

INVENTORY OF WOODY VEGETATION ALONG VITEBSK HIGHWAYS UNDER DIFFERENT ANTHROPOGENIC LOAD

Yulia Fomkina

VSU named after P.M. Masherov, Vitebsk, Belarus

Keywords: woody vegetation, urban environment, inventory, vital state of plants.

Tree plantations in residential areas are exposed to extreme negative loads, most often associated with air pollution. Under the influence of pollution, plants are weakened, sensitive species die off. All this leads to a decrease in their environmental protection functions. The most general expression of the level of compliance of a plant organism with a set of environmental conditions can be considered its general habitus – the state of life. This is one of the indicators that reflects the degree of plant resistance during growth and development [1]. Diagnostics of the state of woody plants is an important component of monitoring, which allows substantiating recommendations for the use of the most productive and durable green spaces in urban gardening.

The purpose of our work is to assess the vital state of roadside trees and shrubs in an urban environment.

Material and methods. The research was carried out in Vitebsk using the route method. Four routes have been laid down: on the street. Leningradskaya (route length 1,00 km), st. Chapaeva (1,03 km), st. Uritsky and Communist (439,3 m), in the period August-July 2020–2021. The object of the study was tree and shrub vegetation. The assessment of the vital state was carried out according to the method [2]. As a result, it was calculated: on the street. Leningradskaya – 301 trees and 8 shrubs, and also the area of 4 flower beds was taken into account; on st. Chapaev – 314 trees, 29 shrubs, 31 flower beds; on st. Uritsky – 81 trees, 5 shrubs, 3 flower beds; on st. Communist – 27 trees.

Findings and their discussion. In the course of the study, the species composition of woody vegetation was determined. As can be seen from Table 1, the largest number of species was found along the roadway of the street. Chapaev and amounted to 22 species, the dominant species were: small-leaved linden (*Tilia cordata*) – 18,3%, horse chestnut (*Aesculus hippocastanum*) – 17,8%. The smallest number of species – 11, found on the street. Uritsky and st. Communist. The dominant species were drooping birch (*Betula pendula*) – 21%; large-leaved linden (*Tilia platyphyllos*) – 21%; small-leaved linden (*Tilia cordata*) – 19%; horse chestnut (*Aesculus hippocastanum*) – 17%.

On st. Leningradskaya, the average diameter of the forest stand was 19.62 ± 1.08 cm, the height was $11,92 \pm 0,59$ m; on st. Chapaev $21,55 \pm 0,82$ cm and $12,41 \pm 0,45$ m, respectively; on st. Uritsky and st. Communist 30.06 ± 1.17 cm and $20,12 \pm 0,78$, respectively.

Table 1 – Inventory of trees and shrubs

Street name	Total number of species	Dominant species, %
st. Leningradskaya (two-way traffic)	13	Fraxinus excelsior – 30,42; Betula pendula – 24,92%
st. Chapaeva (two-way traffic)	22	Tilia cordata – 18,3% Aesculus hippocastanum – 17,8%
st. Uritsky and st. Communist (One Way)	11	Betula pendula – 21%; Tilia platyphyllos – 21%; Tilia cordata – 19%; Aesculus hippocastanum – 17%.

Table 2 reflects the data on the assessment of the vital state of woody vegetation on the streets under study. In all cases, along the roadways both with two-way traffic (Leningradskaya St. and Chapaev St.) and with one-way traffic (Uritskogo St. and Kommunisticheskaya St.), the vital condition index was 86–87, which corresponds to the category of healthy trees with signs of weakening.

