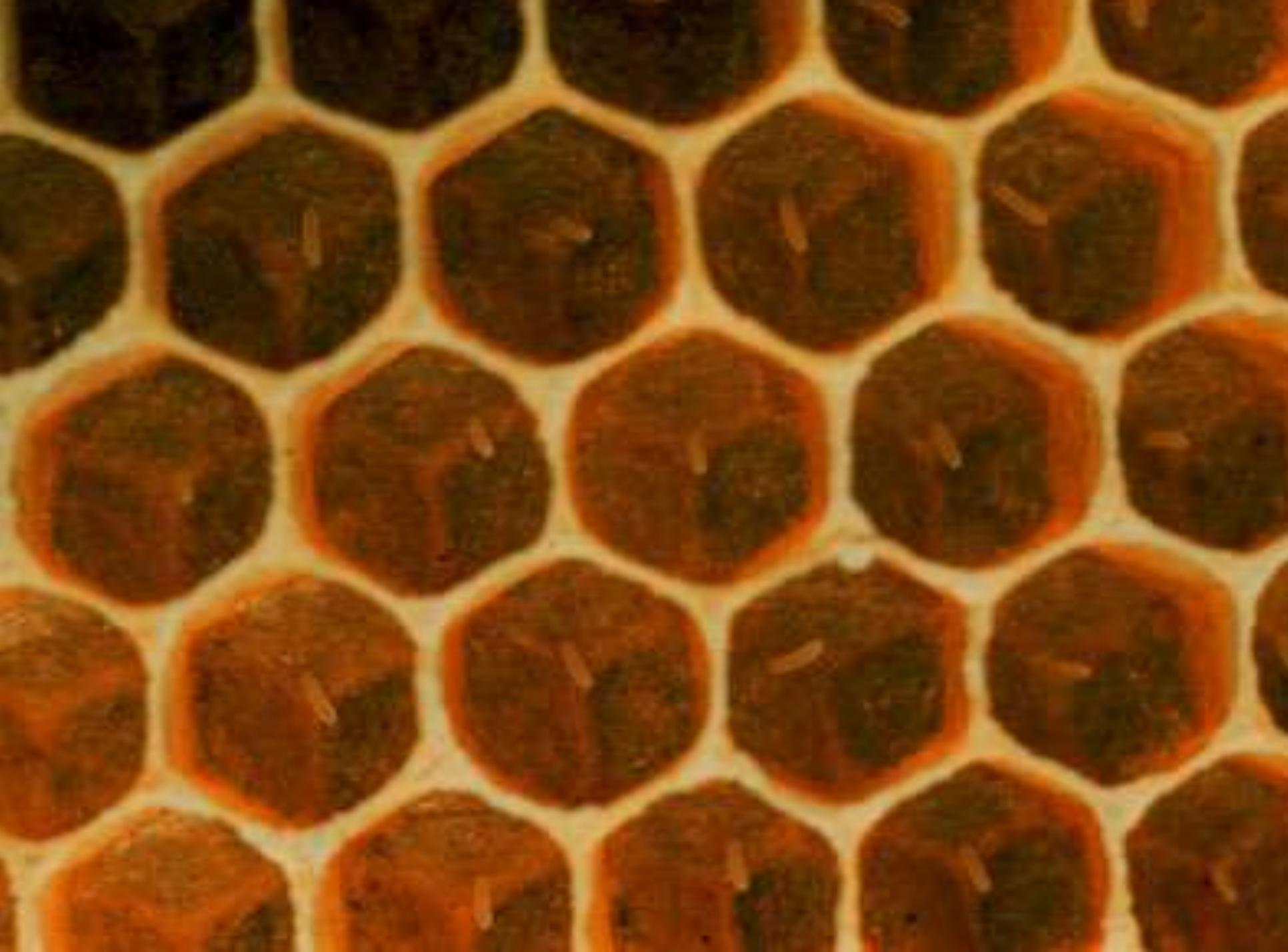
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Workers are affected by the presence of the queen and her pheromones.

