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Охвоение и облиствение более слабое, чем у деревьев на суходоле. Производительность сосняков на верховых и переходных болотах и ельников на низинных болотах не выше Va – V классов бонитета. Период роста сосны в болотных лесах больше, чем у ели [2].

Лесоосушение – это важное звено в системе лесоводственных мероприятий, проводимых на избыточно увлажненных лесных землях.

Вологодская область является одной из многолесных в европейской части России. 83% площади области покрыто лесом и представлено, в основном, насаждениями естественного происхождения, а искусственные занимают лишь 6% площади. Болота доминируют в категории нелесных земель. Зеленомошные типы (брусничный, черничный свежий, кисличный) являются преобладающими по условиям местопроизрастания и занимают примерно 79% лесопокрытой площади. Сфагновые, травяно-сфагновые, долгомошные, лишайниковые типы заняты преимущественно сосняками. Сосняки травяно-сфагновые занимают участки с торфяно-глеевыми супесчаными и торфяными верховыми, и переходными почвами на оглеенных моренных суглинках. Сосняки сфагновые произрастают на участках с торфяно-глеевыми и торфяными верховыми, реже переходными почвами [1, 3].

60% площади приходится на долю среднеполнотных (полноты 0,5-0,7) насаждений. Высокополнотные занимают 37%, низкополнотные насаждения занимают 3% от лесопокрытой площади и сосредоточены на заболоченных территориях [1]. Возрастная структура древостоев характеризуется неравномерным распределением по хозяйственным классам возраста, категориям лесов и лесообразующим породам.

Гидролесомелиоративный фонд Вологодской области включает в себя около 3,4 млн. га земель, что составляет более 30% от всей площади лесного фонда (11,3 млн. га). Переходный тип заболачивания является преобладающим. Среди болот доминируют верховые (85%), переходные (14%) и низинные (1%). Осушаемые лесные земли на данный момент составляют 236 тыс. га, на которых сосновыми формациями занято 67%, а еловыми и лиственно-еловыми 12 и 21% от покрытой лесом площади, соответственно. Среди типов леса наиболее представленной является травяно-сфагновая и сфагновая группы. Осушаемые сосняки (76%), ельники (66%), березняки (82%) преимущественно среднеполнотные. Высокополнотных древостоев больше в еловых формациях, чем в сосновых [1].

Влияние болотных лесов на водный баланс окружающей территории – предмет спорных дискуссий. Поэтому существуют разные взгляды на целесообразность лесоосушения.

В заболоченных и болотных лесах Вологодской области накоплены большие объемы древесины. Заготовка древесины в них, в основном, затруднена отсутствием транспортной доступности и незначительным запасом древесины на 1 га. Рентабельность лесовыращивания в неосушенных сосновых лесах верховых болот крайне низкая, а стоимость депонирования углерода в лесоболотных экосистемах более чем в 2 раза превышает стоимость древесных запасов, накопленных заболоченными и болотными лесами.

В нерентабельных для лесозаготовок болотных лесах за счет продажи углеродоквот текущего прироста можно получать ежегодный доход. При этом обеспечивается сохранение биологического разнообразия заболоченных и болотных лесных массивов.

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#### BIOSTATIONARY AND EXPOSITION PLOT OF VINNYTSIA NATIONAL AGRARIAN UNIVERSITY AS AN EDUCATIONAL, SCIENTIFIC AND MANUFACTURING BASE IN PREPARATION OF THE LANDSCAPE GARDENING SPECIALISTS

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#### Abstract

The questions of formation and use of the biostationary, the exposition plot as training, scientific and production base in the training of specialists in the sphere of "Forestry" and "Landscape gardening" in teaching the subjects of professionally oriented disciplines were considered. The importance of training bases in the study of the prospects of using ornamental plant species for landscaping of different objects of Vinnytsia region was substantiated. The species constitution of the ornamental plants collections of the Botanical Garden "Podillya" of the VNAU was systematized, which today consists of about 100 species placed on the biostationary and over 50 species on the exposition plot. The systematic principle of the selection and the placement of species in collections played a significant role in the systematization of plants not only for research but also for educational work. The

present state of the directions of herbaceous species of peonies usage, dahlias, lilies, Chinese asters, lupines, ornamental shrubs was analyzed and their prospects for greening of the Podillya area were determined. The analysis of researches and publications of peonies, dahlias and lupines varieties concerning the breeding work in our country was carried out. The ornamental properties of the varieties of these species were investigated and the characteristics of the varietal features presented by the originator for all indicators were studied. The analysis of the species and varietal constitution of the studied ornamental plants for the creation of a monosade on the basis of the Botanical Garden of VNAU was carried out.

**Keywords:** biostationary, architectural and exposition plot, phytodiversity, ornamental forms, topiary art, practical training, systematic principle.

