

**PROSPECTS FOR HARVESTING NON-TIMBER FOREST PRODUCTS
IN CHERNIVTSI REGION**

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Abstract. *The volume of harvesting and use of non-timber resources of the forest in Chernivtsi region is considered. The role of non-timber resources in supplying medicinal, food, technical and fodder forest raw materials of consumers in Chernivtsi region is highlighted. The largest share of non-timber forest products was harvested at the State Enterprise "Sokyryany Forestry".*

Average annual volumes of hay harvesting by enterprises of the region in recent years have practically not changed and amount to 254 tons.

Comparisons of the volumes of birch saplings, whose values range from 100 to 500 tons, are directly related to weather conditions.

*The enterprise produces beekeeping products - honey and pollen. The annual harvest of honey did not exceed 100 centers, and pollen - 200 kg. Potential opportunities for enterprises to harvest honey are much greater than their actual harvest, as the region grows the honey plants: *Robinia pseudoacacia* L., *Caragana arborescens* LAM., *Tilia cordata* MILL., *Tilia platyphyllos* Scop., *Acer tataricum* L., *Trifolium repens* L., *Mentha × piperita* L., *Rubus idaeus* L., *Tussilago farfara* L.*

*It was established that the species list of medicinal raw materials reached 22% of the maximum possible. There are regularly harvested 15 medicinal plant species. Last year, only 6 species of medicinal plants (*Sambucus nigra* L., *Hypericum perforatum* L., *Urtica dioica* L., *Tussilago farfara* L., *Plantago major* L., *Chelidonium majus* L.) had in demand on the domestic market. The reasons for the reduction of volumes and the complete cessation of certain types medicinal plants harvesting are the low profitability and competitiveness of wild plants. The comparison of harvesting volumes of wild fruits and berries for the specified period has been carried out. It was found *Juglans regia* L., *Aronia melanocarpa* (MICHX.) ELLIOTT, *Cornus mas* L. are the most popular in the area.*

The solution of the problem of integrated and balanced use of forest natural resources is possible due to increased demand and, accordingly, the promotion of the naturalness and safety of forest non-timber raw materials.

Key words: *uses of forest, non-timber forest products, wild plants, harvesting volumes, medicinal plants, beekeeping products, birch sap.*

In modern conditions, forestry is driven by the multipurpose use of forest wealth. Secondary use of forest becomes an integral part of forest management.

During recent years, in the forests of certain regions of Ukraine, there has been an increase in the volume of special use of non-timber forest resources, including harvesting of secondary forest materials and by-products of forest use (harvesting of wild fruits, mushrooms, berries, medicinal plants).

Intensive forestry should provide for regulated use of non-timber forest products and complete its restoration.

The use of non-timber forest products in the region is safe, unlike the northern regions of Ukraine suffered badly from Chernobyl nuclear disaster. The diversity of the localization conditions, vertical zone has caused the formation of a sufficiently rich flora of higher vascular plants on the territory of the region, of which there are over 1500 species [11]. There are 58 varieties of medicinal plants and berries, which are recognized as official medicine in the Chernivtsi region.

Analysis of studies and publications.

Non-timber forest products may be gathered from the wild, or produced in forest plantations, agroforestry systems and from trees outside forests. Examples of non-timber forest products include products used as food and food additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibres (used in construction, furniture, clothing or utensiles), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes [2].

Biological bases and technological processes of harvesting non-timber forest products are widely covered in popular science literature. In particular, bioecological and therapeutic properties of 240 species of forest plants that are used for medical purposes are thoroughly investigated [3]. Also, the possibilities of using processed products in industry were specified [10]. Methods of accounting for non-wood forest products are detailed in the works of S.M. Koziakov, D.A. Telishevsky,

V.P. Ryabchuk and other researchers [1, 7, 9]. It is established norms of production for harvesting the most widespread wild berries [6].

Contemporary world trends and benefits of non-timber production products highlighted are reflected in the scientific literature separately for each country or region [5].

The current state of industrial production and volumes of wild mushrooms, berries, medicinal herbs, birch sap and beekeeping products in the region have not been studied in recent decades. The natural products demand has been increasing in the world [8].

