

Laboratory of Environmental Soil Science

STAFF	Professor Toshiyuki ISOI	Assistant Professor Hirotatsu MURANO
TEACHING	Material Cycling Systems	Soil Science
	Fertilizer Science	Environmental Soil Science
	Advanced Material Cycling Systems (MC)	
	Advanced Soil Science (MC)	



Professor
Toshiyuki ISOI



Assistant Professor
Hirotatsu MURANO

Research

We study the material cycle of soil, plants and symbiotic microorganisms to contribute to the environment and society.

To establish low-input farming systems, we investigate the behavior of nutrients in soil, focusing on chemical speciation, enzyme activity, organic matter contents, arbuscular mycorrhizal fungi and rhizobium.

We examine the material cycles in ecosystems and farmlands using stable isotopes.

$$\log Q = \log K_f + \frac{1}{n} \log C_e$$

$$Q = \frac{K_f C_e b}{(1 + K_f C_e)}$$

We aim at developing a remediation method of contaminated soils by studying the bioavailability of inorganic and organic pollutants in soil.

We examine the symbiotic interactions between plants and arbuscular mycorrhizal fungi or rhizobium by using the biochemical and molecular biological methods and attempt to improve the level of understanding about the degree to which these microorganisms contribute to plant growth.

Recent publications:

- Isoi, T. and M. Habte (2012) Reactions of sun hemp (*Crotalaria juncea* L.) to phosphorus concentration in soil solution, nitrogen fertilization, and arbuscular mycorrhizal colonization. *Scientific Reports of the Faculty of Agriculture, Meijo University*, 48:7-12.
- Seike, N., M. Sakai, H. Murano, M. Okamoto, T. Saito, I. Narita, Y. Hashimoto, Y. Ikeda, M. Endo, T. Otani (2012) Relationship between dieldrin uptake in cucumber (*Cucumis sativus*) fruits growing in fields and 50% (v/v) methanol-water extractable residue in soil. *Journal of Pesticide Science*, 37 (3): 252-257.
- Maejima, Y., H. Murano, T. Iwafune, T. Arao and K. Baba (2011) Adsorption and mobility of aromatic arsenicals in Japanese agricultural soils. *Soil Science & Plant Nutrition*, 57 (3): 429-435.
- Ozaki, K. and Isoi, T. (2010) Estimation of rhizobial population in soil by a competitive PCR method. *Japanese Journal of Soil Science and Plant Nutrition*, 81: 44-47.
- Murano, H., T. Otani and N. Seike (2010) Dieldrin-dissolving abilities of the xylem saps of several plant families, particularly *Cucurbitapepo* L. *Environmental Toxicology and Chemistry*, 29(10): 2269-2277.