<table>
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<th>Title</th>
<th>Value-Addition of Cereal Crop Residues for Improving the Income, Nutrition and Small-stock Feed for Small-scale farmers using Low Technology Oyster Mushroom Production</th>
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| Purpose | To evaluate the role of oyster mushroom (*Pleurotus* spp.) production in cereal production value-addition by converting crop residues into nutritious and high-value mushrooms for improvement of farmers’ income, nutrition and small-stock feed |
| Project Summary | The project recognizes that small-scale cereal crop production in Botswana is seriously hampered by erratic and poorly distributed rainfall, persistent droughts and pests resulting in low grain yields and income per hectare. Grain yields for maize, sorghum and millet are usually very low averaging 106.9 kg/ha, 124.6 kg/ha and 93.3kg/ha, respectively, for 2009 to 2012 cropping seasons. This affects the food security of small-holder farmer households resulting to the Government of Botswana providing drought relief to farmers. Cereal crop residues are usually left in the field for animals to graze upon the softer parts while the rest is eaten by termites or incorporated into the soil. This project seeks to assess the use of the crop residues for oyster mushroom production as a means of increasing the overall income from a hectare of cereals whilst enriching the crop residues as feed for small stock or as soil conditioner. The methodology will involve quantification of crop residues in the fields of participating small-scale farmers in the Southern region of Botswana, production of oyster mushrooms and assessment income from sale of mushrooms grown on crop residues, assessment of nutritional value of residues before and after mushroom production as feed for small stock and assessment of nutritional values of the mushrooms. The project outcome is the adoption of mushroom production as part of a cereal - small stock production system resulting in higher incomes and better nutrition of small scale farmers. The project is a graduate student research grant designed to train 2 MSc. students and will provide exposure to 4 undergraduate interns. The Botswana College of Agriculture will implement the project and the Ministry of Agriculture, Department of Crop Production will assist in the identification of small-scale farmers to participate in the study |
| Key words | Oyster mushrooms, crop residue value-addition, Botswana College of Agriculture |
Elenimo Billiat Khonga, is an Associate Professor of Plant Pathology in the Department of Crop Science and Production (CSP), Botswana College of Agriculture (BCA) and former Deputy Dean and Dean of the Faculty of Agriculture, BCA from 2004 to 2014. Upon his return to the CSP Department, he is currently responsible for teaching Forest pathology, Mycology, Plant bacteriology and Principles of crop protection at undergraduate and graduate levels. Prof. Khonga’s research interests are in bio-control of fungal diseases, mushroom production and mycotoxicology. Prof. Khonga holds a BSc (Biological and Chemistry) from the University of Malawi, Chancellor College, an MSc (Plant Pathology) from the University of Wisconsin-Madison, USA and a PhD (Plant Pathology) from the University of Guelph (Canada). Prof. Khonga started his academic career in 1978 as a Staff Associate at Chancellor College, university of Malawi and rose to Senior Lecturer position before relocating to BCA. Prof. Khonga was a principle investigator and team member of locally and internationally funded collaborative projects on oyster mushroom production, aflatoxins in peanuts and biltong and Bambara groundnut. As one of the RUFORUM Deans for the past four years, Prof. Khonga has actively participated and contributed in the various RUFORUM planning meetings and conferences. Prof. Khonga is passionate about oyster mushroom production as a means of empowering the youth entrepreneurs and small-scale farmers, and to that end, he runs short courses and provides extension information on mushroom production.

Selected Publications


**Selected Funded Projects**

- **2003-2008:** Basic and applied studies on aflatoxin and *Aspergillus flavus* management and interactions with peanut in the field and storage. Collaborative research with University of Georgia, USA, Texas A&M, USA, University of Botswana and BCA Funded by USAID: $133,000 (Team Leader for BCA)
- **2000-2004:** Increasing the productivity of bambara groundnut (*Vigna subterranea* L. Verdc) for sustainable food production in semi-arid Africa. (Collaborative research with University of Nottingham, Technical University, Munich, University of Swaziland, Department of Agriculture, Namibia and BCA). Team Leader for the BCA Team. Funded by the EU. (Euro 330,000)
- **2004-2008:** Effect of using treated sewage effluent for irrigation on yield and elemental composition of tomato, alfalfa, oats, cabbage, spinach, onions and maize, and soil chemical properties. Funded by RPC, BCA (Team Member responsible for Microbiology BWP 350,000)
- **1994-1996:** Control of soil pests of field crops using integrated pest management approach (Soil Pest Project). Collaborative project with the University of Reading and the Natural Resources Institute, UK. Malawi Project Director from 1994-1996. Funded by ODNRI, (British Pound 201,080)
- **1998-2002:** Development of appropriate technologies for the cultivation of oyster Mushrooms by Small Scale Farmers in Botswana. Funded by Research and Publications Committee, BCA (Team Leader B). BWP 250,000
- **1992-1995:** Mushroom Production in Malawi using local and adapted exotic species on various substrates. Funded by Agricultural Sciences Committee, Contract Research (MK273 542).