

ORNAMENTAL GRASSES WITH CULTIVATION POTENTIAL IN THE PEDO-CLIMATIC CONDITIONS OF IAȘI COUNTY

IERBURI ORNAMENTALE CU POSIBILITATE DE CULTIVARE ÎN CONDIȚIILE PEDOCLIMATICE DIN JUDEȚUL IAȘI

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Abstract. Ornamental grasses are less used in the landscape design from the NE area of Romania. In the current paper is presented an assortment of ornamental grasses cultivated in other areas, but which due to the ecologic and technologic demands could be cultivated in Romania. NE area of Romania, in according with Hardiness Zone Map of Europe, is in the fifth zone of rusticity with minimum temperatures between -29°C and -23°C .

Key words: ornamental grasses, landscape design, NE area of Romania

Rezumat. Ierburile ornamentale sunt puțin utilizate în amenajările peisagere din zona de NE a României. În această lucrare este prezentat un sortiment de ierburi ornamentale cultivate în alte areale, dar care datorită cerințelor ecologice și tehnologice se pretează pentru cultivare în România. Zona de NE a României conform Hardiness Zone Map of Europe, se încadrează în zona de rusticitate 5, cu temperaturi minime cuprinse între -29°C și -23°C .

Cuvinte cheie: ierburi ornamentale, amenajări peisagere, zona de NE a României

INTRODUCTION

Species called “ornamental grasses” belongs, from botanic point of view, to several families. The majority of the species belongs to Poaceae family, a small number to families Cyperaceae, Juncaceae, Typhaceae and less to other botanic families (for example Liliaceae, Agavaceae, Araceae).

Mentioning the ornamental grasses as elements of a natural, free style, could be found in tropical gardens, from Victorian age at the end of 19th century (Hobhouse, 1992 cited by Michael N. Dana, 2002), and then to the middle of 20th century. Karl Foerster (1874-1970) was one of the pioneers in research of ornamental grasses. In his garden in Potsdam-Bornim, Germany, Foerster evaluated plants gathered from all over the world. In 1940 he published a catalogue with 100 species, varieties and cultivars of ornamental grasses (Marilyn Raff, 2005). During 1980 and 1990 decades the usage of decorative grasses increases, both from Poaceae family and also from others botanic families, thanks to advertise the information through bulletin „A Cornell Cooperative Extension Publication” (Meyer Mary et al., 1973, cited by Michael N. Dana, 2002). Due to this publication were known more taxons and the sources for gathering the biological material used for landscape designs (Michael N. Dana, 2002). The assortment of ornamental grasses cultivated in the world is very diversified

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and have species with different ecological demands function of origin place. Some species have a high ecologic plasticity and are spreaded in many geographical areas of the world: America (Hockenberry Meyer Mary, Mower G.R., 1997; Leppert St., 2009), Europe (Walters S.M., 1983; Taylor N., 1994; Rice Graham, 2006; Ardle J., 2007; Darke R., 2007); Asia and Australia (Gao H., Liu J., 2005; Wu J., Teng W., Wang Q., 2006; Wu Ju-ying et al., 2008; Qian Sun et al., 2010).

MATERIAL AND METHOD

Observations were carried out in the experimental field of Floriculture Discipline from USAMV Iași, in 2011. Were studied a number of seven cultivars belonging to four species from Poaceae botanic family (table 1). To establish the experimental crops were used as multiplication biologic material fragments resulted after bushes division. Morphologic characterisation was made in according with the literature (Walters S.M., 1983; Greenlee J., 1992; Taylor N., 1994; Ardle J., 2007).

Table 1

Ornamental grasses which could be cultivated in the pedo-climatic conditions from Iași, Romania

Nr.	Name of specie / variety / cultivar	Rusticity area	Provenience of biologic material
1	<i>Festuca glauca</i> „Elijah Blue”	3(4)	Young plants of 1 year (Hungary)
2	<i>Imperata cylindrica</i> „Red Baron”	(5)6	
3	<i>Miscanthus sinensis</i> „Gracillimus”	(5)6	Mother plants cultivated 3 years in Bucium area, Iași
4	<i>Miscanthus sinensis</i> „Silberfeder”	(5)6	
5	<i>Miscanthus sinensis</i> „Variegatus”	(5)6	
6	<i>Miscanthus sinensis</i> „Zebrinus”	(5)6	
7	<i>Pennisetum alopecuroides</i> „Little Bunny”	5	

Area in which were carried out the observations (North-East of Romania) belongs to the rusticity area number 5 in according with *Hardiness Zone Map of Europe*, characterized by annual minimum temperatures between -29 °C and -23 °C. Local climate of Iași area is continental type with excessive nuances. The annual average air temperature is of 9.6 °C, and the amplitude of the monthly averages is of 24-25 °C.

RESULTS AND DISCUSSIONS

In landscape designs ornamental grasses could be not only companions for other plants but could be the real attraction points. These plants could assure the décor all year round, from spring till autumn decorates through foliage and inflorescences and in winter by their dried inflorescences.