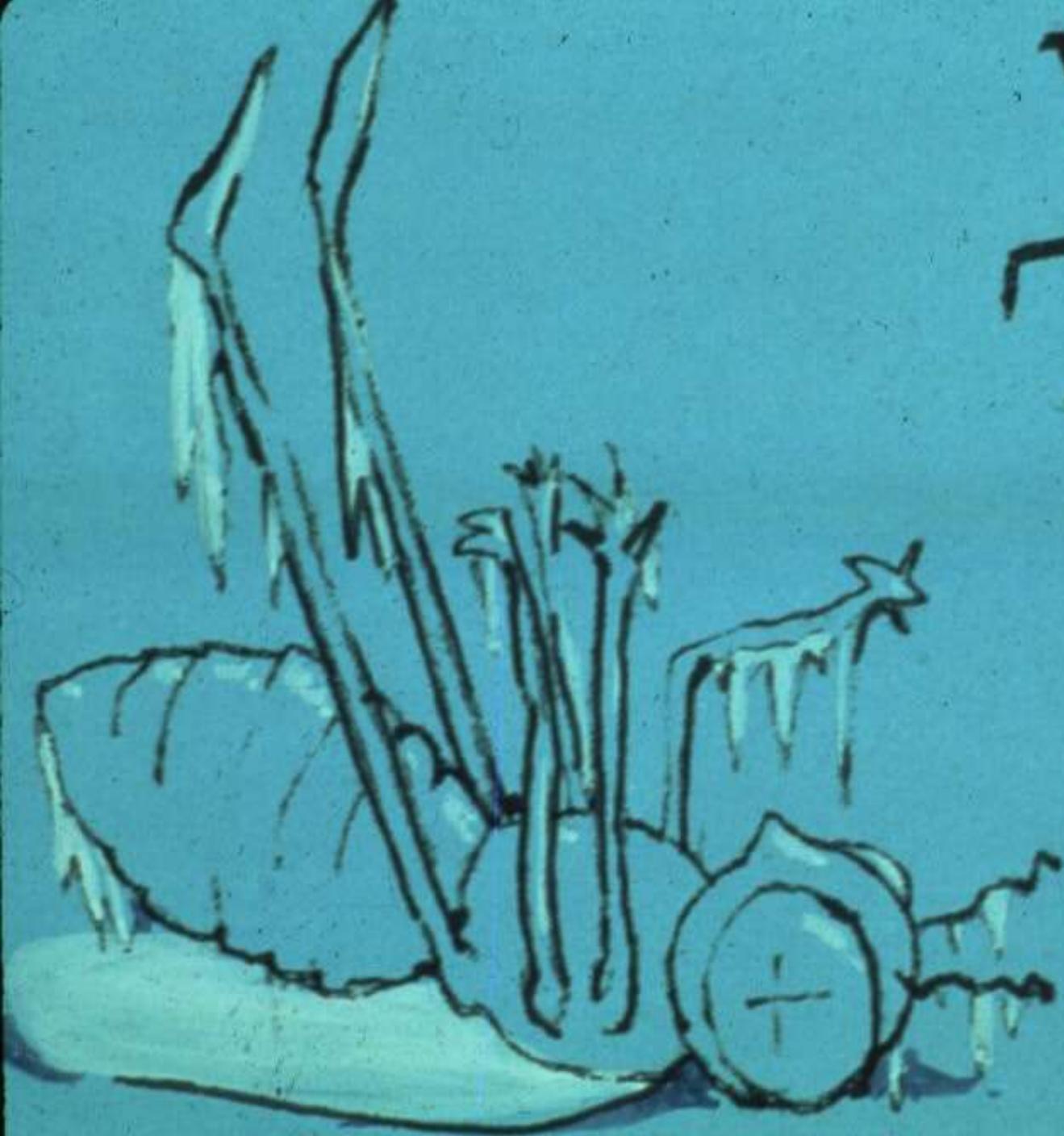




Queens live 2-4 years

