large amounts of tailings in Romania on which vegetation should recover. The objectives of the study were to determine heavy metal content of the tailings and identifying possible impacts of the tailings on the vegetation in this ecosystem. We studied two tailings dumps in Moldova Nouă (Caras-Severin County), the area with the largest tailings areas in Romania. Heavy metals were determined through atomic absorption spectrophotometry at different wavelengths and data were statistically processed using the SPSS 17.0 – Package for the Social Science Statistics program. Plants were sampled and identified using the quadrant method. Results show that the tailings in the Moldova Nouă area have high concentrations of heavy metals such as iron, manganese, zinc, and nickel. Chromium and cadmium were also found, but in smaller amounts. The large amounts of these heavy metals determined the small number of plants with high or moderate forage value; the larger share was that of plants with no forage value at all, plants that are toxic or pests. Heavy metals such as nickel and zinc are toxic for most plant species when their concentrations in the environment are above admitted limits: this is how we could explain the poor presence of vegetation on the studied tailings ponds.

http://dx.doi.org/10.1016/j.jbiotec.2015.06.161

Assessment of the nitrogenous and organic matter levels in sheep water sources

Gheorghe Valentin Goran*, Elena Rotaru, Victor Crivineanu

Faculty of Veterinary Medicine, University of Agronomic Science and Veterinary Medicine, Bucharest, Romania

E-mail address: gvgoran@gmail.com (G.V. Goran).

Nitrates and nitrites pollution, both in Romania and at global level has an unprecedented scale in recent years, constituting a major concern for researchers in the field, in order to prevent/limit the effects induced by their increased levels on the soil–water–plant–animal–man pathway.

This study main goal was to monitor the levels of nitrates, nitrites, ammonia and organic matter in water sources (wells, rivers) for sheep from Olt County, Romania, during 2011–2013.

Water sources from sheep farms located in the submountainous, hilly and lowland areas from Olt County, under different climatic, hydrographic and relief conditions, which could require the use of different technologies for soil fertilization were investigated.

The method used were spectrometric techniques for nitrate and nitrites, spectrophotometric method for ammonia, and an automatic system of CBO5 reading for organic matter.

Nitrates registered higher annual average levels in the lowland area in ground water sources (wells). Mean annual nitrates in surface water sources (rivers) were lower than those recorded in ground water sources (wells), since the amounts of nitrogenous substances entrained by the rainwater from fertilized lands were continuously reduced by downstream entrainment. All annual and monthly averages of nitrites levels almost closely followed the nitrates values, but not in terms of overruns the maximum allowed level.

Maximum allowed level overruns of ammonia and organic matter, but even only their presence in water samples from ground and surface sources, were correlated to periods in which fertilization was made with natural fertilizers (manure).

http://dx.doi.org/10.1016/j.jbiotec.2015.06.162

Research on rehabilitation of ancient oil polluted soil through perennial plant phytoremediation

Smaranda Masu[1], Benoni Lixandru[2], Dumitru Popescu[2,*], Valentin Ciulan[2], Sorin Morariu[2], Florica Morariu[2]

[1] *National R & D Institute for Industrial Ecology Branch of Timisoara, Romania*
[2] *Banat's University of Agricultural Sciences and Veterinary Medicine "Regele Mihai I al Romaniei" from Timisoara, Romania*

E-mail address: dumitrupopescu@animalsci-tm.ro (D. Popescu).

On lands with ancient oil pollution, there remain, for a long time, those chemical compounds characterized by high molecular weight, non-polar nature, and low volatility. They cause the formation of soil aggregates soaked with crude oil. The aggressiveness of heavy petroleum polluted soil, manifested by the specific suffering of cultured plants and it ended in their death. To alleviate aggression of polluted soils, they were treated with a mixture of fly ash and sewage sludge (1:1 wt./wt.). The treatment applied of 50 t/ha on a soil with 8% oil products caused the adaptation of a perennial crops of the Lotus corniculatus species. In the first year of culture, plants occupied 25–35% of the cultivated area. In the spring of the second year of crop, plants expanded and occupied up to 65% of the cultivated area. Maintaining the trefoil plants culture demonstrates the possibility to rehabilitate soils polluted with 8% oil products. The used phytoremediation variants are based on the common agricultural techniques, the application of fertilizer and fly ash adsorbent agents of petroleum products. Furthermore, the reduction with more than 50% in oil content in 0–20 cm soil profile during the monitored period of 12 months represents the motivation for using trefoil in order to ecologically rehabilitate ancient oil polluted land.

http://dx.doi.org/10.1016/j.jbiotec.2015.06.163

Optimization of microbial biopreparations for soil quality improvement: Testing new formulations

Olga Muter[1,*], Vizma Nikolajeva[2], Maris Klavins[3]

[1] *Institute of Microbiology & Biotechnology, University of Latvia, Riga, Latvia*
[2] *Department of Microbiology & Biotechnology, Faculty of Biology, University of Latvia, Riga, Latvia*
[3] *Department of Environmental Science, University of Latvia, Riga, Latvia*

E-mail address: olga.muter@inbox.lv (O. Muter).

Biopreparations (BP) are widely used in the field of agriculture and environmental biotechnologies for many decades. Nevertheless, these technologies are still insufficiently understood. Environmental conditions and application mode influence BP activity. A sustainable carrier should have good water holding capacity, good aeration characteristics, support microbial growth and survival, non-toxic, easily sterilized, manufactured, and handled in the field, environmentally friendly, and have good storage quality.

Seven types of ceramic beads fabricated from Latvian Devonian clay were evaluated in terms of their appropriateness for bacterial cell attachment and further use for soil cleaning/air biofiltration technologies. Activity of microorganisms was tested in experiments under laboratory and mini-field conditions and evaluated by enzyme activity and plating methods. SEM micrographs of the bead