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## SPECIFICITY OF USING ORNAMENTAL SHRUBS IN PLANTING AREAS FOR DIFFERENT PURPOSES UNDER CONDITIONS OF SOUTHERN UKRAINE

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The study analyzes specificity of using ornamental shrubs in planting areas for different purposes applied in landscape architecture as single plants or in compositions for hedging. Ornamental plants create a background for other garden groups or are the main accent in planting areas.

It was established that highly-ornamental species of shrubs are mainly used in planting areas for different purposes in the territory examined: the feather fern (*Spiraea japonica* L.), the common privet (*Ligustrum vulgare* L.), the Japanese barberry (*Berberis thunbergii* L.), the common lilac (*Syringa vulgaris* L.), the common laurel cherry (*Prunus laurocerasus* L.), the golden currant (*Ribes aureum* Pursh), the forsythia (*Forsythia* Vahl), the trailing mahonia (*Mahonia aquifolium* (Pursh) Nutt), the guelder-rose (*Viburnum opulus* L.) and the cotoneaster (*Cotoneaster* Medik.).

The research allowed finding that there is a high demand for *Spiraea japonica* L. in landscape architecture, since the shrub is capable of retaining its ornamental characteristics throughout the growing season. *Spiraea japonica* L. is mainly used for hedging, rockeries, border planting, mixed borders (planted together with the smoke tree (*Cotinus* Mill.), the deutzia (*Deutzia* Thunb.), the dahlia (*Dahlia* Cav.)). The plant looks spectacular with the fir-tree (*Picea* A.Dietr.), the thuja (*Thuja* L.) and the pine (*Pinus* L.).

Scientists highlight that *Ligustrum vulgare* L. has no special requirements and suits for shaping by means of clipping. The shrub has become popular among landscape architects due to these characteristics.

The study analyzes uniqueness of *Berberis thunbergii* L. and possibilities of combining its ornamental characteristics with other plants to create horticultural compositions.

The paper highlights that ornamental plants are damaged by pests and diseases. Planted outdoors, woody plants are mainly damaged by pathogens of stem and root rots, plant leaves are damaged by fall webworm and leaf-miners.

**Key words:** landscape architecture, horticultural object, ornamental shrubs, planting areas for different purposes, landscape compositions.

### **Дементьєва О.І., Лаврись В.Ю. Специфіка використання декоративних кущів у насадженнях ділянок різного призначення в умовах півдня України**

У статті проаналізовано особливості використання декоративних кущів на об'єктах озеленення різного цільового призначення, які застосовують в ландшафтному дизайні для оформлення живоплотів в одиночних посадках, групових композиціях. Декоративні насадження створюють фон для інших садових груп або є основним акцентом на ділянці.

Встановлено, що на об'єктах різного цільового призначення території дослідження використовують переважно високодекоративні види кущів: спірея японська (*Spiraea japonica* L.), бирючина звичайна (*Ligustrum vulgare* L.), барбарис Тунберга (*Berberis thunbergii* L.), бузок звичайний (*Syringa vulgaris* L.), лавровишня звичайна (*Prunus laurocerasus* L.), смородина золотиста (*Ribes aureum* Pursh), форзиція (*Forsythia* Vahl), магонія падуболиста (*Mahonia aquifolium* (Pursh) Nutt), бульденіж (*Viburnum opulus* L.), кизильник (*Cotoneaster* Medik.).

У ході досліджень було з'ясовано, що існує неабиякий попит на *Spiraea japonica* L. для озеленення об'єктів садово-паркового будівництва, причина цьому здатність куща тримати свої декоративні якості упродовж усього вегетаційного періоду. Переважно *Spiraea japonica* L. використовують для створення живоплотів, рокаріїв, бордюрів,

міксбордів (всаджують разом із скумпією (*Cotinus Mill.*), дейцією (*Deutzia Thunb.*), жоржиною (*Dahlia Cav.*)). Рослина ефектно виглядає з ялиною (*Picea A.Dietr.*), туєю (*Thuja L.*) та сосною (*Pinus L.*).

