GENERALITIES CONCERNING MULCHING IN LANDSCAPE ARCHITECTURE

GENERALITĂȚI PRIVIND MULCIREA ÎN AMENAJĂRILE PEISAGISTICE

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Abstract. *Mulching (a technical method of covering the soil/substrate with different materials) acquire an enhanced importance in the circumstances of sustainable landscaping increasing promotion.*

Landscaping mulching materials (bark, compost, shredded paper, leaves, sawdust, pine needles, lawn clippings, gravel, plastic, unwoven textiles) conserve soil humidity, suppress weeds and, most of them, furnish nutrients.

Mulching offers important benefits only if certain rules are respected (the materials and the time of mulching are well chosen and the mulch layers are properly spread).

Rezumat. *Mulcirea (metodă tehnică de acoperire a solului/substratului cu diferite materiale) capătă o importanță sporită în circumstanțele intensificării promovării amenajărilor peisagistice sustenabile.*

Materiale utilizate in arhitectura peisageră (scoarță, compost, hârtie, frunze, rumeguş, ace de pin, pietriş, plastic, textile nețesute) conservă umiditatea din sol, elimină buruienile şi furnizează substanțe nutritive.

Mulching oferă importante beneficii în condițiile respectării unor reguli (o bună alegere a materialelor şi a momentului de mulcire şi întinderea adecvată a acestora).

INTRODUCTION

Mulching represents the technical method through which the soil is covered with different materials with the view of conserving humidity and improving soil conditions.

The advantages of mulching acquire an enhanced importance in the circumstances of sustainable landscaping increasing promotion (minimal impact on environment, the use of native plants, improvement of soil structure, minimalization of water, fertilizers and pesticides consumption).

Materials used for landscaping mulching can be divided in two categories: *organic* (bark, compost, leaves, shredded paper, pine needles, sawdust, wood chips, lawn clippings) and *inorganic* (gravel, stones, biodegradable and non-degradable plastic materials, landscape fabric).

MATERIAL AND METHOD

Researches have been made in the past two years (between 2005 and 2007) at a major landscaping design firm from Iasi. In the same time, researching activity has

been completed with a solid documentation based on a large bibliography and exchanging opinions or ideas with other specialists.

RESULTS AND DISCUSSIONS

In time, researches and practice had shown the negative and positive aspects of some organic and inorganic materials that can be used for landscaping mulching (*Tab.1*).

Table 1

The presentation of positive and negative aspects for some landscaping mulching materials

ORGANIC MATERIALS			
No.	**Mulch materials**	**Positive aspects**	**Negative aspects**
1.	Leaves	- retain humidity in soil; - decrease temperature fluctuations; - improve soil microorganisms activity; - the leaves layer: 7 - 10 cm;	- needs to be shredded and decomposed before use;
2.	Shredded paper	- no residues; - degradable; - good weeds suppression; - the shredded paper layer: 2,5 - 8 cm;	- it may break at placement time; - high cost;
3.	Compost	- a considerable source of organic matter; - very good results in retaining the humidity in soil; - the compost layer: 7 –10 cm; - lifetime: 6 – 8 month;	- if it is not well decomposed, it may bring about plants burn;
4.	Bark	- slow decomposition; - provide nutrients; - the bark layer: 5 -8 cm; - good compaction resistance;	- slow decomposition; - may lead to insect and disease problems;
5.	Pine needles	- pine needles are handled easily; - retain humidity and porosity; - very good for acid loving plants;	- it may appear an acid reaction in soil;
6.	Sawdust	- slow decomposition; - provides nutrients;	- it may be shattered by wind;
7.	Wood chips	- help retain soil moisture; - creates path; - prevents heavy rain damage; - lifetime: 6 – 9 months; - gives a natural look;	- it may need supplemental fertilizers; - in time the chips may lose colors and the esthetic effect could be affected;
8.	Lawn clippings	- widely available and easy to handle; - maintain humidity, provide nutrients and good solarization; - lifetime: 1 – 3 month;	- layers more dense than 2,5 cm lead to anaerobiosis effects;
INORGANIC MATERIALS			
9.	Gravel/ Stones	- aesthetic; - long lifetime; - many colors and sizes available;	- may reflect the heat, having negative influence on plants development;

