

bee nutrition science



Guide

2022



Guide

Book content



Preface

I. Importance of bees

- 1. Facts about bees*
- 2. Protecting bees, sustaining life*
- 3. Threats to bees*

II. Bee Nutrition

- 1. Save bees – Save Nature*
- 2. Hot Season (spring/summer)*
- 3. Cold Season*

III. Beeconomy

- 1. Beekeeper's goal*
- 2. Why to use Dulcofruct products?*

APIARY INFOGRAPHIC



Preface

The present guide offers a general reference framework regarding bee nutrition with “Dulcofruct” brand products, and it is designed to help the beekeepers to understand the essential elements for a better developing of the apiary, supplementing their income/financial resources and help them succeed in sustaining bee life and perpetuation of species.

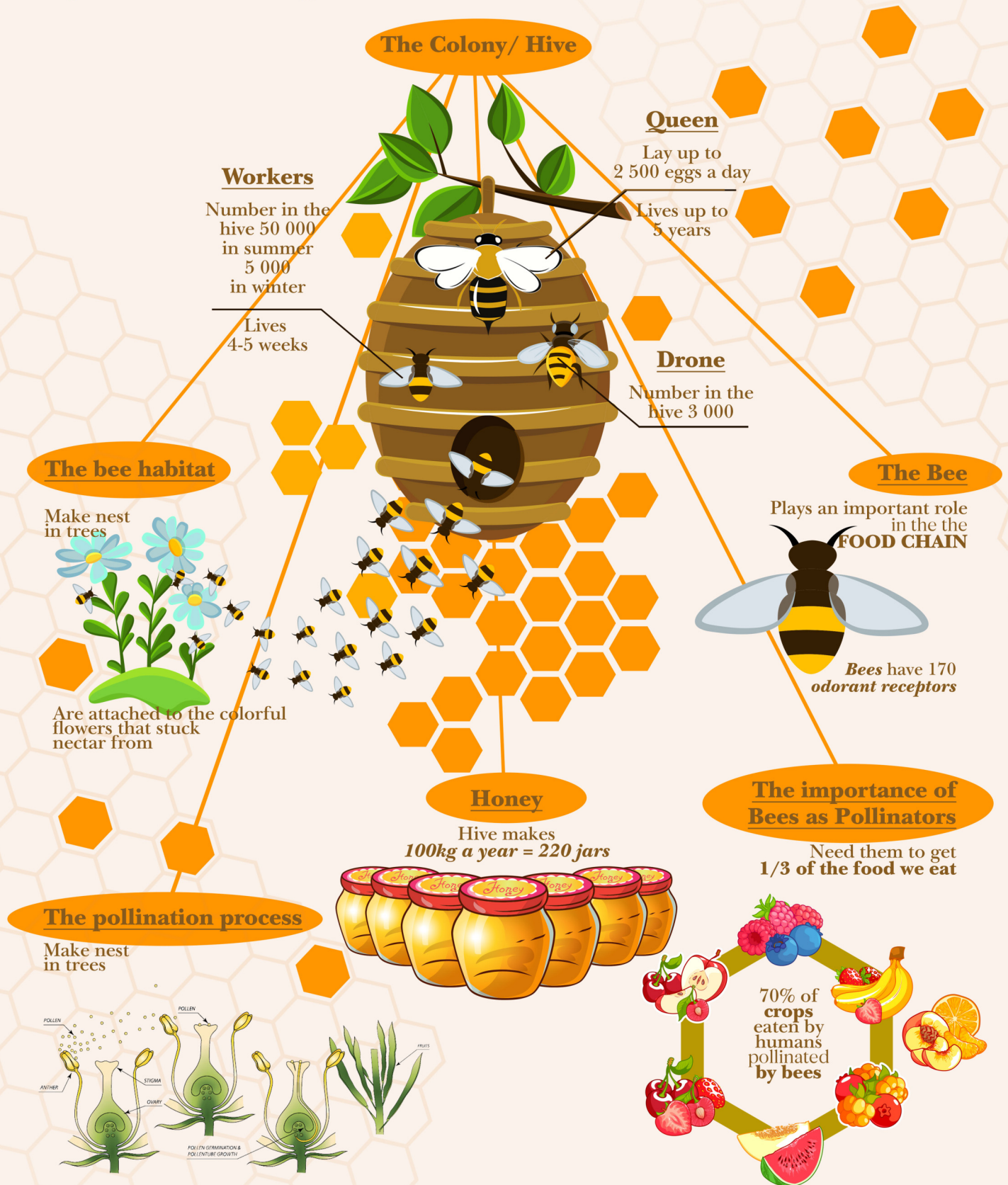


Honeybees don't just make honey....

The greatest contribution of bees is the pollination of nearly three quarters of the plants that produce 90% of the world's food. A third of the world's food production depends on bees, third spoonful of food depends on pollination.

And guess what?

they are in real danger



Colony Collapse Disorder

Bees are vanishing from their hives and leaving the queen behind.