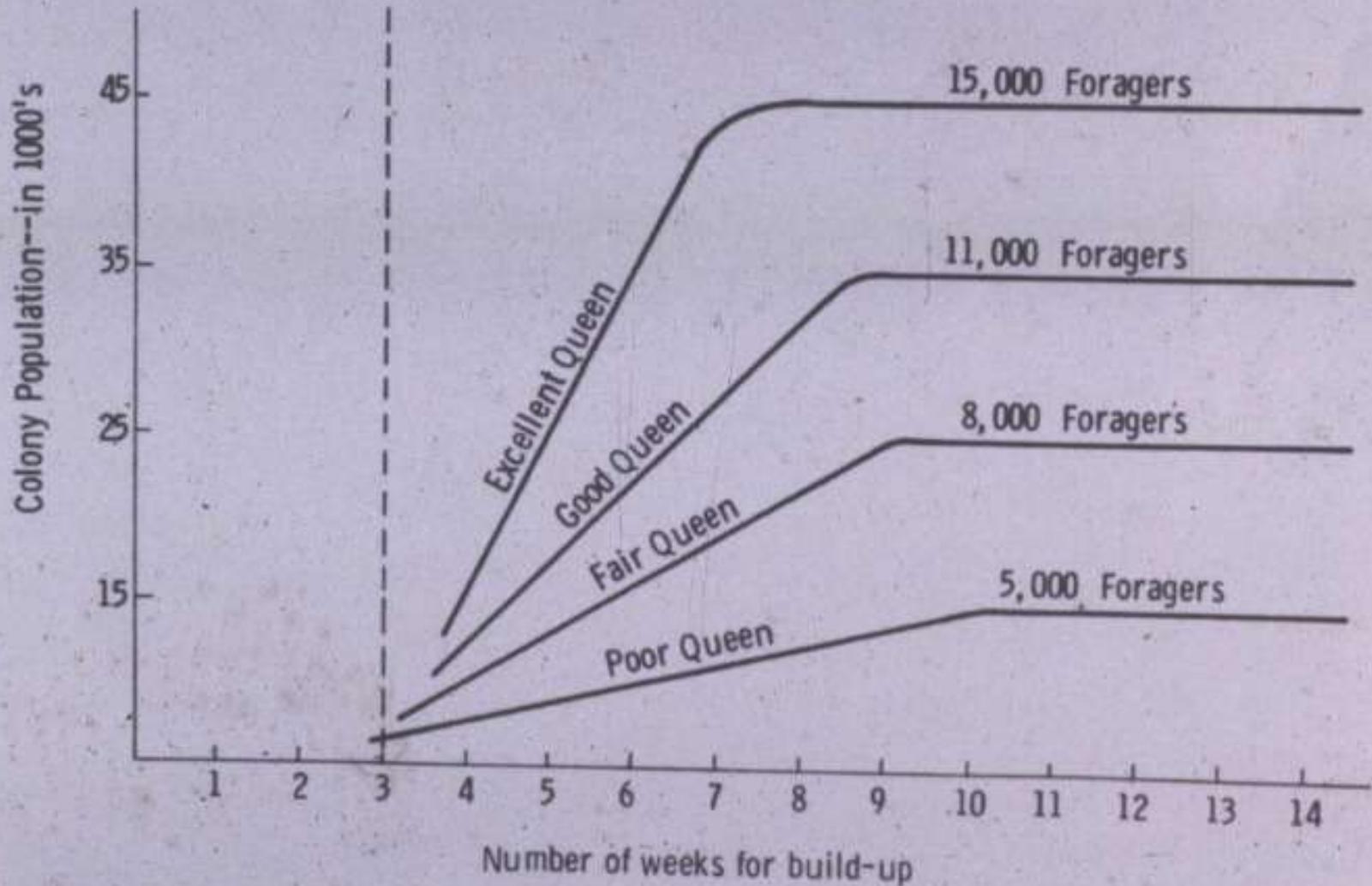
Mate only once (7-15 drones)