The conducted studies pay attention to the necessity of conducting inventory planning and natural accounting of non-timber forest resources and controlling the movement of non-timber forest products [4].

The role of non-timber resources in the context of sustainable forest management is being activated- [3].

Prospects for the development of industrial harvesting of wild plant products in the Chernivtsi region – have not been investigated.

The aim of research is analyze the experience and volumes of modern industrial harvesting of non-timber forest resources in Chernivtsi region and estimate the potential of natural wildlife resources to increase production.

Research Methodology. The research program provided of using of analysis and synthesis methods. Establishing the prospects for harvesting non-timbered production provided for a comparison of industrial harvesting of non-wood forest products volumes in the last eight years. Initial materials for the study were reported annual data of wild produce, medicinal and technical raw materials of forest enterprises, as well as agro-industrial complexes.

Results of research. Chernivtsi Regional Forestry and Hunting Management consists of 15 enterprises. The largest share of non-timbered forest products was harvested at the State Enterprise "Sokyryany forestry".

Among that non-timber forest products harvested to the greatest extent in forest enterprises and agricultural enterprises, there are hay, wild fruits and berries, birch sap, beekeeping products and medicinal plant raw materials.

Hay was being harvested only in enterprises for their own needs in the amount of about 254 tons annually. The largest volumes of work pieces were made in 2013 and amounted to almost 400 tons.

The Chernivtsi region is rich in wild fruits and berries. It has been established that the following fruits and berries are the most in demand: *Juglans regia* L., *Aronia melanocarpa* (MICHX.) ELLIOTT, *Cornus mas* L. By 2015, the listed types of non-timber forest products were harvested annually in the volumes shown in Figure 1.

In the last two years, wild fruits and berries were practically not harvested with the exception of *Cornus mas* L. in the amount of 15 quintals.

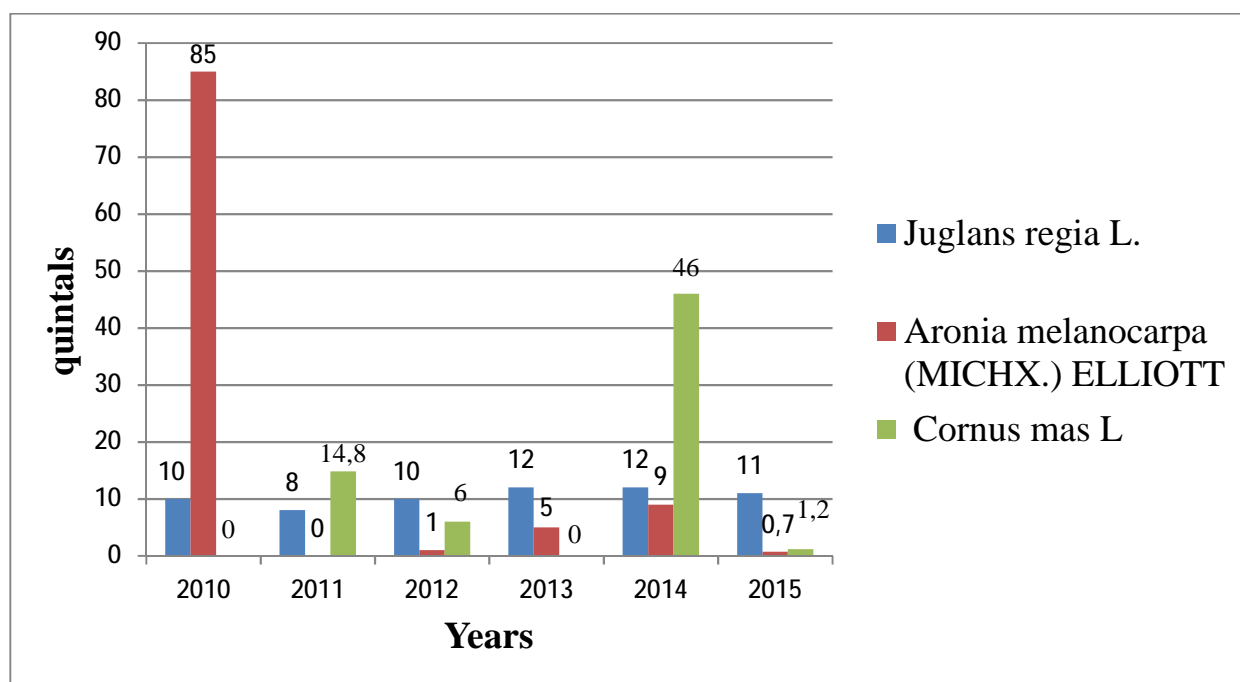


Figure 1. Dynamics of volumes of industrial harvesting of wild fruits and berries in Chernivtsi region