Bees populations have been decreasing since the 1990's.



Pesticides and insecticides treatments.



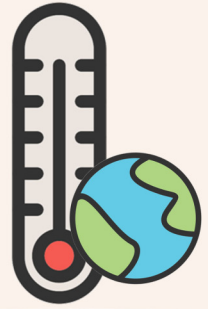
Oil spill.



Burning solid fuels.



Loss of habitat.



Climate change, global warming.

How You Can Help?

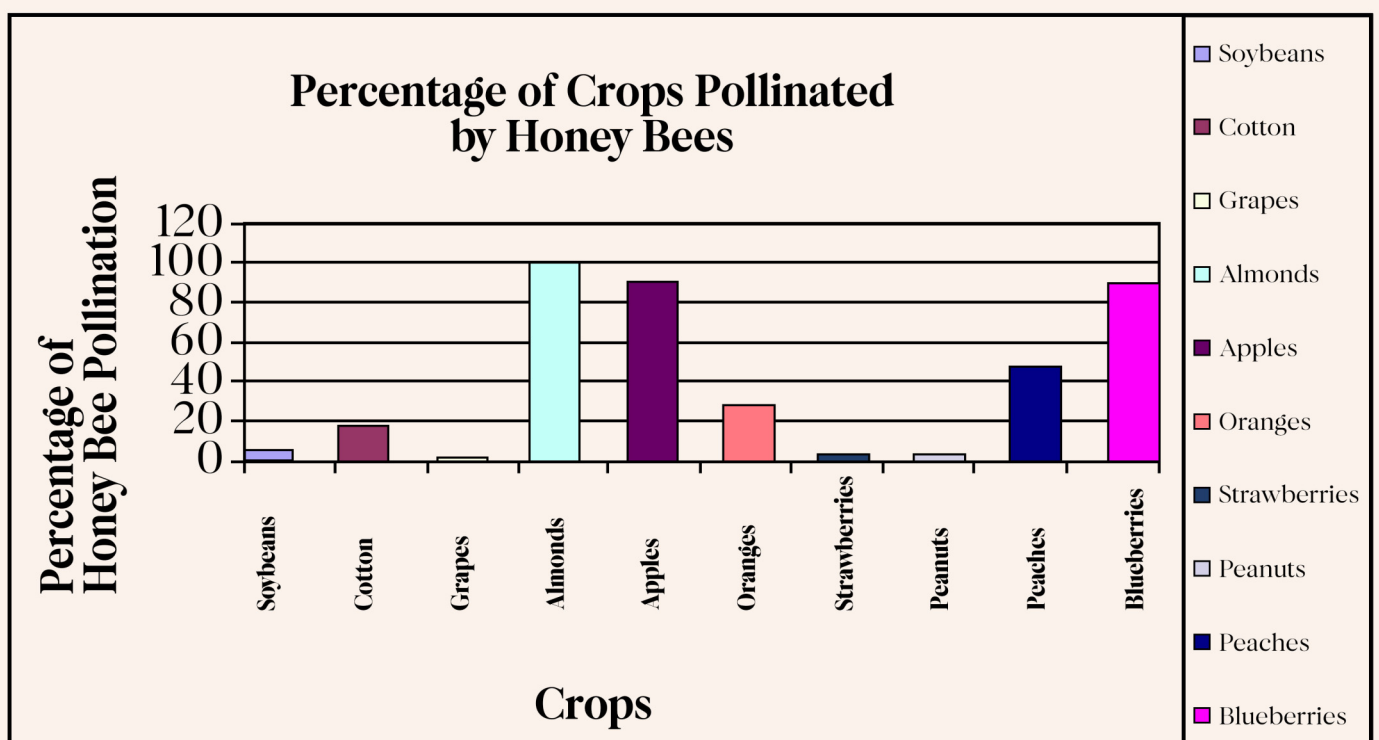
- Information and accountability campaigns.
- Plant trees and plants, flowers.



I. Importance of bees

1. Facts about bees

It is estimated that at a global level one third of the consumed food is based on the crop's pollination done by BEES. Worldwide a decline of 30% of bee population is observed due to external factors such as climate changes, pests, diseases, viruses, monocultures and molds, that could even condemn this wonderful species to the bridge of extension.



2. Protecting bees, sustaining life

“If the bee disappears from the surface of the Earth, man would have no more than four years left to live.”¹

Why do we need to protect bees?

Ecosystem: bees are the crucial species – ***no bees = no life***

As pollinators, bees play a part in every aspect of the ecosystem. They support the growth of trees, flowers, and other plants, which serve as food and shelter for creatures large and small. Bees contribute to complex, interconnected ecosystems that allow a diverse number of different species to co-exist.

Economic purpose: global crop production pollinated by bees is valued at over 500 billion euros, meaning that bees contribute to agriculture industry that makes up to a third of the food consumed by humans.



