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### THE ASSORTMENT OF FLOWER-ORNAMENTAL PLANTS FOR SCHOOL LANDSCAPE GARDENING

The article is devoted to the questions of prospect ornamental plants selection for school territories landscape gardening in conditions of Belarus are offered at the article. Assortment consists of annual, biennial and wintering perennial flower-ornamental plants, culture, no wintering in the open ground. The principles and criteria for the selection of a range of specific activities of this type of educational institution, the study of ornamental and economic and biological attributes of plants are provided.

**Introduction.** The purpose of this study was to develop perspective range of grass (flower-ornamental, medicinal and spicy-aromatic plants for school territories landscaping in the Republic of Belarus. Research aims at improving of aesthetic, recreational and educational functions of plants on the territory of educational institutions, thus determines their currency and significance.

**Objects and methods of research.** The research objects were local and introduced species of ornamental herbaceous plants. Methodology of the research involved the analysis of decorative and economic – biological qualities of plants with the aim of perspective selection range of flower crops for school territories landscaping [1–3].

**The results of the research.** The main selection principles of decorative herbaceous plants range for creation of school territories flower-ornamental design with the specific activity of this type of educational institutions may include the following:

- ensuring sustainable decorative effect, due to the high decorative qualities of flowers (inflorescences) and leaves of the original bush habitus and other characteristics of plants;

- diversity of herbaceous plants life forms, systematic properties, and morphology and biology characteristics, including different ecological groups of plants;

- belonging of grassy plants to local and introduced species;

- not only species of herbaceous plants wide use, but also their decorative forms and varieties with taking account of modern garden flower crops and new selection classification;

- introduction in created compositions along with ornamental herbaceous plants of medicinal, spice-aromatic and vegetable crops;

- flowering terms variety of plants, in order to ensure continuity of their flowering from early spring to late autumn;

- predominant use in flower-ornamental landscaping of perennial spring-summer and summer-

autumn flowering periods plants, taking into account the most intensive functioning of school territories in spring and autumn;

- high rate of plants reproduction, availability of seed and vegetative planting material;

- crops stability and unpretentiousness of plants, their planting longevity (perennial crops);

- the possibility of differential use of developed plants range in different colour gamma compositions both of landscape and regular styles.

The basic range of flowers used in landscaping of school territories should be perennial flower-ornamental plants, both nice flowering and deciduous ornamental.

The possibility of proposed perennial flowers use in landscaping within 3–4 years or more (for example, asparagus, peony, hosta can be grown in one place for up to 10 or even 25 years) permit to reduce the cost of flower-ornamental design creation of school territories. The vegetative mode of reproduction, which is essential for plants of this group, makes it easy to propagate perennial plants in the open ground conditions in spring and autumn terms, involving pupils of different age groups to the work in the implementation of educational process.

Timing diversity of flowering perennial ornamental plants (spring, spring-summer, summer, summer-autumn and autumn) allows creating of continuously flowering landscape composition on the school territory (for example, small gardens and flower beds of uninterrupted flowering – rockeries, mixborders and others). Some perennial flowers (for example, species and sorts of genera Astilbe, Heuchera, Ligularia sibirica, Hosta) can be used in the compositions of the regular style trend, including as composite accents.

It is rationally to include also the annual flowers (nice flowering, ornamental-deciduous, runner, annual immortelle flowers) in the range of flower-ornamental plants for the school territories landscaping, because plants of this group are able to provide a long decorative effect – during the whole

summer to autumn frosts period. Therewith, this advantage of the main annual flower species, including their modern varieties and hybrids, is provided mainly by seedling method of growing flowers, that creates certain difficulties in obtaining of planting material in the terms of school and, as a rule, necessitates its annual purchase, resulting in considerable money expenses.

In this regard, it seems reasonable to plant seedlings of the main annual flower species (ageratum, begonia, Petunia, Salvia, and other) in flower beds and container compositions, created mainly to design the school entrance zone and its most important sites.

It may be perspective for use in landscape gardening of school territories a numerous group of annual flower plants, characterized by a short development period from sowing to the beginning of flowering (eschscholzia californica, Drummond Phlox, zinnia elegance, alyssum marine, tagetes signata, and others) that will give the opportunity to produce their seeds sowing directly into flower beds (nonseedling method of growing) and significantly reduce the costs of planting material purchase. This approach of using annual plants in solving the problem of flowers range selection will permit to give a peculiar character to floral design of school territories and to differentiate it from the traditional floral decoration of urban environment space (squares, streets, highways and others).

