



## Rehabilitation of oil polluted soils by bioremediation

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In Romania about 50,000 ha are polluted with oil and/or brine. The main sources of pollution are the different activities using petroleum products: extraction, transport, treatment, refining and distribution.

Taking into account the large areas and the cost per unit area, bioremediation was tested as a method of rehabilitation. To stimulate the performance of the bioremediation process for a polluted soil (luvisol) by 3% oil, different methods were tested: -application of a bacterial inoculum consisting of species of the *Pseudomonas* and *Arthrobacter* genera;- application of two types of absorbent materials, 16 t/ha peat and 16, respectively, 32 kg/ha Zeba (starch-based polymer, superabsorbent); -mineral fertilization with N200P200K200 and 5 different liquid fertilizer based on potassium humates extracted from lignite in a NPK matrix with micronutrients and added monosaccharides (4 and 8%).

After 45 days from the treatment (60 days from pollution) the following observations have been noticed:

- the application of only bacterial inoculum had no significant effect on the degradation of petroleum hydrocarbons;
- the use of 650 l/ha AH-SH fertilizer (potassium humate in a NPK matrix) led to a 47% decrease of TPH (total petroleum hydrocarbons);
- the application of 16 t/ha peat, together with the bacterial inoculum and the AH-SG2 liquid fertilizer (containing humates of potassium in a NPK matrix with microelements and 8% monosaccharides, in which the nitrogen is amide form) led to a 50% decrease of the TPH content;
- the application of 16 kg/ha Zeba absorbent together with bacterial inoculum and 650 l/ha AH-SG1 liquid fertilizer (containing humates of potassium in a NPK matrix with microelements and 4% monosaccharide in which the nitrogen is in amide form) led to a 57% decrease of the TPH content;
- the application of 32 kg/ha Zeba absorbent, together with the AH-SG2 fertilizer, led to a 58% decrease of the TPH content.