SOIL POLLUTION AND PREVENTION METHODS

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Abstract

This paper will present the main restrictions regarding soil quality both natural and anthrop these leading to degradation of soil quality and even cancelling its functions. Apart from natural influences such as drought, hydrous and wind erosion, the paper will be focused chiefly on agricultural and industrial means of soil pollution. Great attention is given to heavy metal pollution due to the oil industry. Observations made in the field concerning the structural research of soil completes the hereby study from an agricultural point of view. Some improvements for land reclamation are also stated in the final chapter.

Key words: soil, pollution, erosion, land reclamation, humidity, structure.

INTRODUCTION

The continuous development of human society facilitated the invention of new technologies meant to provide aid in improving one`s life. The necessity of producing at an industrial scale resulted in both cheap goods and pollution. In agriculture the soil received various treatments regarding crop improvement, many of them with devastating effects to it and the environment as a whole. Together with the natural processes of soil degradation these factors can lead to land infertility for extended periods of time.

MATERIAL AND METHOD

1. Main restrictions regarding soil quality

Harmful influences can be reflected into damage produced to characteristics and functions of soil, respectively in their bioproductive capacity, especially in damaging the quality of agricultural products as well as food security, with serious repercussions concerning quality of life.

These restrictions are determined whether by natural factors (climate, landscape, edafic characteristics etc) or by agricultural and industrial anthrop actions; in many cases all these can act together in a

negative manner having as a result the reduction of soil quality and even cancelling its functions.

Drought can manifest itself on 7.1 million hectare most of them being arranged with irrigation. The periodic excess of humidity contained by the soil affects around 3.8 million hectares, out of which most of the perimeters that have drainage systems which are inefficiently working.

Hydrous erosion is presented in different degrees on 6.3 million hectares; these, together with landslides provoke soil losses up to 41.5 t/ha per year (http://www.anif.ro/; Man, 2008, 2014).

Wind erosion manifests itself on 0.4 million hectares, possibly extendable taking into account that in recent years some forests and natural protection curtains from areas with sandy soils were cut. Those soils have low water retention capacity and low fertility because of the draught.

Concerning soil pollution this paper will discuss further on the agricultural and industrial pollution.

There is a variety of polluters including heavy metal, cyanide, acidity, hydrocarbons, salt, petroleum or other substances stored in underground tanks. Areas contaminated with heavy metals must be rehabilitated after closing which involves a lot of times expensive treatment for soil and contaminated underground water.

Concerning the oil industry, the sites vary from small (extraction shafts) to large and complex (distilleries or large oil storage-distribution plants). Contamination of soil, underground soil and water associated with the oil industry implies the presence of heavy metals such as lead, zinc, and copper, nickel which involve high decontamination and rehabilitation costs.

The research regarding soil structure under an agro technical point of view is made directly, in the field, where it is considered: form (type) of structure, degree of development (degradation), or in a laboratory where the hydrous and mechanic stability of the structural elements are determined. Indirect analysis of soil structure is possible through some features like: water perviousness, porosity, sealing, penetration resistance.

In the field, the structural research of soil is made first of all through observation of the way in which the furrow lays itself after the plough passes along, as well as the manner of soil grinding left behind the machines that are used to work the field. The most accurate outdoor observations about soil structure are made concerning the fresh humidity of soil through feeling, pressing and decomposing (individualization) of soil mass components.

Development of structure will be favored by the usage of organic fertilizers, by organic and mineral colloids, underground activity of various life forms, freezing defrost alternation, and by plant roots. Degradation or structure pulverizing, takes place due to excessive work of soil, especially

when it is too dry or too wet through tamping, salinity, mineral fertilizing with monovalent metals (Rogobete, 1997).

In the process of plant breeding the soil structure is subject to these two opposite phenomenon: destruction and restoration. According to the applied technology`s features, one of the two phenomena can dominate. Preventing degradation processes assume a succession of technological actions such as: rotation of crops and a suitable way of soil work, maintaining a sufficient "humus proportion" and avoiding soil weariness, preventing acidification of soil through cultivation, facilitating the activity of mezofauna, avoidance of remaining "uncovered" soil during heavy rains.

Soil structure can be rehabilitated through: systematic appliance of organic fertilizers (stable manure, bird manure), green fertilizers, and hacked vegetal wastes. Usage of crop alternation, with Lucerne, clover, esparcet, perennial grasses, together with cultivating annual leguminous plants for beans and in general plants seeded in close lines (12,5 cm); correct execution of tilling at the right humidity, through a reduced number of passing and using chemical substances based on cilium.

RESULTS AND DISCUSSIONS

The principles that form the ground for accomplishment of objectives of land improvement are the following:

-equitable exploitation of arrangements of land reclaim ants, irrigation systems, drainage and works made for protection against floods and soil erosion prevention.

- exploitation of arrangements of land reclamation in such a way as to avoid inefficient use of water, humidity excess, soil pollution and erosion and to promote environment protection (Durac, 2012).

Land reclaim ants have as primary objectives:

a) Ensuring land protection of any kind, and all categories of constructions against floods, landslides and erosion as well as protection of reservoirs against clogging and improvement of river channels.
b) Securing an adequate soil humidity level, which to allow or stimulate plant growth, plantations, crops in agriculture and sylviculture.
c) Assuring improvements of acid soils, salty and sandy, as well as protection against pollution.

The status of these establishments is far from satisfactory, some of the sites not being functional due to lack of exploiting equipment, lack of maintenance for components and funds for service and exploitation.

Therefore, rehabilitating and modernizing land reclaim ants are necessary (Scradeanu, 2014; Sabau, 1997, 1994; Man 2008, 2014).

CONCLUSIONS

As to conclude with, the natural processes of degradation became increasingly damaging to the soil and the efficiency of crops, to a great extent because of the inappropriate use of industrial fertilizers. The poor rehabilitation of former industrial sites also contributed on a prolonged period of land contamination. Rotation of crops, as well as appliance of organic fertilizers remains the simplest method for avoiding soil erosion due to industrial made agriculture. Land reclaim ants can provide some aid in preserving soil quality through works of irrigation and drainage systems, keeping humidity under control and sustaining an efficient use of water.

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