

## **1. INTRODUCTION**

After the transformation of the social and political structure the situation of Hungarian agriculture changed substantially. Private property became dominant the larger firms dissolved or were transformed. With these changes of property and business structure taking place within a relatively short period the parallel development of the necessary and appropriate economic, market and interest groups and organizations did not take place. As a result of these and other economic and political influences the performance of the sector relapsed, its income decreased and the rate of development fall behind compared to other national economy sectors.

There is little information about the situation of the apiary sector. There is a lack of data about the background of production, its conditions, its contribution to human subsistence. The lack of correlation between these data has a disadvantageous effect on the operators of the sector. Their situation and problems cannot be shown and evaluated in an authentic way, and the possibilities for further development can hardly be found. The thesis attempts to find and evaluate this missing information in an accurate way.

The paper wants to show the situation of the Hungarian apiary sector. After the collection and arrangement of the literature and the statistical data comparative evaluation was carried out with national and regional aspect. In order to carry out the analysis of the situation of the apiary sector of the West-Transdanubian Region the most important data and contexts were broken down to county level.

## **2. MATTER AND METHOD**

From the point of view of topic and nature of the thesis the work is primarily characterized by the analysis of the literature which was followed by the examination of documents, and questionnaires and information gathered with oral interviews.

The analysis of the documents was based on principal data from the questionnaire compiled together with the Apiary Product Council (Méhészeti Terméktanács), from databases of other organizations, the Hungarian Central Statistical Office and the Agricultural Economics Research Institute. Further information was gathered from the internet sites of international organizations, and from Hungarian and international literature.

The examination was carried out on a nation wide level, with the analysis of 12000 questionnaires, which arrived back, from the 17000 questionnaires sent out. The collection of the data took place in 2003.

In order to complement the thesis with theoretical and mathematical methods a production function was also applied using the data of an apiary business, which can be considered as representative of the test operational database of the Agricultural Economics Research Institute.

The aim was to evaluate the reality of the situation which was established on the basis of the literature, the identification of the problems and the realization of the subjective opinions. During the examinations if no answer was given to certain questions, this was registered accordingly in the appropriate cell of the table.

Taking into consideration the results gained general tendencies can be established, on the basis of which the organization development models of apiary production can be elaborated. The organizational and systemic models which can be built into the different phases of the production line of honey-management could create an opportunity for the sustainable development of the sector.

To process the statistical results Microsoft Office Excel 2003 program was used.

### 3. OWN EXAMINATIONS

#### 3.1. THE NUMBER OF BEE-FAMILIES AND THE NUMBER OF APIARIES

In the first phase of the investigation the apiarist was examined, as a factor influencing production. It was stated that the technical level of apiary is mainly determined by the fact that production - agricultural production - is carried out as income supplement. (**Table 1**)

Type	Altogether %	1-20	21-40	41-60	61-80	81-100	100
		Families (%)					
Hobby	16,7	64,21	27,72	7,92	0,35	-	-
Complementary income	74,4	35,79	72,18	92,08	99,25	91,38	55,78
Full time producer	6,7	-	0,1	-	0,4	6,52	33,18
Entrepreneur	1,1	-	-	-	-	-	5,5
No data	1,1	-	-	-	-	-	5,6

TABLE 1: THE SITUATION OF APIARCULTURE ACCORDING TO THE BEE-FAMILIES

From among the apiarists only 7.8% are full time apiarists or entrepreneurs. If the question is examined from the aspect of the number of bee-families owned by the apiarists, it can be seen that below 20 bee-families the activity is mainly carried out as hobby, above 20 families as income supplement. Above 100 families full time production becomes dominant.

The following question sheds light on a very serious problem. **Table 2** shows that almost half of the apiarists have actively been involved in this activity for more than 20 years. This rate shows that the profession is aging.