**Formulation of the problem.** In the process of training forestry and gardening specialists at the VNAU, it is of great importance that students contact with phytodiversity - plant grouping, which allows not only to know the theory but also to receive the necessary practical skills.

The Botanical Garden, which include an arboretum, a greenhouse, an architectural and expositional area and biostationary are the nearest floristic objects of the university and act as a kind of "living green laboratory" for a number of subjects, such as an ornamental gardening, silvics, topiary art, ornamental planting, landscaping of settlements, etc. In the presence of appropriate educational - practical and scientific base for students a single educational complex is created.

The purpose of the biostationary and the exhibition area is to preserve, enrich, comprehensively study and effectively use the diversity of cultivated plants.

With the participation of the teachers of the Department of Silvics, Landscape art, Gardening and Viticulture, the biostationary and the exposition plot is constantly replenished with new types of plants due to cooperation with a number of scientific institutions and garden centers.

**Conditions and methods of research.** The main method we used is analytical and comparative. In addition to this, standard biology techniques for morphometric studies and phenological observations were used [3]. In the analysis of the collection fund we kept the garden classification of ornamental plants developed by Moiseychenko V.F. [4], which is traditionally used in Ukraine.

**Research results.** In the educational process, the seed-plot is the main object in the course of studding training and practical training. In completing the lecture course on plant taxonomy, students are introduced to the diversity of life forms, the quantitative composition of representatives of different angiosperm families in a

natural and directly growing form. They have the opportunity to study clearly the morphological biological features of plants, as well as the characteristic features of the species and forms presented in the collection.

At the biostationary and the exposition area, students, during practical classes and educational and industrial practice, under the guidance of teachers, study the features of growth and development of ornamental plants, technology of cultivation, care of them and determine the possibility of their usage in a landscaping. Motivation and activation of independent work forms students' ability to plan, systematize and control their activities, make and implement decisions, which is an essential condition for the future specialist in the landscape gardening.

In addition, students are introduced to plants that can be brought in to the culture (medicinal, ornamental), as well as wild useful plants, mentioned in the lecture course, and other species that deserve an attention.

The species composition of the seed-plot is currently about 100 species, spread over an area of 0.35 ha. The systematic principle of the selection and placement of species in collections played a significant role in the systematics of plants not only for research, but also for educational work. A large number of families that can be met in the flora of Ukraine are represented in the seed-plot. In its turn, each family is represented by species composition. The seed-plot also provides an opportunity to get acquainted with plants from other regions of our country and other countries and continents, and to explore the possibilities of introducing some of them.

During the seed-plot excursion, students are introduced to an interesting and rich collection of rare and relict species. Part of the biostationary, where the tree and shrub forms of plants (park-forest zone) are placed, allows to study the ecological conditions of growth and mutual influence of different species on each other, their general development in the conditions of the collection (Table 1).

Table 1

Species composition of hardy-shrub species and herbaceous plants of the biostationary of VNAU

