

THE EVOLUTION OF THE COMPOSITION OF AN ORNAMENTAL TURF UNDER THE INFLUENCE OF THE MAINTENANCE WORKS

EVOLUȚIA COMPOZIȚIEI UNUI GAZON ORNAMENTAL SUB INFLUENȚA LUCRĂRILOR DE ÎNGRIJIRE

Veronica SĂRĂȚEANU *, Alexandru MOISUC*

*Banat's University of Agricultural Sciences and Veterinary Medicine – Timișoara
Calea Aradului, no.119, 300645 Timișoara, Romania, e-mail:vera_s_vera@yahoo.com

Abstract: The purpose of this work is to show the evolution of an ornamental turf seeded by the municipality in the Opera's Plaza in Timișoara (Timiș County). The turf was seeded at the end of March 2006 after the former vegetation carpet was totally removed with the first 10 cm from the topsoil. After the soil preparation and the primary fertilization phase there was seeded a turf seed mixture of *Lolium perenne*, *Poa pratensis* and *Festuca rubra*. The analyzed aspects of that turf were the NTEP quality ratings of turf. These are evaluated on a 0-9 scale where 9 is best and 1 poorest. An average rating of 6 or above is characterizing an acceptable turf. The rating value of 9 is characterizing generally a perfect or ideal turf grass, but sometimes this rating can characterize a best managed turf that is in perfect accordance with the ecological conditions of the site where is placed. The quality ratings are important for taking into account in a measurable way the aesthetic and functional aspects of the turf. These determinations are based on the evaluation of color, density, uniformity, texture, and resistance to diseases and pests and environmental stress. Some of the features can be important for one turf type and less important for other. For example, color is an important feature for the ornamental turf while traffic tolerance is important for a sport turf. Even the turf was totally renovated there appear problems concerning the density in some points and the weeds starting from the first year of vegetation. There are present both dicotyledonous and monocotyledonous weeds, and their number is growing from a year to another. The proliferation of weeds in turf is favored by the defective management of the turf, especially by the irregular mowing and fertilization. This type of study is important because there are only few researches on turf in this part of the country, most of them being realized in experimental conditions, that may differ powerfully especially from the point of view of frequency maintenance works.

Rezumat: Scopul acestei lucrări este să arate evoluția unui gazon ornamental semănat de municipalitate în Piața Operei din Timișoara (județul Timiș). Acesta a fost semănat la sfârșitul lui martie 2006 după ce vegetația inițială a fost complet îndepărtată împreună cu primii 10 cm de la suprafața solului. După pregătirea solului și fertilizarea primară a fost semănat un amestec de semințe de *Lolium perenne*, *Poa pratensis* și *Festuca rubra*. Aspectele analizate au fost indicii NTEP ai gazonului. Aceștia sunt evaluați pe o scară de la 0-9 în care 9 este cel mai bun, iar 1 cel mai slab. Un indice mediu de 6 sau apropiat de acesta este caracteristic pentru un gazon acceptabil. Nota 9 a indicilor caracterizează în general un gazon perfect sau ideal, însă uneori aceasta poate caracteriza și un gazon foarte bine întreținut care este în perfectă concordanță cu condițiile ecologice ale locului în care este amplasat. Indicii de calitate ai gazonului sunt importanți pentru luarea în calcul într-o formă măsurabilă a aspectelor estetice și funcționale. Aceste determinări se bazează pe evaluarea culorii, densității, uniformității, texturii și a rezistenței la boli, dăunători și la stresul factorilor de mediu. Unele caracteristici pot fi importante pentru un tip de gazon și mai puțin importante pentru altul. De exemplu culoarea este o caracteristică importantă a gazonului ornamental în timp ce rezistența la trafic este importantă pentru gazonul de sport. Chiar dacă gazonul a fost refăcut în totalitate pe acesta apar probleme privind densitatea în anumite puncte și buruienile începând din primul an de vegetație. În acesta sunt prezente buruieni dicotiledonate și monocotiledonate, iar numărul acestora crește de la un an la altul. Proliferarea buruienilor în gazon este favorizată de managementul defectuos și în special tunderea și fertilizarea neregulată. Acest tip de studiu este important deoarece în această parte a țării sunt puține cercetări de acest fel, cele mai multe fiind realizate în condiții experimentale.

Key words: ornamental turf, maintenance works, weeds, mowing, fertilisation.
Cuvinte cheie: gazon ornamental, lucrări de întreținere, buruieni, tundere, fertilizare.

INTRODUCTION

The surface cultivated with turf in some regions of the world is greater, especially in the most developed countries from economic point of view, thus in United States these occupies between 12-15 millions of hectares and is continuing to increase in report with the increase of the population [3, 5].

Even some authors are considering that a lawn represents an important consumer of natural resources; in fact it plays an important role just in their protection, especially in the urban areas [9, 10].

In a brochure edited by the Environment Protection Agency of the U.S.A. (EPA) concerning the importance for the environment of the lawns there is underlined that “a dense layer of grass is preventing the soil erosion, is filtering the contaminants from the rain water and absorbs many types of pollutants carried by air as dust and soot; also grass is very efficient in the conversion of the carbon dioxide in oxygen, this process helping to the purifying of the air. The corresponding care of a lawn is improving its aspect and contributes to the improvement of the environment” [8].

The importance of turf is recognized by the Congress of the United States of America because its presence in the urban areas “can help to the reduction of the carbon dioxide emissions, the attenuating of the excessive heat, respectively the reduction of the energy consumption and it is contributing to the efforts for the reduction of the global heating phenomenon” [6, 7].

The lawns situated around the houses have a recreational role for family. Other valence of the lawn consists in its aesthetic value, respectively its use as background for a landscape.