Table 2 – Data from the study of the vital state of the forest stand, %

Stand characteristics	st. Leningradskaya	st. Chapaeva	st. Uritsky and st. Communist
Healthy	80,1	75,8	75
Weakened	8,6	12,4	13
Severely weakened	5,7	7	5,6
Shrinking	5	3,5	6,5
Deadwood	0,7	1,3	–
Life condition index	86,6	87,5	86,6
Life condition category	Healthy with signs of weakening	Healthy with signs of weakening	Healthy with signs of weakening

On Leningradskaya Street, the predominant age group of trees is the middle-aged generative one – 35,9% (108 trees); the smallest is virginal with 8,6% (26 trees). On Chapaev Street, the predominant age group of trees is the middle-aged generative one – 46,5% (146 trees); the smallest is virginal with 9,6% (30 trees). On the streets of Uritsky and Kommunisticheskaya, the predominant age group of trees is the middle-aged generative one – 88% (95 trees); the smallest is immature with 2,5% (2 trees).

Conclusion. In the course of the study, an inventory of woody vegetation on some streets of Vitebsk was carried out, the index of the vital state of the studied forest stand was determined, averaging $86,5 \pm 0,82$. All three sites are characterized by the predominance of healthy trees – 80,1%, 75,8%, 75%, respectively. The percentage of dead wood is insignificant 0,3% on Leningradskaya street and 1,3% on the street. Chapaev. On the studied streets, the trees correspond to the category “healthy with signs of weakening”.

1. Dudnik, Y.A. Inventory and evaluation of the life state of roadside woody vegetation in the railway area of Vitebsk / Y.A. Dudnik, I.A. Litvenkova // Science – education, production, economics: materials XXIV (71) Region. scientific-practical. conf. teachers, scientific employees and graduate students, Vitebsk, February 14, 2019: in 2 volumes. – Vitebsk: VSU named after P.M. Masherov, 2019. – Vol. 1. – P. 43–45. URL: <https://rep.vsu.by/handle/123456789/17805> (date accessed: 05.11.2022)

2. Methodological recommendations for assessing and mapping the state of the state and sustainability of plantings of cities to anthropogenic impacts / A.V. Pugachevsky [and others] // Natural Resources: Interdepartmental Bulletin № 3. – Minsk: Belarus. Navuka, 2007. – P. 34–36.

DRIP IRRIGATION AS A GUARANTEE OF FOOD SECURITY OF THE REPUBLIC OF BELARUS

Alexander Konstantinov, Viktor Lukashevich
BSAA, Gorki, Belarus

Keywords: drip irrigation, food security, vegetables, productivity.

The most important criteria for efficient production in the most developed countries of the world today are the specific costs of resources and indicators of environmental safety.

One of the promising areas for increasing productivity in crop production is the development and implementation of technologies for artificial irrigation of crops to create zones of guaranteed production of vegetables and other crops, since only the use of technologies adapted to natural conditions will increase the amount of agricultural products, semi- desired per unit area, reduce its cost and improve quality.

Material and methods. Field experiments were laid on the experimental irrigated field of the UO BSHA "Tushkovo-1" of the Goretzky district of the Mogilev region. The experimental field is located on an area with leveled terrain, having a slight slope in the south-west direction. Groundwater lies at a depth of more than 8 m. The main source of the formation of moisture reserves is precipitation, the insufficient amount of which and the uneven precipitation during the growing season do not provide high productivity of crops, which determines the need for irrigation. The soils are sod-podzolic loamy. Observations of meteorological indicators were carried out directly at the experimental site using an equipped meteorological post located to the north at a distance of 150 m.

Findings and their discussion. Vegetables are an integral part of a complete diet that provides a person with vital chemical components that are completely or partially absent in many animal products.

According to the Institute of Nutrition of the Academy of Medical Sciences of the Russian Federation, vegetables can satisfy a person's need for proteins by 15–25%, carbohydrates by 50–60% and vitamins and minerals by 60–80%. [one]

The results of studies on the assessment of national food security indicate that in 2019 the volume of agricultural production per capita corresponded to the level of developed countries.

The level of own production of vegetables was sufficient to meet the needs of the domestic market of the republic and amounted to 104,1%. [2]