№	Plants	Family	Arboretum of use	Application									
				alone	groups	alleyways, slopes, slides	hedges	skirt	curbs	vertical	forest parks	architectural	
1	<i>Picea abies</i>	Pinaceae	I,II,III	+	+								
2	<i>Picea pungens</i>		Ia,Ib,II,III,IV	+	+		+						
3	<i>Picea pungens</i> f. <i>Glauca</i>		Ia,Ib,II,III,IV	+	+		+					+	+
4	<i>Pinus strobus</i>		Ia,Ib,II,III	+	+							+	
5	<i>Pinus sylvestris</i>		Ia,Ib,II,III,IV, V	+	+							+	
6	<i>Picea glauca</i>		Ia,Ib,II,III,IV	+	+		+						
7	<i>Pinus mugo</i>		I,II,III,IV	+	+		+	+					
1	<i>Taxus baccata</i>	Taxaceae	I,IIa,IIb,III, V	+	+		+		+		+	+	
2	<i>Taxus media</i>		I,,IIb,III, V	+	+		+		+		+	+	
1	<i>Juniperus virginiana</i>	Cupressaceae	Ia,Ib,II,III,IV, V	+	+		+						
2	<i>Juniperus communis</i>		I,II,III	+	+		+						
3	<i>Chamaecyparis Lawsoniana</i>		Ia,Ib,IIIa,IIIb, Vb	+	+		+						
4	<i>Chamaecyparis pisifera</i>		Ia,Ib,IIIa,IIIb, Vb	+	+		+						
5	<i>Juniperus horizontalis</i>		Ia,Ib,II,III,IV, V		+		+						
6	<i>Juniperus chinensis</i>		Ia,Ib,II,III,IV, V		+		+						
7	<i>Juniperus sabina</i>		Ia,Ib,II,III,IV, V		+		+						
8	<i>Juniperus excelsa</i>		Ia, V	+	+								
9	<i>Thuja occidentalis</i> f. <i>Smaragd</i>		I,II,III,IV, V	+	+	+	+	+	+			+	
10	<i>Thuja occidentalis</i> f. <i>Pyramidalis</i>		I,II,III,IV, V	+	+	+	+	+	+			+	
11	<i>Platycladus orientalis</i>		Ia,IIIa,IIIb,IVa,IVb, Vb	+	+		+		+				
12	<i>Thuja occidentalis</i> L. f. <i>globosa</i> Gord.		I,II,III,IV, V	+	+	+	+	+	+			+	
13	<i>Thuj aoccidentalis</i> f. <i>Teddy</i>		I,II,III,IV, V	+	+	+	+	+	+			+	
14	<i>Juniperuss copulorum</i>		I,II,III	+	+	+	+						
15	<i>Thuja occidentalis</i> Europe Gold		I,II,III,IV, V	+	+	+		+	+			+	
16	<i>Thuja occidentalis</i> f. <i>Wagneri</i>		I,II,III,IV, V	+	+	+		+	+			+	
17	<i>Thuja plicata</i>		I,II,III,IVa	+	+	+							
1	<i>Syringa vulgaris</i>	Oleaceae	I-V	+	+	+	+	+					
2	<i>Syringa josikaea</i>		I-V	+	+		+	+					
3	<i>Ligustrum vulgare</i>		I-V	+	+		+						
4	<i>Forsythia suspensa</i>		I-V	+	+		+	+	+				
5	<i>Forsythia europaea</i>		I-V	+	+		+	+	+				
1	<i>Hydrangea arborescens</i>	Hydrangea	Ia,Ib,III,IV	+	+		+	+					
2	<i>Philadelphus coronarius</i>		I-V	+	+		+						
3	<i>Deutzia scabra</i>		I-V	+	+		+					+	
1	<i>Ginkgo biloba</i>	Ginkgoales	Ia,Ib,III,IV, V	+	+	+							
1	<i>Magnolia kobus</i>	Magnoliaceae	Ia,Ib,IIIa,IIIb,IVa, Vb	+	+								
2	<i>Magnolia soulangeana</i>		Ia,Ib,IIIb,IVa, Vb	+	+	+							

3	<i>Magnolia acuminata</i>		Ia,Ib,IIIa,IIIb,IVa,Va,Vb	+	+														
4	<i>Magnolia tripetala</i>		Ia,Ib,IIIb,IVa,Vb	+	+	+													+
1	<i>Berberis vulgaris</i>	Berberidaceae	I-V	+	+				+		+								
2	<i>Berberis thunbergii</i>		I-V	+	+				+		+								
3	<i>Berberis ottawensis</i>		I-V	+	+				+		+								
1	<i>Cotoneaster horizontalis</i>	Rosaceae	I-V		+				+	+									
2	<i>Viburnum opulus</i>		I-III,IV,V	+	+				+	+									+
3	<i>Spiraea vanhouttei</i>		Ia,Ib,III,IV,V	+	+					+	+								
4	<i>Spiraea japonica</i>		I-III,IV	+	+					+	+								
5	<i>Spiraea japonica (Goldflame)</i>		I-III,IV	+	+					+									
6	<i>Chaenoméles japónica</i>		Ia,Ib	+	+	+													
7	<i>Spiraea nipponica</i>		Ia,Ib,III,IV,V	+	+					+	+								
8	<i>Physocarpus opulifolia</i>		I-V	+	+		+												
9	<i>Physocarpus opulifolia (Lutescens)</i>		I-V	+	+		+												
10	<i>Physocarpus opulifolia (Red Diablo)</i>		I-V	+	+		+												
11	<i>Spirea thunbergii</i>		Ia,Ib,III,IV,V	+	+					+	+								
12	<i>Amygda lustriloba</i>		Ia,Ib,III,IV,V	+	+					+	+								
13	<i>Spiraea salicifolia</i>		Ia,Ib,III,IV,V	+	+					+	+								
14	<i>Prunus serrulata</i>		Ia,Ib,II,III,IV,V	+	+														
1	<i>Euonymus verrucosoides</i>	Celastraceae	Ia,Ib,II,III,			+											+	+	
2	<i>Euonymus verrucosus</i>		Ia,Ib,II,III,				+											+	+
1	<i>Buxus sempervirens</i>	Buxales	Ia,Ib,III,IV,V		+					+	+							+	
1	<i>Genista tinctoria</i>	Fabaceae	Ia,Ib,II,III,			+												+	
1	<i>Catalpa speciosa</i>	Bignoniaceae	Ia,Ib,III,IV,V	+	+					+	+								
1	<i>Quercus rubra</i>	Fagaceae	Ia,Ib,II,III,IV	+	+	+												+	
1	<i>Corylus colurna</i>	Betulaceae	I-III,IV		+		+	+										+	
1	<i>Acer platanoides</i>	Aceraceae	Ia,IIIa,IV6,IVa,Vb	+	+														
1	<i>Lonicera caprifolium</i>	Caprifoliaceae	I-III,IV		+		+	+										+	
1	<i>Rhamnus cathartica</i>	Rhamnaceae	I-V	+	+		+												
1	<i>Hosta</i>		Ia,Ib,II,III,IV,V		+		+											+	
2	<i>Aster alpinus</i>		Ia,Ib,III,IV,V		+													+	
3	<i>Penstemon barbatus</i>		Ia,Ib,II,III,IV,V		+													+	
4	<i>Pelargonium zonale</i>		Ia,Ib,II,III,IV,V		+													+	
5	<i>Flox subulata</i>		Ia,Ib,III,IV,V		+													+	
6	<i>Iris barbata</i>		Ia,Ib,III,IV,V		+													+	
7	<i>Veronica longifolia</i>		Ia,Ib,II,III,IV,V		+													+	
8	<i>Callistephus chinensis</i>		Ia,Ib,III,IV,V		+													+	
9	<i>Chrysanthemum chillaea</i>		Ia,Ib,II,III,IV,V		+													+	