¹Albert Einstein quote

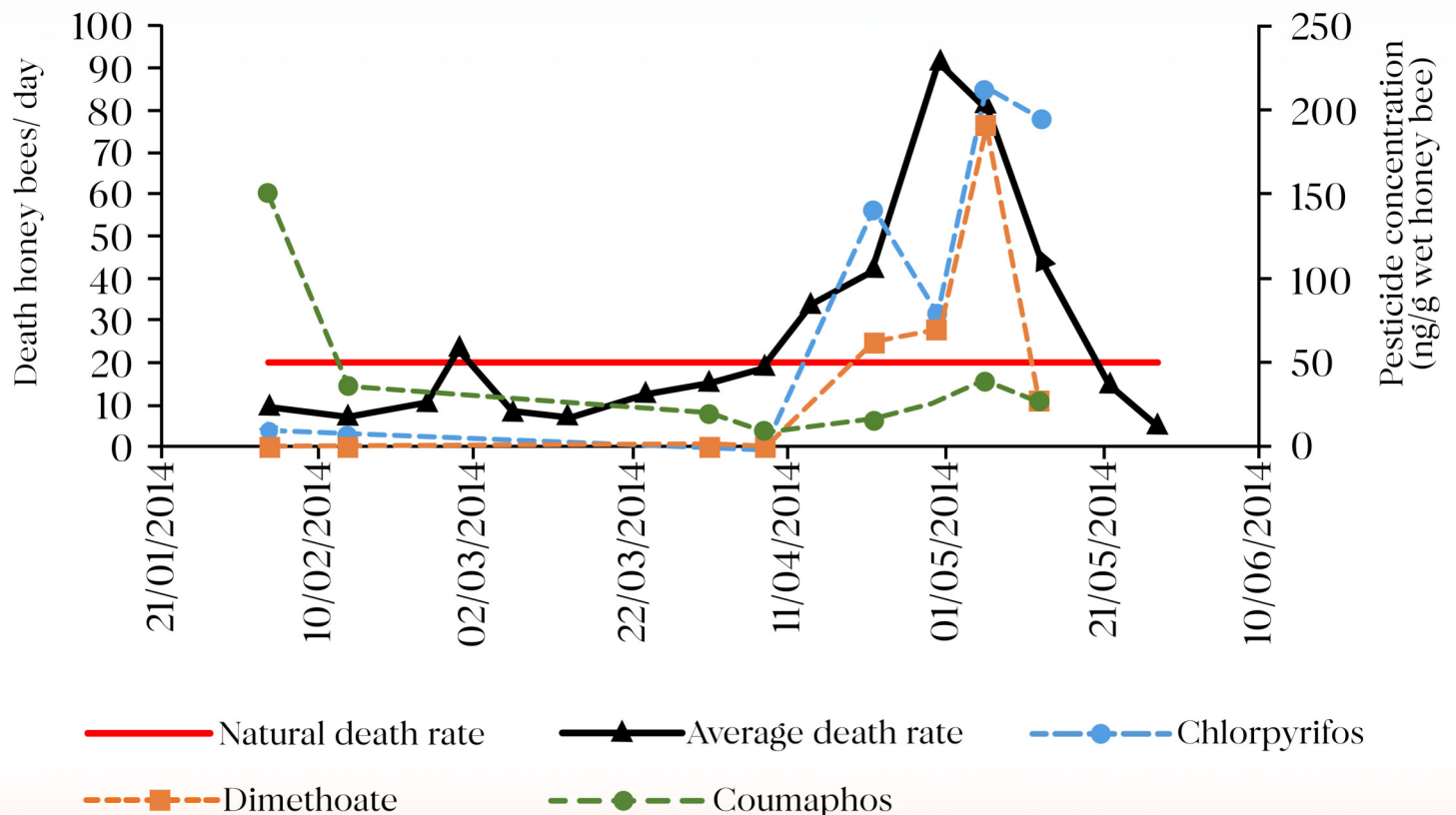


3. Threats to bees

Use of Pesticides: usage of pesticides and herbicides in modern agriculture have a negative impact on bees, it can kill them or severely weaken the bee's health. Colony collapse disorder is a direct result of industrial agriculture. Hives are hauled long distances from field to field, further stressing the bees and exposing them to a wider variety of agricultural pesticides and genetically engineered crops.

Climate change: there are multiple factors related to nowadays climate changes that affect the bees, variations in vegetation - late blooming, rising temperatures - desert zones which are creating inhospitable conditions for bees.

Treatments: nowadays the high challenge is to protect the bee colonies from parasites and diseases that resists the conventional treatments, mites have developed resistance to these chemicals and residues persist and accumulate in wax.



II. Bee Nutrition

CONSEQUENCES OF DEFICITARY FEEDING

When can the consequences of deficitary feeding of bees be observed in an apiary:

Lowering the life span of adult bee by reducing the fat body development which indirectly leads to hive depopulation;

Bee immunity is being reduced, because the capacity of detoxification at the level of fat body is affected;

Reduction of bee brood and decrease of population;

Affecting the quality of drones (decrease of fertility), ending up to degradation of genetic material;

Affecting the quality of queen breed.

