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In order to obtain seed from hybrid populations, it is advisable to freeze hardened germinated seeds in autumn (approximately in the 2nd and 3rd decades of September), and after counting live plants, plant them in field conditions, in which they will undergo vernalization and further vegetation without additional costs

Thus, the improved method of freezing hardened germinated seeds makes it possible to evaluate, differentiate and select breeding material for frost resistance. The advantages of this approach are relatively low energy consumption, quick assessment of a significant amount of breeding material, and, if necessary, selections.

Conclusions.

For the first time in the conditions of the Forest-Steppe of Ukraine, as a result of the research carried out, the method of approach to determine the frost resistance of multiflorous and perennial ryegrass in different links of the breeding process was improved. The temperature and exposure modes of artificial freezing have been worked out, contributing to the differentiation of ryegrass breeding material by frost resistance in germinated seeds. In the primary stages of selection (collection and hybrid nurseries), to differentiate a significant number of numbers, it is advisable to use this method of freezing in hardened germinated seeds.

References

1. . Vattcke G. (1984). Vozdelyvanie italianskogo raigrasa v GDR dlia proizvodstva zelenykh i konservovanykh kormov. 2, 9-11 .

2. Dospekhov B. A. (1985) Methods of field experience. - M .: Kolos, 315.

3. Dubovoy V. I, Chepur G. T., Yaremenko R.V. (1998) An improved method of evaluation and selection of selection material for winter cereals (Searches and solutions). 38.

4. Kurenkova S.V. (1991). Annual ryegrass - a promising forage crop. 9-16.

5. Larin I.V. & Kuksin M.V. (1960). Lukivnytstvo i pasovyshchne hospodarstvo. 483.

6. Poltarev E.M. (1990). Development of methods for diagnosing winter hardiness of winter crops: Methodological recommendations. Kharkiv. 42.

7. Udovenko G.V. (1988) Diagnosis of plant resistance to stress: A methodological guide. All-Union Research Institute of Plant Breeding. N. I. Vavilova - L .: VIR. 128–154.

8. . Shirokii Unifitcirovannyi klassifikator SEV semeistva Poace barnh. rodov Phleum L., Festuca L., Dactylis L., Lolium L. i drugikh rodov mnogoletnikh zlakov – SSSR. Leningrad,1985, 45.

9. Methods for determining frost and winter hardiness of winter crops. - M., 1969, 42.

10 Methodical recommendations for the application of mathematical methods for the analysis of experimental data on the study of combinatorial ability. - H, 1980, 75.

11 Khomenko L .O. (2012). Manifestation and inheritance of the trait of frost resistance and its use in the selection of soft winter wheat: Abstract. K., 20.

12 Cinis E.T. (1958). Viengajliga airene. LVI Riga, 54.

Duvick D.N. (1965). Cytoplasmic pollen sterility in corn. Adv. Genet., №13. 56.

Грабарівська Валентина Леонідівна
Вінницький національний аграрний університет, Україна
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ТЕХНОЛОГІЧНІ ПРИЙОМИ ПІДВИЩЕННЯ ПРОДУКТИВНОСТІ БДЖОЛИНИХ СІМЕЙ

Hrabarivska Valentyna Leonidivna
Vinnytsia National Agrarian University, Ukraine

TECHNOLOGICAL TECHNIQUES TO INCREASE THE PRODUCTIVITY OF BEE FAMILIES

Анотація.

Узагальнено результати досліджень науковців щодо використання технологічних прийомів підвищення продуктивності бджолиних сімей. Відзначено залежність продуктивності бджолиних сімей від сили сім'ї, вікового складу, використання молодих високопродуктивних маток, забезпеченості сімей впродовж року доброякісним кормом, особливо в ранньовесняний та осінній періоди, застосування комплексних підгодівель, підтримання оптимального мікроклімату бджолиного гнізда, покращення кормової бази, впровадження раціональних способів попередження та боротьби з хворобами бджіл.

Abstract.

The results of research of scientists on the use of technological methods to increase the productivity of bee colonies are summarized. The dependence of productivity of bee colonies on family strength, age composition, use of young highly productive queens, provision of families with good quality food during the year, especially in early spring and autumn, application of complex fertilizers, maintenance of optimal microclimate of bee colony, improvement of feed prevention and control of bee diseases.

Ключові слова: *бджоли, продуктивність, сила сім'ї, бджолина матка, медозбір, кормова база.*
Keywords: *bees, productivity, family strength, queen bee, honey collection, fodder base.*

Introduction.

Beekeeping is an important branch of agricultural production, which is engaged in breeding bees to obtain bee products. It has long been one of the favorite crafts of our people, which provides valuable, nutritious and medicinal products, indispensable raw materials for industry.

