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THE IMPLEMENTATION OF AN APIARIAN MANAGEMENT IN THE DOBROGEA RURAL SPACE - ION CORVIN VILLAGE, ROMÂNIA

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Abstract. For the implementation of an accurate apiarian management in the research area (In Corvin village is situated in Dobrogea historical area, in the South-East of Romania) it had to be determined the elements of apiarian management depending on the organization and administration of the apiarian farms within the respective area, which directly imply the available honey-bearing resources. Methodologically, the actual situation analysis related to the beekeeping allowed us to establish the main methods and techniques of the implied research. In accordance with the bee keeping potential evaluation, the honey quantity that can be produced during one year of vegetation in Ion Corvin village is that of 102 tons. The fluctuation on short term of this indicator is that of 4.7%, and that of medium term is that of 0.8% at the level of total area. Taking into consideration the natural factors' influence, the fluctuation of the beekeeping potential is that of 5%. The beekeeping activity from Ion Corvin village is characterized by a medium profitableness of 24%, but the majority of the exploitations (80%) is under the value of this indicator, some of them registering losses of about 110 monetary units spent. This phenomenon is caused by the existence of a apiary which do not have as a main purpose to obtain profit out of this activity, but ensures the family consumption with bee products or there are maintained out of beekeeping hobby. These apiaries, although they are not profitable, do a service to the beekeeping by popularization of the products quality and bees' importance, therefore, do not represent wastes but, most of the times, represent the embryos of the future medium and large beekeeping gardens. The exploitations' management describes more organizational options like: beekeeper-leader, beekeeping garden and beekeeper, mobile teamwork and mixed option comprising mobile teamwork and beekeeper.

Introduction

The world wide increase of population, the technical – scientific and socio – economic evolution has determined the growth of food products requirement and

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its diversity. Under these conditions, the beekeeping gains a more important role as a supplier of honey, but also as vector of apiarian production increase by the pollination of entomophilic cultures. Also, it provides different products with the role of maintaining the population healthy, having a great prophylactic and therapeutic value. It is recognized the fact that this field contributes to ensuring the population prosperity especially within the rural area, by a supplementary income and a superior usage of natural and human resources. Additionally, the beekeeping achieves a great importance by supporting and stimulating the natural environment, by the indisputable effects of flower biodiversity. Our country's honey-bearing base comprises a total area of 5 million hectare; out of which 3 million hectare can be made profitable by bees through maintenance can be revaluated by bees by maintenance and production harvest. From the 3 million hectare area, most of it (~60%) is represented by forest species and ~40% by cultivated agricultural plants and spontaneous species (Cârnu, Hociotă, 1973). As structure and surface, the honey-bearing basis goes through permanent changes. Area 1 - CÂMPIA ROMÂNĂ and DOBROGEA has got continental climate, with a medium annual temperature of over +10° and annual rainfalls between 400-600 mm. The flora is typical of steppe and forest steppe. The acacia plantations prevail (60000 ha), which constitute massifs of national interest in Olt and Dolj counties, then the lime-tree in isolated forests, the most famous ones being those from North of Dobrogea (20000 ha), the sun-flower, which, nationally, for the past years has been oscillating around 1 million ha, the marsh vegetation, especially the mint in Danube river meadow and Delta and small areas of natural lawns, (meadow sage, white clover, wild thyme, lathyrus and oak tree, Cârnu, 1980).

1. Materials and methods of research

The choice of the area taken into consideration is based on the necessity of determining the elements of apiarian management, which have got a direct effect on the available honey-bearing resources. In order to measure the resources necessary for this respective study, it was needed an aeoral type sampling, which consists of dividing the area aimed in sectors differentiated by a certain feature like: exploitation size, production structure, organizational system, administration type and the existent relations type. For the quantitative and qualitative research of the beekeeping (the division into zones, the honey-bearing potential, the technologies, the economic efficiency, the market) the economic analysis and direct examination were chosen.