Winter Kill





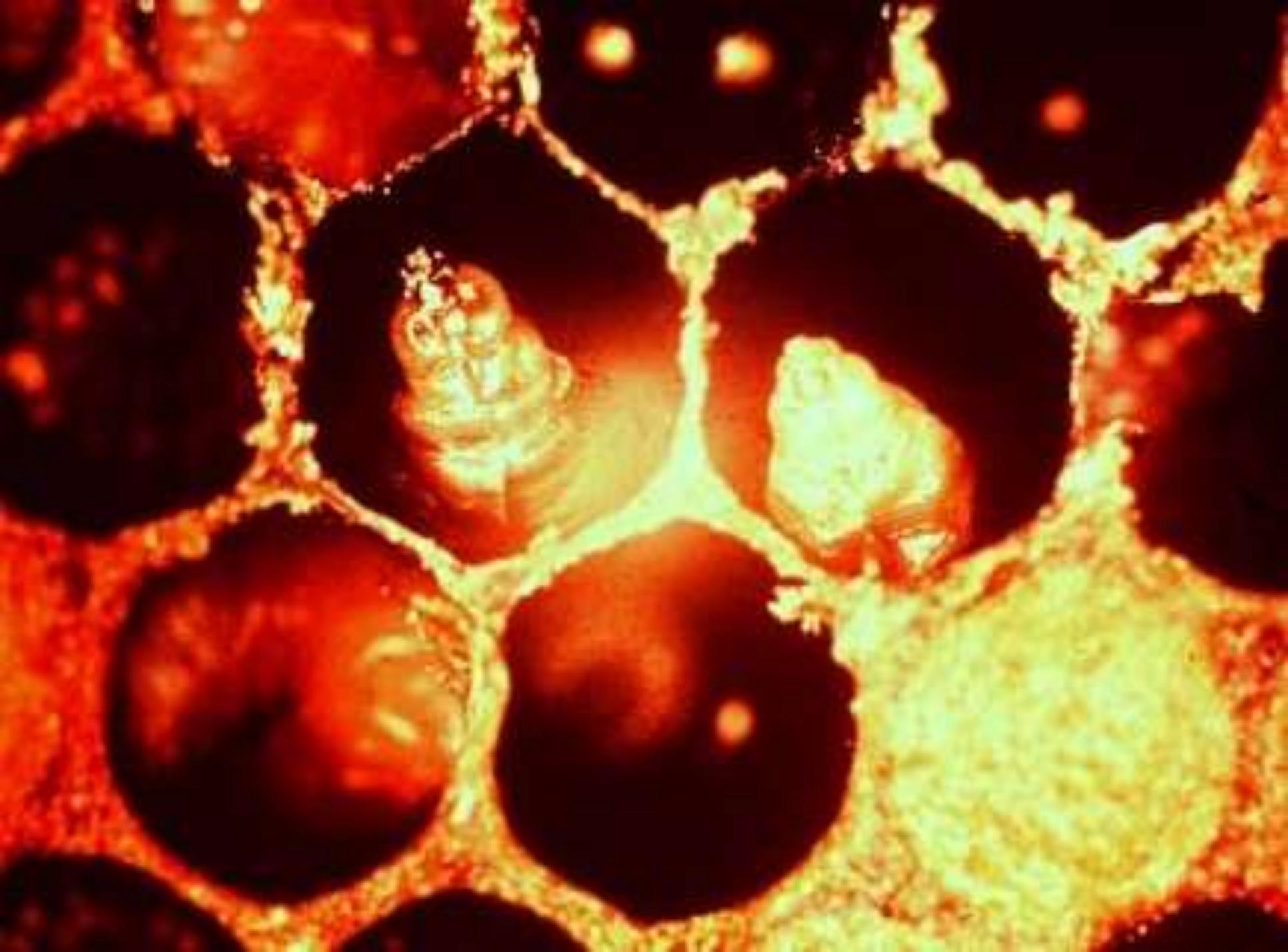
The value of the queen to colony build-up and maximum populations