A similar approach to the use of biennial flower-ornamental species will permit to create the conditions for their effective application in the design of the school site. Just the same preference should also be given to spring-flowering species (e.g., viola Vitrokka, forget-me-not hybrid, Daisy perennial).

Perspective range development of herbaceous ornamental plants for landscaping in school territories should be taken into account their features permitting to differentiate the use of specific species and varieties in flower beds, defining their appropriate place in the flower-ornamental composition:

- accent (A) – mostly large or medium size plants, characterized by a stable decorative effect and a special aesthetic expressiveness;
- background (B) – tall or medium height plants for placement on the composition background, forming a relatively dense homogeneous, often neutral in color groups;
- the middle plan (M) – mainly medium size plants with expressive colouring and texture;
- foreground (F) – undersized, including ground cover plants, creating a low tier of composition.

On the basis of the developed selection range principles and criteria for landscaping of the school territories we proposed 235 species of flower-ornamental plants.

Fig. 1 shows that the basis of the offered range are perennial (131 species, or 56%) and annual (90 species, or 38%) flower-ornamental plants. The presence of experimental plots for growing plants in the structure of school experimental plots assumes inclusion of local and introduced plants species range of different appearance and systematic accessories that will allow to use them as visual aids during the teaching lessons, group circle work and research activities.

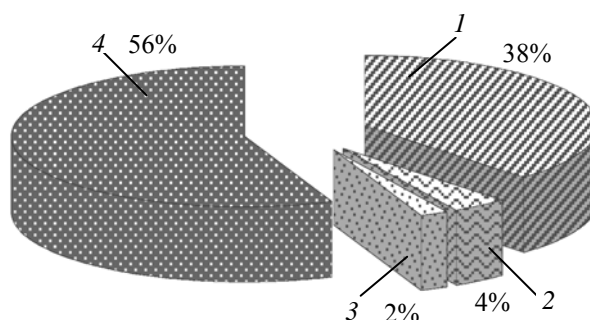


Fig. 1. Distribution of the flower-ornamental plants perspective range by groups:  
 1 – annual flower-ornamental plants of open ground;  
 2 – biennial flower-ornamental plants of open ground;  
 3 – potted plants, annual used outdoors;  
 4 – perennial ornamental plants

The flowering timing of included in the plants range species varies from one (33 species, or 14%) to six months (2 or 1%). The flowering duration of most plant species (88 species, or 37%) is about two months, due to the inclusion in the range of annual flower-ornamental plants. Flower-ornamental plants variety by the flowering timing and duration will create long flowering compositions from April to frost (Fig. 2).

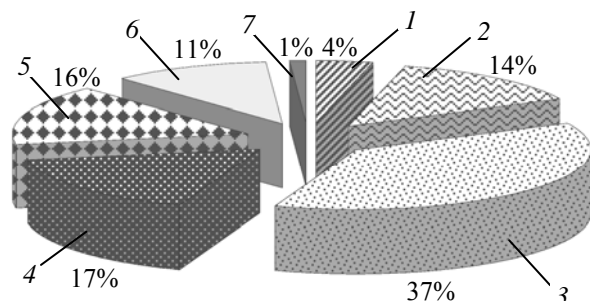


Fig. 2. Distribution of flower-ornamental plants of perspective range by duration of flowering:  
 1 – not flowering among plants species;  
 2 – flowering up to 1 month; 3 – flowering up to 2 month; 4 – flowering up to 3 month;  
 5 – flowering up to 4 month; 6 – flowering up to 5 month; 7 – flowering up to 6 month

The perspective range of herbaceous ornamental plants is designed to enable the formation on the school territories of thematic gardens and separate flower-ornamental compositions. For example, in architecture and landscape organization of school territories in the terms of urban environment nowadays it is topical to apply one of the modern trends of landscape design – creation of landscape natural compositions, particularly of natural objects (meadows and others) gardens-models. An important method of their development is widespread using of the most decorative and resistant to anthropogenic loads of native herbaceous species and varieties of plants which use in landscaping of the Republic of Belarus has not yet received widespread distribution.