At present, there are 411 specimens of a hardy-shrub flora collected at the biostationary. The life forms of plants include: trees (21%) - 89 individuals, bushes (79%) - 322 individuals. According to taxonomic affiliation, collection plants are classified as 70 species and intraspecific taxa, 36 genera, 18 families.

Live botanical collections of the biostationary play a cognitive role, broaden the horizon and are an addition to the excursions into the nature, which helps students to create a broader understanding of the richness of living forms of the plant world, which is especially important for future specialists in forestry and park management. Biostationary activity is not limited to the work associated with forming the collection.

Phenological observations of hardy-shrub and herbaceous plants are carried out from the beginning of the laying of collections, and active work is being done in

cooperation with domestic botanical institutions, garden centers "Etis", "Amitis", "Sontse-garden", "Tetianyn garden" MUS "Vinnytsiazelenbud", "Decoplant" LLC, in particular for the exchange of seeds and planting material. In addition, there are guided tours for a wide range of visitors.

On the basis of the biostationary and the exposition plot, scientific researches are conducted to study the conservation basics, reproduction and usage of plant resources. The present condition of the directions of usage of herbaceous peonies species and dahlias is analyzed and their prospects for landscaping of the Podillya area are determined.

An analysis of studies and publications of varieties of peonies and dahlias concerning breeding work in our country was conducted. The ornamental properties of the varieties of these species have been investigated and

the characteristics of the varietal characteristics presented by the originator for all indicators were studied. An analysis of the species and varietal composition of peonies, lilies and dahlias for the creation of a monogarden on the basis of the Botanical Garden of VNAU was carried out. (Tables 2, 3).

The collection of sorts and species of the genus *Dahlia Cav* aims to become a source of planting material for the usage of dahlias in various fields of industrial and amateur floriculture (landscaping, crop production, production of planting material, selection) in Vinnytsia region. However, until now, with the exception of the list and description of varieties [5], other developments related to the study of the collection of dahlias in Ukraine were not carried out to a significant extent.

This is the main reason that introductory work with cultivated plants, even in scientific institutions was still often conducted to satisfy certain time-related scientific or production needs, without the need to form a comprehensive collection with a certain level of scientific, cognitive and cultural-educational value. Therefore, our aim is to analyze the existing collection volume of the *Dahlia* genus at the exposition plot of Vinnytsia National Agrarian University, to evaluate it initially by qualitative and quantitative indicators and to work out the main directions of its further purposeful enrichment.

According to the research, 27 varieties of *Dahlia Cav.*, grown in Podillya region and belonging to 10 garden groups, 11 varieties are tall, 12 are medium-sized

and widely used in planting of flower beds, garden bet, mixborders. Also there are dwarf and undersized species of dahlias Gallery Art Deco (40 sm), Retro (60 sm), Garden Princess (60 sm), Onesta (70 sm), which are indispensable in container culture and curb planting. For landscaping balconies, terraces, you can also use these undersized varieties with abundant blooming and bright colored flowers. Dahlias are widely used in the flower gardens of parks, streets, squares and other public places. Particularly spectacular are large flowered dahlias in mixed plantings (mixborders), namely along the main paths and groups of shrubs in parks, squares, gardens.

When evaluating a collection of the genus *Dahlia Cav.* at the exposition plot of VNAU, it was found that the collection is dominated by varieties of garden groups such as cactus, nymphs and ornamental. In terms of flowering in the collection the varieties of medium and late flowering dominate.