Number of years sent in apiculture	Altogether	1-20	21-40	41-60	61-80	81-100	100 -
		Families (%)					
1-5	20	50	20,8	16,3	6,1	-	-
6-10	22,2	17,6	32,3	20,9	27,3	-	5,8
11-15	12,2	-	15,6	14	21,2	-	5,9
16-20	11,7	8,8	6,3	7	12,1	-	47,1
21-	33,9	23,6	25	41	33,3	5	41,2

TABLE 2: THE NUMBER OF YEARS ON THE BASIS OF THE NUMBER OF BEE-FAMILIES

The capital and investment necessity significantly influences the number of families for the young apiarists. Ten years spent in apiary – as it can be seen from **Table 2** – is enough time spent gaining experience and capital for increasing the number of families significantly. 76.1% of apiarists do not have a professional certificate.

It is quite promising that 62% of the apiarists would need some kind of professional training and are open for professional novelties. It is even more positive that more than 41% of the apiarists with a stock of more than 100 families have a certificate. These data show that this activity can only be carried out as full time activity, with a large number of families and in a secure way if the necessary professional knowledge is available.

This attitude would guarantee, that by eliminating the lack of capital in the apiaries, a new apiary system would evolve – from a qualitative point of view – which would result in the increase of honey production in Hungary.

In the yearly development of the number of families a kind of periodicity can be observed. **Table 3** shows that compared to 1990 in 1995 there were 57805 fewer bee-families. Examining the following 5 year period between – 1996-2000 – the number of bee-families increased with 235438 families. In this period a steady increase can be observed. From 2001 the number of families however has not changed. This number of families compared to the structure and amount of bee-pastures is adequate in Hungary.

Year	Number of bee-families	Year	Number of bee-families
1990	727 243	1998	690 345
1991	716 394	1999	806 539
1992	725 615	2000	840 235
1993	674 230	2001	896 563
1994	646 806	2002	881 610
1995	669 438	2003	872 650
1996	604 797	2004	880 729
1997	642 078	2005	882 416

*Source: National Hungarian Apiary Association*

**TABLE 3: THE DEVELOPMENT OF THE NUMBER OF BEE-FAMILIES (1990-2005)**

Examining the changes in the number of apiaries and bee-families it can be stated that the number of families concentrate according to apiaries, as fewer apiarists take care of more families. In 1990 the number of families per apiarists was 36, this number changed to 57 by 2005.

At the same time with the changes in the number of families the number of apiaries also changed. From 1990 there was a steady decrease in the number of apiaries (**Table 4**) and by 2005 there were 4600 apiaries less than in the starting year.

Year	Number of apiaries	Year	Number of apiaries
1990	20 102	1998	16 672
1991	19 923	1999	17 087
1992	19 013	2000	16 579
1993	17 598	2001	16 325
1994	16 970	2002	15 576
1995	16 887	2003	15 302
1996	15 372	2004	15 451
1997	15 677	2005	15 480

*Source: National Hungarian Apiary Association*

**Table 4: The development of the number of apiaries (1990-2005)**

From an economic point of view it is advantageous that the number of apiaries is further concentrating, however the disappearance of the smaller apiaries and the changes in the proportional dissemination of bee-density can become disadvantageous from an ecological point of view. When analyzing the dissemination of apiaries per county it can be stated that the whole territory of Hungary is suitable for this activity. Concentration is expected to grow further since production can be considered economic only in this way and subsidies are also based on it.

Another reason for the decrease of apiaries is the relatively high average age of apiarists. According to the data of the General Agricultural Census (Általános Mezőgazdasági Összeírás) almost half (47%) of the Hungarian apiarists are pensioners.

### **3.2 THE HIVE SYSTEM**

One of the obstacles of the development of apiary is the fact that almost 50 types of hives are currently in use.

The backward technical level of current apiaries is basically determined by the fact that production as agricultural activity is mainly part of the home market production. Furthermore the background industry supporting agricultural production has not evolved. There is a lack of tools and equipment necessary for continuous development and up to date apiary technology. This resulted in the fact that every apiarist goes his own way to supply his needs for tools and equipment. Small, versatile and different family apiaries, which run in an economic way, have evolved. These apiaries differ not only in their supplementary tools and equipment but also in the types of hives they use. 65% of the apiaries prefer the beehives with the so called "lying system", while the "loading type" of hives are used by 35%. Foreign apiaries of industrial scale use the "loading type" of hives. Because of the increasing significance of the types of honey the use of this "loading type" of beehives is suggested in Hungary, as well.