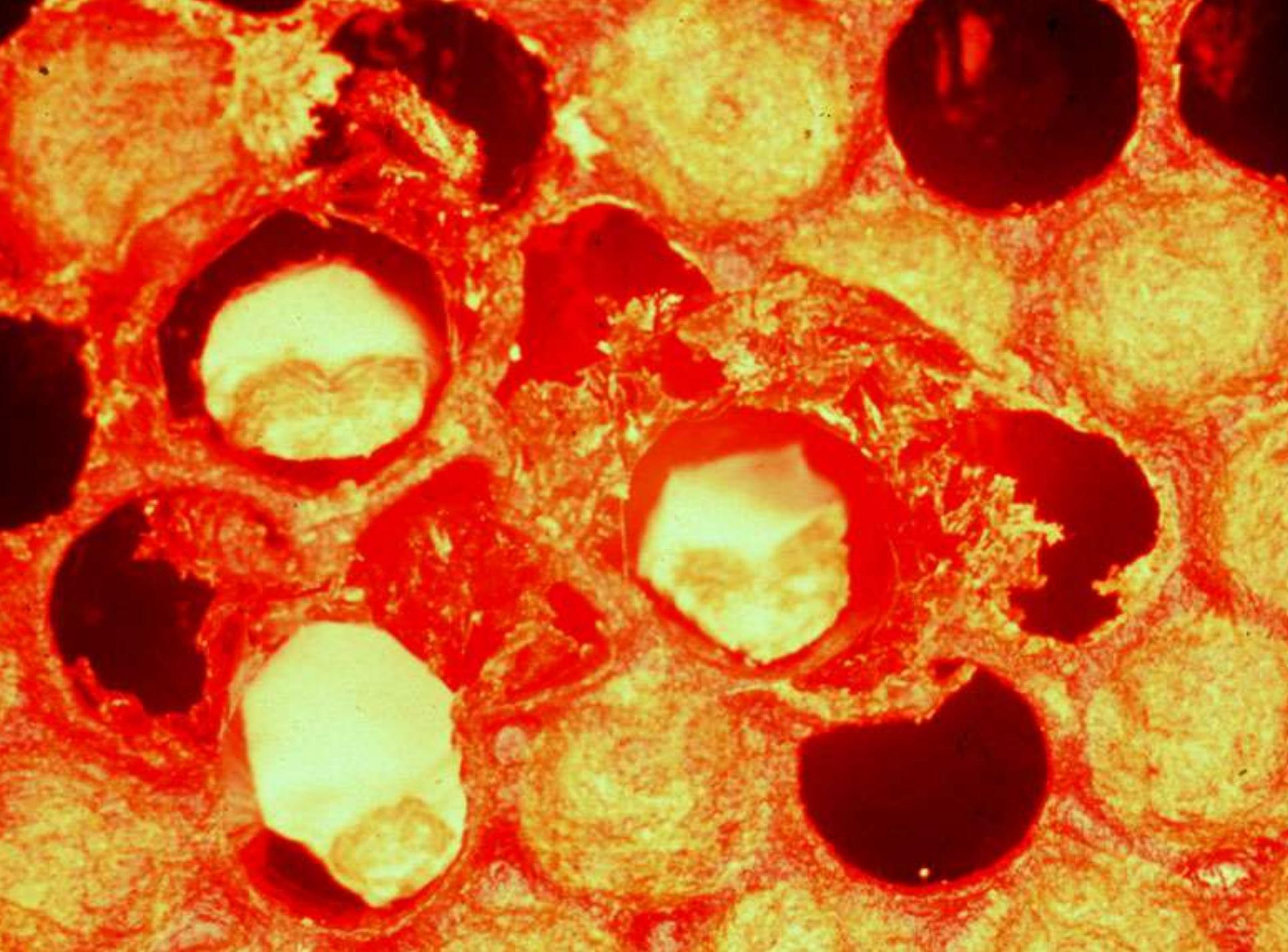




Aggressiveness

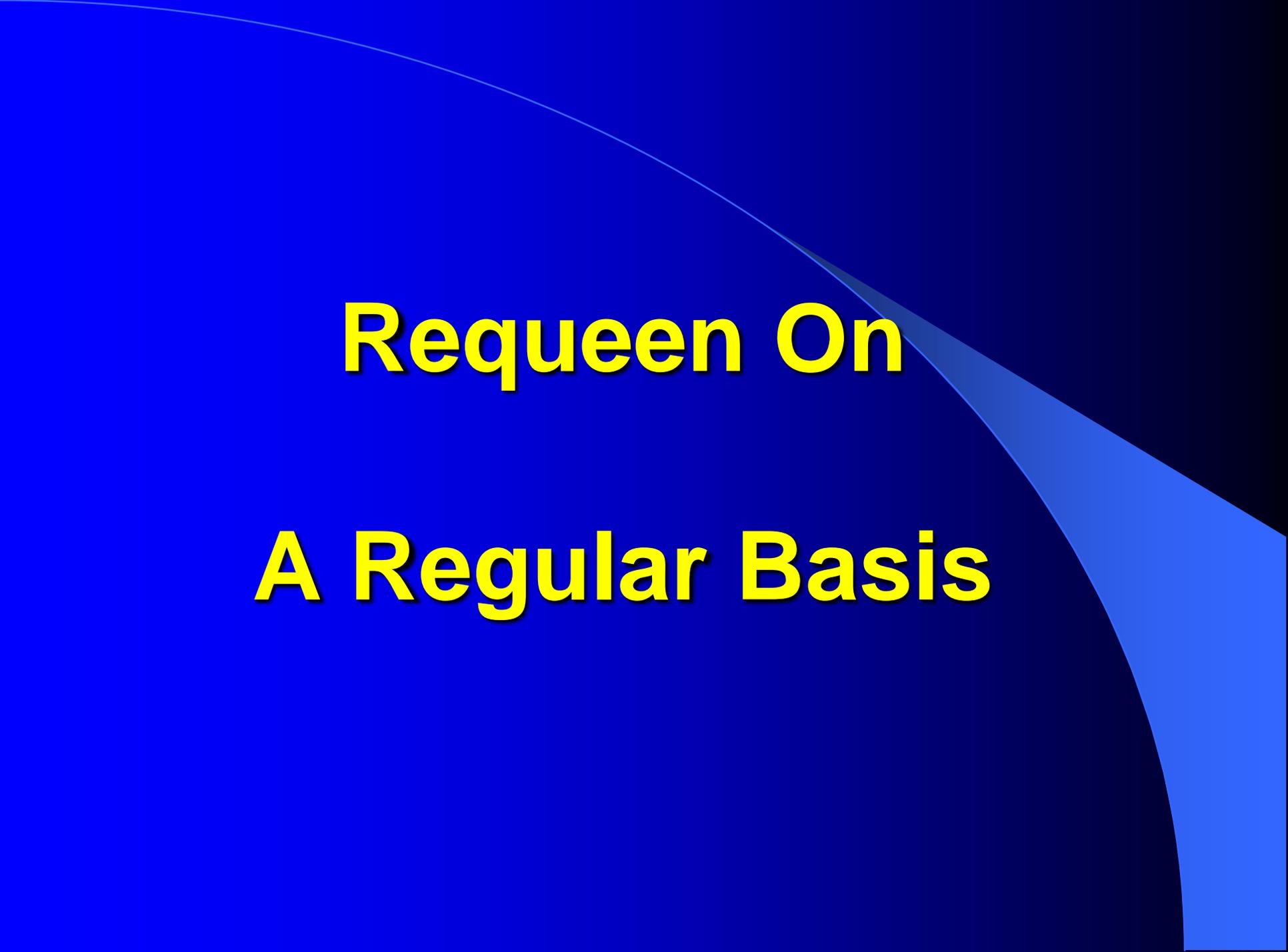






Break in brood cycle





Requeen On A Regular Basis

**Requeen at a minimum of
every two years**

Queens Are Produced Under Three Conditions

**Emergency
Supersedure
Swarming**





What makes a good queen?

