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The impact of hormones on below ground interactions

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A key requirement for a circular bio-economy is that rest products, e.g. faeces, urine, sewage sludge, are returned to soil for replenishing nutrients for crops. However, a major concern is that these by-products contain hormones, both natural (e.g. testosterone) and from medicinal treatments and reproductive manipulations (e.g. estradiol, progesterone), which may distort ecosystem functioning and crop safety. Mammalian hormones from surface water negatively impact above-ground invertebrates. The hypothesis is that hormonal activity in by-product-fertilizers might also influence the soil ecosystem, specifically invertebrates such as nematodes. With a young-researchers-wildcard within the Connected Circularity theme, a pilot experiment addresses for the first time effects of hormones from rest product fertilizers on (1) ecosystem functioning as a whole, using soil nematodes, omnipresent at various positions in the soil food web, as a model, and (2) direct food and feed safety, by analyzing crops.

Keywords: by-product-fertilizers, hormones, soil ecosystem, residue analysis, food safety