Innovative approach to legal regulation for using beekeeping data in forest areas

T Shatkovskaya\textsuperscript{1,2,*}, T Epifanova\textsuperscript{2}, N Romanenko\textsuperscript{2} and V Bulgakov\textsuperscript{3}

\textsuperscript{1}\textit{Department of Theory and History of Law and State, The Russian Presidential Academy of National Economy and Public Administration, 70 Pushkinskaya Street, Rostov-on-Don 344002, Russian Federation}

\textsuperscript{2}\textit{Department of Civil law, Rostov State University of Economics, 69 Bolshaya Sadovaya Street, Rostov-on-Don 344002, Russian Federation}

\textsuperscript{3}\textit{Faculty of Economy, Voronezh State University of Forestry and Technologies named after G F Morozov, 8 Timiryazeva Street, Voronezh 394087, Russian Federation}

\textsuperscript{*}E-mail: Shatkovskaya-tv@ranepa.ru

Abstract. The article descends in developing a legal framework for utilizing databases in forest beekeeping to resolve urgent beekeeping issues and improve the efficiency of its legal support. The goal was achieved basing on a systematic approach. To generalize the empirical data presented by statistical and economic indicators, authors applied methods of analysis, synthesis, and deduction as well. Combining both functional and modelling methods, authors developed legal patterns of databases. The authors confirmed that such problems of Russian beekeeping as poor development of industrial management, mass bees’ mortality caused by pesticides and agrochemicals, lack of qualified experts and expert laboratories to assist beekeepers in their economic activities cannot be solved without using the databases proposed in the study. The novelty and value of the research findings include highlighting the advantages of the development and implementation of databases of experts, beekeepers, expert organizations, pesticides, indicating active substances that are dangerous to bees and clinical signs of poisoning, using specific examples, which make possible qualitatively improving the economic activities, as well as increasing the efficiency of legal protection of the beekeeping producers’ interests in courts.

1. Introduction

One of the types of economic activity that humanity has been engaged in for thousands of years is beekeeping. The first bee-keepers in Russia used to purposefully set up their production in forest areas (wild-hive beekeeping). This was explained by convenient use of hollows in tree-trunks for hives, as well as special properties of honey that was produced in forest areas. Forests also offer natural landscape protection for apiaries. Numerous cases were presented in the study by I Bogdanova [1]. The benefits of bee products and the importance of their quality characteristics are primarily due to the fact that they are vitally necessary to humans. The results of beekeeping are used in cosmetology, food, medical, chemical and many other areas. Beekeeping is so organically woven into the modern forest ecosystem that any negative processes occurring in it result in systemic failures not only in the economy, but also in the ecology of modern society, and pose a threat to the food and environmental security of the state [2].
The social significance of beekeeping, its important role in ensuring the biological diversity of the forest ecosystem and the centuries-old experience of its legal regulation have not protected this area from numerous threats and challenges, most of which arise as a result of irrational production, neglect of the environment, for example, deforestation, the uncontrolled use, storage and disposal of pesticides and agrochemicals, etc., that is, the human factor.

Thus, only in 2019 and only in Kursk Region from the use of chemicals in agriculture, about 6 thousand bee colonies died, and the damage to beekeepers amounted for more than 20 million roubles [3]. Last year, up to 100% of bee colonies died in some areas of the Russian black soil region. On a global scale, this problem looks even more disastrous. According to A Ponomarev, every year, from 30 to 45% of bees in the United States, Argentina, and a number of European and Asian countries die from poisoning [4].

First of all, natural scientists are engaged in bringing Russian beekeeping out of the crisis. [5] present a comprehensive analysis of the beekeeping problems in modern conditions [6]. Several foreign specialists focus on the problematic of forest beekeeping. [7] and some other articles propose economic solutions to overcome the crisis of industrial beekeeping. Discussions on urgent practical problems of beekeeping are deployed on the pages of the professional journal ‘Beekeeping’ and Internet portal ‘The World of Beekeeping’.

Publications of foreign scientists (biologists, economists, sociologists, ecologists) from Saudi Arabia [8], Iran [9], Australia [10], Europe [11], the Philippines [12] and others testify that problems in the field of beekeeping are international.

Preserving habitat and biological diversity of insects of the family Apoidea is one of the strategic areas of the state activity in many countries such as Brazil, Argentina, European Union, USA and the Russian Federation [13]. Many Russian regions have developed programs to support beekeeping. The Republic of Bashkortostan is the leader in this direction [14].

It is the legal aspect of beekeeping that remains a significant gap in science. Legal research in this area is rare. Among the lawyers, makes specific proposals to improve the legal framework for beekeepers [15] makes some practical recommendations [16]. One of the ways to solve this serious problem is to provide legal support for the use of information techniques in beekeeping, inclusive of forest beekeeping.

