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HISTORY AND PRACTICES OF THE USE OF GRAMINEOUS PLANTS IN UKRAINE AND ABROAD

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There were analyzed the works of some scientists concerning the use of gramineous plants in landscape art in Ukraine and abroad. There were determined the practical value of the grassy gardens in anthropogenic environments of modern cities and there were provided recommendations concerning the placement and use of "New Wave" gardens.

Ornamental grasses, landscaping, "New Wave" gardens, grassy gardens

In any country in the world it is difficult to imagine improvement of cities and towns without the top quality landscaping. The workers of landscaping industry strive to achieve the highest decorativeness level of stands during a relatively short time and it encourages them to grow planting material which acquires its full habitus for one growing season. The list of such plants includes flowering crops, grasses, and ornamental grasses.

Many scientists study the issues of flower crops both in Ukraine and in the world, in whole. It is not surprising, since any flowers, of course, can be found both in the streets and public space for general use and in the private possessions. Grain crops in Ukraine are found only in gardens as a backdrop for flower arrangements.

The aim of the research is to analyze the use of grain crops in the garden art in Ukraine and abroad.

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The subject of research is the scientific papers, articles, publications and books devoted to features of the use of grain crops in the garden art of Ukraine and the world.

Object of research are the following: representatives from the grain crops family (Poaceae), namely their ornamental species.

During the period of gardening many stylistic trends and directions appeared. One of these trends was the garden style introduced by the Danish landscape architect that was called “New Wave”. It originated in the early XXI century [21]. The feature of this style is that garden is created with the use of cereals and permanent grasses only [27].

One-flower gardens (mono gardens) are popular worldwide (rose gardens, lilac gardens, tulip gardens) but mono gardens with the ornamental grasses are not currently regarded as a special type of garden called Graminaceae (from Latin). In Ukraine to date all the works are associated with the study of cereals aimed at their use in feeding. In terms of decorative function grasses are not currently taken into consideration.

Tsvyelyev M.M. [16] notes in his work “Zlaky SSSR” (Cereals of USSR): “... Cereals are used as ornamental plants, mostly for lawns, also for dry bouquets and single planting (e.g. pampas grass - Cortaderia).

Many of them are good sand binders and all kinds of earth fills, they provide construction materials and raw materials for paper production (especially bamboo and cane), contain aromatic substances used in perfumes (some tropical genera of the tribe Andropogoneae) ... » [16].

The issue about grains classification is considered in the works of German and Russian botanist and academician of the Petersburg Academy of Sciences named after Triniusa K.A. (1778-1844 years) [16], who described many new species of cereals both in our country and in other areas of the globe. A major contribution was made by him in the taxonomy of this family. Most of the subdivisions that were placed above all genera and those ones that were placed

inside the classification were quite correctly installed. But unfortunately, they were issued without an accurate indication of taxonomic rank [16].

There is also a cereal herbarium of Trinius K.A. that is preserved in the Herbaria of the Botanical Institute of the USSR. This herbarium contains not only authentic copies of almost all species described by Triniusom, abut also numerous types of grains that were described by his predecessors and contemporaries [16].

In 1784 the academician of St. Petersburg and Berlin Academies of Sciences, Professor Pallas P.S. in his scientific work "Flora Rosiyi" (Russian Flora) (Latin: "Flora Rossica") [8] described the environmental conditions of growth and zonation of some species, including cereals. Analyzing the possibility of the use of grass gardens in Ukraine, the above-mentioned research work were considered in the literature review because Ukraine was part of the USSR during the period of writing.

For the first time all the information about the taxonomy of cereals that grow on the territory of Ukraine, as well as in the former Soviet Union, was concluded by German botanist Hrizebah A. (1814-1879) [16]. This taxonomy includes 368 species from 98 genera of grasses.

However, after the scientific work of Pallas P.S. «Flora Rossica» [8] was published, the scattered data accumulated in respect of cereals. Rozhevits R.Y. was the first one who systematized these data (1882-1949) [12]. He published a number of summary work on grasses for different parts of the Soviet Union; many collections of cereals were processed. It is essential that Rozhevits became the principal author and co-editor of the second volume of "Flora of the USSR", released in 1934, this volume contains only the family of grasses. This volume was compiled by Nevsky S. [7], Ovchinnikov P, [16] Krechetovich V.I. [5], Bobrov E.G. [16], Goncharov N.F. [16], Komarov W. JI. [16], Lavrenko E.M. [16], Shishkin B.K. [16], Vvedenskyi A.I. [16], Sochava V.B. [16], Nekrasov V.L. [16], Krishtofovich A.N. [16], Larin I. [6]. This volume deals with issues of grasses taxonomy, their morphological and ecological features.