However, the importance of beekeeping is not limited to production and profit from sales. Ukraine is a country of intensive agriculture, in which crops need pollination. Due to the pollination of entomophytic plants, honey bees have become an important element in maintaining diverse relationships in the animal and plant world. They account for up to 80-95% of pollination work on entomophytic crops, which allows to significantly increase the yield of orchards, field crops, improve seed quality and fruit taste. In areas without bees, 30 to 50% or more of the possible harvest is not selected, and the reproductive process on natural lands is disrupted.

The importance of bees as a living indicator of the environment is growing. They represent a "unique ecological link" in the system that ensures the stability and conservation of wildlife and are directly involved in maintaining the ecological balance on earth [30, 31, 33].

An integral part of the responsibilities of human activity is to provide the conditions necessary for the reproduction, maintenance and preservation of bees.

To address the issue of providing the population with bee products, scientists are constantly working to improve technological methods to increase the productivity of bee colonies.

Analysis of recent research.

Beekeeping, as an industry, has great prospects. The increase in honey production should be due to the use of new techniques and methods of keeping and using bees, which will increase the yield of marketable products. One of the most important prerequisites is to improve the efficiency of beekeeping, which depends on a complex of many factors.

Factors influencing the productivity and life expectancy of the bee family are divided into external and internal. The external ones include: climatic and weather conditions, flora and fauna, fodder base, pathogens, enemies and pests of bees, human economic activity (use of pesticides, herbicides). Most of these factors are almost independent of humans, but they are of great importance for the life and productivity of bee colonies.

The internal factors include those factors that are formed inside the nest as a result of the life of the bee family. They are important for productivity, can vary by person and are highly dependent on genotype.

From the group of internal factors of the bee family, the strength of the family is important. The more bees in a family, the stronger it is and the more products it can produce. During the active season, a bee family weighing 1 kg produces 7 kg of honey, 2 kg - 20 kg of honey, 4 kg - 49 kg of honey.

The strength of the bee colony is also important for pollination of agricultural plants. Young bees raised in strong families have well-developed organs for collecting and processing nectar and pollen, and young drones and queens have better-developed reproductive organs.

Of the internal factors, the main role belongs to the uterus, its phenotype and genotype. To create and keep families strong, it is necessary to use full-fledged breeding queens of breeding lines. The quantity and quality of the brood grown depends on the age, physiological condition of the uterus, the ability to lay eggs and the presence of a bribe. These factors affect the intensity of egg production of the uterus, which depends on the growth rate of the bee family. The larger the uterus, the better developed the ovaries, they have more fallopian tubes, the higher its fertility. The strength and productivity of bee colonies is directly dependent on the quality of queen bees and their ability to lay large numbers of eggs. The strength of the family affects the quality of bees, their composition, reflexes and the quality of the queens, and the number of bees depends on the quality of the uterus, the age of the family and the quality of the bees themselves [22, 23, 30].

Analysis of research results.

To increase the number of young bees in the fall before winter and spring - to use the main honey harvest, the uterus must lay a large number of eggs. Research Zotko M.O. [9] the influence of age and weight of queens on the intensity of development and productivity of bee colonies was established. According to the results of research, it is established that the uteruses of the Ukrainian steppe breed are characterized by high reproductive capacity and can lay up to 1101-2007 pieces / day of eggs during the period of maximum development of bee colonies. Uteri weighing 260 mg or more for two years tended to have better reproductive activity at the beginning and end of the season (13-31%).

In order to increase the number of bees and strengthen the bee colony before the main honey harvest, the uterine egg-laying is required. To do this, use different fertilizers. Providing the bee family with nutritious carbohydrate and protein feed all year round is the basis of high productivity. Bees raised in such conditions, resistant to disease, have better physical development.

In order to identify the effect of biologically active substances on the egg production of queen bees Vedmid I. V., Sheremeta V. I., Kaplunenko V. H. [5] conducted an experiment in which control families were fed sugar syrup, experimental - sugar syrup with the addition various biologically active substances and drugs. The first experimental group used top dressing "Glutam 2BM", the second - cobalt chloride (8 mg per 1 liter of syrup), the third - cobalt aquachelate (8 mg Co per 1 liter of syrup) and the fourth - top dressing "Nanstimulin", the active substance which is a mixture of monosodium glutamate and cobalt aquachelate. Feeding was carried out every other day at 200 g of syrup per bee colony. Studies have shown that feeding bee colonies sugar syrup with biologically active substances contributes to the intensification of egg production. The queen bees had the highest egg production, whose families were fed pure Glutam 2BM and Nanostimulin. It was

found that in the case of feeding families of pure sugar syrup and with the addition of biologically active substances, the uterus shows significant individual characteristics of egg production, and insufficient pollen in the bee family probably reduces the effectiveness of stimulating effect on egg production of the uterus. sugar syrup, and with the addition of biologically active substances.

Honey bees have developed an instinct for economical consumption of food supplies. In the spring, bees lack their own honey, and some of its varieties are completely candied by spring. Insects cannot feed properly, so the issue of proper food supply is important.