NECESSARY CONDITIONS FOR EFFECTIVE FEEDING

For an effective bee feeding from nature sources there are conditions to be accomplished:

To have nectar and pollen source from the environment in sufficient quantity, meaning that the foraged quantity to be equal or more than the consumption;

Free of toxins nectar, not to contain organic toxins or minerals that came from pollution, soil or plant rich in toxic minerals;

Sufficient quantity of nectar in the presence of brood are essential for foraging pollen by the worker bees;

Is mandatory that the pollen to be polyfloral and very good quality (min. 20% raw protein) and doesn't contain toxic waste;

To have enough worker bees inside the hive;

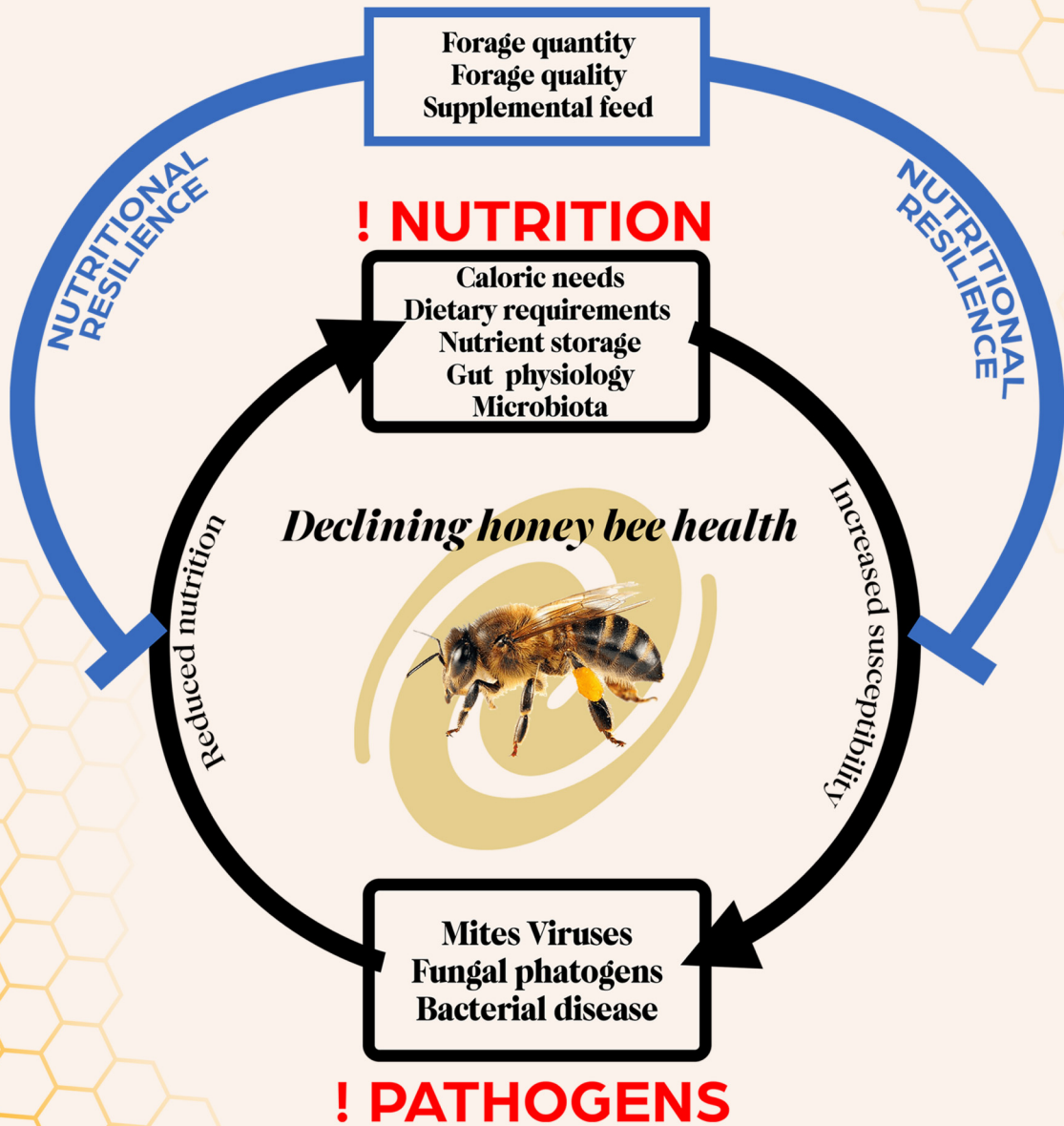
Good climate for flight and nectar secretion of plants.