The entire research was accomplished by making use of informing and bibliographical documentation, field research by direct examination, standard farms monitoring and design of new models of apiarian exploitations[1]. For the accomplishment of the interview guide some pertinent answers to the subject

aimed in this study were looked into, with research purposes: • beekeepers' identification data like : age, professional status, beekeeping experience and performed specialty training courses; • bee garden size, types of beehives provided an maintenance systems (stationary, pastoral, mixed); • the technological options related to the breeding and reforming of the bees families, the methods of prevention and fighting against the sworming, methods of gathering the honey and the other apiary products, prophylactic and therapeutic methods against the diseases and pests, methods of hibernation of the bees families and the quantity of honey left available for the colony for hibernation; • working hours, number of workers who participate to the maintenance of the bee families and the family's contribution to the works inside the bee garden; • apiary implements used for the size and structure of the apiary exploitation capital and the method of obtaining it (acquisition or own management) ; • volume and structure of expenses ; • volume and structure of production and weight of pollination services within; • level, place and method of production development; • processing extent and methods used ; • info system used ; specialty books, periodical publications, internet, meetings within the profile association, etc.; • methods of increasing the economic performance: increase of bees families number, beekeepers' association or their availability for this, production specializing and diversifying, integration, etc.; • methods adopted with respect to the exploitation' activities organization, bee garden and human resources organization • the attitude and measures taken towards the opportunities or threats related to the integration in EU. The period chosen for the investigation is during springtime because the final results related to the production obtained and commercialized the previous calendar year are known this season, as well as the beehives losses occurred during the winter time. In the same time, it was necessary to be taken into account the avoidance of the period in which the beekeepers are away in pastoral that is why April was considered to be the best period to achieve the interview.

2.Results and discussions

Ion Corvin village is considered representative for the bee keeping in the county with regard to the honey bearing basis but also with respect to the bees families hibernation (permanent hearths).

General characteristics. Ion Corvin village is situated in the South West of Constanta county, 79 km distance from Constanta city and has got as neighbours : Danube river on the North, Dobromir village to the West, Baneasa city to the South and Adamclisi village to the East. The relief is hilly, plateau specific to Danubian Dobrogea platform. Viile marsh is also part of the village administration. In Ion Corvin village forest can be seen beautiful clearings with Dobrogea peonies and a reservation of mouflons, wild boars and roebucks. Presently, the village is made up

of five villages: **Ion Corvin** – village residence**, Viile**, **Rarişţea**, **Crângu** and **Brebeni**. Towards the village residence, the villages are situated at distances between 3 km (Brebeni) and 8 km (Viile). The village has got an agrarian economy, having an agricultural area of 8514 ha. Within the cultivated area and vegetal production, the cereals cultures have the greatest coverage. There are no irrigation systems available in the village. The main activities in the village are related to agriculture, zootechnics and wine growing. The total forest area is 682 ha, from which 0.9 ha is private property. Saint Andrei Cave is located within the village at 59 km S-V of Constanța, in the forest nearby Ion Corvin village. Within the cave Saint Andrei led the life of an anchorite, the only apostle of Jesus who preached the evangel, baptized the first Christians in the 9 springs, and ordained priests, this place being the first cult shelter within our country's territory and Christian gate.

Description of honey bearing basis and bee keeping production in Ion Corvin. On Ion Corvin village territory 3.5% is exploited from the total of 39000 bees' families from Constanța. This number of bees' families is to be found on permanent hearth, but during the active season (early spring and especially during acacia harvest) there are in the area around 3000-4000 colonies. Reported to the total landed stock - 10857 ha, the permanent number density is that of 0.7 colonies to 100 ha. The honey production obtained within the area researched was in accordance with the average from period 1999-2008 of 22.52 tones, from the total of 110 tones, which represents 22.24% from the village honey bearing basis. The secondary production can be considered as being reduced, but, by transforming it in conventional honey units, it reaches to 0.3 t within the entire area.

Tab. 1 - Total number of bees' colonies from Ion Corvin village

Current No.	Village	Bee keepers no.	Bees' families no.
1.	Ion Corvin	6	135
2.	Viile	4	100
3.	Rarişţea	0	0
4.	Brebani	1	32
5.	Crângu	16	1098
Total		27	1365

The researches do not indicate the necessity of settling the best global dimension for the apiary exploitations, but its adjustment to the existent resources in each village, following the principle of complete usage[7]. This is the reason why we consider that a bee garden of 10 bees' families, as well as one of 350 bees'

families is as profitable for the bee keepers as for the environment as well, if they efficiently make use of available resources, especially the honey bearing basis.