According to the results of research Mishchenko O.A., Lytvynenko O.M., Afara K.D., Kryvoruchko D.I. [17] determined the effectiveness of carbohydrate-protein feeding, namely, the influence of protein feed (bee pollination) on the development of bee colonies and physiological parameters of bees in the absence or low level of its receipt. The influence of the use of carbohydrate and protein fertilization on the spring growth of bee colonies and their preparation for the effective use of honey collection has been studied, the expediency of its use in order to improve the physiological parameters of bees has been shown. Studies have confirmed the feasibility of carbohydrate-protein fertilizers in the form of a paste (candy), which includes: powdered sugar - 500 g, liquid honey - 125 g, bee pollen - 155 g, water - 30 ml. It was found that in all periods of accounting for bees, the families of the experimental group, fed in the form of candy with bee pollination, grew more brood than control, which on average grew 22.3% less brood.

The mass of larvae is one of the indicators of normal life of bees. Studies to determine the effect of carbohydrate and protein feed on live weight of 6-day-old larvae and newborn bees show that in the families of the experimental group live weight of 6-day-old larvae averaged 154.96 ± 0.60 mg, which is 8.61 mg more than in the control group (146.35 ± 0.87 mg); live weight of newborn bees of the experimental group receiving carbohydrate-protein feeding was 93.02 ± 0.59 mg, which is 2.57 mg more than the weight of bees of the control group, whose live weight averaged 90.45 ± 0.43 mg .

Carbohydrate-protein feeding affects the growth of bee colonies and promotes the growth of a strong family before the honey harvest, the production of larger larvae, which, in turn, allows you to get more complete bees.

Protein-carbohydrate feeding contributed to the increase of honey productivity of bee colonies at the honey harvest, which averaged 19.7 kg of marketable honey against 14.1 kg in the control group, which is 5.6 kg less. The introduction of bee pollen into the candida during the spring development of bees contributed to more intensive uterine egg laying - 11.3% more than in the control. There is also a positive effect of carbohydrate and protein nutrition on the reproductive function of the uterus.

The proposed method of feeding is simple and effective and can be recommended to beekeepers to increase the honey productivity of bee colonies and increase the intensity of egg production of queen bees. However, bee pollination can be used for feeding only in the absence of infectious and invasive diseases of bees in apiaries. It is also worth noting that bee colonies, regularly receiving carbohydrate and protein feed throughout the spring and summer, did not stop developing and no family went into a swarm state.

Scientists and practitioners have been researching the methods and means of feeding bees for many years. Complex stimulant preparations, which contain protein, mineral and vitamin components, stimulate the development of bee colonies and increase their productivity. The effect of various additives on honey bees depends on their composition. Razanova O.P. and Holubenko T.L. [27] studied the type of effect of stimulant supplements, which include vitamins, proteins and minerals, studied the productivity of queen bees, honey production and perga in bee colonies for stimulant feeding. For this purpose, complex additives were used - stimovit and antivir, which are designed to feed bee colonies for therapeutic purposes and to stimulate growth and productivity. They consist of a mixture of pollen, garlic extract and glucose.

Stimulating feeding of bees in the spring helped to increase the average daily egg production of queens in bee colonies, which received as a supplement stimulating drugs antivirus and stimovit, by 20.9 and 26.9%, respectively. The medical productivity of families in the spring was higher by 26.0% in the second group for the introduction of antivirus and by 30.1% - in the third group due to stimovit. At the end of the active season, this figure increased in the respective groups by 8.4 and 10.1% compared with the control, which was given as a stimulating feed pure sugar syrup. At the end of the spring period, bees in the experimental groups harvested more perga, respectively, by 21.8 and 29.1%. The best indicators were found in the group of bee families, which were stimulated with stimovit.

The age of the bees has an important influence on the nature of development, productivity and survival of the family. It is important that the age groups of bees are naturally formed in the family at all periods of its life. Therefore, beekeepers need to regulate the age of the family so that in the spring there is an intensive increase in nursing bees, the main bribe has accumulated a lot of flying bees, and before winter to have a sufficient number of physiologically young bees in the nest. Instincts and reflexes that determine the behavior of individuals and the family as a whole are important for the life and productivity of the bee family. Manifestation of the swarming instinct reduces the honey harvest and requires large unproductive labor costs, so the prevention of swarming - is one of the important tasks of managing the life of the family and increase the productivity of the apiary.

Kovalskyi Yu. V., Kovalska L. M. [10] investigated the influence of the number of open brood on the development of the swarm process and the age of queens on the intensity of swarming of honey bees. In families in which the number of open brood ranged

from 13 to 15 thousand cells, the lowest breeding rate was found. The swarming instinct does not manifest itself if there are 2-3 young larvae per bee colony in the family. The emergence of the swarming process led to a decrease in the number of individuals at the larval stage, regardless of the nature of the bribe. The presence of one-year-old queens in nests increased the strength of families.