Відмічено невибагливість *Ligustrum vulgare L.* та можливістю формувати фігури за допомогою обрізки. Саме завдяки цим якостям куц став популярним серед ландшафтних дизайнерів.

Проаналізовано унікальність *Berberis thunbergii L.* та можливості поєднання її декоративних якостей з іншими рослинами у створенні садово-паркових композицій.

Відмічено, що декоративні рослини пошкоджуються шкідниками та хворобами. У вуличних насадженнях деревні рослини частіше пошкоджуються збудниками стовбурових і кореневих гнилей, листя рослин пошкоджуються американським білим метеликом та комахами-мінерами.

**Ключові слова:** дизайн ландшафту, садово-парковий об'єкт, декоративні куці, об'єктах озеленення різного цільового призначення, ландшафтні композиції.

**Problem statement.** Ornamental horticulture is an important part and a main component of horticulture on the whole. Its main task is to improve landscaping in urbanized environments. Different varieties of flowering, woody plants and shrubs are used in the area of landscaping in order to create green compositions in planting areas for different purposes. Professionals in horticulture plant ornamental shrubs in the areas for different purposes. Coloration, forms, seasonal changeability and evergreen characteristics are taken into consideration when creating compositions that allow ensuring ornamentation throughout the year [1].

Woody plants and shrubs are one of the most important long-term elements of landscapes decorating residential areas. In addition to an ornamental function, green plants take part in the formation of urban environments, create special micro-climatic and sanitary conditions [2].

Ornamental shrubs are widely used in decorating private gardens. Their popularity is determined by tolerance, attractive look and a vast diversity. They are used in decorating hedges, including single plants and group compositions. Ornamental plants create a background for other horticultural groups or are the main accents in the area [3].

**Analysis of the latest studies and publications.** The issue of interaction of different components of horticultural ecosystems in urbanized environments and also the processes of establishing parks and forest-parks in urban ecosystems and, partially, public gardens were examined in numerous publications of Ukrainian and foreign scientists, in particular, in the studies of Yu.P. Biallovych, O.O. Nitsenko, T.H. Larina, Yu.O. Klymenko, Ya.V. Henyk, R.B. Dudyn, V.P. Kucheriavy [4].

Scientific literature devoted to the issue of planted areas numbers many studies of Ukrainian scholars, namely, the ones by Boiko T., Melnyk R., Kovalevskiy S., Boiko L., Boiko P. V.M. Cherniak, V.P. Vodnyk, L.P. Kazimiriv, L.I. Rubtsov, M.V. Maurer etc [5-8].

**Task setting.** The purpose of the study was to examine the specificity of using ornamental shrubs in planting areas for different purposes under conditions of Southern Ukraine.

**Research materials.** The research conducted in the territory of Kherson region in 2021–2022 was aimed at analyzing the specificity of using ornamental shrubs in planting areas for different purposes in Kherson.

Planting areas are divided into two groups: suburban and urban. Further they include planting areas for different purposes consisting of three groups:

– for special purpose – cemeteries, sanitary-protective zones, flower farms, streets, lanes, roads, zoological gardens, pathways, botanical gardens, pedestrian and bicycle paths, nurseries etc;

– of general use – public gardens, recreational zones, parks (lawn-parks, hydro-parks, forest-parks, urban parks), boulevards, gardens, grounds etc;

– of limited use – private gardens, residential areas, school territories, kindergartens, playing grounds etc.

We found that highly-ornamental species of shrubs are mainly used in the areas for different purposes: the feather-fern (*Spiraea japonica* L.), the common privet (*Ligustrum vulgare* L.), the Japanese barberry (*Berberis thunbergii* L.), the common lilac (*Syringa vulgaris* L.), the common cherry laurel (*Prunus laurocerasus* L.), the golden currant (*Ribes aureum* Pursh), the forsythia (*Forsythia* Vahl), the trailing mahonia (*Mahonia aquifolium* (Pursh) Nutt), the guelder-rose (*Viburnum opulus* L.) and the cotoneaster (*Cotoneaster* Medik.).

