Sustainable Cotton Production in Africa (SCOPA): Organic Cotton for Employment, Growth and Environment? (14-02KU)

End of project popular science description

Introduction
Cotton production is a major source of livelihood for millions of poor households in Sub-Saharan Africa (SSA). However, cotton production in Benin and several other West African countries is unsustainable particularly due to massive use of pesticides, while cotton production in Tanzania and some other East African countries is economically and socially unsustainable for many farmers due to limited access to yield-enhancing inputs and, thus, low yield, low cotton quality and low income. Our project has analysed to what extent organic cotton production or other more environmentally friendly ways of cotton production can increase the environmental, economic, and social sustainability of cotton production by smallholder farmers in Benin and Tanzania.

Results
Our results indicate that emissions of N2O, a very potent greenhouse gas, are generally similar for conventional, organic, and other more sustainable cotton farming practices. However, organic cotton farming and other more sustainable cotton farming practices are more profitable for farmers in Tanzania than the conventional cotton farming practices that are currently used by conventional farmers. While conventional smallholder cotton farmers in Tanzania use only limited amounts of synthetic pesticides, smallholder cotton farmers in Benin use enormous amounts of synthetic pesticides. Residues of these pesticides can be found in the soil and the harvested seed cotton. Contamination with synthetic pesticides substantially deteriorates the health of conventional cotton farmers in Benin. They can substantially improve their health by protecting themselves with much more personal protective equipment than they currently use when they handle and spray pesticides or by switching to organic farming, which does not allow the use of synthetic pesticides. However, switching to organic cotton reduces the income of smallholder cotton farmers in Benin and reduces their food security. Our ongoing research with the data obtained in the project will generate further results. Capacity was built in Benin and Tanzania through close collaboration and joint supervision of PhD students.

Conclusions
Smallholder cotton farming has several sustainability challenges such as greenhouse gas emissions, contaminations with pesticides, and insufficient income for farm households. Making cotton production in Africa more sustainable is a complex task because it seems difficult to find cotton farming practices that reduce greenhouse gas emissions and switching to organic farming can decrease the income and food security of smallholder farmers.

Recommendations
In Tanzania, promoting organic cotton farming and other more sustainable cotton farming practices could improve some aspects of environmental sustainability and increase the income of smallholder farmers (economic sustainability). In Benin, promoting the use of personal protective equipment when handling and spraying pesticides can greatly improve the health of smallholder cotton farmers (social sustainability). Politicians in Benin could also consider to reduce subsidies on cotton pesticides and to use the money for supporting organic cotton farming instead, which would make organic cotton farming more competitive relative to conventional cotton farming.