Since 1933, in ESI of Botany of Kharkov University Yuri Prokudin began to be engaged in the issues of cereals that grow in Ukraine [10]. Thereafter he devoted his life to finding cereals in Ukraine and drawing up detailed maps of the growth of these species. During his life M. Prokudin described 19 new species of cereals that were new for science of the families of Agropyron Gaertn., Briza L., Elytrigia L., Helictotrichon L., Bess L., Melica L., Poa L., besides, there were elaborated more 48 sippes of cereals family [11]. In general, Prokudin published about 120 works, most of which is devoted to cereals. Among them there are the analysis of cereals that was published in *"Vyznachnyk roslyn URSR" (Plants Guide of USSR)* (1965), *"Vyznachnyka roslyn Krymu" (Plants Guide of Crimea)* (1972), *"Vyznachnyk roslyn Ukrayins'kykh Karpat" (Plants Guide of Ukrainian Carpathians)* (1977), *"Vyznachnyk vyshchykh roslyn Ukrayiny" (Guide of higher plants of Ukraine) (1987)* and was released and edited by Prokudin [11].

Under the guidance of Prokudin M. at Kharkov University a new comprehensive study of the trend in grains with the use of different research methods formed [22].

In order to solve the issues of taxonomy, besides traditional morphological and geographical methods, such methods as anatomical, karyological, anthecological are widely used. This enabled the Kharkiv graminologs to evaluate critically new species that were described from the territory of Ukraine as well as to examine the part of the large families of the flora of Ukraine (Poa L., Bromopsis Fourr., Bromus L., Elytrigia L., Fesluca L., Kocleria Pers.). As the part of the study there were specified the species composition of grasses of Ukraine, found their anatomic and morphologic signs, installed chromosome numbers, studied eco-phytocoenotic characteristics and distribution of individual species. As a result Prokudin Y.M. published a monograph "Zlaky Ukrayny" (Cereals Ukraine) (1977) [10], which was highly appreciated by specialists. He also created a herbarium of cereals, which was included to the composition of Kharkov University Herbarium [11].

The history of the origin of crops in our country beginning the time of Tripoli culture was outlined by Pashkevych G.O. in his book "*Ril'nytstvo plemen trypil's'koyi kul'tury" (Farming of tribes of Tripoli culture)* [9]. In this paper, the problem of the origin of tripolian agriculture and its development for over two millennia were considered. Rich illustrative material enables us to see the findings of crops, tools that allowed growing the crops seven to five thousand years ago, to harvest and process into food.

The modern scientific information concerning where and when people first began to cultivate crops, how and when and under what circumstances farming emerged in Europe and in Ukraine [9].

Many scientific works were dedicated to the importance of cereals in feed use. Shramko V. in his paper *"Pidbir ta otsinka sumishok odnorichnykh kul'tur dlya lanok zelenoho konveyera perekhidnoyi zony polissya-lisostep"* (Selection and evaluation of the mixtures of annual crops for green conveyor chains of woodland – steppe transition zone) [17] described the results of studies on the improvement in energy efficiency elements of fodder production through efficient use of small doses of nitrogen fertilizers, and by choosing the mixed annual crops depending on terms of use and green parts of the conveyor [17]. In general, the paper aims to assess the cereal plants as feed. However, ornamental feature of cereals is not taken into consideration.

Sakhnenko Vladimir V. [13] in his work *"Zastosuvannya novykh pestytsydiv v intehrovaniy systemi zakhystu ozymoyi pshenytsi vid naybil'sh poshyrenykh zbudnykiv khvorob v umovakh pravoberezhnoho Lisostepu ta Polissya Ukrayiny"* (The use of new pesticides in an integrated system of protection of winter wheat against the most common pathogens in terms of right-bank forest- steppe and woodlands of Ukraine) studied the protection of winter wheat against common pests and pathogens. There were studied the effect of different concentrations of fertilizers and drugs on the growth and development of winter wheat crops, and were estimated optimal dose and conditions of use of these drugs [13].

In 1996, the issue of increasing the productivity of crops (including legumes) through the use of biological products and fertilizers in Ukraine in terms of Polesye (forest area) was studied by Dynnik A.V. [3]. As a result of experiments, it was found that before sowing it is reasonable to handle grass seed with drugs of associative action, such as *mizorin and* flavobakterin in order to increase yield. Dynnik A.V. studied the fertility of cereal, but not analyzed their decorative effect [3].

Solyanik O.P. [14] explored in her work the legume - cereal mixtures, principles of selection and use, as well as their effects on symbiotic nitrogen accumulation.