Guide

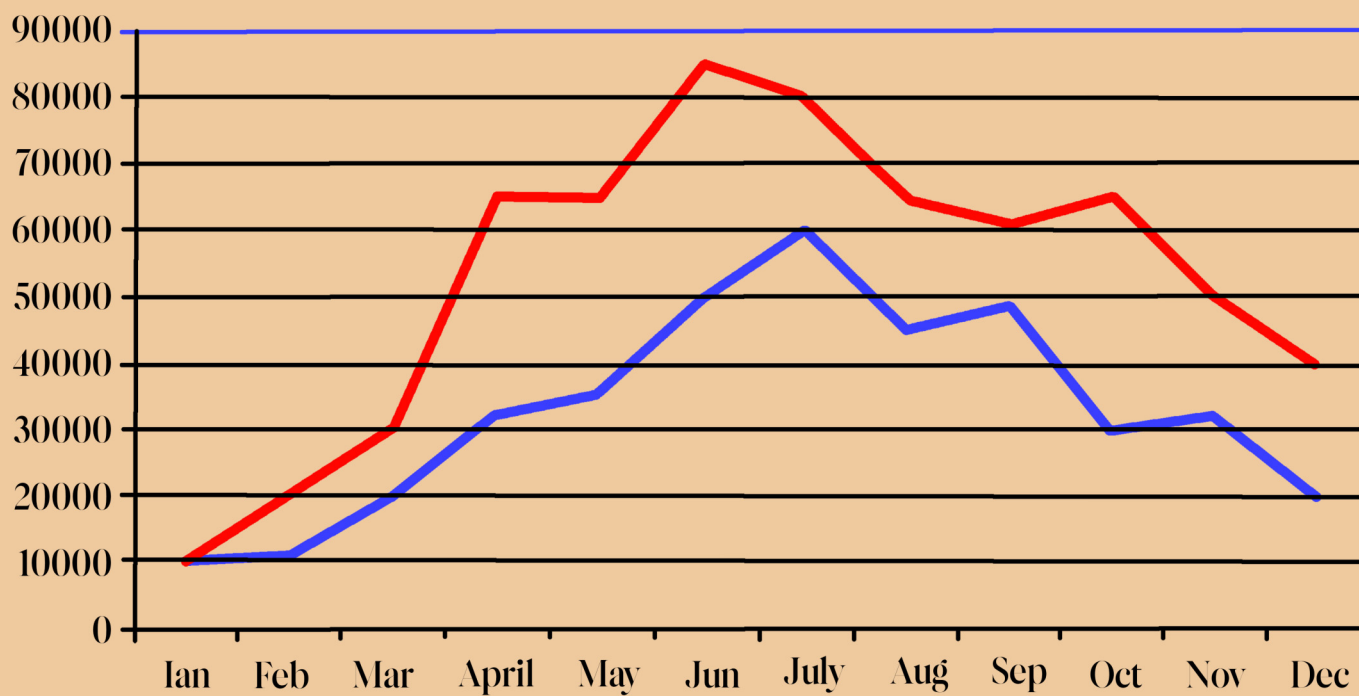
II. Bee Nutrition

Current opinion in Insects Science





ROMANIA CLIMATE



— *Feeding only from nature sources (nectar + pollen)*
— *Feeding with Dulcofruct products*

although optimal pollen exists in nature it is ignored because of lack of nectar and/or bee brood, thus depriving the freshly hatched young bees from protein feeding.

1.1 Hot Season (spring/summer)

Honey bees need a range of elements to satisfy their nutritional requirements for normal growth and development. These elements include proteins (amino acids), carbohydrates (sugars), minerals, fats/lipids (fatty acids), vitamins and water.

Lack of one or more of these essential substances will lead to a serious reduction in the population of the colony, reduced longevity of the bees, reduction in drone populations, increased disease susceptibility and ultimately, death of the colony.

Honey bees need a lot of fuel in early spring for comb construction and population build-up, and packaged bees are starting out with nothing. It is crucial to feed packages upon installation, and very important for nucs and swarms to have all the nutrients for development (important basis of protein plus carbohydrate – Superprotein Pattie/SuperProtein Candy) when the weather is limiting foraging activity, and when mother nature doesn't provide.

Spring development period (after flowering of the first fruit trees, characterized by daytime temperatures above 8°C, often above 12°C, conducive to flight). Colonies have large brood quantity, generally larger than adult bees. The queen's egg laying is growing. Feed needs, especially protein is maximum.






1.1 Hot Season (spring/summer)

The basic requirement is that the intake of liquid food (nectar or *Dulcofruct* syrup possibly diluted with water) is constant and at least equal to or greater than consumption.

Both the family's metabolism and the collection of pollen (essential during this period) depend on liquid food. Stimulation or maintenance of bee families is necessary during periods without natural food intake.