It should also be noted that more than 90% of the beehives currently in use are home made, from low quality material and are bad individual constructions.

### **3.3. HONEY MARKETING**

Marketing honey also has a significant influence on the economic nature of an apiary. Highest income would be secured by own packaging, but because of the high initial costs only 15.6% of the apiarists carry out packaging on their own (**Table 5**).

Type	Altogether (%)
For forestallers	52,1
Own packaging	15,6
Both	25,6
No data	6,7

ABLE 5: MARKETING METHODS OF HONEY

Honey is marketed in a multi channel way. Taking into consideration the development of bee-families it can be stated that in smaller apiaries home-made packaging is surprisingly frequent. This is possible, because with such amounts and without a serious filling device filling into jars is done manually after one filtering.

These types of honey are mainly sold individually from home as home made products. For larger amounts of honey, filling can only be imagined using a filling device, the investment value of which is significant, and because of the obstacles of marketability of jarred honey only 5.9% of larger apiaries deal with own packaging.

The current situation of producers and merchants is characterized by – apart from a very few exceptions – and because of the emphasis on short term interest, an irreconcilable conflict.

The main reason is the defencelessness of the producers, as most of them have no surpluses and can only cover the costs of feeding, wintering and other costs necessary from the summer income.

From other reasons and in a different way the merchants are also defenceless. The main reason for this defencelessness is the fact that Hungarian honey is only represented at a small scale in international markets, and can easily be substituted with the products of other competitors. Merchants are in connection with importers of significant capital capacity, who prove their interest without remorse. Most Hungarian honey merchants do not have commercial capital, which would enable them strategic acquisitions, to take part in the financing of production or to make stocks.

In practice commerce is based on intermediaries, and most Hungarian merchants only act as forestallers for the importer.

These conditions and processes had the consequence that with an ever increasing change within apiculture the profitability of honey production decreased.

### 3.4. Bee-hygiene

In the survey the question about the occurrence of certain illnesses at the apiaries was raised. It was stated that the Varroa mites are present almost in every family. The pathogen causing chalkbrood was present at 58% of the families, while Nosema disease only at 12%.

The pathogens of these illnesses are present all year at the families; however large loss of production is only caused by their extensive proliferation. Because of the Varroa mites 8.5% of the bee families die; this rate, however will increase with the development of resistance. Using the medicines, which have been state subsidized since 1998, can prevent the listed diseases.

#### 4. ANALYSIS OF THE COST STRUCTURE

The study is trying to find an answer to the question that to what extent the cost structure of apiculture is adequate for the produce-structure of the investments of honey production, to put it in another way, whether the costs of the most effective expenditure elements represent the highest rate within the cost structure of honey production. The qualification of the produce structure, based on the numeric return of certain expenditures can be solved with the help of an adequately defined multivariable production function. For the calculations the sector expenditure and income data of honey production in 2005 of the test operational database of the Agricultural Economics Research Institute was used. The detailed expenditure register of the database enables to get access to the following separate expenditures:

- feed costs
- machinery costs, mainly fuel (fuel and lubrication)
- costs of stock recovery
- other directly changing costs
- costs of animal hygiene
- costs of maintenance activities
- labour investment value
- depreciation expense
- sector general expense
- economy general expense
- family installation costs

It can be stated that the further increase of feed-use – in this case the use of winter feeding sugar – is not justified. However, its more efficient use could well be imagined.

