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Press release

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Research projects, Research results
Biology, Environment / ecology, Information technology, Oceanology / climate, Zoology / agricultural and forest sciences
transregional, national

"Metal of Dishonor" - munitions from depleted Uranium (DU) contaminates soils in crisis areas

They are called "hellfire", "smart bombs", "advanced penetrators" or "bunker-busters". They all have the component of depleted Uranium (DU) in common. DU remains after the fissile isotope 235U has been extracted from natural Uranium for the production of nuclear fuel or nuclear weapons. However 235U only comes to 5% of the total Uranium content, so that DU consists of the isotope 238U almost entirely. Between DU and natural Uranium there are no chemical and toxicological differences, merely the radioactivity is approximately 40 % less. DU is a waste product of the nuclear industry, for which there is no further use. Worldwide over 1.1 million tons of DU lie on dumpsites, a minimum of 46 thousand tons are added to this every year. The frontrunners of the DU production are the US and Russia, Great Britain and China are ranking after them by a wide margin.

The military has become a grateful purchaser of DU because DU has special advantages for the production of missiles (picture 1) compared with conventional materials. With a specific weight of 19 kg/L DU is 70 % more heavy than lead, almost as heavy as gold or wolfram, but simply incomparably cheaper than those. The heavy missiles go through armour plating of vehicles and buildings better than any other material. Furthermore DU is "pyrophor" i.e. it burns when mechanically stressed and therefore increases the destructive effect of the munitions. In wars of the past 14 years (Iraq, Kuwait, Bosnia, Kosovo, Serbia, Montenegro, Afghanistan) approximately 1.4 million DU missiles were used up, according to a mass of 400,000 kg DU.

Besides the US France, Great Britain, Israel, Pakistan, Russia, Saudi Arabia, Thailand and Turkey possess or develop DU munitions. The UNEP (United Nations Environmental Program in Nairobi) depicts the typical attack of an A10 bomber on an aim on the ground as "a burst of fire of approximately 2 seconds, during which approximately 200 projectiles in straight line in a distance of 1-3 metres cover an area of approximately 500 m2". However hardly more than 10 of these 200 missiles hit their aims the rest disappears in the soil. UNEP assumes 30.000 DU-projectiles used up in Kosovo. However the search expedition of the "Balkan Task Force" sent by UNEP in November 2000 only found seven and a half projectiles. Herein lies a problem: Up to now one has been concerned toxicologically and ecologically only with DU of the few hit-missiles, burning to Uranium oxide dust during the impact, which pollutes the air or contaminates objects. The DU's destiny from the far larger number of missiles, which get into the soil without hitting any aim, is unknown to a great extent. Besides its dangerousness as a radionuclide Uranium is a toxic heavy metal, which mainly accumulates in bones and causes several diseases, ranging from functional disturbances of the kidneys, the lungs and the liver to cancer and has mutagenic properties. Uranium pollution is connected especially with the so-called "Gulf-war" syndrome among soldiers who saw action in these areas; a fact which DU brings in the name "Metal of Dishonor" among veterans. In extensive tests scientists of the Institute of Plant Nutrition and Soil Science of the Federal Agricultural Research Center in Braunschweig, Germany have been investigating factors for five years, which are responsible for the dissolution of Uranium and its oxides in the soil (foto right). The Uranium concentrations put in the soil correspond to the pollution of a "standard attack" with DU munitions as descrobed by UNEP. The results showed that Uranium, applied to the soil as Uranium oxide, is dissolved and can be absorbed by plants by physicochemical and biological processes. After three years up to 40% of the supplied Uranium was converted into mobile species. Such mobile

Uranium species can either be absorbed by plants or leached from the soil to water bodies. In the tests of FAL the Uranium contents supplied by the plants directly depended on the Uranium concentrations in the soils. In respect to the total Uranium content of the soil 0.4 - 0.6 %, or in respect to the available Uranium share 5-6 % went over to above ground of plants from the soil. The Uranium concentrations of the plants were thousand times higher up even in the lowest levels of contamination. Furthermore the scientists found out that the mobilisation of Uranium grows with a decreasing fertility of the soil (minor pH value, less content of mineral plant nutrients, especially phosphorus). But soils with low levels of fertility are typical for crisis areas and the population has to rely on self-sufficiency on the own soil. Both of them are aspects, which increase the tragic of the consequences of the DU-munitions severely, just a "metal of dishonor".

More information are available at the website of the workshop "Uran-Umwelt-Unbehagen" held at FAL on November 25, 2004; see in "workshops" at: http://www.pb.fal.de/index.htm?page=/home.htm

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URL for press release: http://www.pb.fal.de/index.htm?page=/home.htm - more information

Research assistant of the Institute of Plant Nutrition and Soil Science of FAL working with U contaminated soil
Foto: FAL-PB

MG-amunition (173*30mm) with DU-Penetrator (300g)