To supplement the exposition and its representativeness, it is necessary to enrich the collection with cultivars of a group of garden dahlias: orchid, pompous, anemone, also mixed (this garden group includes also divided species). The studied varieties of dahlias are perspective for cultivation in condition of the sort. Replenishment of the collection of the genus *Dahlia Cav.* remains the main task of scientific and collection work as an important way of preserving and enriching plant diversity.

Table 2

Morphometric indicators and recommendations for the use of *Dahlia Cav.* decorative varieties. in Podillya zone

Garden group	Sort	Plant height, sm.	Diameter of a flower, sm.	Variants of the usage in landscaping
Cactus	<i>MingusRandy</i>	120	15-20	flower beds, ridges, mixborders
	<i>Reference</i>	120	10-15	flower beds, ridges, mixborders
	<i>YellowStar</i>	120	10-15	flower beds, ridges, mixborders
	<i>GoldGrown</i>	120	15-20	flower beds, ridges, mixborders
	<i>GardenPrincess</i>	60	10-15	container culture, border planting
Nymph	<i>LeCastel</i>	110	10-15	flower beds, ridges, mixborders
	<i>Tourdumonde</i>	100	10-15	flower beds, ridges, mixborders
	<i>Jamaica</i>	120	7-10	flower beds, ridges, mixborders
	<i>LadyDarlene</i>	120	15-20	flower beds, ridges, mixborders
	<i>Nagano</i>	110	5-10	flower beds, ridges, mixborders
Ornamental	<i>AitaraDiadem</i>	90	15-20	flower beds, ridges, mixborders
	<i>BristolStripe</i>	120	25-30	flower beds, ridges, mixborders
	<i>Retro</i>	60	12	container culture, border planting
	<i>Happygolucky</i>	80	22	flower beds, ridges, mixborders
Mixed Group	<i>KarmaAmanda</i>	80	10-15	flower beds, ridges, mixborders
	<i>KarmaProspero</i>	110	10-15	flower beds, ridges, mixborders
	<i>Onesta</i>	70	10-15	flower beds, ridges, mixborders
Giant	<i>LindsayMichelle</i>	80	20	flower beds, ridges, mixborders
	<i>Ciaboss</i>	110	25	flower beds, ridges, mixborders
	<i>Pashmina</i>	110	20-25	flower beds, ridges, mixborders
Semi-cactus	<i>Shootingstar</i>	130	15-20	flower beds, ridges, mixborders
	<i>Nenekazi</i>	120	10-15	flower beds, ridges, mixborders
	<i>RedMajorette</i>	120	10-15	flower beds, ridges, mixborders
Pompon	<i>Souvenird'Ete</i>	90	6	flower beds, ridges, mixborders
Peony	<i>Encore</i>	90	23	flower beds, ridges, mixborders
Orchid	<i>GalleryArtDeco</i>	40	5-10	container culture, border planting
Ball-shaped	<i>Peter</i>	120	6	flower beds, ridges, mixborders

Table 3

Morphometric indicators and recommendations for the usage of ornamental *Paeonia* L. varieties in the Podillia zone