The role of rate of return of the fixed assets and the connected fuel and energy input (0.04:1) – namely its rate of 4 “fillérs” – is not sufficient. This situation is either because of the high scale of fixed asset provision, or because of its low-efficiency operation, putting it differently the operation of the tools and equipment, which in this case involve transportation tools and equipment is so expensive that the apiary cannot efficiently manage their costs. On the other hand the current situation can also be the result of the fact that apiaries have only a single profile. Producers dealing with apiculture usually do not take part in other agricultural activities.

## 5 . the apiculture of the West-Transdanubian region

The West-Transdanubian region is a territorial entity of Hungary with the most up to date economy and agriculture of the highest quality and calibre. It covers three counties, Győr-Moson-Sopron, Vas and Zala. It has an extreme significance both from the point of view of its economic weight and also from that of human resources. Unemployment is low in the region and the conditions creating the basis for economic activities are more developed. Examination was carried out in such economic environment, trying to find an answer to how the situation of the apiary sector is developing in the region.

The aim of the activity is similar to the country average, even in this region the supplementary income is the highest motivating factor. Considering the age characteristics, it could also be stated that mainly the age group of the elderly take part in this activity, 38.1% of the apiarists is older than 60 years. (Table 6).

	<20 years	21-40 years	41-60 years	61-80 years	81<	No answer
<b>Region, %</b>	0,3	12	45,3	36,9	2,2	1,9
<b>Country</b>	0,4	19,5	44,9	32,3	1,8	2

TABLE 6: THE AGE DISTRIBUTION OF APIARISTS

It is a very important warning for the West-Transdanubian region that only 13% of the younger generation, which is below the country average, start participating in apiary activity. As opposed to apiculture industry and services offer more attractive challenges and especially for the younger generation. Compared to the national average in the West-Transdanubian region 7.5% less chooses the activity dealing with apiculture. This phenomenon can later cause significant differences in the territorial dissemination of bee-density, and can even reach a scale which might have a significant influence on the successful pollination of plants.

The examination of the presence of supplementary workforce also supports this picture, as very often this is the first step towards choosing a profession for life. As far as the level of wages and the data on income per person is concerned the West-Transdanubian region has far more favourable characteristics than the national average. This is the reason why it is very difficult to find the suitable supporting personnel, moreover the wages would be so high that the profitability of apiculture could not support it.

### 5.1 THE NUMBER OF BEE-FAMILIES AND APIARIES OF THE REGION

Analyzing the number of bee-families of the region various tendencies could be observed. (Table 7)

Region	Country	Győr -Moson -Sopron	Vas	Zala
<b>Number of families</b>				
72,33	57	62,56	65,68	88,75

TABLE 7: NUMBER OF BEE-FAMILIES PER REGION

In average the apiarists of the region deal with 19 more families than the average. This number has two reasons, on the one hand the strong competition requires more bee-families to be able to have and maintain the expected life-style, and on the other hand because of the aforementioned age characteristics. The older generation already has the capital to invest into a larger stock of families. This is also proved by **Table 8**.

< 20 years	21 – 40 years	41 – 60 years	61 – 80 years	81<
71 families	90.09 families	85.1 families	61.17 families	65.48 families

**TABLE 8: THE NUMBER OF BEE-FAMILIES IN THE LIGHT OF THE AGE DISTRIBUTION OF APIARISTS**

The apiaries of the region are more up to date than the national average and the use of the “loading type” of hives is more common as a result of the possibilities in the differences in the pastures and the closeness of the Western border. One should however aim at reducing the 18% mixed hive system to a lower level, as the differences in the systems undermine development and industrialized apiculture.

The paper also analyses the development aims of apiarists. 48.3% of the apiarists plan to buy or make new hives, at a national level this rate is even better, as 51.1% plan to buy new hives. With the efficient distribution of EU subsidies the Hungarian apiary sector could develop steadily. A background industry supporting apiculture could evolve, and the tools and equipment necessary for an up to date technology would be available. In the region honey production showed the following output in 2004 (**Table 9**).