Harvesting birch sap directly depends on weather conditions. The best weather conditions for birch sap also were in 2013. Then 486 tons of birch sap was harvested. This year spring weather with the temperature, which stimulates the intense sap flow in trees, was only two weeks. In connection with this, the least volume was harvested.

There were amounted 101 tons in 2018. The average annual harvest of birch sap was 224 tons. Modern trends of increasing the area of birch stands are expected to increase potential volumes of birch sap work pieces.

Honey and pollen are products of beekeeping, which are harvested by enterprises of forestry and agro-industrial complex.

The productivity of honey plants also depends on weather conditions, reducing or prolonging the timing of their flowering. It's known, bees in the cool or rainy weather also do not fly.

The most productive in terms of harvesting honey was 2014. Then about 96 quintals of honey were collected. The most productive in terms of harvesting pollen was 2017. Then the enterprises were able to harvest and sell 200 kg of pollen. The average annual volume of honey was about 25 quintals. The pollen was almost not harvested until 2017.

Potential able of enterprises for harvesting honey are much larger than their actual harvest. Large areas of honey plants are in the region. But the component of the formation of plans for harvesting non-timber products, mainly birch sap and bee products, is the size of demand for products. The dumping of prices for products of lower quality substantially affects demand and does not allow increasing the volume of beekeeping products.

The enterprises of the Chernivtsi region are preparing medicinal raw materials. Medicinal plants are harvested during the period of maximum accumulation of biologically active substances in them. About 15 medicinal plants that harvests in the research region have a strongly expressed therapeutic effect.

The active substances accumulate in separate parts of plants: in leaves (*Hypericum perforatum* L., *Urtica dioica* L., *Tussilago farfara* L., *Plantago major* L.), flowers (*Tilia cordata* Mill.), inflorescences (*Sambucus nigra* L. and fruits (*Crataegus monogyna* Jacq., *Sorbus aucuparia* L., *Rosa canina* L.).

The main customer of the pharmaceutical raw material is the pharmacy union. It buys the forest medicinal raw materials. Current trends in the pharmacy business

reflect the decline of demand for medicinal forestry raw materials in the region (Figure 2).

