

Mirosław WYSZKOWSKI<sup>1</sup> and Agnieszka ZIÓŁKOWSKA

**RELATIONSHIPS BETWEEN PETROL  
AND DIESEL OIL CONTAMINATION  
VERSUS MINERAL NITROGEN CONTENT  
IN SOIL FOLLOWING APPLICATION  
OF COMPOST, BENTONITE AND CALCIUM OXIDE**

**RELACJE MIĘDZY ZANIECZYSZCZENIEM BENZYNĄ  
I OLEJEM NAPEĐOWYM A ZAWARTOŚCIĄ AZOTU MINERALNEGO  
W GLEBIE PO APLIKACJI KOMPOSTU,  
BENTONITU I TLENKU WAPNIA**

**Abstarct:** A study has been conducted to identify the effect of soil pollution with petrol and diesel oil on the content of  $\text{N-NH}_4^+$  and  $\text{N-NO}_3^-$  in soil treated with compost, bentonite and CaO as the substances neutralising the influence of petroleum substances. Soil pollution with petroleum substances as well as introduction of substances neutralising the effect of petrol and diesel strongly modified the content of ammonia and nitrate nitrogen in soil after crop harvest. The effect of petroleum substances on soil properties was dependent on the rate of pollutants. In a series without neutralising substances, petrol or diesel oil pollution up to the rate of 2.5 or  $5 \text{ cm}^3 \cdot \text{kg}^{-1}$  of soil, in contrast to the highest rate ( $10 \text{ cm}^3 \cdot \text{kg}^{-1}$ ), caused a very high and significant increase in the content of ammonia nitrogen in the analysed soil. Petroleum substances raised the ratio of ammonia nitrogen in soil to the detriment of the level of  $\text{N-NO}_3^-$  compared with the variant free from contamination. Bentonite and calcium oxide produced an evidently stronger effect on soil properties than compost, typically increasing the concentration of  $\text{N-NO}_3^-$ ; in addition, they contributed to a decline in the content of  $\text{N-NH}_4^+$ ; CaO produced such effect in the series polluted with petrol while compost and bentonite were effective in objects contaminated with diesel oil. Bentonite and CaO caused a significant decrease in the ratio of  $\text{N-NH}_4^+$  or a decrease in the ratio of  $\text{N-NH}_4^+$  in soil in the objects polluted with petrol and diesel oil as compared with the series without such neutralising substances. Compost produced a similar effect in pots polluted with diesel oil.

**Keywords:** petrol, diesel oil, soil, compost, bentonite, CaO,  $\text{N-NH}_4^+$ ,  $\text{N-NO}_3^-$

The issues related to environmental pollution caused by nitrogen compounds have become very important in many countries around the world, in Europe and in Poland. It seems that nitrogen entering aqueous environment (particularly closed water bodies)

<sup>1</sup> Department of Environmental Chemistry, University of Warmia and Mazury, pl. Łódzki 4, 10-727 Olsztyn, Poland, phone 89 523 35 66; email: miroslaw.wyszkowski@uwm.edu.pl