Bee-pasture	Altogether	Győr	Vas	Zala
	Kg			
<b>Rape</b>	10,14	11,59	12,48	6,09
<b>Acacia</b>	12,12	11,28	12,12	12,34
<b>Sunflower</b>	8,36	8,35	9,2	6,89
<b>Mixed</b>	7,2	9,43	7,7	4,96
<b>Other honey types</b>	15,13	19,7	8,53	7,56

**TABLE 9: THE OUTPUT OF HONEY PRODUCTION ACCORDING TO TYPES IN THE REGION**

**Table 9** shows that county Győr–Moson–Sopron has excellent possibilities on the territory of producing other honey types. The seed production centre of *Phacelia tanacetifolia* can also be found in this region, and the honey producing capacity is very rewarding and can bridge the period between acacia and sunflower bloom.

## **6. THE ROLE OF BUSINESSES IN THE STRUCTURAL TRANSITION OF APICULTURE**

When elaborating the models the direction of the transition has to be stated, and also that under what social and economic conditions those models could function. As an aim of model it can be stated that they should provide for the efficient operation conditions of all honey production forms. The elaborated cooperation and association forms should urge apiarist to produce market oriented quality products. The operational and structural system of the drafted forms should give a possibility for all the parties involved to make use of the capital and labour invested.

The structural transition of apiculture is a conscious process, which should make Hungarian apiculture be able to stand in the international competition under the changed market conditions, accept challenges in connection with the EU accession, and make use of the advantages of membership.

The structural transition involves:

- transition of the product structure, to increase the extra quality products packaged for the consumer,
- the technical and technological renewal of production,
- the moderation of the rate of increase of production costs,
- the transition within the producers according to size, the strengthening of concentration,

The aim of businesses to accommodate the necessary structural transitions of apiculture, and to guarantee the highest possible purchase prices under the given market conditions through enforcing the interests of producers.

## **7. PRODUCTION MODELS WITHIN THE APIARY SECTOR**

### **7.1. NEW TYPES OF COOPERATIVES**

These cooperatives essentially differ from the cooperation form based on common property. The apiarists continue to produce on their own, and the tools and equipment are in their property. These cooperatives are mainly created for common marketing and common purchase of certain materials, products and services.

These new types of cooperatives give a possibility for the apiarists, with 40-80 hives, and mostly in danger of slipping off, to stabilize their positions. This, however, can only be carried out under the following conditions:

The larger amount of products produced by more than one apiarist strengthen the enforcement of interests, and decreases the defencelessness of the apiarists.

Business planning, which currently is completely absent from the activities of apiarists of this scale, becomes common even in middle-size apiaries, (income forms part of the family income, and investments and developments also have to be paid from the family budget).

It helps to carry out the necessary hive-change, and this provides for the starting of technological development.

The common investments and services, which become available for the members helps to moderate the increase of production costs.

The new types of cooperatives can be classified into two groups.

In the first case the members associate into a cooperation to enforce their interests. The starting presumption is that individually they have a weak position opposed to the merchants, for whom the few hundred kilograms of honey is not a significant amount.

They expect the cooperative to be in a stronger negotiating position on the basis of a common product stock, to get more favourable purchase prices and other advantages, the apiarists on its own could not get against the merchants.

The other possibility is to create a so called “channel” cooperative. This would mean going beyond offering their products within a common framework and would also participate in processing, packaging and marketing, and would also get their share from the profit.

## **7.2. Local association models**

Local initiatives have a significant role at settlements and smaller regions. Their advantages come from the aspects already mentioned at the collector types of cooperatives.

Enforcing their interests means that the amount of honey produced individually but offered for marketing in a common way puts them in a better negotiating position with the merchants, and which results in increased purchase price.

These associations enable the better control of the honey produced, because apart from collecting the honey to their storage site, they can also run the honey with the standard device which complies with the current regulations, and can store their products in a standard way. This also puts the members in an advantageous position from the point of view of competition, as they not only get a larger amount of honey but also of homogenous quality. This type of association has a significant role in the production of honey types and local specialities. Individually all the producers could market their products as mixed flower honey, but if they associate they can produce volumes which can be put to the market (linden, chestnut, bear’s garlic, giant goldenrod, forest, lavender, phacelia).