The research allowed establishing that the demand for *Spiraea japonica* L. f. for horticultural objects is very high, the reason for it is the ability of the plant to retain its ornamental characteristics during the entire growing season, tolerance in cultivation and suitability for combining with other plants growing next to them [5].

The shrub is used for creating different compositions in landscape architecture. The plant is often combined with *Ligustrum vulgare* L. and the common jasmine (*Philadelphus* L.) for creating hedges.

*Spiraea japonica* L. is used for creating hedges, rockeries, green borders, mix-borders (planted together with the smoke-tree (*Cotinus* Mill.), the deutzia (*Deutzia* Thunb.), the dahlia (*Dahlia* Cav.)). The plant looks attractive with the fir-tree (*Picea* A.Dietr.), the thuja (*Thuja* L.) and the pine (*Pinus* L.) (Fig. 1) [9].



Fig. 1. The borders with *Spiraea japonica* L.f.

*Ligustrum vulgare* L. – the plant has been used in landscape architecture due to its tolerance and a possibility to shape figures by clipping. The plant has become popular in professional designs due to these characteristics [10].

This ornamental shrub allows creating hedges and figures of topiary. The plant is used for decorating public gardens, parks etc.

*Berberis thunbergii* L. – the shrub is considered to be multi-purpose, it can be used as a single plant and allows creating group compositions, in both cases it will look harmonious. The plant is combined with the box (*Buxus* L.), the jasmine (*Jasminum* L.), the lilac (*Syringa vulgaris* L.), the smoke tree (*Cotinus* Mill.), the deutzia (*Deutzia* Thunb.), the forsythia (*Forsythia* Vahl) etc. In combination with other plants the shrub is

used for creating green borders, hedges, rockeries, stone gardens and near water bodies. The shrub is suitable for shaping different forms. Hedges created using the plant are impenetrable due to its thorns and look aesthetically (Fig. 1.4) [9; 10].

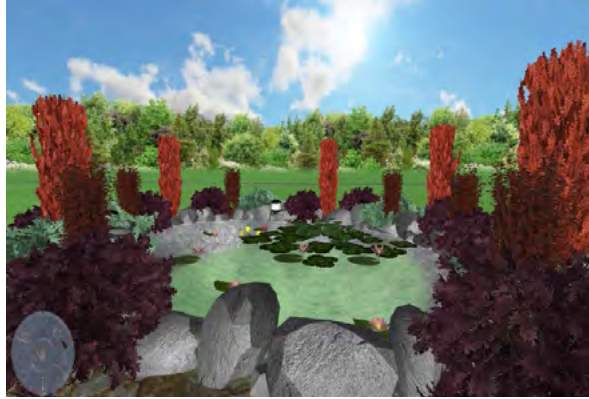


Fig. 2. *Berberis thunbergii* L. near the water body

*Viburnum opulus* L. – this ornamental plant is used in landscape architecture in combination with different compositions and as an individual object. The shrub is considered to be tolerant of pollution. Professionals plant it along the alleys and roads, on grounds, lawns, near summerhouses and in private gardens. It is used to create beautiful flower beds.

Landscape designers combine this plant with the mock orange (*Philadelphus* L.), spiraea (*Spiraea* L.), the barberry (*Berberis* L.), the lilac (*Syringa vulgaris* L.) etc [4; 10].

*Syringa vulgaris* L. – is an ornamental shrub which is tolerant of combining it with different plants species in landscape architecture that allows creating a mixed composition in combination with the forthysia (*Forsythia* Vahl), the tree peony (*Paeonia suffruticosa* L.), the barberry (*Berberis* L.), the hydrenagea (*Hydrangea* L.), the thuja (*Thuja* L.), the privet (*Ligustrum vulgare* L.) and the juniper (*Juniperus* L.) (Fig. 3) [4; 9].