The decisive factor in the maximum production of honey along with the development of families is the nomadism during the spring-summer season, which significantly affects the level of food supply for bees. After all, in the absence of honey collection, the uterus stops laying eggs, bees do not secrete wax and do not build honeycombs. Due to the nomadism of the apiary, honey resources are more widely used, the production of beekeeping products increases accordingly, and the pollination of entomophilous agricultural plants is ensured.

Various species of honey plants are widespread on the territory of Ukraine. Hrechka H. M. [7] the honey-harvesting conditions of the Forest-Steppe of Ukraine were studied, and the possibilities of their use by bee families of the Ukrainian steppe breed were determined. The apiary was taken to the forest in the spring, and to the entomophilous crops in the summer. Honey plants of gardens, meadows, forests, roadside plantations, fields provided bees with supporting and basic honey harvests. The main agricultural honeysuckle are sunflower, sainfoin, buckwheat. Entomophilous crops are the basis of the forage base, but forest honeybees should also be used. Early spring forest honeybees provide bees with pollen - a necessary source of vitamins, proteins and fats. You can get a good honey harvest from linden and acacia plantations. The source of supporting honey is summer and autumn honey plants.

Extracting nectar and pollen from flowers, bees do important work on their pollination, significantly increasing crop yields. Bees intensify their work in the presence of a stronger honey plant. The flow of nectar into the bee colony stimulates the uterus to increase egg production, and the growing brood stimulates the flight of bees in search of food. The productivity of the bee family increases accordingly.

The growth of the family, its strength and productivity also depend on the quality of cells and their number. Eggs are more willing to lay eggs on light honeycombs, so they should be used more in the spring. A strong family needs additional honeycombs to store nectar and honey during the honey harvest, as their lack will reduce the strength and development of bee colonies, which will negatively affect their productivity.

In order for the bees to be able to place all the brood and feed stocks brought during the main honey harvest in the middle of the season, they must be kept in hives of a large enough volume. This is one of the conditions for building strong bee colonies.

Lack of fodder and its low quality are the main cause of winter losses. Long-term observations have shown that bee families that consume more food in the winter will produce significantly more honey next season than families that use less food, the uterus will lay more eggs, and the family will grow rapidly in the spring. These data indicate that bee families need to be fully provided with food for the winter period and bring it to the established norms: at least 2 kg per street of bees.

Also an important condition for intensive family growth is to ensure the optimal microclimate of bee housing. In the nest of bees it is necessary to maintain the optimal temperature (34-35 °C) for the normal development of the brood, to support which the bees spend a lot of energy and food. To do this, if necessary, it is necessary to insulate the bee nest, reduce flight holes, limit air exchange. In summer, to reduce the cost of lowering the temperature, the hives are protected from excessive overheating.

Buhera S.I., Mishchenko O.A. [4] experimentally proven variant of insulation and sealing with polyethylene terephthalate (PET) transparent film of the upper part of the bee nest. The object of the study were Carpathian bees in one of the apiaries in the Kyiv region. With the traditional method of cushion insulation, there was a loss of heat produced by bees, and the weakening of bee colonies. During the use of the film, no heat loss actually occurred, and the condensate formed by bee respiration and chemical conversion of honey on the inside of the film remained in the nest. It was used in the form of water droplets by worker bees for internal needs. Breeding did not stop in families, so the need for water increased to 200-250 g per day. Bees used less energy to heat the nest, which directly affected their life expectancy and savings in food supplies. It is also noted that the bees in the experimental group produced gross honey by 25.5 kg, or 67.3% more than the control. The use of polyethylene terephthalate (PET) transparent film in the spring not only extended the lifespan of bees after hibernation, reduced their loss, but also helped to increase them before preparing for honey collection.

Prolonged rains reduce the flight activity of bees, adversely affect the secretion of nectar, reduce its sugar content. Razanova O.P., Lotka H.I. [29] the honey-collecting conditions from white acacia and the possibility of their use in the conditions of Vinnytsia region were investigated. According to research, the nectar productivity of acacia depends on weather conditions. The flowering period of acacia for the period of research fell on the end of May-beginning of June. White acacia produces nectar during the day and the bee family of medium-strength control hive produced from 2350 to 8400 g of nectar per day. One flower of white acacia released up to 5.3 mg of nectar under optimal weather conditions. At the beginning of the flowering period was 3.2 mg of nectar, on the third day - 5.3 mg, 4-9 days - the nectar content in the flower of white acacia was at the level of 4-4.2 mg, and from day 10 the nectar content decreased to 1.2 mg. Adverse weather conditions during the flowering of white acacia reduced the flight activity of bees. High wind speeds also affected their flight collection activities, and due to rainy and cloudy days, bee families did not collect a significant amount of nectar. Summarizing the results of the research, it can be stated that the best honey harvest is facilitated by warm, moderately humid, windless weather, during which the honey productivity of bee families from white acacia averaged 9.7 kg per family.