The scientific and practical value of the research consists in developing a legal framework for utilizing databases in forest beekeeping to resolve urgent beekeeping problems and increase the effectiveness of its legal support.

2. Methods and materials
Achieving the goal is possible through a system approach to the research problem posed, since a compromise between human production activities and ensuring the ecological safety of forest ecosystems cannot be achieved without developing an integral reliable legal framework for the use of bees in human activities. This approach is also important because bees and plants pollinated by them should be considered from a comprehensive point, since their vital activity depends on each other. Natural diversity is a prerequisite for the proper performance of the forest ecosystem.

This approach requires the use of a wide empirical data range. First of all, the authors used their own practical legal experience and collected over 200 court decisions concerning various beekeeping issues and conflicts.

Legal relations connected with the use and protection of animals, including bees, are governed by Art. 58 of the Constitution of the Russian Federation [17]; Federal Law ‘On Animal World’ [18]. In accordance with Art. 3 of the Law ‘On the Animal World’, property relations for the use of animals are regulated by the civil legislation of the Russian Federation. The relations in feeding, watering, transportation, vaccination of farm animals, including bees, are governed by the Law ‘On Veterinary Medicine’ [19]; Federal Law ‘On the Development of Agriculture’ [20]; The Federal Law ‘On State Support in the Field of Agricultural Insurance and on Amendments to the Federal Law On the Development of Agriculture’ [21].
To generalize the empirical data presented not only by court decisions, but also by statistical and economic indicators, as well as standards and guidelines, the authors utilized methods of analysis, synthesis, deduction, formal and legal, and comparative and legal methods.

Using the functional method and the modelling method, the authors developed the legal frameworks of databases and justified their functional purpose. In particular, the authors highlighted the legal possibility of using databases and their implementation by beekeepers. Moreover, the most reliable mechanisms of legal protection and directions for the subsequent commercial use of rights to these objects were identified as well.

3. Results and discussion

In this regard, we note that Russia's lack of high-tech developments could not be overcome only at the state level. Most professional problems in this area should be addressed to beekeepers themselves. Under the conditions of market capitalism, entrepreneurs could rely on the help of the state to a limited extent.

Hence, it is necessary to consolidate efforts of Associations of beekeepers to improve beekeeping activity, create effective economic and legal frameworks for its implementation [22]. According to official data, more than 90% of honey in Russia is contained in private apiaries. Private farms account for more than 94% of all bee colonies, including apiaries [23].

The lack of industrial beekeeping leads to the fact that Russia mainly imports honey. Honey, especially from China, is usually inferior in quality when compared to Russian one, but it has a lower cost and lower wholesale price. Industrial beekeeping is a highly efficient management system. For example, the productivity of American beekeepers is ten times higher than that of Russian beekeepers [24].

Only the legally based joint economic activity of beekeepers makes it possible to develop new forms of entrepreneurship. Choosing the appropriate organizational and legal form of interaction will allow to joint efforts and solve spatial and material problems that could not be addressed on individual level.

Modern society is becoming more and more digitalized including business operations as well. This fact creates some difficulties for beekeepers, mostly associated with the inability to utilize new technological innovations, however also presents a lot of advantages.

For the Association (Union) of beekeepers, there are opportunities to acquire assets that will act both as a means of solving the most urgent problems and a valuable intangible asset of the organization. It is the intellectual property, the creation, maintenance and legal support of which is burdensome for individual beekeepers, but not for the company.

These can include commercial designations, trademarks, names of places of origin of goods, geographical indications, secrets of production and databases [25]. In this study, the advantages of using objects of intellectual rights and equivalent means of production are investigated on the example of databases.

In modern Russian civil legislation, set of independent materials presented in an objective form, systematized in such a way that they can be found and processed using an electronic computer is a protected database.

Russian civil law demonstrates a negative approach to the legal regulation of the emergence and protection of exclusive rights to databases, which is wholly consistent with European law. Databases with proper legal support are protected by the Civil code of the Russian Federation both as objects of copyright (article 1,260) and as objects of related law (article 1,334) for a long time.

Summarizing the practice of beekeeping in Russia, world experience, and modern law enforcement practice, the analysis of more than 200 court rulings of Russian courts, each of them is a topical problem of beekeepers, allowed to identify three of the most serious problems of beekeeping in modern conditions. We consider their solution possible, through the formation and subsequent use of the appropriate databases. In this regard, we propose the following:
First, beekeeping is associated with some risks. We consider the qualification of bees as a potential source of high danger as very misleading. However, the very significant damage in beekeeping relations can be caused both to the entities that carry out beekeeping activity, and by the entities that carry out beekeeping activity.