№	Sort (hybrid)	Shape of a flower	Time of flowering	Size of a flower	Presence of aroma	Colour of a flower	Usage
1	China Maid	Japanese	Medium late	20	Fragrant	Light pink	For cut
2	Charivnyk	Terry globular	Medium	18	Aroma of lily of the valley	White	Monogarden
3	Heritage	Terry	Early	18	Fragrant	Red	<u>Single specimen set</u>
4	Triumphedu Nord	Terry	Late	18	Fragrant	Pink	For cut
5	Korifei	Terry	Early	20	Poor	Red	Mixborder
6	Malynova vatra	Terry	Medium	18	Fragrant	Carmine-red	Background
7	Antei	Terry rosy	Medium	16	Poor	Raspberry-red	Group, massif
8	Mahogany	Simple	Early - medium	18	Fragrant	Red	Group, massif
9	Diana Parks	Terry rosy	Early- medium	14	Fragrant	Bloody-red	Mixborder, ridge
10	Cherry Red	Terry rosy	Early	20	Fragrant	Red	<u>Single specimen set</u>
11	Venus	Terry crowned	Medium	18	Poor	Pink	<u>Single specimen set, mixborder</u>
12	Sara Bernar	Semi-terry	Medium late	20	Poor	Light pink	<u>Single specimen set, cut material</u>
13	Reine Hortense	Terry	Medium	17	Poor	Pink	For crop
14	Chervoni vitryla	Simple	Early - medium	15	Poor	Red	For crop
15	Svitoch	Terry	Medium late	16	Poor	Red, pink	Flowerbed
16	Lihtaryk	Terry	Early	17	Poor	Raspberry-red	Flowerbed
17	Zhemchuzhnaya rossyp'	Japanese	Early	16	Fragrant	Yellow-pink	Group, massif
18	Henry Bockstoce	Terry	Early - medium	20	Poor	Bloody-red	<u>Single specimen set</u>
19	Mons. JulesElie	Terry	Early	19	Не надто сильний	Pink	<u>Single specimen set, groups, massifs</u>
20	Seraphim	Simple	Very early	15	Fragrant	White	Floral compositions
21	Chervonyi oksamyt	Semi-terry	Early	15	Poor	Dark red	Monogarden
22	Rubraplena	Terry semi-globular	Early	14	Poor	Red	<u>Single specimen set, mixborder</u>
23	Tenifoliaplenu	Terry	Early	10	Poor	Red	Rockerries, mixed flower beds
24	Tonkolystna stepova	Non-terry	Early	10	Poor	Bloody red	Rockerries, mixed flowerbeds
25	Doreen	Japanese	Medium	16	Fragrant	Pink, staminode yellow	<u>Single specimen set</u>
26	Gay Paree	Japanese	Medium late	13	Fragrant	Pink	<u>Single specimen set</u>
27	Gold Standart	Japanese	Medium	15	Poor	White	Flowerbeds
28	Hit Parade	Japanese	Medium	14	Fragrant	Pink	Mixborder, massifs, groups
29	Moonof Nippon	Japanese	Medium late	16	Fragrant	White light green	Cut mateial, mixborder monogarden
30	Neon	Japanese	Late	16	Fragrant	Pink	Flowerbed
31	Philomele	Terry crowned	Early	12	Poor	Pink	Mixborder
32	Hot Chocolate	Japanese	Medium	16	Fragrant	Dark-red	For cut, groups

According to the results of the study of 32 varieties of herbaceous peonies, it was found that in the flowering period of 14 varieties (*Heritage*, *Korifei*, *Cherry Red*, *Lihtaryk*, *Zhemchuzhnaya rossyp'*, *Mons. Jules Elie*, *Seraphim*, *Chervonyi oksamyt*, *Rubraplena*, *Tenifliaplenu* *Tonkolystna stepova*, *Philomele*) to early

bloom group (second half of May), 16 varieties (*Mahogany*, *Diana Parks*, *China Maid*, *Charivnyk*, *Malynova vatra*, *Antei*, *Venus*, *Sara Bernar*, *Reine Hortense*, *Svitoch*, *Doreen*, *Gay Paree*, *Gold Standart*, *Hit Parade*, *Moonof Nippon*, *Hot Chocolate*) – to medium flowering group (late May, early June) and 2 varieties



(*Neon*, *Triumphedu Nord*) (second half of June) - up to late flowering holes [8].

The considered peony decorative varieties have proven to be well adapted to the climatic conditions of Vinnytsia region and have proven themselves as ornamental crops that can improve and increase the range of landscaping facilities of landscape objects in the Podillya region [9].

The presented species are offered for decoration of the park area and creation of a monogarden of peonies of the exposition plot of the VNAU, as well as for landscaping of private objects of Vinnytsia region.

The study of morphometric indices of species and varieties of the genus Lily (*Hemerocallis* L.) allowed us to establish that individuals of some species in the conditions of the exposition area differ in larger parameters than in natural habitats (Table 4).

Table 4  
Morphometric indicators and recommendations for the use of decorative varieties of *Hemerocallis* L. in Podillia

Name of a sort \ hybrid	Height of a plant, sm	Width of a plant, sm	Colour of a flower	Variants of usage
`Abbount`s Magic`	70	40-50	pink	Flowerbeds, ridges, mixborders, groups
`Blizzard Bay`	70	40-50	white-creamy	Flowerbeds, ridges, mixborders, <u>single specimen set</u>
`Dan Mahony`	65	40-50	pink	Flowerbeds, ridges, mixborders, groups
`Flamboyant Eyes`	65	30-40	bright-pnk	Flowerbeds, ridges, mixborders, stalls
`Highland Lord`	75	50-60	red	Flowerbeds, ridges, mixborders, <u>single specimen set</u> , groups, stalls
`White Perfection`	70	40-50	white	Flowerbeds, ridges, mixborders
`Fooled Me`	60	30-35	orange	Flowerbeds, ridges, mixborders, stalls

Watching the growth and development of *Hemerocallis* L., it is established that varieties and hybrids are intended for flower garden decoration, landscaping through the creation of modern garden compositions.

Studies have shown that no less promising for flowerbeds are lupine tree (*Lupinus arboreus* L.), many-leaved (*L. polyphyllus*), narrow-leaved (*L. angustifolius*), yellow (*L. luteus*), volatile (*L. mutabilis*) and others. Perennial plants with decorative qualities. The natural capabilities of these representatives of plants of the genus *Lupinus* L., plasticity to change their life forms, high quality on the set of features that determine their ornamental characterizes these plants as a source for the introduction and enrichment of the range of decorative cultures of the Podillya region [10].