Bee diseases negatively affect the productivity of families, as well as dramatically increase costs. In bee colonies affected by infectious and invasive diseases, there is a significant departure of adult bees, the number of brood is reduced. In case of untimely measures for their recovery, bee families weaken and may even die. Issues of prevention and control of diseases should be under the constant control of the beekeeper, because in the apiaries there is a mixed form of co-occurring diseases, in particular, varroasis, rot, ascospherosis, and sometimes nosematosis. Productivity of nosematous bee families decreases to 60-70%, putrefactive - to 25-75%, varroat - to 50-80%.

Maslii I.H., Niemkova S.M., Stupak L.P., Desiatnykova O.V. [15] conducted epidemiological studies on bee diseases and monitoring data in 17 regions of Ukraine. Bacterial, fungal, viral infections and infestations cause great damage to beekeeping, leading to the death of adults, larvae and pupae. This reduces the development of bee colonies and adversely affects honey and pollination productivity. Human intervention also contributes to the spread of bee diseases: nomadic apiaries, exchange of breeding material, noncompliance with the recommendations for diagnostic tests for pathogens and veterinary measures in apiaries. Also in the conditions of reduction of the areas of crops of entomophilous cultures the high concentration of bees is registered. This contributes to the creation of favorable conditions for the development of various pathogenic microorganisms and parasites, their transmission from sick to healthy individuals, spreading throughout Ukraine. Reducing the risk of disease spread is possible with timely diagnosis, clinical examinations of apiaries, laboratory tests, organization of measures for the recovery of bee colonies, disease prevention.

Significant damage to beekeeping is caused by poisoning of bees with chemicals - pesticides and herbicides, due to the widespread use of pesticides in agriculture. In Ukraine in 2018 due to poor quality pesticides and lack of information on the schedules of field cultivation killed about 45 thousand bee families.

Crop production is the main source of honey and an important factor in improving the fodder base, which due to climate change is unevenly distributed by honey harvest according to the seasons. The purpose of research Kucheriavyi V.P., Razanova O.P., Razanov O.S. [14] was the determination of nectar productivity and sugar content in the nectar of a rare honey plant species - roundhead. The plant was sown on infertile soils in the Vinnytsia region. Round-headed golovaten is unpretentious, resistant to adverse conditions and secretes nectar even in dry weather. Flowering of honeydew in the year of research lasted 35 days and took place in the hot conditions of 2017. The following year, the nectar productivity of the plant increased to 591.1 kg / ha, or 51.4% compared to last year. The sugar content in the nectar was 1.19-1.27 mg. The flight activity of bees during the flowering of round-headed beetles was 197 pieces in 3 minutes. Roundhead has a high sugar content of nectar. The sugar content in the nectar of one flower was 1.27 ± 0.0018 mg in 2017, which is 6.7% more than last year. In the second year, nectar productivity increased to 591.1 kg / ha, or 51.4%. Despite the infertile soil and hot conditions for the growing season, the medical productivity of round-headed beetles was high.

Conclusions.

The productivity of bee colonies depends on the improvement of technological methods: application of advanced beekeeping methods, improvement of pollination qualities of bees, improvement of queen production, improvement and expansion of fodder base resources, preservation of bee colonies in winter, stimulation of uterine egg production with diseases, conducting systematic surveys of bee colonies.

Used literature

1. Адамчук Л. О., Броварський В.Д., Новицька А.Т., Білоцерківець Т.І. Cichorium L. для забезпечення бджіл кормами. Науково-технічний бюлетень. 2016. № 116. С. 5-15.

2. Баглей О. В. Оцінка екологічного стану територій за допомогою продуктів бджільництва. Матеріали XII Міжнародної науково-практичної конференції "Проблеми та перспективи розвитку науки на початку третього тисячоліття у країнах СНД": Збірник наукових праць. Переяслав-Хмельницький. 2013. С. 24.

3. Броварський В.Д., Папченко О.В. Кормові ресурси, розвиток і продуктивність бджолиних сімей. Вісник Житомирського національного агроекологічного університету (Науковотеоретичний збірник). 2014. Том 23. № 2 (44). С.155–158.

4. Бугера С.І., Міщенко О.А. Весняний розвиток та продуктивність бджолиних сімей при використанні поліетилентерефталатної плівки в якості утеплювача гнізда. Бджільництво України. 2017. № 2. С. 27-32.

5. Ведмідь І. В., Шеремета В. І., Каплуненко В. Г. Стимуляція яйценосності бджолиних маток біологічно активними речовинами. Вісник Сумського національного аграрного університету. 2014. № 2/1 (24). С. 200-204.

6. Гиниятуллин М.Г., Лебедев В.И., Ишемгулов А.М. Биологические основы комплексного использования семей. Пчеловодство. 2002. № 1. С. 11-14.

7. Гречка Г. М. Сучасний медозбір і його використання бджолиними сім'ями. Вісник Полтавської державної аграрної академії. 2011. № 3. С. 63-67.