10.	Biodegradable and non-degradable plastic materials	- excellent effects in controlling weeds and retaining humidity in soil; - good applicability; - good weeds suppression;	- high cost; - there is the risk of soil pollution with parts from plastic material; - is not ecological; - removal complexity;
11.	Unwoven textiles	- has the ability of taking the objects shapes; therefore, they offer new design possibilities; - semipermeability for air, water, gas; - they are recyclable and biodegradable; - according to the results of the researches from Belgium, France, Germany, Switzerland, the individual protection (trees) or in group (shrubs) with unwoven textiles is the best mulching solution;	- high cost; - difficult removal (whenever we want to replace the material); - may be affected (torned, displaced) by certain animals (dogs, cats, moles etc.) - it may be appropriate to apply a pre-emergent herbicide before installing the fabric;

The trees and shrubs protection can be realized temporarily (over spring and wintertime) or permanently. Autumn represents the main moment for mulching, because the materials maintain the heat in soil during the winter and in the new season offer a higher "start" temperature. In spring, before sowing or planting time, the mulch could be removed to allow the soil warming. New mulch can be applied in the first weeks of spring in order to preserve humidity, protect soil structure against fast rains mechanic damages and enrichment with humus as a result of a slow decomposition of the organic materials used for covering.

For summer mulching, the materials used for covering should be spread all around the tree or shrub in a 4 –5 cm layer.

For winter mulching, the protective layer will be denser (8-12 cm) (Mateescu, 2002).

In landscaped areas, mulch should not be placed within 5 cm (shrubs) and 10 cm (trees) of the base of the trunk of trees or shrubs.

Ornamental trees and shrubs and pathways can be mulched permanently with bark or gravel.

The main goals of landscape mulching are water soil conservation (by reducing water loss through evapotranspiration - ET) and weeds suppressing (therefore, the interventions with herbicides will be reduced and the efforts for weeds manual elimination minimal).

Mulching has also different additional aspects, as following:

- regulation and maintenance of an optimum soil temperature level; therefore, the roots of arboricultural species are protected from excessive heating or cooling (Mateescu, 2002);

- improvement of absorbing and retaining water process in nutrition substrate;

- mulch prevents infiltration which encourage soil erosion and offer protection against its surface frost;

- improvement of soil characteristics (structure, especially porosity);

- soil degradation process decreases (heavy soils are improved and sandy soils are stabilized (Mateescu, 2002));

- mulching makes possible even a solarization of the nutritional substrate; the result of this process is a decrease of pathogens population (especially, nematodes) and weeds percent;

- preclusion of salts increase in soil;

- mulch can create a "free weeds/turf area" around protected species; therefore, the risk of damaging roots while mowing the lawn decreases;

- mulch can give planting beds a uniform, well-cared-for look;

- mulch can improve the appearance of any landscape;

Mulch that is not properly spread has undesirable effects. Covering soil with dense layers of mulch leads to humidity excess around roots system followed by decay and, therefore a stress for the plant. Mulch that is too deep will stimulate root growth in the mulch layer rather than in the ground. The resulting shallow root system is susceptible to cold and drought damage. Piling mulch (for example, gravel) against the trunk or stems of plants can stress stem tissues and may lead to insect and disease problems. A long-term use of some materials, especially lawn clippings, can affect soil pH or cause deficiencies/toxicity in micronutrients.

CONCLUSIONS

1. Materials used for landscape mulching are widely available, conserve humidity, have good weed suppression qualities and, most of them, furnish nutrients. Moreover, they are recyclable (paper, gravel) and biodegradable (wood chips, unwove textiles). Therefore, this type of mulching integrates in the "sustainable landscaping" concept;

2. The mulching time should be respected, as it varies from species to species, from area to area etc.;

3. Trees and shrubs mulching must respect certain rules regarding the type of materials chosen for mulching and, what is far more important, the depth and length of mulching layer; otherwise, the mulch will not be efficient and, in some cases, could have negative effects on trees and shrubs;

4. Mulching materials must "complete" landscape and, in the same time, increase its aesthetic value;

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