Bees, if they have a favorable temperature (over 8 °C), regardless of the season, will tend to raise brood, and this brood needs food. In the absence of food needed for the brood, bees will consume carbohydrates from the existing reserve in honeycombs and proteins, especially from the body reserve, less from honeycombs, but in parallel can be activated more or less, depending on the breed, and an adaptation system. to the state of deformity by reducing the amount of reared brood, a mechanism that has as a consequence the population weakening of bee families, the decrease of immunity / resistance to diseases and of course the weakening of the production capacity.





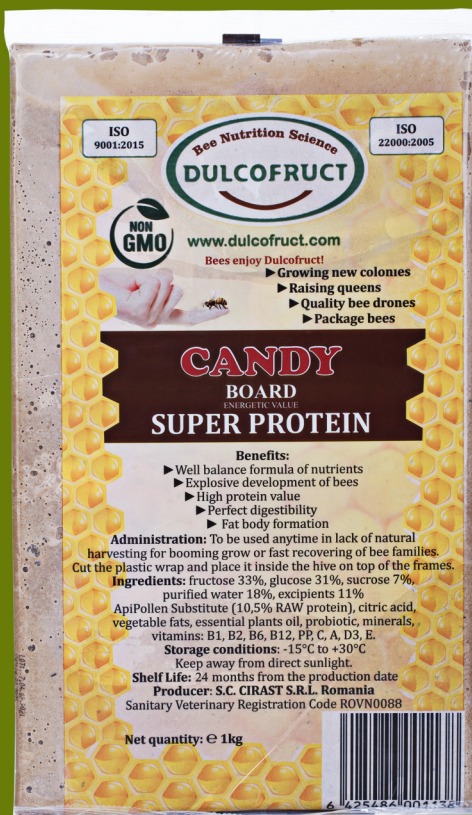
In order to keep the families in maximum production capacity, the stimulating feeding must be done:

1. Spring, from the first flights of the bee, during the temperatures that allow the bees to hatch from the cluster.

2. In all breaks / «gaps» between harvests.

3. Further of the last harvest until the natural cessation of the young growth in order to ensure the volume and vigor of the wintering population. Naturally, the flora has a generous supply of food during this period.

The risks are mainly related to weather conditions (cold, wind, rainfall), which can affect the ability of nectar to be secreted by plants at too low a temperature or even the ability of bees to fly. The risk of protein deficiency is lower, but it can also occur especially in long periods with lack of flight or lack of nectar.





Feeding is done primarily with stimulation with **Dulcofruct** brand syrups diluted **1: 3** or **1: 2** with water and it is recommended to apply it in close correlation with the evidence of the evolution of the control scale, to be interrupted during periods of positive increase of weight based on foraging food from the environment.

In families with depleted food reserves, a supplemental feeding with 2-5 kg of undiluted supplementary Dulcofruct brand syrups / family can be done urgently, preferably at the beginning of the season or immediately after the problem is found, especially if no nectar cannot be found in nature.

Protein feeding with Super Protein Candy or Super Protein Pattie can be maintained in families with a small adult population and in periods of bad weather and lack of flight, especially if the rapid development of colonies is desired, as well as in families destined for the production of biological material is mandatory.

To start the wintering season, the bees require large quantities of high-quality protein that helps a better developing of the bee's fat body. In lack of qualitative pollen, protein feeding becomes mandatory to avoid loss by depopulations during the winter/cold season.





2 Cold season

2.1 Inactive period

Passive wintering period (late autumn and first part of winter):

It begins after the hatching of the last generation of bees, during the end of autumn and beginning of winter. The duration depends on the outside temperature, being prolonged by the frost and the lack of temperatures conducive to the cleansing flight.

It is characterized by the organization of bees in cluster on the background of outdoor temperatures below 8°C, and in the hive, the temperature fluctuates widely, generally below 30°C.

Requirements: The population is protected from wear and stress, both from environmental stressors and from feed.

Naturally consumed energy food (honey, syrup) covered with honeycombs.

There are risks like:

- supplies are insufficient,
- crystallized in honeycombs (in weak families)
- the cluster should be formed on honeycombs with insufficient supplies (families with large quantities of brood that hatched late, long after the last supplies).

Moving from one honeycomb to another in the cold is difficult or impossible. Sugar-free high on fructose candies are used:

Candy Board Energetic: Assures the energetic excess in the cold season.

Candy Board with Plants: gives extra resistance to intestinal diseases, including Nosemosis.

Candy Board with Vitamins: it is used especially for weak families or with the insufficiently prepared winter generation (poorly fed during the period of growth and fat body development)

Candy Board Forte: has the effect of control potentially pathogenic gut bacteria and reducing the Varroa population.



2.2 Active wintering period.

The population is gradually activated after the cleansing flights, as the amount of brood appears and increases, and the temperature of the cluster increases to 35°C with minimal oscillations. The size and dynamics of the egg is determined primarily by hereditary (genetic) characters and stimulated by dietary factors and the size of the light period of the day. Nutritional requirements: During this period, the developing brood requires increasing amounts of protein, which can come mainly from the body's protein reserve of bees.