When harming human or animals health by insect stings, the basic evidence can be an expert opinion. At the same time, to ensure the objectivity of the study, it is advisable to conduct two examinations in relation to people: forensic medical and forensic entomological ones, and in case of harm to animals forensic veterinary examinations. When conducting a forensic medical examination, it is necessary to put a number of questions to the expert, first of all, what violation of the rules for keeping bees are in a causal relationship with stings or the threat of stinging people and animals.

Damage to subjects engaged in beekeeping activity is most often caused by the use of neonicotinoids and other agrochemicals in agriculture, and harm to subjects engaged in beekeeping activity can be caused, for example, by stinging people or animals with bees belonging to the Defendant [26].

The death of bee families is one of the main reasons underlying the crisis of beekeeping in the modern world. In 2019, the mass death of bees was recorded in 25 regions of Russia. According to official statistics of the Ministry of agriculture, by the end of the summer, more than 40 thousand families of domestic bees died, that was about 1.5% of their total number. That fact has not only economic consequences (reduction of honey production by 30%, decrease in crop yields, etc.). First of all it indicates the rapid destruction of the bee population [27].

As for legal consequences, the property damage often occurs in relation to entities engaged in beekeeping activity, since it is associated with material losses for the victim, that means the destruction or damage of bee colonies. Extermination is loss of bee families in full, damage to bee families is a decrease in their quality characteristics and, accordingly, a decrease in cost.

Damage, as a general rule, is compensated in kind. This means that the person caused the damage must make up for damaged bee families or provide the victim with bees of the same kind and quality. However, it is not always possible to make up for damaged bee families, for example, in nature, and therefore the damage can be compensated financially, estimating for damaged or exterminated bee families.

The loss of bees can be defined as physical death, as well as their so-called retirement from the economic ownership, when the family of bees continues its existence, but the owner is deprived of the opportunity to possess it, for example, when gathering a significant number of families of bees for rent. Damage to bees implies a decrease in their value, for example, when the family strength is reduced by pesticide poisoning.

It means that in order to participate in court hearings in disputes about causing harm in the field of beekeeping, just experts with special knowledge must act as experts. They must be able to professionally convince the court, for example, that it is necessary for the apiary to make a fence of a certain height, the expert must be able to explain in which case it should be solid or lattice; also the expert must know the components of the Commission assessment for poisoning bees with chemicals and understand the local specifics of melliferous base, that is prevalent for forest beekeeping in particular.

In addition, only the expert with ability to skillfully substantiate the objective manifestations of bee poisoning with pesticides is considered to be a professional. For example, the fact that the mass death of bees is not one-time case, but it passes gradually. Therefore, a live bee mass of 100 g on five or six different time frames when its withdrawal is necessary to recognize the death of the entire family, since the distillation of bees to clean honeycombs, with pure honey reserves, may only delay the further death of bees, while the life of surviving bees in case of poisoning is significantly reduced.

It is important to prove that in this way, the quality characteristics of the bee family are lost in full, etc. The database of specialists selected and verified by the Union (Association) of beekeepers will be a significant guarantee of making fair judgments.
Second, it is necessary to make up the database of expert organizations able to determine the actual damage from the loss by beekeepers themselves, and failure to get planned profit due to reducing the strength of bee colonies, that courts virtually ignored, or losses caused by beekeepers’ activity.

It is advisable to form such organizations at the Union of beekeepers and include specialists either with the appropriate competence or ready to undergo training. These organizations will not only help to define the fact of causing harm, without which it is impossible to incur civil liability, they will ensure collecting relevant, admissible and reliable evidence of causing damage and recovery of losses and lost profits, but also they will be able to improve the existing methods of calculating damage. The improvement is primarily related to the use of digital techniques to account all the components of harm and to adequately calculate the full amount of losses of beekeepers and their lost profits.

The modern approach of courts to these calculations based on average market prices is unacceptable, since market prices for some types of such products may be unformed in the subjects of the Russian Federation and its municipalities.

In addition, these organizations can provide consultative service for beekeepers to form veterinary and sanitary passports of the apiary [28] and give specific recommendations on the correct registration of documents to the court and other state authorities, as well as requests to expert laboratories.

Third, in connection with the formation of expert laboratories, we will once again touch upon one of the most important problems of beekeeping in modern conditions, related to the poisoning of bees with chemicals. About seven hundred registered pesticides are allowed to be used on the territory of the Russian Federation. A major threat to the development of beekeeping is the misuse of plant protection products, as well as the use of new chemicals without thorough testing. This is also relevant for forest beekeeping, as the majority of apiaries is located on the edge of the forest areas, where bees have access to the bordering fields and meadows. Evidence suggests that pesticides, including insecticides, from the neonicotinoid group pose a threat to pollinators all over the world.

