Sustainable intensive beekeeping

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Abstract- The aims of this paper are to analysis intensive beekeeping practices. The paper main objectives are to identify an analysis model for development of integrated aquaponics with intensive beekeeping. This integrated production system can satisfy human food needs and enhance environmental quality by producing crops using environmentally friendly practices that minimize water and nutrient waste discharges to the sustainable environment. The paper finds to improve the production conditions and ensure the marketing of apiculture products. Under the practice of beekeeping, the balance of ecosystems is not disturbed, maintained and rebuilt, and the protected natural area may well constitute the geographical area of origin of honey.
Keywords – Intensive Beekeeping, Aquaponic, Sustainable

I. INTRODUCTION

Bees need natural or semi-natural habitat for survival to provide nesting places and for pollen and nectar from wild flowers. Mint cultures of Lophantus Anisatus offer the advantage of a perennial culture with a vegetation period of 9 months per year of which 6 months is blooming.

Intensive agriculture has become heavily dependent on managed hives to meet the needs of pollination services [1-3], [5, 6]. Nature is specialized; plant species must be compatible with bee species. Efficiency of pollination is important for harvest. For strawberries, a combination of wild bees and successful bees is required to produce high quality fruit. From research, it becomes clear that the diversity of wild bees is essential for the production of sustainable crops. A recent study has analyzed 41 different plant systems in the world. The result of this study found that, even if bees pollute a lot, they make it quite ineffective [13]. Instead, visits to wild pollinators mainly wild bees it is an important factor for increase the production.

II. PROPOSED ALGORITHM

Aquaponics is a food production system that combines the production of hydroponic vegetables and aquaculture in a closed recycling system. This combination of production methods of integrated multi-trophic hydroponics and aquaculture eliminates problems associated with individual production methods.

The main objectives of beekeeping integrated in aquaponic systems are: simultaneous integration of technical, economic, ecological, spatial and societal objectives into the development of multipurpose aquaponic production platforms.

One of the most important aspects of aquaponc is system design. The technical implementation of the correct aquaponic system will determine the success or failure of the business. In view of this, the design phase of the aquaponic system is the first step towards an appropriate implementation process.

Basic aquaponic research is still warranted to optimize the production of high quality yields of fruit, vegetables and fish products. The results of these studies will not only create only opportunities for farmers to diversify their market in the plant and fish sector, but the food they produce can actually be healthier for consumers.

III. EXPERIMENT AND RESULT

Solutions for reducing and diminishing bee decline and increasing biodiversity are the integration of intensive apiculture into aquaponic systems. The main problem with recycling systems in aquaculture is the production of nitrates rich in waste, the water that needs to be treated and causing environmental problems. For hydroponic systems, the main problem is the dependence on chemical fertilizers. The main advantages of beekeeping integrated with aquaponics:

• The three types of products can be obtained in the same system (fish, mint and honey).

• Mint production is obtained without generating a competition for nutrients and is integrated with an intensive system of apiculture. Ecological aquaculture is a management technique that helps support aquaculture businesses to take action to protect natural environmental resources.

Through this research theme, propose:

• Improved waste management and reduced waste disposal, recovery efficiency and resource intelligence.

• Integration of beekeeping with aquaculture is a sustainable, environmentally sustainable business model based on sustainability and economic competitiveness, is a future scientific concern.

• Integration of the aquaculture system with Asian mint production and also with intense beekeeping;

• Adoption of an integrated business model of fish, beekeeping and aromatic plants obtained from Lophantus Anisatus peppermint growing in the aquaponic system;
• Integration of social activities that follow the social, economic and environmental objectives through processing, marketing and adding value to finished products;
• Improving waste management and reducing the amount of waste eliminated.
Based on current and future market demands in aquaponic, sturgeons sleep and carp have the most powerful potential, followed by vegetable production: cauliflower, cabbage, salad, spinach, tomatoes, sweet pepper, basil, mint, rosemary.
The key factors known to cause of the bee decline:
• intensification of the production that have led to habitat loss;
• the use of toxic pesticides;
• parasites;
In turn, this has potentially harmful effects on bees because they need an optimal nutritional balance to support their growth and reproduction [7-12]. Flowering crops, such as rapeseed, can offer alternative foods for some wild bees' species that can effectively harvest flower crops, but not for more specialized species. Integrating intensive apiculture with aquaponic provides an efficient production model that frees space for wild bees. Acclimatization and introduction into culture of asian mint species Lophantus Anisatus offer thus a permanent feed source for bees from the beginning of spring to the time of freezing.
Scientific research shows that a variety of wild bees is essential to ensure sustainable plant production. Thus, we cannot rely on a bee species for pollination. A variety of wild bees is also essential to ensure that food is delivered daily to our tables. Recent scientific studies have shown that chemicals for intensifying industrial agriculture are involved in the decline of bees and pollinating services they provide to wild crops and flowers. The application of fertilizers, herbicides and insecticides has a negative impact on the health of bees [4, 9] and on the loss of natural and semi-natural habitat on the field at farm level and are major factors in decreasing populations bees. In addition, the modern industrial farming model also causes problems of pest and weed resistance, soil fertility and water retention, groundwater contamination, high energy and CO2 emissions as well as reduced resistance and vulnerability increased to climate change. In addition, within this paradigm, farmers are becoming more and more dependent on seeds and chemicals from multinational companies. These are just a few examples of the negative impact resulting from current practices of industrial chemical-intensive agriculture. Alternatively, a model based on modern organic farming methods could ensure food production and avoid the negative effects outlined above. Scientific studies show that the implementation of organic farming is feasible and, in fact, the only solution to the growing problems associated with intensive chemical industrial agriculture. Organic farming, which includes several organic farming methods, promotes biodiversity on farmland and supports the restoration of semi-natural habitat on farms as ecological compensation areas for bees and other wildlife. Organic farming is not based on the use of synthetic chemical pesticides and herbicides and therefore protects bees from the toxic effects of these agrochemicals.
In Romania, apiculture is one of the branches of agriculture with the oldest traditions, knowing that the ancestors of the Romanian people, Dacians and Thracians, were growing bees for honey and wax. In Romania there were and there are natural conditions favorable to beekeeping due to significant honey resources.
This explains the richness and diversity of resources as elements of a valuable melliferous patrimony:
- a high degree of biodiversity of the elements of the spontaneous and cultivated flora, as a result of the eco- climatic conditions, comparable, almost to some categories of honey plants with the one registered at the country level, ensuring at the same time:
- the succession of blooms and the practice of beekeeping from the 3rd to the 10th of the year, about 8 months/year due to climatic conditions;
- concentration in a variety of floral elements for honey;
- the possibility of obtaining a high yield on certain honey categories, compared to other areas of the development regions (eg acacia honey, lime honey, sunflower honey, rape honey);
- extending the succession of the same flowering for species recognized and sought by beekeepers (acacia etc.) on the basis of eco-climatic differentiations in the vast expanse between the Carpathians of the Curvature and the Black Sea, which ensures the increase of the production time on the honey type and the triggering of the pastoral phenomenon; for example the onset of the pastoral phenomenon with acacia flowering in the Sub-Carpathians due to the presence of feons that ensure a temperature increase and its ending with the phenophase as well as the flowering of the acacia in the littoral area because the presence of the Black Sea causes a backwardness of the area thermal point of view;