Naturally, small amounts of pollen can occur in the environment (alder, horn, hazelnut, conifer), but they are of poor quality (fat body) or inaccessible due to the cold that blocks the flight. The bee bread reserve is usually absent or there is a false "bee bread" in the combs which has been avoided by nurses due to the lack of quality.

The family also needs water and heat (thermal insulation, abundant and crowded population, wind protection).





The risks are maximum for protein malnutrition, which leads to fat body (vitellogenin) depletion in the adult population, its decimation, but without succeeding in forming a new generation of normal quality, but a protein malnutrition, also with deficiencies in the fat body, with short life and unable to protein feed the next brood. The result is visible depletion of the colonies, which will stop after the first consistent pollen harvests or after protein feeding.

These risks are greatest in weak and fast-growing families (large number of eggs laid from the beginning) and diminish in well-populated families, where queens have slow-growing (slow-growing) spawnin dynamics. A second category of risks is the depletion of the food supply.

Used:

Super Protein Candy - The safest complete coverage of nutritional requirements, sometimes the only source of protein this season. To prevent the risk of depletion of feed stocks we use energetic candies.



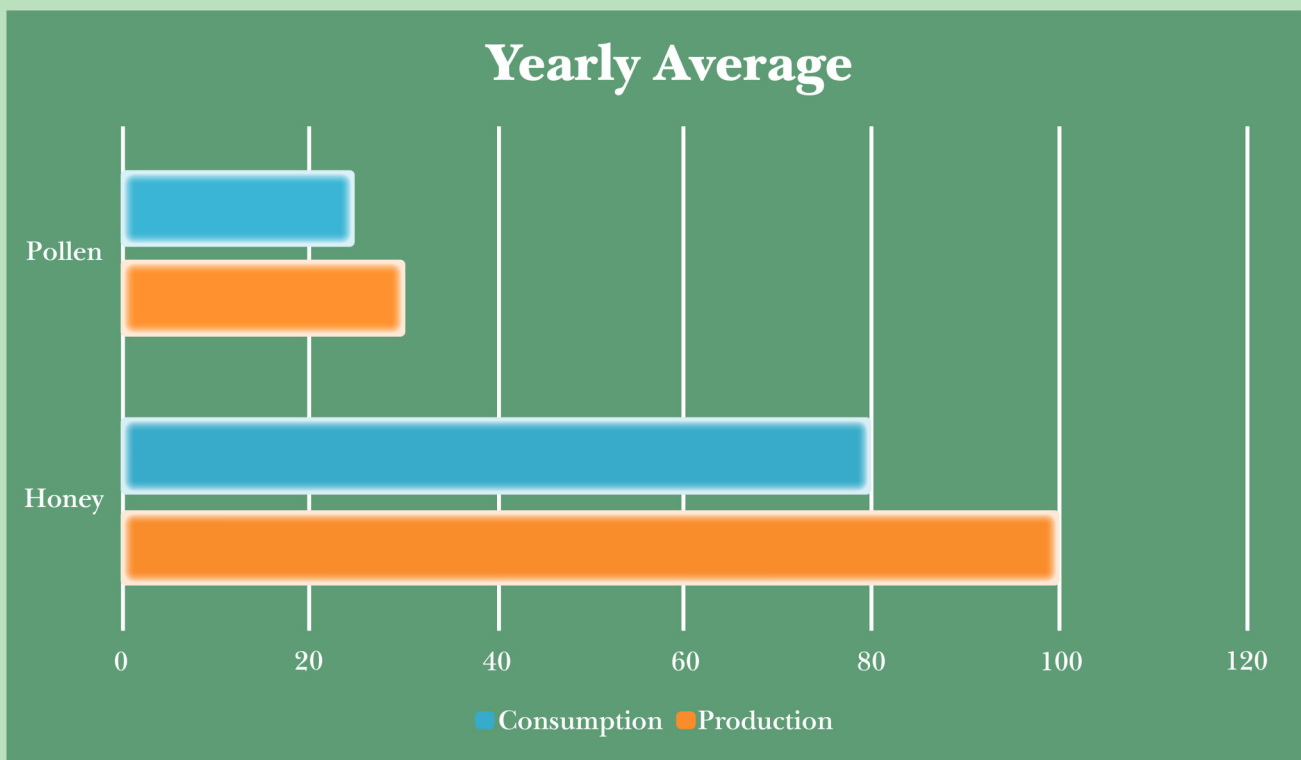
Guide

III. Beeconomy



1. Beekeeper's goals

As presented in the previous chapter, feeding bees is essential for their race development and survival but we need to take into account also the advantage of taking care and grow bees.



Our Research and Development department, led by PhD. Popovici Daniel specialized in bee nutrition has been studying continuously to create a special portfolio of products designed to make life easier for beekeepers and adapted for bees' requirements.