8. Жилин В.В. Организационно-технологические аспекты производства маток. Пчеловодство. 2006. № 6. С. 12-14.

9. Зотько М.О. Вплив віку і маси бджолиних маток на репродуктивну діяльність та медову продуктивність. Аграрна наука та харчові технології. 2019. № 2 (105). С. 86-94.

10. Ковальський Ю. В., Ковальська Л. М. Особливості розведення карпатських бджіл. Науковий вісник ЛНУВМБТ імені С.З. Ґжицького. 2016.Том 18. № 1 (65). Ч. 3. С. 60-64.

11. Кочетов А.С. Сила пчелиной семьи и качество пчел. Пчеловодство. 2007. № 4. С.10-11.

12. Кравченко М. В. Розвиток економічної

ефективності бджільництва в ринкових умовах. Економіка. Управління. Інновації. 2014. Вип. № 2 (12). Режим доступу:http://nbuv.gov.ua/UJRN/eui_2014_2_34

13. Кривцов Н.И., Лебедев В.И. Разведение и содержание пчелиных семей с основами селекции. М., 2006. 386 с.

14. Кучерявий В.П., Разанова О.П., Разанов О.С. Зміцнення кормової бази для бджіл шляхом посіву головатня круглоголового. Аграрна наука та харчові технології. 2018. № 2 (101). С. 44-51.

15. Маслій І.Г., Нємкова С.М., Ступак Л.П., Десятникова О.В. Моніторинг хвороб бджіл в Україні. Ветеринарна медицина. 2015. № 101. С. 116-121.

16. Мирось В.В., Ковтун С.Б. Практикум з бджільництва. Харків: ХНАУ. 2014. 192 с.

17. Міщенко О.А., Литвиненко О.М., Афара К.Д., Криворучко Д.І. Ефективність використання вуглеводно-білкової підгодівлі для медоносних бджіл. Вісник аграрної науки. 2021. № 3 (816). С. 39-45.

18. Папченко О. В. Розвиток бджолиних сімей за умов інтенсивних медозборів та різних способів їх утримання. Науковий вісник НУБіП України. 2015. № 223. С. 155–161.

19. Пашаян С.А., Столбов Н.М. Кормовые добавки для пчел. Пчеловодство. 2008. № 7. С. 14-15.

20. Поліщук В. П. Бджільництво. К. : Вища школа, 2001. 287 с.

21. Поліщук В., Волощук І. Вплив бджолиних маток різного віку на розвиток і продуктивність бджолиних сімей. Тваринництво України. 2014. № 2 (54). С. 7-10.

22. Разанов С.Ф., Безпалий І.Ф., Бала В.І., Донченко Т.А. Технологія виробництва продукції бджільництва. К.: Аграрна освіта, 2010. 277 с.

23. Разанов С.Ф., Недашківський В.М., Разанов О.С. Основи технології виробництва продукції бджільництва: навчальний посібник. Вінниця: ТОВ "Нілан-ЛТД", 2018. 196 с.

24. Разанова О.П. Вплив апівіту на тривалість життя бджіл та масу ректиму. Збірник наукових праць "Аграрна наука та харчові технології". Вінниця. 2017. Вип. 5 (99). С. 46-52.

25. Разанова О.П. Влияние апивита на жизнеспособность пчелиных семей в период зимовки. Ştiinţa agricolă. 2018. nr. 2. С. 111-114.

26. Разанова О.П. Расширение кормовой базы пчеловодства для повышения производительности пчелиных семей. Сборник научных трудов "Актуальные вопросы переработки мясного и молочного сырья". 2019. С. 224-229.

27. Разанова О.П., Голубенко Т.Л. Продуктивність бджолиних сімей за стимулюючої підгодівлі комплексними препаратами. Аграрна наука та харчові технології. 2018. № 4 (103). С. 130-138.

28. Разанова О.П., Жуковська Т.С., Горячий В.А. Використання біологічних препаратів для лікування вароатозу бджіл. Збірник наукових праць "Аграрна наука та харчові технології". 2018. Вип. 2 (101). С. 142-149.

29. Разанова О.П., Льотка Г.І. Акація біла, як кормовий ресурс для розвитку бджолиних сімей. Сільське господарство та лісівництво. 2020. № 19. С. 86-92.

30. Разанова О.П., Скоромна О.І. Технологія виробництва продукції бджільництва: Навчальний посібник. Вінниця, 2020. 408 с.

31. Разанова О.П., Скоромна О.І., Микитюк І.Г. Тенденції розвитку ринку українського меду. Аграрна наука та харчові технології. Вінниця. 2017. № 3 (97). С. 198-205.

32. Сіменко Л. І. Добра матка – запорука успіху: з власного досвіду. Пасіка. 2017. № 1. С. 11.

33. Скоромна О. І., Разанова О. П. Розвиток галузі бджільництва як джерело структури продовольчої безпеки. Збірник наукових праць "Аграрна наука та харчові технології". 2019. № 3 (106). С. 70-82.