- the huge potential reflected in the production of honey and apiculture products and felt but not statistically recorded in other parts of the country, by the producers practicing the pastoral form (also expressed by the very high number of applications demanding, hard to quantify for the location of the apiary on the territory of the administrative units in the area of the region in question);
- conditions favorable to the practice of beekeeping due to the high duration of sunshine, which has led to the increase of the sunflower areas (registered among the development regions) and the production of sunflower honey, and by the relief with generally low altitudes stretches (which, due to the geographic position relative to the general dynamics of the air masses) do not introduce rapid changes in the baric (thermal) regime, (positively influencing the bee flight) unlike other areas of the country.

New practices in directed pollination in geographical areas with medicinal and aromatic / ornamental plants in open field and greenhouses are aimed at:
- extending the duration of the activities of both beekeepers and other agricultural workers (with concern only for ornament plants) outside the hot period of one year (generally April - September), by polluting these plants grown in greenhouses, avoiding / overcoming unfavorable agro-meteorological phenomena;
- to diversify and increase the production of apiculture products and honey through flavors, color and therapeutic properties to meet market requirements;
- obtaining a recipe for a disease (a disease) / affection of an organ by directed pollination from the plots grown in the "laboratory sera" of plants in the structure of the recipe;
- transforming businesses into more viable markets with better orientation and market integration that support and develop the apiculture sector and related activities;
- the expansion of land with certain medicinal and aromatic herbs, some and ornamental, even by introducing new plants, and / or double crops / double crops a year following the warm season extension ex: lantern);
- reducing migration on the young age group and its participation in rural development, especially in more remote areas (eg the Danube Delta) and / or those facing severe natural constraints (eg declining areas)
- advantages of the aging population through local practice of apiculture in the greenhouse without calling for pastoral stepping;
-conscious participation in the preservation of biodiversity and the protection of the environment in general and at the same time to determine the population (through the diversity of bee products correlated with the diversity of the spontaneous and cultivated flora species and their properties, to acknowledge the value of biodiversity and apicultural products, have bees in pollination and increase agricultural output;

The unforeseen and extreme climatic phenomena in recent years, especially autumn and spring, caused by climate change, make it difficult to determine the exact breeding and harvesting cycles for beekeepers and honey bees. Under such conditions, with sudden temperature drops, high thermal amplitudes in a short time, frost, strong winds, abundant precipitation, even spring spring, etc. (as it was recently in mid-april in 2017, with many plants in the flowering phenophase), prolonged autumn drought etc. Bee populations suffer: their number is reduced, the bee's biological cycle is disturbed, pollen bee pollination or lean bee is being sought after long-drought feed (fall 2016) and then colonies consume feed supplies from hives.

That is why practicing bee-laboratory bee-keeping far away from polluting areas is a viable solution, a challenge for the beekeepers of the South East Europe because these phenomena are more prevalent in the first part of spring in the region due to their geographical position , relief with altitudes less than 200 m high and air mass circulation. This practice is a special one for adapting the beekeeping sector to climate change vulnerability.

IV. CONCLUSION

Profitability is essential for the sustainability of the beekeeping sector. Like other agricultural producers, beekeepers can produce fruit and fish. In the case of diversification of production branches, various factors can affect the production of beekeeping. Exposure to chemicals, losses in plant diversity, adverse climatic conditions, or deterioration of honeybee natural habitats, hives are factors that contribute to health problems and determine mortality rates. Not only colony losses affect the economic viability of beekeeping, but also threaten the production of food. The integration of beekeeping with the agricultural production branches can be achieved within an aquaponic system that integrates in the ecological production system apiculture production with the production of fruits and vegetables, fish and honey aromatic plants.

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