In close cooperation with the joint Ukrainian-Dutch enterprise Decoplant, the main activity of which is the production of seedlings of roses and other ornamental crops, two compositions were created on the territory of the exposition area using different groups of garden rose varieties. The main feature of ornamental shrubs is in the variety of their size, color, crown shape, reproduction possibilities and their usage in landscaping. These issues are reflected in scientific researches.

For today, it has been established that 12 varieties of roses that have been successfully tested have been involved in the formation of the scientific collection and exposition plot "Rosary".

Table 5  
The number of cuttings of varieties of rose (*Rosa* L.) of floribunda group during the treatment with a growth regulator "Kornevin"

Name of a sort	Cuttings, treated with the growth regulator «Korneviv»				Control			
	Substrate - peat + sand + deciduous soil		Substrate - deciduous soil		Substrate - Peate + sand + deciduous soil		Substrate - deciduous soil	
<i>Nev Star</i>	9	90	7	70	9	90	7	70
<i>Mein Munchen</i>	10	100	8	80	9	90	6	60
<i>Solero</i>	10	100	9	90	10	100	8	80
<i>Claret Pixie</i>	8	80	7	70	8	80	6	60
<i>Marco</i>	9	90	8	80	7	70	7	70
<i>Brand Pixie</i>	8	80	9	90	7	70	6	60

According to the research on the breeding characteristics of 6 varieties of roses, it was found that the highest rate of callus formation of roses was in the group of floribunda of the Solero variety treated with the root growth regulator "Kornevin" on the substrate - peat + sand + deciduous soil (table 5). After the callus formation process, all varieties of roses passed intensive rooting.

The results of the research are used for the course of lectures and practical classes for students in the specialty "Landscape gardening", and scientific research and their results are the basis of graduation thesis.

Topiary figures are represented as the art of decorative pruning of trees and bushes. According to the technique of forming, the topiaries available on the object are divided into two types: classic and frame. Traditional (classical) technology, on the architectural

and exposition area, is a haircut of hedges and geometric figures.

Wood sculptures of forestry theme were installed as a technique for forming the artistic image of the exposition area and for the purpose of promoting decorative woodcarving art. Surveys made of decorative tiles in combination with modded living green walls of hawthorn, plums and berries, wooden sculptures and planted collections of ornamental Chinese aster, garden peonies, garden groups of dahlias, roses, lilies and

chrysanthemums create the only architectural and artistic concept of the exhibition.

Topiary figures are represented as the art of decorative pruning of trees and shrubs. According to the technique of forming, the topiaries available on the object are divided into two types: classic and wireframe. Traditional (classical) technology, on the architectural and exposition plot, is a cut of live fences and geometric figures.

Table 6  
Specific, quantitative composition of topiaries and peculiarities of their formation at the architectural and exposition plot of VNAU

No	Topiary varieties	Names of the figures	Species of plants	Shape of plants	Quantity of plants, pieces.	Peculiarities of formation
1	Wireframe	elephant	Thuja Western <i>Thuja occidentalis</i> L.	Brabant	4	Trim three times a season
2	Wireframe	Cactus	Thuja Western <i>Thuja occidentalis</i> L.	Brabant	1	Trim three times a season
3	Wireframe	Amphora	Thuja Western <i>Thuja occidentalis</i> L.	Brabant	3	Trim three times a season
4	Wireframe	Star	Thuja Western <i>Thuja occidentalis</i> L.	Aurea plicata	1	Trim two times a season
5	Traditional	Raddle	Plum broad <i>Prunus cerasifera</i> L.	-	80	Formation depending on the growth
6	Traditional	Sphere	Boxwood evergreen <i>Buxus sempervirens</i> L.	-	12	Formation depending on the growth

A live fence formed by plum broad, cherry-plum tree (*Prunus cerasifera*) more than 2.5 meters high forms green walls and is one of the decorative elements of the plot. Due to the fact that the live fence is high and thick, viewing the object from the hedgerow side for a certain period was complicated. Therefore, there was a need to dilute a solid fence line with one of the popular techniques of landscape designers - "slit windows". This made it possible to make rhythmicity in the green wall and increase its aesthetic look.

Frame topiaries are represented on the plot by voluminous figures of an elephant, a cactus, an amphora and a small figure of a star. In the metal frame of the figures are planted thujas western, which in the process of growth and development create the necessary shape. All the above mentioned topiaries are arranged singly as accents of garden compositions. The dynamics of the

figure of the cactus, stars and amphorae are static, because the composition does not show the movement. The wireframe topiary of the elephant is dynamic.