This specific situation results in a larger amount of honey, the exquisiteness of honey types, and quality of honey, and the apiarists can sell their products at a higher price. It also should be mentioned that these co-operations and associations have low operation costs.

## **7.3. The model of the apiarist share holding Co.**

Acacia honey (at least 25000 tons) has a stable market in the EU, 60% the real acacia proportion is produced in Hungary.

The European consumer knows, looks for and buys the acacia honey. The problems arise not with the producer, but the producers have difficulties in getting access to the market. The most significant problem is that there is a lack of concerted market activity. 15000 apiarists, who get poorer each day, and have difficulties in making ends meet offer their products and stand opposed to a handful of people, who on the other hand possess a large capital (more than half of the honey marketed in the EU go through the less than 10 companies) and lose against them each time. A national marketing organization should be established, and its most suitable establishment form is the share holding company, which would be made up of regional marketing and purchasing units.

This form is suitable to integrate a larger number of proprietors (apiarists) and would be able to involve significant capital from outside the sector. If the apiarists were able to stand up in unity through this form (which could only be realized for acacia honey for reasons already described above) they could make decisions concerning every question important for them (the most important factor is the price of honey) the business and market processes.

The aim of the established company would be to reach a higher price than the current one, and to keep it steady, through the regrouping of a significant income of acacia honey product channel (from the hive to the consumers) to the Hungarian producers. The main advantage of this business construction would be the fact that the Hungarian producers could determine the minimum selling price of acacia honey. The result of the establishment of the apiarist share holding company would be a higher purchase price from the currently used ones for acacia honey.

In longer terms even more significant results could be achieved. If there is a unified approach for acacia honey, than it would become obvious for each honey packager that it has two possibilities concerning the purchase of acacia honey: it either cooperates with the share holding company, well aware of the interests of the company, and then honey supply would be guaranteed, or would compete for the remaining (from outside the share holding company, mainly Romanian and Bulgarian) lower quality and non-guaranteed supply of acacia honey. (It is without doubt that larger businesses have no other possibilities than to accept these conditions.) From this position it could be reached that the Hungarian acacia honey is not “multiplied”.

## **8. THE DEVELOPMENT POSSIBILITIES OF THE HUNGARIAN APIARY SECTOR**

From the presentation of the Hungarian apiary sector it is obvious that most apiaries are characterized by technological backwardness. The core of the problems lies in the application of the so called “nagyboczonádi fekvőkaptár” (NB “lying type of hive”), which among its numerous excellent characteristics is complicated, expensive and cannot be automated. The extensive manual labour requirement limits the number of hives in apiaries based on family labour, and also prevents the development of larger apiaries.

These problems will intensify further as it is quite obvious that the most important cost element of apiaries is the **labour costs**, which are not taken into account in practice these days.

The harmonization of Hungarian wage levels with the Western European will increase the labour costs of permanent and temporary workers employed in apiaries. The restrictions in line with EU regulations concerning foreign workers, and the effective control of labour rules will make illegal employment a great risk. If this situation is not well prepared for, the competitiveness of Hungarian honey will further decrease.

The cooperative could help to limit the continuous increase of the production costs of members, and would strengthen competitiveness.

The cooperatives can contribute this by assisting technological developments. With the help of extension experts they can develop and promote technology types to their members, which will help to reduce the need to feed sugar. They can carry out common acquisitions on behalf of the members, which make the VAT claims possible, and the greater amounts can create better payment conditions.

By the gross the rent of transportation tools and equipment, which could be put at the disposal for members for the migration of bees, is more advantageous.

The export position of Hungarian apiarists would be strengthened if the honey – almost 10 tons per year – going for export would be produced by large apiaries running with up to date technology. In order to achieve this, a polarization should take place, in the framework of which a kind of division of labour should evolve between smaller and larger apiaries.