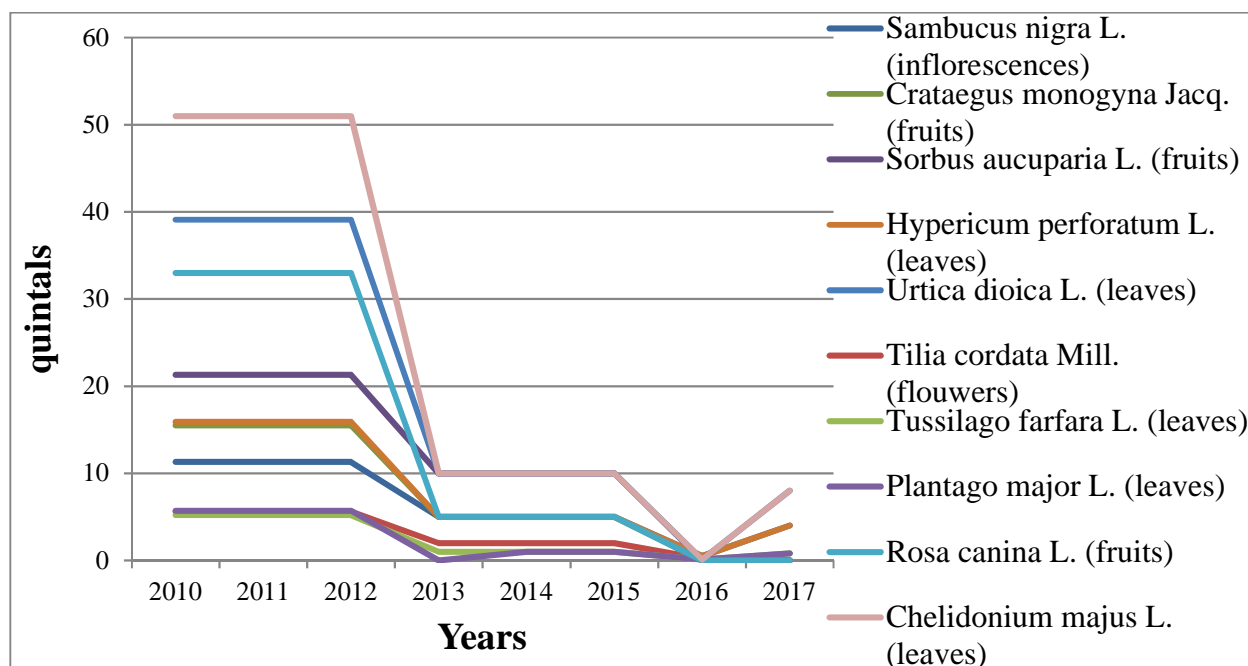


Figure 2. Dynamics of volume of harvesting of forest medicinal raw materials

Starting from 2012 the provision volume of medicinal raw materials was annual decrease. In 2016 there was a complete cessation of the medicinal plants industrial harvesting. Last year, only 6 species of medicinal plants (*Sambucus nigra* L., *Hypericum perforatum* L., *Urtica dioica* L., *Tussilago farfara* L., *Plantago major* L., *Chelidonium majus* L.) had in demand on the domestic market.

Conclusions and Prospects

1. Non-timber forest resources have insignificant reproduction times compared to forest resources. The use of non-timber resources should be supported and encouraged. Purposeful, rational and non-exhausting interference in the processes of plant growth and development will allow the full use of natural forest riches.

2. The non-timber Chernivtsi forest resources are very diverse in species composition and character of the use. They cover food, medicinal, honey, technical, fodder and other economic groups of plants. Sometimes, the profit from the sale of these resources may exceed the profit from the sale of wood. However, recent years,

demand for non-timber forest products and harvesting them accordingly significantly reduced.

It was established that the species list of medicinal raw materials reached 22% of the maximum possible. It has been established that the following forests plant part are the most in demand: *Juglans regia* L., *Aronia melanocarpa* (MICHX.) ELLIOTT, *Cornus mas* L., *Sambucus nigra* L., *Hypericum perforatum* L., *Urtica dioica* L., *Tussilago farfara* L., *Plantago major* L., *Chelidonium majus* L.

3. The reason of the situation is the low competitiveness of wild produce in market conditions and the lack of information on the extraordinary useful properties of forestry products. The solution of the problem of integrated and balanced of forest natural resources use is possible due to increased demand and, accordingly, the promotion of the naturalness and safety of forest non-timber raw materials.

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ПЕРСПЕКТИВИ ЗАГОТІВЛІ НЕДЕРЕВНОЇ ПРОДУКЦІЇ ЛІСІВ У ЧЕРНІВЕЦЬКІЙ ОБЛАСТІ

О. В. Токарева, Т. М. Собко, В. В. Товарницький

Розглянуто обсяги заготівлі та використання недеревних ресурсів лісу у Чернівецькій області. Висвітлено роль недеревних ресурсів у забезпеченні лікарською, харчовою, технічною та кормовою лісовою сировиною споживачів у Чернівецькій області. Найбільша частка недеревної продукції лісів заготовлюється у ДП "Сокирянське ЛГ".

Середні щорічні обсяги заготівлі сіна підприємствами області за останні роки практично не змінились та становлять 254 тони.

Проведено порівняння обсягів заготівлі березового соку, значення яких коливаються від 100 до 500 тон і безпосередньо залежать від погодних умов.