Tab. 2 - Honey bearing balance

Specification: Bee keepers no.=27 Beehives no.=910	Arable fields / Value within the county	Non productive fields / Value within the county	Forests / Value within the county	Vineyards / Value within the county	Fodder / Value within the county	Sun flower / Value within the county	Rape / Value within the county
	7694 ha/68 %	214 ha/20.1 5%	2366 ha/5.6 9%	583 ha/1.75 %	2119 ha/8.66 %	2900 ha/11.8 5%	60 ha/-
Production kg/ha-	-	-	100	20	50	30-130	30-50
Total production /tone - **330.36 to**	-	-	236.6	4.66		87	2.1

*no. of bee families that can be maintained on the village territory is calculated by dividing 1/3 of the global honey production to 129 (from 90 kg represent the honey quantity necessary for the maintenance and development of a bee family for one year, 9 kg for the development of a swarm and 30 kg for honey harvest)

In compliance with the honey bearing potential evaluation[6], the quantity of honey which can be produced within one year of vegetation in Ion Corvin village is that of 110 t. The fluctuation on short term of this indicator is about 4.7%, and on medium term is about 0,8% at the level of total area. From the point of view of natural factors' influence, the fluctuation of honey bearing potential is that of 5% in Ion Corvin village. In general, at the level of Ion Corvin village, the bee keeping does not owe a profitable management, although there are enough resources for its accomplishment. This result is caused by the low interest for the economic information in general and especially for the management information, that is why the management models populating, specific for the apiary exploitations within the bee keepers meetings of the professional associations, the ones organized by state structures with a role within the support and development of rural environment, like Agricultural and Rural Development Offices, Agricultural Consultancy County Offices, etc. The apiary activity from Ion Corvin village is characterized by a medium profitableness rate of 24%, but most of the exploitations (80%) are under the value of this indicator, some of them registering losses up to 110 monetary

units spent. This phenomenon is caused by the existence of some bee gardens which do not have as main goal obtaining the profit from this activity, but only to ensure the family consumption of apiary products or they are maintained as a hobby. These bee gardens, although non profitable, do a favor to the bee keeping by populating the quality of the products and importance of the bees, so, they do not represent scraps, but most of the times the germs of future medium and great bee gardens.

The increase of economic efficiency of the investments can be achieved by increasing the production level, its diversifying, obtaining a superior price by placing the products within a different quality category, reducing the fixed costs by increasing the number of families maintained and those variable by making use of methods and procedures which imply a superior proportion of economic efficiency.

Adjusting to the economic politics measures, improving the apiary activity as well as elaborating and implementing different technologic solutions, enforce classification of apiary farms after certain criteria which characterize the organizing and usage methods of the resources (Lazăr, 1992).

Tab. 3 - SWOT analysis- Ion Corvin village

Characteristics	Strong points	Weak points	Opportunities/ Threats
1. Bio- apiary area	One of the best area for bee keeping in the county	Ensure only one important harvest (acacia)	A very good area for hibernation and spring bees families in spring time/ -
2.Organizations structure	-	No local organization	Affiliation of bee keepers to other county organizations, setting up of an inter-county organization, etc./ Clear division, a lot of small associations which do not have strong representatives locally or nationally
3.Number of beehives	Around 910 bee gardens	-	Honey bearing can bear a larger number of bee hives, around 5000-6000/ -
4. Number of bee keepers	Around 15 which have permanent hearths and a number of 40-50 which have got seasonal hearths	-	A lot more practitioners of this activity settle their bees garden hearth in the area/ Many practitioners are older
5. Honey production	High production of acacia harvest	Rather weak per beehive quantity	May increase together with the number of bee hives/ A greater usage of bees food (apiinvert)
6. Production	A lot of pollen for	Rape, sun flower,	A very good area in spring time

diversity	early development, acacia, clover, much honey for winter reserves	coriander, white mustard	for pollen (snowdrops, spring crocus, white melilot)/ -
7. Selling price	-	Rather low price	Increase by wrapping and selling the honey to the final consumer/ Development of en-gross salesmen
8. Processors	-	No authorized processor	Development of labs for honey processing, a large and profitable market/ -
9. Method of collection	-	Collection directly from the bee garden, no authorized storehouse	Collection and storage can also be performed in labs especially designed - extraction rooms/ -
10. Markets	-	Quite reduced for en-detail uncase, no specialty store	A very profitable market, especially on the seashore, the consumption during summer being really impressive/ Counterfeit honey, which could reduce the consumption
11. Distribution systems	-	Very poorly developed or even inexistent	A very good system of distribution can be set up at the level of restaurants, hotels, schools, fairs, expositions/ Other companies of food products delivery
12. Honey consumption	-	Low in comparison with other areas	The consumption of honey can evidently increase by advertising/ Non- informing the consumers
13. Revaluation degree	Revaluation of production is almost 98% by authorized processors	Very low for the final consumer and direct sale from the bee garden	Can develop by advertising the project Crângu –Apiary Village –selling to the final consumer/-
14. Ecologic bee keeping	The best area from the ecologic bee keeping point of view, an area without industrial objectives	The larger and larger request of ecologic honey on the internal and external market	-
15. Importance of the honey bearing basis within the country	A very good honey bearing basis by the presence of the forests within the area	Rather reduced to textile plants	-