The assortment of decorative grasses is very diversified having species with high ecological plasticity or only species typical to certain areas.

On world level the rusticity areas are numbered on a scale from 1 to 12 (in area Z1 minimum temperature is below -46 °C and in area Z12 +16 °C) in according with *World Hardiness Zones* (Graham Rice, 2006). In Europe could be found rusticity areas of plants from 3 to 10 according with *Hardiness Zone Map of Europe* (fig. 1). This map shows the rusticity areas function of minimum temperature recorded in each area.

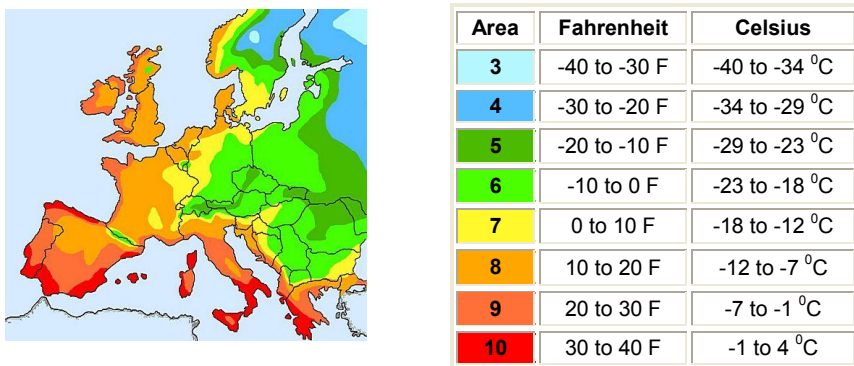


Fig. 1 - Europe – Rusticity areas of plants
(<http://www.your-garden-ponds-center.com/plant-hardiness-zones.html>)

Assortment of decorative grasses is very rich and diversified, species being cultivated in different areas of rusticity. The North-East area of Romania is in area 5 of rusticity in according with *Hardiness Zone Map of Europe* (fig. 2) and function of this criteria were selected species which could resist at conditions with minimum temperatures according to the following areas: Z3 ($t = -40...-35^{\circ}\text{C}$), Z4 ($t = -35...-29^{\circ}\text{C}$), Z5 ($t = -29...-23^{\circ}\text{C}$).

In the last 10 years (2000-2010) minimum temperature recorded at Iași was -23.6°C , in February 2005, and in the others years between -18°C and -23°C . From this reason were selected for our study also species which are cultivated in rusticity area Z6 ($t = -23...-18^{\circ}\text{C}$). Function of plants' biology and ecological demands those species are cultivated as annual or as perennial ones.

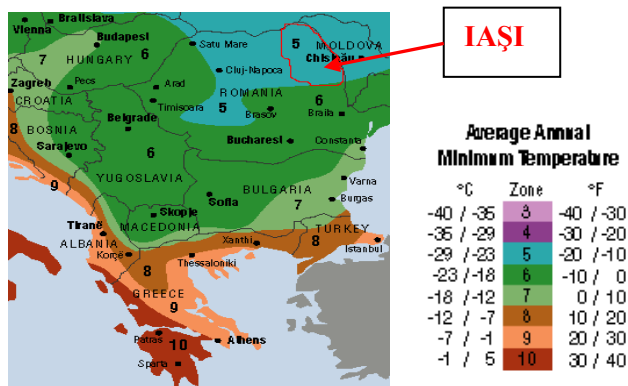


Fig. 2 – Rusticity areas of plants for Europe
(<http://www.gardenweb.com/zones/europe/hze7.html>)

Festuca glauca „Elijah Blue” (blue fescue) is a perennial cultivar (fig. 3 original). Have the aspect of a compact and dense bush, with height of 25-50 cm and diameter 50-75 cm. Leaves are green-blue, with a bloom aspect, linear, thin, with soft texture. The flowers are green-lilac, grouped in panicles. Blooms took place in June - July.

It prefers lands with sunny exposure, soils well drained and low moisture. Could tolerate drought periods and air polluting. The plant didn't like moisture excess.

Decorate through leaves and port from early spring till the beginning of winter and through flowers in June – July. Could be used in borders, rocks shape designs, ornamental pots but also as cut flowers.

It is cultivated as ornamental grass from rusticity area 3 up to area 8.

***Imperata cylindrica* „Red Baron”** (Japanese bloodgrass) is a perennial plant with a bushy aspect (fig. 4 original). Leaves have a vertical grow, and the colour is red. At maturity could reach a height up to 30-50 cm. It blooms very rare.

It has a good development both on lands with sunny exposure and also on semi-shadows, on well drained soils with moderate moisture. Could tolerate drought periods and polluted air.

It is used due to the leaves colouring and the aspect of the bush in landscape designs such as: borders, rock gardens, edging plant, accent or massed as a ground cover. Foliage colour can be superb when backlit by early morning or late day sun. It is also good for patio containers or tubs.

Cultivar could be found in landscape designs from rusticity area 5 up to area 9.

