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## Full Length Research Paper

# Effect of rotation of cowpea (*Vigna unguiculata*) with fonio (*Digitaria exilis*) and millet (*Pennisetum glaucum*) on *Macrophomina phaseolina* densities and cowpea yield

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## Abstract

*Macrophomina phaseolina*, the causal agent of charcoal rot, causes great damage to cowpea in the Sahel. One of the few options to manage the disease is by cropping nonhosts that may reduce the soil inoculum below a damage threshold level. To test this, fonio (*Digitaria exilis*) and millet (*Pennisetum glaucum*) were cropped continuously for 3 years in plots with a natural infestation of 24 - 53 microsclerotia g<sup>-1</sup> soil at the onset of the experiment. Next, a susceptible cowpea variety was grown to quantify disease incidence and severity on these soils. Fonio and millet both reduced microsclerotial densities in soils from the first year onwards. Reductions under fonio (81% after the 2<sup>nd</sup> year; 86% after the 3<sup>rd</sup> year)

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were significantly stronger than under millet (56 and 66% for the 2<sup>nd</sup> and 3<sup>rd</sup> year respectively). Fonio was not infected by *M. phaseolina*, while the root systems of millet had low densities of microsclerotia. Cowpea yielded significantly more hay and pods after 3 years of fonio than of millet. Cowpea yields and disease incidence (dead plants) could be explained well by pre-planting microsclerotial densities. We conclude that rotation of cowpea with a gramineous crop may lead to a relatively fast decline of inoculum density. In the case of a high inoculum density, fonio can be grown for three years to reduce *M. phaseolina* densities in soil.

**Key words:** Charcoal rot, fonio, millet cowpea, crop rotation, Sahel.

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