*На підприємстві заготовляють продукти бджільництва – мед та пилік. Щорічна заготівля меду не перевищувала 100 центнерів, а пиліку – 200 кг. Потенційні можливості підприємств щодо заготівлі меду набагато більші ніж фактичні їх заготівлі, оскільки в регіоні зростають медоноси: *Robinia pseudoacacia L., Caragana arborescens Lam., Tilia cordata Mill., Tilia platyphyllos Scop., Acer tataricum L., Trifolium repens L., Mentha × piperita L., Rubus idaeus L., Tussilago farfara L.**

*Встановлено, що видовий перелік лікарської сировини сягав до 22 % від максимально можливого. Регулярно заготовлювались 15 лікарських видів рослин. В минулому році лише на 6 видів лікарських рослин (*Sambucus nigra L., Hypericum perforatum L., Urtica dioica L., Tussilago farfara L., Plantago major L., Chelidonium majus L.*) існує попит на внутрішньому ринку збуту. Причинами зменшення обсягів та повного припинення заготівлі окремих видів лікарських рослин є низька рентабельність та конкурентоспроможність дикорослих рослин. Проведено порівняння обсягів заготівлі дикорослих плодів та ягід за зазначений період. Встановлено, що найбільше користується попитом: *Juglans regia L., Aronia melanocarpa (MICHX.) ELLIOTT, Cornus mas L.**

Вирішення проблеми комплексного та збалансованого використання лісових природних ресурсів можливе завдяки підвищенню попиту, і відповідно популяризації натуральності та безпечності лісової недеревної сировини.

Ключові слова: *побічне користування, недеревна продукція лісу, дикорослі рослини, обсяги заготівлі, лікарські рослини, продукти бджільництва, березовий сік.*

ПЕРСПЕКТИВЫ ЗАГОТОВКИ НЕДРЕВЕСНОЙ ПРОДУКЦИИ ЛЕСОВ В ЧЕРНОВИЦКОЙ ОБЛАСТИ

О. В. Токарева, Т. М. Собко, В. В. Товарницкий

Рассмотрены объемы заготовки и использования недревесных ресурсов леса в Черновицкой области. Освещена роль недревесных ресурсов в обеспечении лекарственным, пищевым, техническим и кормовым сырьем потребителей в Черновицкой области. Наибольшая доля недревесной продукции лесов заготавливается в ГП "Сокирянское ЛХ".

Средние ежегодные объемы заготовки сена предприятиями области за последние годы практически не изменились и составляют 254 тонны.

Проведено сравнение объемов заготовки березового сока, значения которых колеблются от 100 до 500 тонн и напрямую зависят от погодных условий.

*На предприятиях заготавливают продукты пчеловодства - мед и пыльцу. Ежегодная заготовка меда не превышала 100 центнеров, а пыльцы - 200 кг. Потенциальные возможности предприятий по заготовке меда гораздо больше, чем фактические, поскольку в регионе растут такие медоносы: *Robinia pseudoacacia* L., *Caragana arborescens* LAM., *Tilia cordata* MILL., *Tilia platyphyllos* Scop., *Acer tataricum* L., *Trifolium repens* L., *Mentha × piperita* L., *Rubus idaeus* L., *Tussilago farfara* L.*

*Установлено, что видовой перечень лекарственного сырья достигал до 22% от максимально возможного. Регулярно заготавливались 15 лекарственных видов растений. В прошлом году лишь на 6 видов лекарственных растений (*Sambucus nigra* L., *Hypericum perforatum* L., *Urtica dioica* L., *Tussilago farfara* L., *Plantago major* L., *Chelidonium majus* L.) существовал спрос на внутреннем рынке сбыта. Причинами уменьшения объемов и полного прекращения заготовки отдельных видов лекарственных растений является низкая рентабельность и конкурентоспособность дикорастущих растений по сравнению с химическими лекарственными препаратами. Проведено сравнение объемов заготовки дикорастущих плодов и ягод за указанный период. Установлено, что наиболее пользуется спросом плоды древесных растений: *Juglans regia* L., *Aronia melanocarpa* (MICHX.) ELLIOTT, *Cornus mas* L.*

Решение проблемы комплексного и сбалансированного использования лесных природных ресурсов возможно благодаря повышению спроса, и соответственно популяризации натуральности и безопасности лесной недревесной продукции леса.

Ключевые слова: *побочное пользование, недревесная продукция леса, дикорастущие растения, объемы заготовки, лекарственные растения, продукты пчеловодства, березовый сок.*