The questions concerning the botanical and biochemical composition of legume - cereal crop fields and the general principles of their formation were also studied. The aim of the study was to increase the production of a highly cheap herbal feed through the most productive use of the potential of legumes and cereals [14].

The issue of selection of cereals (for example, winter wheat) in terms of steppes and forest area (Polesye) in Ukraine was studied by Burdeynyuk - Tarasevych L.A. [1]. She has created highly adapted productive varieties of winter wheat; she suggested the methods of breeding winter wheat for adaptability to adverse environmental conditions [1]. Also the questions on winter wheat breeding on earliness in conditions of forest area (Polesey) and steppes of Ukraine was studied by Ishchenko V.I. [4]. In this paper the author touches upon the principles of making types of wheat with simultaneous signs of precocity, high performance, hardiness, etc., by the method of selection [4].

Many researchers have investigated the effect of cereals on the human body. N. Trojan [15] in his book “Lechebnye zlaky y zabolevanyya oporno-dvyhatel′noho aparata” provides guidance on the rules of use of cereals as food for humans. She notes that cereals contain large amounts of vitamins, minerals, cellulose. Also grains contain vitamins B, PP, folic acid, calcium, magnesium, sodium, copper, zinc, and phosphorus. These elements greatly improve peristalsis,

it start to function better; restore skin structure [15]. Demidov N. dealt with sprouting grasses and described the principles and methods of treatment of vitamin deficiency with the help of grains [2].

Analyzing the above-mentioned work, we can conclude that the grains in Ukraine today are not considered in terms of decoration. Greater emphasis in the study of the question of cereals is made on the basis of characteristics. In contrast, abroad ornamental grasses have always taken the special place in the garden.

In the XIX century the gardens of England and America have been using miscanthuses and pampas grass as plants that perfectly conveyed the Victorian style.

Among foreign cereal lovers were: Englishman William Robinson [23], Gertrude Jekyll [25]. Among the pioneers was a Dutch biologist Jacques P. Tiysse [26] who created the park at the beginning of XX century in the vicinity of Amsterdam's city, populated by peculiar to plants of former surrounding areas. It was the time when it was announced not to mow grass in gardens that was created in imitation of nature [26].

Cereals gained height of their fame after 1957, when the book of the German gardener, Karl Forster [26] “Cereals and ferns - new plants for the garden”. After Forster the issue of grassy gardens was studied by the following gardeners: Wolfgang Ehmeya, James Van Zvedeno, Rosemary Weiss and many others [26].

The famous “prairie – gardens” have appeared, they were filled with the space and freedom, a theme which is being actively developed by Dutchman Piet Udolf [27]. He believes that the form and structure of plants are immeasurably more important than color, but grasses have this feature, they have their structure and form [27].

In the beginning of XXI century the Danish landscape architect Peter Udolf [21] thought about the idea of landscape garden, where a person does not copy nature but brings a sense of nature in the garden. In his view, the main idea of any garden is its emotional component.

Any landscaped area should bring a sense of balance and calm for a visitor, it should inspire him with contemplation and reflection. Tools of the garden are its structure and form, the second important thing is color, after it when a shape is selected, then suitable size and texture of the plant is chosen [27].

Udolf P. became the founder of stylistic trend that was called the «New Wave» and took into consideration the abovementioned principles of a garden planning. Key plants in the garden "New Wave" are ornamental grasses, supplemented with perennial flower crops.

It is important to assert that such gardens serve their decorative function throughout the year. Udolf P. [19] teaches to see aesthetics even in the dead plants in the winter period and emphasizes not do pruning of dead shoots for a long time from the beginning of the summer blossom until the next spring [19].

Besides Udolf the issue of grassy gardens was actively developed by Briton Neil Lucas (Neil Lucas) [18]. He believes that modern man strives too hard to control everything around, even his garden that sometimes leads to slightly negative impact in a relationship with nature. In order to create a beautiful garden you need to refer, to the natural combinations and not trying to conquer nature, but merely trying to replicate [18]. In the works of Lucas N. there are description of ornamental forms of most cereals, and there also were determined the principles of selection of plants for herb gardens including climatic and soil conditions of an area. In addition to this, a number of recommendations were provided as for the maintenance of the gardens [18].

Conclusions. The use of 'New Wave" gardens are very promising direction in the development of gardening and landscape art of Ukraine, in a whole. However, in order to create such gardens one should examine planting thoroughly the material that would be suitable for growing in our climate, to analyze the features of the growth and development of ornamental grasses, study the features of germination of seeds. Today in Ukraine cereals are studied only in terms of forage crops. Therefore, taking into account the international experience, it is necessary, to develop the idea of gardens in which plants are the main cereals.

These gardens will reach their full decorative function within a year of growth, and do not require many costs to create and maintain.

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