Fig. 3. The hedge with *Syringa vulgaris* L. and *Forsythia* Vahl

Studies show that the plant is used to create hedges, it is planted in private gardens, near benches and houses. *Syringa vulgaris* L. is planted in gardens, parks, near fences etc.

*Mahonia aquifolium* (Pursh) Nutt. – when using the plant in landscape designs, professionals should know that the shrub should be planted in shady places to prevent it from losing its ornamental characteristics. It is planted together with roses (*Rosa* L.), azalea (*Azalea* L.), rosebay (*Rhododendron* L.), camelia (*Camellia* L.) and magnolia (*Magnolia* L.) [10; 11].

This ornamental shrub is planted as a single plant and in groups that does not affect the shrub's incredible look. The plant is also used in decorating rockeries, motorways, borders, gardens and parks.

*Ribes aureum* Pursh is a popular and attractive plant in landscape architecture. It is used to create hedges, decorate borders, private gardens etc. When planting the shrub in combination with other plants, it is necessary to consider that there should be similar requirements to the growing conditions: honeysuckle (*Lonicera* L.), gooseberry (*Ribes* L.).

*Forsythia* Vahl – the plant is used to decorate fences and private gardens, create hedges. The shrub is often planted in combination with evergreen plants: box (*Buxus* L.), holly (*Ilex* L.) and lawn narcissus (*Narcissus* L.) [11].

*Cotoneaster* Medik. – landscape architects use the shrub for creating hedges with creative general look. The plant attracts professionals since it is tolerant in terms of growing conditions and plant care (Fig. 4) [10; 11].



Fig. 4. The bed with 3 *Viburnum opulus* L., *Berberis* L., *Cotoneaster* Medik., *Ligustrum vulgare* L.

This ornamental shrub is also planted in combination with the Canadian redbud (*Cercis canadensis* L.). Their combination looks incredibly picturesque.

It is necessary to highlight that ornamental plants can be damaged by pests and diseases which ruin stems, roots, leaves, buds, flowers and fruits, reducing ornamental characteristics of these shrubs.

Having analyzed scientific literature concerning the research on the phyto-sanitary state of green areas in Kherson, Boiko T. O. emphasized that different types of areas differ in the species of pathogenic organisms, and also in the intensity of damage to host plants. In parks there are more diseases and pests damaging leaves or needles of woody plants. Woody plants in streets are mainly damaged by pathogens of stem and root rots, plant leaves are majorly ruined by fall webworm moths and leaf-miners [12].

The research also analyzes pests and diseases of highly-ornamental species of shrubs: the feather fern (*Spiraea japonica* L.f.), the common privet (*Ligustrum vulgare* L.), the Japanese barberry (*Berberis thunbergii* L.), the common lilac (*Syringa vulgaris* L.), the common laurel cherry (*Prunus laurocerasus* L.), the golden currant (*Ribes aureum* Pursh), the orsythia (*Forsythia* Vahl), the trailing mahonia (*Mahonia aquifolium* (Pursh) Nutt), the guilder-rose (*Viburnum opulus* L.) and the cotoneaster (*Cotoneaster* Medik.).

It was found that one of the pests of *Syringa vulgaris* L. is the lilac leaf mining moth (*Gracillariidae* Stainton.) which damages plants, leaving brown spots on them. In the middle of May – at the beginning of June the moth lays a great number of eggs developing into worms which damage leaf blades.

The lilac spider mite (*Tetranychidae* Donnadieu.) is a dangerous pest for *Syringa vulgaris* L. Its size is 0.2 mm. The pest feeds on sap of young leaves damaging buds and causing wizened plant branches.

The diseases of *Syringa vulgaris* L. include powdery mildew which looks like white dust on damaged leaves. When the disease appears on leaves of this plant it is covered with small white spots which grow covering the entire leaf area. The disease is mainly spread at the end of a cold season and at the beginning of a wet summer.

Cercosporosis or septorios emerge on leaves of *Ribes aureum* Pursh as brown spots up to 3 mm, occasionally such signs emerge even on its berries. In some cases, its leaves are covered with other dark-brown spots, this disease is spread in the middle of summer. Damaged by these diseases, leaves wither and drop. We found that the disease is mostly spread in densely planted shrubs.