16. Types of predominant harvesting	Acacia, clover	-	-
17. Pollination	-	Almost inexistent taking into consideration the payment to bee keepers	-
18. Age of the bee keepers	A great number of young bee keepers, the average between 35-45 years old	-	-
19. Structure of apiary exploitations	-	Over 90% of the exploitations are semi-subsistence	-
20. Biological material producers	-	Only 51 exploitations authorized to produce biologic material	-
21.Pastoral practicing	Very few exploitations practice the pastoral, 3	-	Pastoral practicing

Tab. 4 - Classification of apiary farms and their characteristics

By the degree of specializing on field branches and sub-branches	**No. of bee gardens**
Farms specialized on apiary activity – represented by farms which do not accomplish other activities than bee keeping. These farms have got specialized work force, generally have sizes greater than 100 families, accomplish pastoral, are characterized by high productivity and imply investments greater than the other exploitations.	4
Mixed farms (bee keeping as completion)- are agricultural farms which activity also consist of bee keeping for the fructification of local honey bearing resources and eventually for the use of work force unemployed in certain periods of the year. These farms have got the advantage of using some production factors common to other branches, increasing its degree of usage and reducing the level of costs adherent to the agricultural production, do not require work force entirely specialized and there is a form of integration horizontally. These exploitations usually accomplish other activities connected to the bee	23

keeping like joinery, metallic devices, etc.	
By farm size	
Farm having a number of bee families smaller than 50 – specific to amateur bee keepers	18
Farm with 50 – 100 families –in which semi-professional bee keepers are working. These people have to guide by profitability principles because their maintenance requires important resources.	5
Farm having a number of bee families over 100 bees families – which bee keepers are considered to be professionals and are characterized by: - Working time overpasses 2000 hours per year - uses modern techniques of breeding and maintaining the bees families - requires the completion of seasonal work force because there are periods in which the work necessity overpasses the available one.	4
By maintenance system	
Apiary exploitations which perform pastoral bee keeping which are characterized by a superior level of capitalization to the stationary bee gardens (by means of transportation, apiary inventory specific to the business trips, apiary car for bee keepers, etc.), ability to adapt and high flexibility with the purpose of production profitability.	3
Stationary apiary exploitations which make use of nectar resources, local work force and other unused production factors within the household or apiary farm. It's an alternative to pastoral because it ensures a complete usage of the entire honey bearing potential but in most of the cases is disadvantaged by the fact that there are periods in which they do not have enough food resources. This type has as an economic reason the reducing of costs and improving of the dimension depending on the existent resources.	24
By the degree of production specializing	
The apiary farm specialized in obtaining apiary products or only one single product or service (e.g.: pollination, honey, swarm, etc.), the others being considered secondary products.	1
The apiary farms with a varied production, in which the activity consists of accomplishing more and more products offered by bees' families. The decision related to the degree of production variety should be based on an economic and social efficiency analysis, taking into account the importance of apiary products, local honey bearing resources usage, and especially the pollination of the cultivated and spontaneous species.	26
By the degree of production integration:	
The non-integrated economic agent whose activity reduces to obtaining apiary productions without having any kind of processing form reason for wich the economic profitability is reduced only to this level of production. This type of exploitation is relatively rare within the population studied because, according to the tradition, the Romanian bee keeper processes some apiary products the same as the honey and the wax (a rudimentary	15