Students of the specialty "Landscape gardening" during the practical classes in the discipline "Topiary art" are taught the technique of figure cutting of plants. Yes, the live fence trimmers are usually used: brush cutters and garden scissors, while cutting frame and simple geometric shapes is done with secateurs.

Observing the growth and development of topiary figures, it was found that the lack of regular watering leads to a change in the color of leaves in plants and decline of the aesthetic qualities of topiaries. Therefore, watering in time, systematic cutting and feeding in the spring and autumn period further to the growth and development of shaped plants.

At the initiative of the masters of the specialty "Landscape gardening" a project of the exhibition area in the form of embroidery was created (fig.1).



Fig. 1. Sketch of the architectural and exposition plot of the VNAU

Particular attention in the formation of the exposition is given to the aesthetics of the ground floor flower garden. Particular attention is paid to the aesthetics of the ground flower garden in the formation of the exposition. The stall is based on the VNAU logo of dwarfish flowering ornamental plants of velvets emphasized on the lawn. The border of the lawn is a riddle made from spirea Japanese and ordinary privet that emphasizes the classic style of the object. Addition to the stall is a geometrically planted with a bearded iris and a garden peony, which gives the plot a complete appearance. The dominant motif of the stall composition is the garden wooden sculpture of an owl, symbolizing wisdom and learning. Visual communication elements are present as one of the structural elements of any garden object in the exposition plot.

**Conclusion.** The presented species are perspective for cultivation in conditions of a crop. The replenishment of their collections remains to be the main task of scientific and collection work as an important way of preserving and enriching plant diversity. To supplement the collections of ornamental plants and their representativeness, it is necessary to enrich the collections with cultivars that have abundant flowering and bright flower color and are widely used in flower gardens of parks, squares, squares and other public places of Vinnytsia region. The accents of garden compositions - wireframe topiaries and set wooden sculptures on the viewing deck - are the main method of forming the artistic image of the exhibition plot. The presented types and their forms, varieties of ornamental plants are used for the course of lectures and practical classes for students within the program of the specialties "Forestry" and "Landscape gardening", and scientific research and their results are represented in the basis of graduation thesis.

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#### ВЛИЯНИЕ ФУНГИЦИДОВ НА РАЗВИТИЕ ГРИБОВ РОДА *FUSARIUM* – *F. EQUISETI*, *F. POAE* И *F. PROLIFERATUM*

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#### INFLUENCE OF FUNGICIDES ON THE DEVELOPMENT OF FUNGI OF THE GENUS *FUSARIUM* – *F. EQUISETI*, *F. POAE* AND *F. PROLIFERATUM*

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##### Аннотация

Изучено влияние фунгицидов Абакус Ультра, Альто Супер, Амистар Экстра, Фалькон и Фоликур на развитие колоний грибов *Fusarium equiseti*, *F. poae* и *F. proliferatum*. Эксперименты проводились с применением метода агаровых пластин. Установлено, что виды грибов *Fusarium equiseti* и *F. proliferatum* проявляли заметную резистентность к некоторым препаратам. Наибольшей (93,2 – 100,0 %) биологической эффективностью в отношении изучаемых видов грибов обладал препарат Фалькон. В среднем этот показатель составил 97,7 %. У других фунгицидов средняя эффективность варьировала от 70,1 до 91,9 %.

##### Abstract

The influence of fungicides Abacus Ultra, Alto Super, Amistar Extra, Falcon and Folicur on the development of colonies of fungi *Fusarium equiseti*, *F. poae* and *F. proliferatum* was studied. The experiments were carried out using the agar plate method. It was found that the species *Fusarium equiseti* and *F. proliferatum* showed significant resistance to certain preparations. The greatest (93,2 – 100,0 %) biological effectiveness in relation to the studied species of fungi was the preparate Falcon. On average, this figure was 97,7 %. For other fungicides, the average effectiveness varied from 70,1 to 91,9 %.

**Ключевые слова:** фунгициды, грибы рода *Fusarium*, колония, биологическая эффективность, резистентность, метод агаровых пластин.

**Keywords:** fungicides, fungi of the genus *Fusarium*, colony, biological efficiency, resistance, agar plate method.

В условиях Центрально-Чернозёмного региона (ЦЧР) на посевах пшеницы и других зерновых культур достаточно часто встречаются грибы рода *Fusarium*. Они являются возбудителями корневых гнилей и фузариоза семян. Следует отметить, что такое опасное заболевание, как фузариоз колоса

наносит наибольший вред посевам пшеницы в южных регионах России. В средней полосе страны, где относительно умеренный климат, данное заболевание носит скрытый характер и выявляется с помощью микологического анализа [2,4]. Но и здесь грибы рода *Fusarium* наносят ощутимый экономи-

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