References

1. Adamchuk L. O., Brovarskyi V.D., Novytska A.T., Bilotserkivets T.I. (2016). Cichorium L. dlia zabezpechennia bdzhil kormamy. [Cichorium L. to provide bees with food]. Naukovo-tekhnichnyi biuleten. 116. 5-15.

2. Bahlei O. V. (2013). Otsinka ekolohichnoho stanu terytorii za dopomohoiu produktiv bdzhilnytstva. [Estimation of ecological condition of territories by means of beekeeping products]. Materialy XII Mizhnarodnoi naukovo-praktychnoi konferentsii "Problemy ta perspektyvy rozvytku nauky na pochatku tretoho tysiacholittia u krainakh SND": Zbirnyk naukovykh prats. Pereiaslav-Khmelnytskyi. 24.

3. Brovarskyi V.D., Papchenko O.V. (2014). Kormovi resursy, rozvytok i produktyvnist bdzholynykh simei. [Feed resources, development and productivity of bee colonies]. Visnyk Zhytomyrskoho natsionalnoho ahroekolohichnoho universytetu (Naukovoteoretychnyi zbirnyk). 23. 2 (44). 155–158.

4. Buhera S.I., Mishchenko O.A. (2017). Vesnianyi rozvytok ta produktyvnist bdzholynykh simei pry vykorystanni polietylentereftalatnoi plivky v yakosti utepliuvacha hnizda. [Spring development and productivity of bee colonies when using polyethylene terephthalate film as nest insulation]. Bdzhilnytstvo Ukrainy. 2. 27-32.

5. Vedmid I. V., Sheremeta V. I., Kaplunenko V. H. (2014). Stymuliatsiia yaitsenosnosti bdzholynykh matok biolohichno aktyvnymy rechovynamy. [Stimulation of egg production of queen bees with biologically active substances]. Visnyk Sumskoho natsionalnoho ahrarnoho universytetu. 2/1 (24). 200-204.

6. Giniyatullin M.G., Lebedev V.I., Ishemgulov A.M. (2002). Biologicheskie osnovyi kompleksnogo ispolzovaniya semey. [Biological bases of complex use of families]. Pchelovodstvo. 1. 11-14.

7. Hrechka H. M. (2011). Suchasnyi medozbir i yoho vykorystannia bdzholynymy simiamy. [Modern honey collection and its use by bee colonies]. Visnyk Poltavskoi derzhavnoi ahrarnoi akademii. 3. 63-67.

8. Zhilin V.V. (2006).Organizatsionno-tehnologicheskie aspektyi proizvodstva matok. [Organizational and technological aspects of uterine production]. Pchelovodstvo. 6. 12-14.

9. Zotko M.O. (2019). Vplyv viku i masy bdzholynykh matok na reproduktyvnu diialnist ta medovu produktyvnist. [Influence of age and weight of queen bees on reproductive activity and honey productivity]. Ahrarna nauka ta kharchovi tekhnolohii. 2 (105). 86-94.

10. Kovalskyi Yu. V., Kovalska L. M. (2016). Osoblyvosti rozvedennia karpatskykh bdzhil. [Features of breeding Carpathian bees]. Naukovyi visnyk LNUVMBT imeni S.Z. Gzhytskoho. 18. 1 (65). 3. 60-64.

11. Kochetov A.S. (2007). Sila pchelinoy semi i kachestvo pchel. [The strength of the bee family and the quality of bees]. Pchelovodstvo. 4. 10-11.

12. Kravchenko M. V. (2014). Rozvytok ekonomichnoi efektyvnosti bdzhilnytstva v rynkovykh umovakh. [Development of economic efficiency of beekeeping in market conditions]. Ekonomika. Upravlinnia. Innovatsii. 2 (12). Rezhym dostupu:http://nbuv.gov.ua/UJRN/eui_2014_2_34

13. Krivtsov N.I., Lebedev V.I. (2006). Razvedenie i soderzhanie pchelinyih semey s osnovami selektsii. [Breeding and maintenance of bee colonies with the basics of selection]. M., 386.

14. Kucheriavyi V.P., Razanova O.P., Razanov O.S. (2018). Zmitsnennia kormovoi bazy dlia bdzhil shliakhom posivu holovatnia kruhloholovoho. [Strengthening the forage base for bees by sowing roundworms]. Ahrarna nauka ta kharchovi tekhnolohii. 2 (101). 44-51.

15. Maslii I.H., Niemkova S.M., Stupak L.P., Desiatnykova O.V. (2015). Monitorynh khvorob bdzhil v Ukraini. [Monitoring of bee diseases in Ukraine]. Veterynarna medytsyna. 101. 116-121.