Smaller apiaries with few hives would produce for their own supply and pleasure, for selling from home and for markets, while larger apiaries would produce for output. Changes therefore would be necessary for medium sized apiaries with between 40-100 hives, which currently represent 41% of the producers amounting to almost 7000 apiarists. These apiaries would be able to get among the larger apiaries by buying up other apiaries and installing new families, while at the same time the growing competition would force others to stop production and continue with beekeeping only as a hobby.

## **9. NEW AND NOVEL SCIENTIFIC RESULTS**

1.) Using a multi-variable production function it was stated that the level of feeding sugar is high so the further increase of feed-utilization is not justified.

The role of rate of return of the fixed assets and the connected fuel and energy input (0.04:1) – namely its rate of 4 “fillérs” – is not sufficient. This situation is caused by the inefficient operation of the fixed assets, putting it differently – the operation of the tools and equipment, which in this case involve transportation tools and equipment – is so expensive that the apiary cannot efficiently manage their costs.

2.) Analyzing the development initiatives of the region it could be stated that the purchase or creation of a new hive is planned by 48.3% of the apiarists of the Western-Transdanubian region. At national level this rate is even more advantageous as 51,1% of the apiarists want to buy new hives. With the efficient distribution of EU subsidies the Hungarian apiary sector could develop steadily. A background industry supporting apiculture could evolve, and the tools and equipment necessary for an up to date technology would be available.

3,)The export position of Hungarian apiarists would be strengthened if the honey – almost 10 tons per year – going for export would be produced by large apiaries running with up to date technology. In order to achieve this, a polarization should take place, in the framework of which a kind of division of labour should evolve between smaller and larger apiaries. Smaller apiaries with few hives would produce for their own supply and pleasure, for selling from home and for markets, while larger apiaries would produce for output.

4,) Businesses are offering advantageous solutions for medium sized apiaries with between 40-100 hives, which currently represent 41% of the producers amounting to almost 7000 apiarists. These apiaries would be able to get among the larger apiaries by buying up other apiaries and installing new families, while at the same time the growing competition would force others, who would not fit into the businesses, to stop production and continue with this activity only as a hobby.

The aim of businesses to accommodate the necessary structural transitions of apiculture, and to guarantee the highest possible purchase prices under the given market conditions through enforcing the interests of producers.

## **LIST OF PUBLICATIONS**

### **SCIENTIFIC PUBLICATIONS**

#### **Publications in a foreign language**

NAGY I .(2005):Analysis of economic and social relations in apicultural production. Acta Agronomica Óvariensis. Vol. 47. No. 2 .

#### **Publications in Hungarian**

1. NAGY I. (1999): Méhészet (Apiculture). (Editor: NAGY I.) Department handout Mosonmagyaróvár. 128. p.
2. NAGY I. - MILTALLER Á. ( 2007 ) : A magyar méhészeti ágazat helyzete (The situation of Hungarian apiculture). Acta Agraria Kaposvariensis .

#### **Publications published in proceedings**

- NAGY I. (1998): A méhek megporzó tevékenységének vizsgálata, (The examination of the pollination activity of bees) PATE Georgikon Faculty of Agricultural Sciences IV. Scientific Youth Forum. (19. March 1998. március 19.) Keszthely. 23-28. pp.
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- NAGY I. (2002): A méhészeti termelés gazdasági társadalmi összefüggésének vizsgálata, Rendszerváltás – változtatás mérlege tanulmánykötet (Examination of the economic and social connections of Apiary production – Transition – The balance of transition) KOMÁROM VEAB. 2002. Vol. 1 233-240 pp.
- NAGY I. (2004): A termelés gazdasági és társadalmi összefüggései. (Economic and social connections of production) East-Hungarian Apiarist Forum. (21.08.2004.) Debrecen 17-20 pp.
- NAGY I. (2004): A magyar méhészek az Európai Unióban (Hungarian apiarists in the EU). XXX. Scientific Days of Óvár: Agricultural production – In harmony with nature. (07.10.2004.) Animal breeding section 61. p.

#### **Publications for dissemination of scientific information**

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