Guide

Main questions of a beekeeper are:

1. What are my goals to succeed in this business sector?

A. Keeping a powerful and strong bee population.

B. Maximizing bees' resources by capitalization of products like: honey, royal jelly, Beebread, Pollen, Propolis, Wax, Queen multiply, raising nucs.

C. Maintaining the bees' colony healthy.

D. Save time - work less.

- *“A beekeeper must feed the soul and fill the pocket”*

2. Why should I replace the Honey and/or Pollen in the hive?

In an experiment “Bee longevity test” conducted by our head of research and development department, PhD. Popovici Daniel – specialized in bee nutrition, we proved the importance feeding in colonies development.

The experiment started in 20.06.2020 and continued until 31.08.2020, comparing the results in an apiary compound out of 12 bee hives with sister queens, 6 hives trial(feed with Apitotal syrup and Superprotein Pattie) and 6 hives (unfeed), before the harvesting season as presented in the table below:

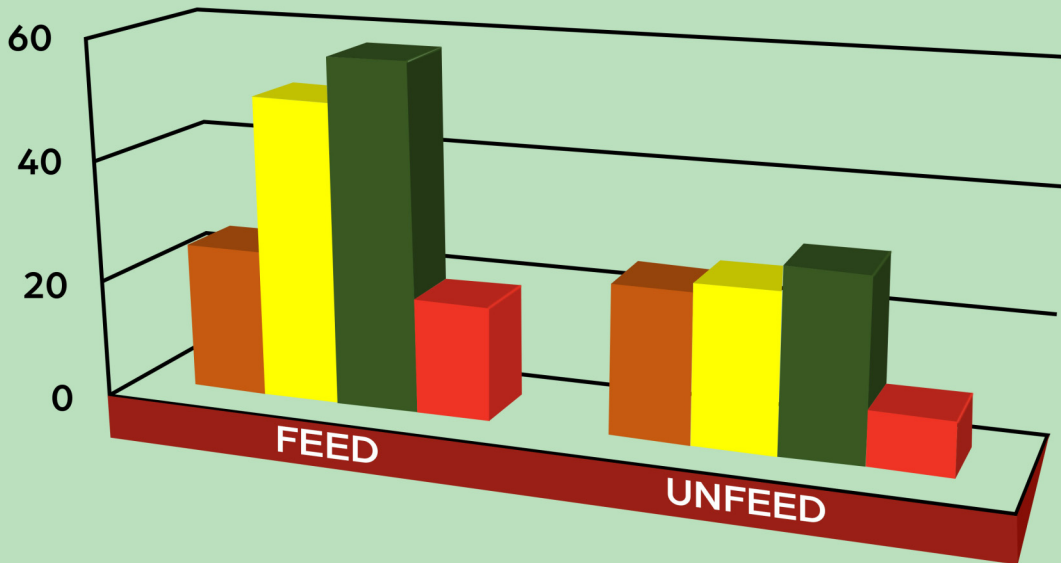
BATCH	DEBUT 20.06		10.07 (AFTER 21 DAYS) BEGINNING OF HARVEST		31.08 HARVEST STOP			WINTER POPULATION (INTERVALS)
	BROOD dm ²	POPULATED INTERVALS (FRAME)	BROOD dm ²	POPULATED INTERVALS (FRAME)	BROOD dm ²	POPULATED INTERVALS (FRAME)	HONEY PRODUCTION PER HIVE	
FEED	24,5	3,3	50,125	4,5	57,5	8,8	19	5,6
UNFEED	24,8	4	26,2	4	30	4	9	4

- The trial hives were feed first 3 weeks with 200ml of syrup from 3 to 3 days(total of 1,6 kg of syrup/hive), plus 1kg Super protein Candy(1kg/hive)



Guide

• *The results of the experiment are presented in the graphic bellow:*



	FEED	UNFEED
26.06 Brood dm ²	24.5	24.8
10.07 Brood dm ²	50.125	26.2
31.08 Brood dm ²	57.5	30
Honey production	19	9

• *Answer is presented in the graphic bellow:*

Costs effective	Climate changes	Certified safety products
<ul style="list-style-type: none"> • 1 kg of honey = 3.6 € vs 1.5 € 1kg of Apitotal • 1 kg of pollen = 8 € vs 4 € 1kg of Apipollen 	<ul style="list-style-type: none"> • Environmental inconsistency • Modern farming technology • Pesticides usage 	<ul style="list-style-type: none"> • Nutritional • Sanitary • Veterinary • Premium quality • Unique products

• *Prices are reported to the medium value of products in Europe.*

• *Minimum 200 euro/ hive savings.*



Guide



www.dulcofruct.com



[instagram.com/dulcofruct_ro](https://www.instagram.com/dulcofruct_ro)



[facebook.com/dulcofruct](https://www.facebook.com/dulcofruct)



Sat Goleștii de Sus, Com. Cotești,
Jud. Vrancea, România



+40 740 326 762
+40 237 252 240



office@cirast.com