



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

The potential of mushroom production for food security and farmer incomes in Uganda

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Abstract

It is common practice for smallholder farmers in Uganda to burn maize straw on the field after harvest. This quickly clears the fields for ploughing and sowing but it pollutes the air and reduces the carbon content and fertility of soils over time. Instead, maize crop residues can be used as a substrate for oyster mushroom cultivation following a low-tech procedure. Oyster mushrooms are an esteemed food in Uganda and their production can increase the amount of food, especially protein, produced per hectare, thus contributing to food security. The revenue from selling oyster mushrooms can furthermore help to diversify farmer incomes. To assess the potential of this idea, we carried out a case study in Kibale, Uganda. We first quantified maize yields and the amount of crop residues on different fields over two seasons and interviewed the respective farmers regarding agricultural practices. We took samples of maize grains and crop residues and analysed them for proximate composition, carbon and nitrogen content. Then, we cultivated oyster mushrooms on the crop residues to assess their production potential. We show how much of the maize crop residues can be converted into edible mushrooms and spent mushroom substrate, which can be used as an organic fertiliser. Finally, we interviewed mushroom farmers in and around Kampala, to learn about the state and constraints of local production technology markets and identified substrate availability as a key challenge. We combine fieldwork, experimental data and interviews, to show that there is a considerable potential for producing oyster mushrooms on maize crop residues in Uganda. Furthermore, we discuss obstacles to adoption of this approach and potential environmental pitfalls.

Keywords: Circular economy, food security, mushrooms, recycling, smallholder farming, soil fertility