

as a result of soil sorption and precipitation reactions. Even though marine phosphorites (sedimentary phosphate rock) contain much more Se than igneous phosphate ores (e.g., from the Kola Peninsula), their Se/P concentration ratio is often not as high as that of the topsoils of natural terrestrial ecosystems (McConnell, 1979). The application of commercial fertilizers may lead to a reduction of the total Se/P concentration ratio in the soil (depending on the Se/P ratio of the fertilizer), which would also lead to reduction of the Se/P ratio of food and forage plants. What this points to, as a general principle for management of soil fertility, is that when fertilizers are used to supply the most limiting nutrient, there may be long term implications for the uptake of other nutrients into plants. Continued application of P fertilizer, without regard to other nutrients, risks the development of soil deficiencies in nutrients like S, Se and Zn.

Use of As-contaminated groundwater for household and irrigation purposes in the Bengal basin has led to increased levels of As in both drinking water and in the irrigated crops produced. It is estimated that 140 million people worldwide are at risk for As-related diseases, the majority in Bangladesh. Recent research on animal models has shown a potential role for Se enrichment in countering As toxicity. Feeding lentils of varying Se content (Saskatchewan lentils with 0.3 ppm Se compared to northwestern USA lentils with <0.01 ppm Se) to rats, Sah et al. (2013) found that Se played a role in reducing the retention and increasing the excretion of As, resulting in lower levels of liver damage. The relevance of these findings for human nutrition needs to be confirmed by clinical trials. However, biofortification of Se in lentils through plant breeding and fertilization, and/or selection of foodgrains based on the Se level of the soils in which they were grown, could potentially play a role in addressing the huge human health concern posed by excess As. 

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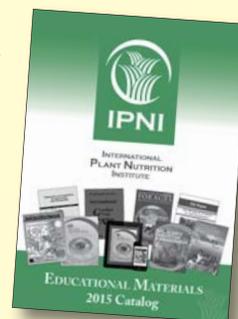
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