# HONEY BEE DISEASES AND PESTS

# Parasitic Diseases

## VARROOSIS

# Treatment and Control

- Biological methods:

- Extraction of the brood cells and trap method (extraction of worker cells, trapping of drone cells)
- Trapping of artificial swarming.
- Electricity application (12V) to honeycomb wire.
- Pollen trap application method.
- Heat application method (up to 45 C)
- Working with the young queen (changing every year)
- Limitation of drone cells
- Use of varroa-resistant bee strains

- Using a full pollen drawer in the hive is a practical method and reduces the varroa number by 35-40% without any medication.
- The strategy to be applied in order to be successful in combating with varroa should be done with the other beekeepers in the same region.

- For this;
- Hive record system should be established.
- The struggle should be performed in the same way and same day in all apiaries around 5 km (bee flight).
- Individual struggle does not make sense.
- There should not be more than 50 hives in a apiary.
- The main struggle should be performed in the autumn, and it should be entered with strong and healthy bees to the winter.
- Bee medicines used must be to be licensed, and other veterinary medicines and pesticides should not be used.
- A weak hive (2-3 frames) and a strong hive (6-8 hives) should not be in the same place.
- Migratory beekeeping should be well organized and controlled by the veterinarian.

- Struggle using drugs.

1. Chemicals use
2. Organic acid use
3. Essential oil use

- Organic phosphorous, formaminidines and synthetic pyretroids have come to the forefront in chemical medicine.

- Especially Coumaphos, Amitraz, Flumethrin and Fluvalinate are the most commonly used.

- In the classical sense, medicinal combat is recommended at early spring and late fall.
- The use of slow-released plastic strip preparations in the fall (following honey harvesting) has shown that drug use can be reduced by one time per year.
- When the environmental temperature falls below 12 C (it will cause winter cluster), the drugs used in this period will not work.

- In regular medication;
- Amitraz (500 mg plastic strip)
- Coumaphos (1,36 gr. rubber strip)
- Flumethrin (4 mg plastic strip)
- Fluvinate (824 mg plastic strip) can be used.

- In particular, it is recommended to apply in early spring because of the low residual levels of synthetic pyrethroids.
- It is necessary to change medicines every 2-3 years to prevent varroa resistance.

- The use of organic acids (Formic acid and lactic acid) has become increasingly popular in recent years.
- From these, especially formic acid is toxic and caustic, therefore it should be used with caution, even though it has the advantages at low environmental temperatures (2-5C) in the struggle with varroa. Also, it does not cause the residues in honey.
- However, the dosage adjustments should be made as the environmental temperature increases.
- Otherwise, it has been seen that the queen cut the ovulation, the cubs were ripped out, and the bees left the hive.

- When the organic acids and essential oils (thymol, mentol, eucalyptol, camphor) are used in intense and hot months, the stress proteins of honey bees rise.
- This causes excessive honey consumption, aggression and an increased tendency to leave the hive.
- If organic acids and essential oil derivatives are given to hives from the top, the desired effect is achieved.
- Both do not cause residues in honey.

- Some fungi have also been identified as entomopathogenic against to varroa.
- Metarzhzium anisopliae
- Hirsutella thompsonii
- However, there is no practical application yet.

- The main purpose of the struggle should be to organize and consciously make use of drugs with biological control measures.
- In addition, the hive records should be kept.
- Good colony management with good nourishment should be done and it should be worked with powerful colonies.
- Beekeeping is to complete the deficiencies of the essential column in the autumn and enter the winter with healthy and strong hives.
- Beekeepers should not take queens outside their territory and should perform hard hygienic rules.

# Economical Losses

- Today there are approximately 6 million honey bee colonies in Turkey.
- Cost per hive is around 15TL if only a single treatment is carried out annually.
- Approximately 15-25 million dollars cost arise for only medicines.
- If we add it to honey and colony losses, the loss will increase exponentially.