processing most of the times) and sells the resulted products directly to the final consumer.	
Integrated apiary unit in which, besides the apiary production processes includes processing activities, storage, remaking, distribution and sale. These units have minimum two links leading to a partial integration form) or the entire chain which starts from de revaluation of honey bearing structure up to the consumer. The last alternative owe a complete info system, does not achieve stocks, it's adaptable to the market and accumulates economic results specific to each link.	0
By integration direction	
Apiary units integrated horizontally by gathering of producers or by starting economic relations of production acquisitions, distribution, promoting, crediting, contractually established.	0
The apiary farm integrated vertically makes use of the technical results obtained (apiary production and services) as entrances within other economic processes.	0
By the type of bee hives used	
1. Bee garden provided with multi levels bee hives which have as specific method the reversal of bodies upside down, always replacing the the superior body which was occupied with young bees and food reserves with an empty body from the low part of the family. This system has got the advantage that the volume can be modified easily; generally, the work is performed on the body and less on the frame like in the case of other systems, determining a reduction of work force; it respects the family inclination to work vertically; it can be transported relatively easily but it requires vigorous professional skills. It's the most productive bee hive system and is generally used by professional bee keepers.	3
2. Exploitations which have got horizontal bee hives of bigger sizes (17, 20, 24 frames) which can not be modified unless the diaphragms are introduced; it obliges the bee to work horizontally; they have got a less degree of flexibility than other systems but do not require specialized work force. It is indicated to the beginners bee keepers who maintain the bee hives on hearth.	15
3. Exploitations provided with vertical bee hives have got advantages common to the other two systems but the frame dimension (greater with about 30%) do not always allow obtaining a specialized honey by ranges. This type of bee hive can be easily transported in pastoral, it offers the possibility of adjusting to the volume in accordance to the bee family necessities ensures the best development conditions and can be successfully used by all the categories of bee keepers.	0
4. The last type of exploitations owe atypical bee hives of different sizes nd shapes or have got mor etypes of bee hives specialized on different activities like: bee hives for hibernation, for artificial swarm, for transportation, etc.	9

Conclusions

The main causes which reduce the bee gardens development are the following:

Current No.	**Name of the main risks**
1	Harvest conditions, including the weather conditions; as much as possible harvesting sources will be assured for the bees' families during the entire active season
2	Health: incidence of diseases, pest and pollution
3	Technologic accidents
4	Fluctuation of prices and other economic factors (overproduction, inflation)
5	There might be the risk of achieving unauthorized sprinkles which could affect 20-30% from the number
6	Summary wrapping of bee hives – freezing risk 2-3%
7	Winter prolongation and food stock - risk 2-5%
8	Progressive increase of transport costs
9	Higher prices of apiary equipment
10	Subventions low level
11	Honey and pollen hardly sell
12	Chemification of rape cultures
13	Consequences of climate changes
14	Non-representation at the level of state (gouvernemental)
15	Cultures which auto pollinates
16	Pollen is not exported
17	Lack of personnel
18	Association (ACA) moved away from the bee keepers
19	Taxes too high for the pavilion
20	Chaotic treatments for cultures
21	Theft from pastoral
22	Intermediaries
23	Delay in immediate payment
24	Forests cutting
25	Honey price on international level
26	Changes of agricultural cultures, progressive aggravating of phyto-sanitary treatments effects and climate changes to outline a clear deterioration of nectar contributions

Exploitations Management

Option of bee keeper – leader supposes that the entire activity to be organized and managed by the bee keeper owner, being assisted by one or more workers that carry out the work, most of the time unskilled. The advantages of this option consist in the possibility of performing a vigorous control over the production, a	27

superior productivity of production capacities (bees family), but it can be applied to small or medium bee gardens and suppose the incomplete use of work force during some periods.	
Option of bee garden and bee keeper can be completed by an unskilled support and consists of delegating a bee keeper who could execute all the works within the bee garden, with the exception of those who require a higher volume of work (honey extractions, pastoral transport, etc.), most of the time he is living nearby the bee garden or in the apiary hut. (at pastoral).	1
Option of mobile work teams is different from the others due to the fact that the bee garden are located in protected areas in which security is provided and the works are executed with work teams coordinated and supervised by bee keepers owners. In case of pastoral system of maintenance of families it is necessary their trip to the pastoral hearth, if this one is not situated very far.	0
Mixed option having a mobile work team and bee garden supervisor bee keeper takes over all the advantages of the previous option, completed by the improvement of the disadvantages by ensuring a complete info system and operative intervention capacity. The only disadvantage seems to be related to the increase of costs for the work force and its use. Solutions have been found for this problem (2,8% from the bee keepers are already using it) by the implication and personal interest of the people who work nearby the bee gardens, making actually use of a free work time and ensuring them a supplementary income.	0

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