16. Myros V.V., Kovtun S.B. (2014). Praktykum z bdzhilnytstva. [Workshop on beekeeping]. Kharkiv: KhNAU. 192.

17. Mishchenko O.A., Lytvynenko O.M., Afara K.D., Kryvoruchko D.I. (2021). Efektyvnist vykorystannia vuhlevodno-bilkovoi pidhodivli dlia medonosnykh bdzhil. [Efficiency of using carbohydrate-protein fertilization for honey bees]. Visnyk ahrarnoi nauky. 3 (816). 39-45.

18. Papchenko O. V. (2015). Rozvytok bdzholynykh simei za umov intensyvnykh medozboriv ta riznykh sposobiv yikh utrymannia. [Development of bee colonies under conditions of intensive honey harvests and different ways of keeping them]. Naukovyi visnyk NUBiP Ukrainy. 223. 155–161.

19. Pashaian S.A., Stolbov N.M. (2008). Kormovьe dobavky dlia pchel. [Feed additives for bees]. Pchelovodstvo. 7. 14-15.

20. Polishchuk V. P. (2001). Bdzhilnytstvo. [Beekeeping]. K. : Vyshcha shkola. 287.

21. Polishchuk V., Voloshchuk I. (2014). Vplyv bdzholynykh matok riznoho viku na rozvytok i produktyvnist bdzholynykh simei. [Influence of queen bees of different ages on the development and productivity of bee colonies]. Tvarynnytstvo Ukrainy. 2 (54). 7-10.

22. Razanov S.F., Bezpalyi I.F., Bala V.I., Donchenko T.A. (2010). Tekhnolohiia vyrobnytstva produktsii bdzhilnytstva. [Technology of beekeeping production]. K.: Ahrarna osvita. 277.

23. Razanov S.F., Nedashkivskyi V.M., Razanov O.S. (2018). Osnovy tekhnolohii vyrobnytstva produktsii bdzhilnytstva: navchalnyi posibnyk. [Fundamentals of beekeeping production technology: a textbook]. Vinnytsia: TOV "Nilan-LTD". 196.

24. Razanova O.P. (2017). Vplyv apivitu na tryvalist zhyttia bdzhil ta masu rektymu. [Influence of apivite on bee life expectancy and rectal mass]. Zbirnyk naukovykh prats "Ahrarna nauka ta kharchovi tekhnolohii". Vinnytsia. 5 (99). 46-52.

25. Razanova O.P. (2018). Vliyanie apivita na zhiznesposobnost pchelinyih semey v period zimovki. [The influence of apivite on the viability of bee colonies during the winter]. Ştiinţa agricolă. nr. 2. 111-114.

26. Razanova O.P. (2019). Rasshirenie kormovoy bazyi pchelovodstva dlya povyisheniya proizvoditelnosti pchelinyih semey. [Expanding the fodder base of beekeeping to increase the productivity of bee colonies]. Sbornik nauchnyih trudov "Aktualnyie voprosyi pererabotki myasnogo i molochnogo syirya". 224-229.

27. Razanova O.P., Holubenko T.L. (2018). Produktyvnist bdzholynykh simei za stymuliuiuchoi pidhodivli kompleksnymy preparatamy. [Productivity of bee colonies with stimulating feeding with complex drugs]. Ahrarna nauka ta kharchovi tekhnolohii. 4 (103). 130-138.

28. Razanova O.P., Zhukovska T.S., Horiachyi V.A. (2018). Vykorystannia biolohichnykh preparativ dlia likuvannia varoatozu bdzhil. [The use of biological drugs for the treatment of bee varroasis]. Zbirnyk naukovykh prats "Ahrarna nauka ta kharchovi tekhnolohii". 2 (101). 142-149.

29. Razanova O.P., Lotka H.I. (2020). Akatsiia bila, yak kormovyi resurs dlia rozvytku bdzholynykh simei. [Acacia is white as a fodder resource for the development of bee colonies]. Silske hospodarstvo ta lisivnytstvo. 19. 86-92.

30. Razanova O.P., Skoromna O.I. (2020). Tekhnolohiia vyrobnytstva produktsii bdzhilnytstva: Navchalnyi posibnyk. [Technology of beekeeping production: Textbook]. Vinnytsia. 408.

31. Razanova O.P., Skoromna O.I., Mykytiuk I.H. (2017). Tendentsii rozvytku rynku ukrainskoho medu. [Trends in the development of the Ukrainian honey market]. Ahrarna nauka ta kharchovi tekhnolohii. Vinnytsia. 3 (97). 198-205.

32. Simenko L. I. (2017). Dobra matka – zaporuka uspikhu: z vlasnoho dosvidu. [Good uterus - the key to success: from personal experience]. Pasika. 1. 11.

33. Skoromna O. I., Razanova O. P. (2019). Rozvytok haluzi bdzhilnytstva yak dzherelo struktury prodovolchoi bezpeky. [Development of beekeeping as a source of food security structure]. Zbirnyk naukovykh prats "Ahrarna nauka ta kharchovi tekhnolohii". 3 (106). 70-82.

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