Studies conducted in France, Italy, the United States, and other countries have shown that neonicotinoids enter pollen and nectar from treated plants and pose a risk to pollinator insects, and can persist for a long time in the soil [29]. As a result of the interaction of neonicotinoids with some fungicides, a compound is formed that is a thousand times more toxic than the neonicotinoids themselves. Pesticides and other persistent organic pollutants may have a feature of migration that leads to mass death of bee colonies in different regions of the world. The European Union imposes moratoriums on the use of these systemic pesticides [30], but in Russia their use has doubled over the past decade. Thus, based on the State catalogues of pesticides and agrochemicals, we calculated that in period from 2014 to 2017 (the latest data is not available in the public domain), the number of herbicide formulations increased from 595 to 748, and fungicides increased from 316 to 406.

In total, the quantitative growth of used pesticides is about 26% [27]. Some of them are made of active substances (461 in total according to data of 2017), prohibited by the legislation of the European Union based on the results of scientific research on the permissible residue of pesticides in food and feed products of plant and animal origin, including bee products [28].

In this regard, databases of pesticides with indication of active substances that are dangerous for bees and clinical signs of poisoning and the protection regime of bees caused by the use of specific pesticides are crucial to ensure sustainable beekeeping. For example, not releasing bees for a certain period of time, installing special equipment to isolate bees in hives, or timely transporting bees to a territory remote from the place of the pesticide use, to a safe zone, and so on.

In addition, it is advisable to form databases of expert laboratories with modern equipment to determine the fact of poisoning and the active substance used in this case, the accumulation of harmful substances in bee families.

Some state laboratories define this fact according only 3-4 markers. The toxicity of the medicament and the hazard class is determined by the sanitary and epidemiological service. It determines norms for the medicine use. Taking into account the fact that about a thousand pesticides are used in the territory of the Russian Federation, hence such examination cannot be considered adequate.
Therefore, the database of expert institutions will help a beekeeper to choose an expert institution that can provide a full expert opinion, which will form the basis of evidence of bee poisoning in court. Such an expert laboratory must have appropriate specialists, technical means and reference samples. Since toxic substances can be single-component or multi-component, it is important to choose such expert laboratories, which have reference samples for all toxic substances.

In addition, if there is a complete database of beekeepers carrying out economic activity in certain areas, including forests and forest-steppes it is possible to inform them by agricultural producers about the place and time of the pesticides use. This duty, although contradictory, is mandatory in the legislation for the local administration or the agricultural producer who applies them.

The interaction of entrepreneurs in information and telecommunications networks is recorded by both parties, and accordingly it will be easy to prove the fact of information or its absence [31]. This is even more necessary that under the current legislation an aggrieved party acting as the plaintiff must ensure the collection of evidence in terms of damage, illegal actions of the causer of the damage, the causal link between the action for damages and adverse effects, i.e. to prove that the damage is a result of the defendant’s actions. However, the most important thing is that the use of these techniques can significantly reduce the harm caused to bees and thus contribute to the preservation of the environment and forest ecosystems.

4. Conclusion

Summing up the results of this study, we note that the proposed databases, first of all, have no existing analogues in Russia, but they have the characteristics necessary for their protection as copyright works or objects of related law. Databases are one of two copyright objects that can be registered by Rospatent, which gives additional protection to the copyright holder.

Secondly, the above mentioned databases will allow beekeepers to qualitatively improve their business activity, in particular, to organize the production of new types of environmentally friendly bee products (including products of forest beekeeping), to take preventive measures to protect bee colonies, and to intensify the exchange of professional information between beekeepers whose apiaries are geographically scattered throughout the country and are often located in the remote areas, independent of territorial location of the apiaries.

Third, proposed changes will increase the effectiveness of legal protection of the interests of bee producers in the courts by increasing the involvement of professional experts and other specialists in court sessions, in the examinations, veterinary documents, as well as in the collection and provision of procedural evidence.

Fourth, it is important to receive additional income from the above databases, for example, by signing license agreements for the transfer of exclusive rights to these objects for their use by other business entities, public authorities, and municipalities.

In addition, including the above databases, as well as trademarks, service marks, names of places of goods origin, the rights to which belong to beekeepers and their organizations in the Customs register of intellectual property objects [30] will significantly advance in solving the problem of importing counterfeit bee products in the territory of the Russian Federation and preventing the falsification of honey.

Russia's accession to the WTO has caused an influx of cheap foreign honey, bankruptcy of non-competitive farms, a decrease in the profitability of beekeeping, and its attractiveness as an economic activity. The formation of the Customs register, which currently has more than 3,000 items, makes it possible to quickly prevent, detect and stop cases of illegal trafficking in counterfeit products. This positive experience should be extended to the field of beekeeping.

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