It was established that the most widespread disease for *Forsythia* Vahl. is bacteriosis which manifests itself at the beginning as scorched leaves. The disease causes the shrub withering, unfortunately, it cannot be fought. When the disease is identified, the shrub should be immediately uprooted and burnt. If it is not done, bacteriosis will spread to other flowers, shrubs and trees. When the shrub is uprooted, the soil is treated with magnesium. *Forsythia* Vahl. can be damaged even by birds which eat the plant buds in winter or in spring. In order to protect the shrub from them, the plant is wrapped in chicken wire.

While examining the ornamental shrub, we found that the number of diseases and pests damaging *Forsythia* Vahl. is not considerable.

*Viburnum opulus* L. – the examined plant is damaged by fungal and viral diseases including powdery mildew, cercosporosis, ascochyosis, grey rot and viral diseases [4].

We found that the shrub *Spiraea japonica* L. is damaged by the following pests: red spiders, ash bugs and rose leaf rollers. Diseases damaging the plant were not identified [5].

The study analyzes that *Ligustrum vulgare* L. is highly resistant to plant diseases, but spots or powdery mildew can appear under increased soil acidity. In order to prevent these diseases, it is necessary to monitor soil acidity. Crushed limestone, dolomitic meal etc should be added to reduce soil acidity [10].

*Mahonia aquifolium* (Pursh) Nutt. can be damaged by such pests and diseases as rust or powdery mildew.

*Berberis thunbergii* L. is resistant to pests and diseases, but in some cases powdery mildew, spots, rust, ash bugs and withered branches and others may occur.

It was established that the examined plants are mainly damaged by leaf blotch miners (*Gracillariidae* Stainton.), red spiders (*Tetranychidae* Donnadieu.), powdery mildew, bacteriosis, septorios etc.

**Conclusions and suggestions.** Thus, our observations allow stating that the demand for highly-ornamental shrubs for decorating planting areas for different purposes is extremely high.

With regard to specificity of the examined plants, we found that ornamental shrubs differ in shapes, structure and smell of flowers. They have seasonal changeability and can be evergreen that allows retaining ornamental characteristics throughout the year.

It was established that there should be appropriate growing conditions and proper care for shrubs to maintain ornamental characteristics and features of these plants. The most widespread pests and diseases of the examined plants were identified.

#### REFERENCES:

1. Дементьева О. І., Котляр К. О. Використання декоративних кущів для озеленення об'єктів різного цільового призначення. Матеріали V-ої Міжнародної науково-практичної конференції «Екологічні проблеми навколишнього середовища та раціонального природокористування в контексті сталого розвитку» м. Херсон, 27–28 жовтня. 2022 р. Херсон, 2022. С.
2. Бойко Т.О. Таксономічна структура і стан вуличних насаджень міста Херсон. Науковий вісник НЛТУ України, 2019. С. 51–54.
3. Boiko TO, Dementieva OI. The tree vegetation of the Kherson State Agrarian University Arboretum. *Ukrainian journal of ecology*. Вип.2. 2018. С. 120–127.
4. Кохановський В.М. Декоративна дендрологія. Навчальний посібник. Частина 1. Суми : «Сумський національний аграрний університет», 2011. 267 с.
5. Ковалевський С.Б., Соловей Д.С. Сади «Нової хвилі»: особливості створення та використання на об'єктах садово-паркового мистецтва. Монографія. К. : ЦП «КОМПРИНТ». 2017. 188 с.
6. Кучерявий В. П. Озеленення населених місць : підручник. Львів : Світ, 2005. 456 с.
7. Верещагіна П. М., Коваленко О. А., Чепак О. І. Технологія озеленення населених місць: курс лекцій, Миколаїв : МНАУ, 2015. 104 с.
8. Бойко Т.О. Фітосанітарний стан зелених насаджень міста Херсон. *Науковий вісник НЛТУ України*. 2020. С. 67–72.