When creating thematic flower-ornamental compositions on the school territories it is perspective to use differentiated ranges of plants taking into account the interests of different age groups of schoolchildren, as well as various types of monoidal - rose gardens, of runners, etc. that will significantly diversify the landscape.

Developed range includes plants that have medicinal (pot marigold, peony, Echinacea and others) and volatile properties (origanum vulgare, tansy, Polemonium caeruleum L. and others), as well as some spice-aromatic plants (hyssop, Salvia officinalis and others). Their use in flower-ornamental design of school territories design along with performing aesthetic and cognitive functions will contribute to the environment improvement as a kind of "environmental aerophytherapy".

Almost all included in the designed range of ornamental plants species can be used to create compositions and thematic gardens of landscape stylistic trends; 109 plant species (47%) can be used in the compositions of the regular character.

Analysis of decorative signs, which are characterized for included in the range of flowers, allowed to differentiate their use in flower beds, defining their appropriate place in the composition. Most of the proposed plant species can be used as a plant of medium (155 species) or front (107 species) plan. To create the background 48 species can be used; as composite accents it is reasonable to include 36 species of plants in the compositions. It should be noted that some species of plants in the compositions can take different location (Fig. 3).

For many perennial flowers of perspective range reproduction, several types of planting material, for example of sections and rooted sprigs.

Included in the flower crops range in general are characterized by the availability of seed and

vegetative propagating material under the terms of our Republic.

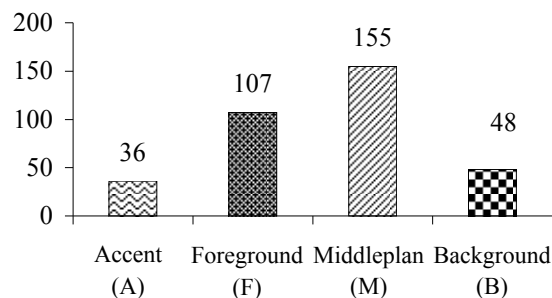


Fig. 3. Distribution of perspective flower-ornamental plants range by their location in the compositions, pieces

The following lower-ornamental planting material species of annual and long-term plants use for landscaping of school territories are recommended: seeds for sowing in open ground, seedlings, rooted sprigs, sections, segments of rhizomes, bulbs, tubers, bulbotubers (Fig.4).

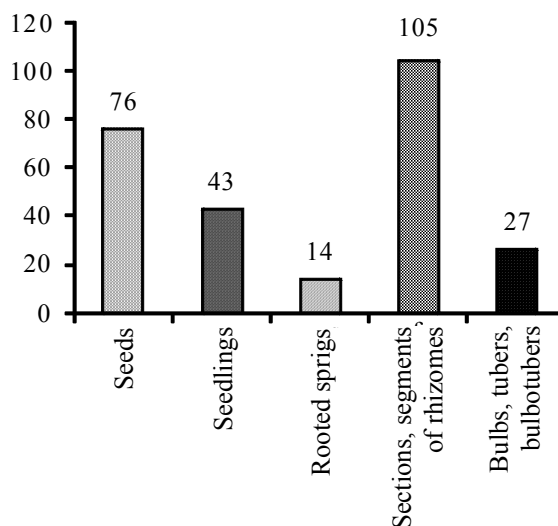


Fig. 4. Distribution of perspective flower crops range taking into account recommended species of plant material for creation of flower beds on the school territories, pieces

**Conclusion.** As a result of the research, the principles basic on selected 235 flower-ornamental plants species of perspective range were developed. This range assumes a stable decorative effect, a variety of herbaceous plant life forms, systematic properties of morphological and biological characteristics, herbaceous plants properties of the native and introduced species number. Medicinal, spice aromatic and vegetable crops are included. The recommended plant species are discriminated by stability and crops unpretentiousness, longevity in the planting. Their important

advantage is the possibility of differential use of plants in various colour compositions of landscape and regular styles.

It is taken into account plants timing diversity of flowering, in order to ensure continuity of their flowering from early spring to late autumn. When choosing the composition of crops, it is important a preferential use of flower-ornamental perennial plants of spring-summer and summer-autumn flowering periods in landscaping of school territories. Flower crops included in the recommended range are characterized by a high rate of reproduction and expressed accessibility of seed and vegetative propagating material under the terms of the Republic of Belarus [4].

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