**How can you determine if
you have a good queen?**



Beekeepers evaluate queens on basis of colony characteristics:

- **Brood pattern**
- **Behavior of the queen on the combs**
- **Temperament of workers**
- **Production records**







**A queen controls
fertilization by regulating
the release of spermatozoa
from her spermatheca.**

Her entire supply of spermatozoa is limited to those obtained before she starts egg laying, so she must dispense them gradually.

Several spermatozoa are apparently released each time a fertilized egg is laid, but the actual depletion rate is unknown.

Queens (Alberta Canada)

- 1-2 weeks old 9.77 million sperm
- 1 year old 7.63 million sperm
- 2 years old 5.57 million sperm
- 3 years old 2.08 million sperm

Szabo & Davis 1991

Genetic Factors
Physiological Condition
Food Quality and Quantity
Ovary Size
Mating Success

Number Of Nurse Bees

Broodnest Temperature

Fresh Nectar And Pollen

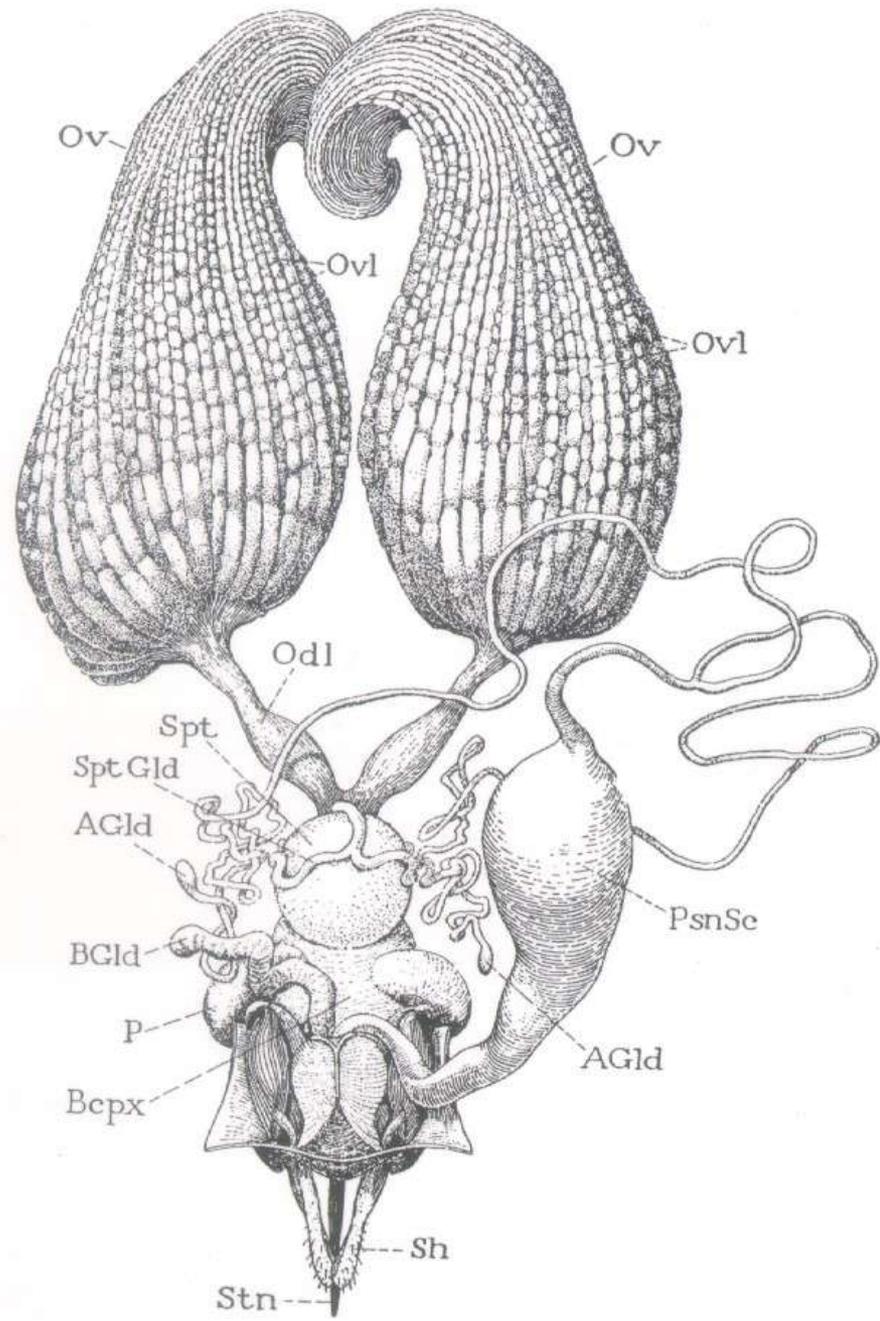


**Significant correlations
have been found between
egg laying rate, population
size, and honey production.**

Several researchers have attempted to evaluate queens by relating body size or weight and other morphological characteristics with:

- **Egg production**
- **Size of brood area**
- **Total colony population**
- **Honey production**

**Queen Weight
&
Number Of Ovarioles**



Weight of Queen & Brood Area



**Brood Area
&
Honey Production**

Weight Of Queen & Honey Production

Heavier queens produce more brood and honey.

Best time to weigh queens is when they are 12 days old and in their mating nucs.

Discard 15 to 25% of the lightest queens.

Nelson and Gary 1983

Heavier queens have more ovarioles/ovary and thus potentially can produce more eggs.

Number of ovarioles

130-186 ovarioles/ovary

Queens with 300 or more ovarioles are considered to be of good quality.

Dietz (1985, 1986) was able to show that queen weights are correlated with queen acceptance by workers and hence may indicate the value of a queen.

Colony traits change due to different matings.

Sperm clump and form layers in the spermatheca.

Needs to be considered when judging a queen.

Poor Queens





Larval Age

