Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.33355

# Potential of the bioenergy crop, *Erianthus arundinaceus*, for the phytomanagement of radiocesium-contaminated soils

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Management of radionuclide-contaminated land following the 2011 Fukushima Daiichi nuclear accident remains a critical environmental challenge. For vast areas exhibiting low contamination levels, sustainable and efficient remediation solutions are required. Phytostabilization, a technique wherein plants immobilize contaminants within the soil matrix to prevent further dispersal via leaching, erosion, or wind, offers a viable strategy for minimizing exposure risks. This study evaluates the efficiency of *Erianthus arundinaceus*, a potential bioenergy crop with an extensive root system, for the phytomanagement of radiocesium-contaminated soils. Plant samples were collected from *Okuma* town in Fukushima and separated into grass, shoot, and root components. Following drying and homogenization, the activity concentration of gamma emitters was determined using standard electrode coaxial Ge detectors. Transfer factors (TFs) were calculated to determine the relative uptake of radiocesium by plant parts with respect to the soil. Results indicated that radiocesium concentrations in *E. arundinaceus* parts followed the order: root > grass > shoot. The root system accumulated the highest concentration of radiocesium ($^{137}$Cs: 186.3 Bq kg$^{-1}$). Calculated TFs demonstrated that transfer from soil to roots (0.089) was significantly higher than transfer to aerial parts (0.024 for grass and 0.019 for shoots). This limited translocation suggests that *E. arundinaceus* effectively restricts the movement of radiocesium into harvestable biomass. The preferential accumulation in the root system supports the plant's suitability for phytostabilization. By retaining radionuclides in the root zone, *E. arundinaceus* prevents re-entry of contaminants into the food chain or atmosphere while enabling the simultaneous production of bioenergy resources from the less-contaminated aerial biomass.