***Miscanthus sinensis* „Gracillimus”** (maiden grass) have an aspect of a compact bush (fig. 5 original). Cultivar could reach the height of 1.2-1.8 m. Flowers are grouped in digital panicles, of a purple-brown colour. It blooms late in autumn.

Prefer sunny lands or semi-shadowed ones. Develop well on fertile soils, well drained. Demand moderate moisture. Tolerate drought periods and polluted air.

Decorate through bush aspect and by flowers and it is cultivated in rusticity area 5 up to area 9. Versatile ornamental grass, but clumps need lots of room. It could be used for borders, meadows, wild gardens, cottage gardens, naturalized areas or pond/water garden peripheries.

It could also be used as cut flowers, in fresh or dry state and also to control soil erosion.



Fig.3 - *Festuca glauca* „Elijah Blue”



Fig.4 - *Imperata cylindrica* „Red Baron”



Fig.5 - *Miscanthus sinensis* „Gracillimus”

***Miscanthus sinensis* „Silberfeder”** (silvergrass) (fig. 6 original). Foliage is green, the blade width is 2.5 cm, 150-200 cm in height. It flowers in August through frost.

Prefer full sun; moist fertile soil. Tolerate a wide range of soil types; moderately drought tolerant; holds up to wind and snow.

Is cultivated from area 5 of rusticity up to area 9 and used as specimen, border, screen, hedge, background plant, drifts, by the water, dried arrangements.

***Miscanthus sinensis* „Variegatus”** (striped eulalia) (fig. 7 original). It is a perennial plant with an aspect of a compact bush, 150-200 cm in height. Foliage is variegated, almost equal amount of green and white; blade width is 1.5 cm. Flowers are grouped in inflorescences of fingered panicle type, and flowering rods could reach the height of 175-225 cm. It blooms in September - October.

Prefer full sun; moist fertile soil; tolerates a wide range of soil types; moderately drought tolerant; holds up to wind and snow.

It is cultivated from rusticity area 5 up to area 9.

It could be used as: specimen, English border, woodland edge, accent plant, hedge, massing, by the water, dried arrangements.

***Miscanthus sinensis* „Zebrinus”** (zebra grass) (fig. 8) is a deciduous, clump-forming, perennial grass, high of 200 cm and diameter of 120 cm. It has upright or arching bluish-green leaves with pale yellowish horizontal bands across them. Maroon-purple leaves appear in autumn complementing the rest of the plant, which turns a russet colour. In autumn, it may carry awed, hairy, pink-white spikelets in fan-shaped panicles. Flowering rods could have a length of 180-200 cm.

This plant prefers full sun or very light shade, is drought-tolerant, and grows in most well-drained soils. Resist at air pollution. Plants look good either as specimen plants or planted in groups in herbaceous borders.

It is a versatile ornamental grass. It could be used as: accent, specimen, grouping, mass or screen. Also could be used for borders, meadows, wild gardens, cottage gardens, naturalized areas or pond/water garden peripheries.

It is cultivated from rusticity area 5 up to area 10.

***Pennisetum alopecuroides* „Little Bunny”** (dwarf fountain grasses, Chinese pennisetum) (fig. 9) is a perennial cultivar, with a globular bush, height of 25-40 cm. Leaves of dark green colour. Flowers are white-green, grouped in spike form inflorescences. It blooms from August till October.

Full sun is best but chinese pennisetum can be grown in partial shade. Chinese fountain grass is moderately tolerant of drought, but does best with regular watering. It requires supplemental water in arid climates. This is actually a good grass for the edge of the water garden.

It is cultivated from area 5 of rusticity up to area 9 and it is utilised as cut flower, dried flower, groundcover, erosion control, rain garden.

“Little Bunny” is the smallest of the dwarf fountain grasses. It is particularly at home in a rock garden setting or on a slope with other mat-forming or small perennials.



Fig.6 - *Miscanthus sinensis* „Silberfeder”



Fig.7 - *Miscanthus sinensis* „Variegatus”



Fig.8 - *Miscanthus sinensis* „Zebrinus”



Fig.9 - *Pennisetum alopecuroides* „Little Bunny”

CONCLUSIONS

1. Assortment of decorative grasses cultivated in the NE area of Romania is very reduced, so it is necessary to complete it with species or cultivars which correspond to the eco-pedologic conditions of the area.

2. Due to the ecological particularities *Festuca glauca* „Elijah Blue”, *Imperata cylindrica* „Red Baron”, *Miscanthus sinensis* „Gracillimus”, *Miscanthus sinensis*

„Silberfeder *Miscanthus sinensis* “Variegatus”, *Miscanthus sinensis* „Zebrinus”, *Pennisetum alopecuroides* „Little Bunny”, *Phalaris arundinacea* are framed in the pedo-climatic conditions of NE area of Romania.

3. Ornamental grasses could be used in landscape designs due to their decorative features and their adaptability capacities. It could be used for groups, massive, borders, ornamental pots, on the shore or even inside water ponds and as cut flowers.

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