Other aspects have in view the capacity of the soil stabilization against the erosion caused by water and wind. From this point of view the turf represents a tool for the conservation and preservation of the soil resources [5].

The lawns have other positive contributions too on the environment health and implicitly on the humans' health (oxygen producing, elimination of dust, air filtering, water filtering, noise diminishing, air cooling), in recreational level (protective surface, is diminishing the risk of injury in falling down, positive impact scientifically proved on the mental health), at aesthetic and economic level (increases the market value of a property) *etc.* [2, 3, 4].

Excepting the roles mentioned previously the knowledge provided by the turf technology can be used in works of ecological reconstruction, slope consolidations, consolidation of river banks, covering with vegetation of the sterile dumps, ash *etc.*

MATERIALS AND METHODS

The material of these researches is represented by the ornamental turf from the Opera's Plaza from Timișoara (Timiș County). The turf was seeded at the end of March 2006 after the former vegetation carpet was totally removed. There was seeded a turf seed mixture of *Lolium perenne*, *Poa pratensis* and *Festuca rubra*.

The analyzed aspects of that turf were the NTEP quality ratings of turf. These are evaluated on a 0-9 scale where 9 is best and 1 poorest. The quality ratings are important for taking into account in a measurable way the aesthetic and functional aspects of the turf.

The determinations are based on the evaluation of color, density, uniformity, texture, and resistance to diseases and pests and environmental stress.

The data were collected during a three years period, respectively 2006-2008 in April, July and November.

RESULTS AND DISCUSSIONS

The turf was seeded at the end of March 2006 at the Opera's Plaza from Timișoara after the former vegetation carpet was totally removed with the first 10 cm from the topsoil. After the soil preparation and the primary fertilization phase there was seeded a turf seed mixture of *Lolium perenne*, *Poa pratensis* and *Festuca rubra*. That turf was analyzed after the NTEP quality ratings of turf. They have been evaluated on a 0-9 scale where 9 is best and 1 poorest. An average rating of 6 or above is characterizing an acceptable turf. The rating value of 9 is characterizing generally a perfect or ideal turf grass, but sometimes this rating can characterize a best managed turf that is in perfect accordance with the ecological conditions of the site where is placed. The quality ratings are important for taking into account in a measurable way the aesthetic and functional aspects of the turf. These determinations are based on the evaluation of colour, density, uniformity, texture, and resistance to diseases and pests and environmental stress. Some of the features can be important for one turf type and less important for other. For example, colour is an important feature for the ornamental turf while traffic tolerance is important for a sport turf.

Table 1

The NTEP quality ratings of the turf from Opera's Plaza from Timișoara

Appreciated features	Year								
	2006			2007			2008		
	April	July	November	April	July	November	April	July	November
Density	-	-	-	8	9	9	8	9	9
Foliage finesse	5	-	-	6	-	-	6	-	-
Foliage color	7	-	-	7	-	-	7	-	-
Comportment in summer	-	8	-	-	8	-	-	8	-
Resistance to diseases	9	9	7	8	9	7	7	9	7
Setting capacity	-	8	8	-	-	-	-	-	-
Global aesthetic aspect	-	8			8			8	

First feature analyzed on the ornamental turf from Opera's Plaza is represented by density. This is reflecting the coverage of the soil with vegetation and it is appreciated after a year from the setting of the turf. Here the density of the turf carpet was marked with 8 in April 2007 and 2008 being good and very good (9) when were taken the other data.

The foliage finesse is appreciated in spring and is influenced by the length and width of the leaf. From this point of view the foliage of the analyzed turf is medium coarse because of the presence of the species with coarse leaves (*Poa pratensis* and *Lolium perenne*) near the one with finer leaves (*Festuca rubra*).

The moment for the appreciation of the foliage color is in spring, as in the case of foliage finesse and 1 is for very light green and 9 for dark green, this being determined by the genotype. This feature is analyzed when the turf isn't under any stress factor. The foliage color of the analyzed turf is green to dark green (7).

The comportment in summer of the turf is appreciated in the absence of the irrigation and it was good (8) in all three years of observations.

From the point of view of the resistance to diseases is very good (9) in summer and then is decreasing being medium to good in spring and autumn (7) because of the colder and more humid weather. The diseases noticed in this turf are the rusts caused by *Puccinia* species.

The global aesthetic aspect of the turf is taken in account after the turf setting and is measured six times in a year and is represented as an average of the observations. This is taking in account the results of the external factors as weather, pathogens, nutrition *etc.* In our turf the global aesthetic aspect is good to very good (8).

In this turf were found during the research a series of annual and perennial weeds and their number is increasing from a year to another. These are represented by monocotyledonous and dicotyledonous species. Thus the weed species found in the turf from Opera's Plaza are: *Agropyron repens*, *Cynodon dactylon*, *Settaria viridis*, *Taraxacum officinalis*, *Plantago major*, *Stellaria media*, *Glechoma hederacea*, *Bellis perennis* *etc.*

The fact that in this turf is present a great number of weeds, is due to the defective management of the maintenance works.

CONCLUSIONS

After the analysis of the observations realized at the ornamental turf from Opera's Plaza can be formulated the next conclusions:

- generally it has a good to very good global aesthetic aspect;
- one of the main problems of this turf are weeds that are present in some certain places from the edges where the turf was set defectively;
- the resistance to diseases was reduced in spring and autumn because of the humid and colder weather, this fact favouring some fungal disease as rusts.

There is recommended for the ornamental turf from the Opera's Plaza that the maintenance works to be realized correctly and at the proper moment. This fact can provide the maintenance of the perennality of the turf.

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