Each Increase In 1 Day of Age of Brood Grafted

Decreased
Body Weight
Size of Spermatheca
Number of Ovarioles
Number of Spermatozoa In
Spermatheca

Woyke 1971

Larval Nourishment

Inadequate starter or finisher colonies result in small cells.

Small queen cells should be discarded.

Cell sculpturing should also be considered.



**Volume and Length Queen Cell
&
Weight of Queens
Number of Ovarioles**

Chilling Of Queen Cells

Rough Handling Of Queen Cells

**Queen Cells Placed On
Their Sides During The
Pupal Stage May Die Or The
Virgin Queen May Emerge
With Deformed Legs Or
Wings.**

Poor Mating Conditions

Number of Spermatozoa & Size of Spermatheca

**Queens With Sperm Counts
Less Than 3 Million Are
Unable To Head Colonies
For One Season.**

**Average Drone
8 million Spermatozoa**

**Average Queen
50 million Spermatozoa**

**Queen's spermatheca normally
contains 5-7 million
spermatozoa.**

Drones are sexually mature at approximately 12 days of age.

Sperm count goes down after 20 days of age.

Shipping Conditions



Supersedure



**There are numerous diseases and physiological problems that can prevent the queen from laying fertilized eggs.
(Drone Layers)**

Lack of Fertilization
Unsatisfactory Fertilization
Exhaustion of Sperm Supply

11% Low Sperm Counts
10% Queens had Nosema
54% Attendants had Nosema
47% Packages had Nosema
(1963-1966)

Late Packages Arriving In
Canada, Queens Had Higher
Sperm Counts.

Queens In Mid- To Late-
Summer Are Best.

Nosema causes a high level of supersedure.

Damages cells lining mid and hind guts.

Metabolic processes are disturbed.

Ovaries suffer severe damage.

High proportion of eggs fail to hatch.

Stops laying eggs.

Summary

- **Colonies should be headed by young vigorous queens.**
- **Select large queens that have been reared when colony nutritional conditions are excellent and mated when large drone populations are present.**

Summary Continued

- **Solid brood patterns, temperament, colony characteristics and productivity are the characteristics that you should be using to judge your queens.**
- **Remember, you cannot judge a queen without a large population of bees so the queen is able to develop to her full potential.**