African Organic Conference 2009

Book of Abstracts

Fast tracking sustainable development in Africa through harnessing Organic Agriculture and Biotechnology

May 19th-22nd, 2009 Kampala, Uganda

First African Organic Conference 2009
May 19th- 22nd, 2009 in Kampala, Uganda

'Fast tracking sustainable development in Africa through harnessing Organic Agriculture and Bio-technology'

Book of Abstracts

edited by

Charles Ssekyewa & Daniel Neuhoff

Conference hosted by

National Organic Agriculture Movement of Uganda (NOGAMU)
Uganda Martyrs University, Nkozi, Uganda, UMU-CODESRIA
Inter-Faculty Social Science Seminar on Indigenous Knowledge in Agriculture

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Cover: Christian Dahn, IOL, Bonn, Germany

Layout: Anja Schneider, IOL, Bonn, Germany

Printed by: University Press Bonn, Germany

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Group B: Smallholder farms and group certification: Sulma Foods Ltd ICS Farmers' Group

Group C: Marketing and processing: Bio-Fresh Exporting Company, NOGAMU Local Market Shop, Phenix Organic Textile Industry

6.30 pm: Official opening and conference dinner

Wednesday, 20th May 2009
General Organic Agriculture issues

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8.30 am - Opening paper: The contribution of Organic Agriculture to achieving MDGs (IFOAM)

9.00 - 10.30 am Session 1: Mitigating and adapting to climate change (papers 1-3)

1-Climate change and the importance of best environment conservation practices (Hira Jhamtani, Third World Network Associate, Bali, Indonesia

2- What can organic agriculture contribute to sustainable development; long-term farming system comparisons in the tropics? (M.W.Musyoka, International Centre for Insect Physiology and Ecology, Nairobi, Kenya)

3- The Role of Organic Agriculture in combating climate change (Bernhard Freyer, BOKU, Austria)

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11.00 - 12.30 pm Session 2: Appropriate mechanisms to eradicate poverty (papers 4 - 6)

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Open space participatory discussions on food security and networking

Session 1 and 2 with support from Danish Development Research Network (DDRN) and co-organized with ICROFS, University of Aarhus, and Organic Denmark

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Theme: The future contribution of Organic Agriculture to food security in Africa

8:30 am - 9:30 am Opening papers
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2. Exploiting the potential of Organic Agriculture: Adoption of agro-ecological methods and needs for future adaptation and development (Mwatima Juma, IFAD, Tanzania)

3. Exploiting the potential of Organic Agriculture: The balance between export oriented and diversified farming (Charles Walaga, UGOCERT, Uganda)

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Group 2: How to address capacity building in Organic Agriculture at different levels (Facilitator: Norman Mukuru, Kilimohai Africa Ltd, Uganda)

Group 3: How to strengthen community level development through Organic Agriculture (Facilitator: Charles Walaga, UGOCERT, Uganda)

Group 4: How to support chain development and market access (Facilitator: Bo van Elzakler, AGRO-ECO, The Netherlands)

HEALTH BREAK (30 min)

11.00 - 12.00 noon Session 1 continued
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12.00 - 1.00 pm Session 2
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Group 2: Appropriate nature, structure and responsibilities for the African OA network, place for government linkages (group leader: Chitalu Munshimbwe, OPPAZ, Zambia)

Group 3: Nature, Roles and Needs of the African OA Center of Excellence (Group Leader: Florence Kata, UEPB, Uganda)

Group 4: Needs for organic research and research networking in Africa in perspective of food security, and overall value chains (group leader: Dr. Olugbenga Adeoluwa, Nigeria)

LUNCH BREAK (1hr.30min) and visit to exhibitions

2.30 - 3.30 pm Session 2 continued
Plenary presentation of group reports (10 min per group) and discussion (20 min)

HEALTH BREAK (30 min)

4.00 - 5.00 pm Session 3

4.00 - 4.30 pm: Kick-starting the African Organic Center of Excellence (AOCE) (Charles Olweny, Vice Chancellor, UMU)

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5.30 - 7.30 pm: Closing cocktail

Preface

The First African Organic Conference (AOC) is focusing on clearly bringing out attributes of Organic Agriculture as a science relevant to food security, poverty alleviation and natural resources conservation in Africa, and hence the role that Organic Agriculture has in offering lasting solutions to the factors limiting economic and social growth on the continent. The conference also encourages the recognition that Organic Agriculture has to co-exist with other schools of thought. In this regard, the conference tries to harmonize our understanding of biotechnology vis-a-vis other strategic options and to explore a potential contribution to organic agriculture and economic development based on the organic principles. The AOC also offers a platform for experience sharing and discussion on best organic practices, standards, certification, trade, policy formulation and other development initiatives achieved over years, especially in the African Region. Participants can share and exchange knowledge, which is needed for the development of the Organic Agriculture sector in Africa and to realize its full potential towards achieving the Millennium Development Goals.

The AOC covers three main perspectives of organic knowledge including field research, scientific investigations as well as knowledge dissemination and exchange. Each conference day has an overall topic and will allow extensive discussion of the presented papers. The Conference attracts over 200 participants from across Africa with additional input coming from stakeholders from all over the world, who are interested in the development of Africa. At least 25 papers on Organic Agriculture will be presented including some dozens of posters. Four keynote papers on the relevance of organic sector development towards meeting the millennium development goals, addressing climate change, responding to biotechnology, and meeting the food security demands of Africa will be presented. There will also be highlight session on Indigenous Knowledge (IK), hence show-casing Organic Agriculture in social sciences.

Attentive participants will also realize a considerable increase of networking activities including the Launching of the African Organic Network (AON) and the Network for Organic Agriculture Research in Africa (NOARA). Likewise the African Organic Centre of Excellence will be kick-started, and the Organic Research Centers' Alliance (ORCA) formation will be presented. The AOC is hosted by the National Organic Agricultural Movement of Uganda (NOGAMU) and Uganda Martyrs University (UMU) with technical support from Agro Eco-Louis Bolk Institute (AELBI), and the International Society for Organic Agriculture Research (ISOFAR).

We have high esteem in the contribution of this conference to the development and achieving of Millennium Development Goals in Africa. This would not be possible without the massive support to convening of this first African Organic Conference. On behalf of the organizing committee, we highly appreciate all those who supported the conference. Agriculture is a substantial contributor to climate change and is in turn seriously affected by it. Conventional and intensive agriculture characterized by mechanization and use of agro-chemicals (mineral fertilizers, herbicides, pesticides) and reliance on high external inputs (chemicals, irrigation, fossil fuels) have led to high environmental and social costs, including contributing to climate change, that

may undermine future capacity to maintain required levels of food production. However, there is a large mitigation potential that can change agriculture from being the second largest emitter of greenhouse gases (GHGs) to a much smaller emitter or even a net sink,while small-scale farmers and agro-ecological methods provide the way forward.

Assoc. Prof. Charles Ssekyewa

Uganda Martyrs University

ISOFAR Board Member

Moses K. Muwanga

National Organic Agricultural Movement of Uganda

IFOAM Board Member

Climate change and the importance of best environment conservation practices

Hira Jhamtani[1] and Lim Li Ching[2]

[1]Third World Network Associate for Asia, Bali, Indonesia; [2]Third World Network Senior Researcher, Bali, Indonesia

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Abstract

Agriculture is a substantial contributor to climate change and is in turn seriously affected by it. Conventional and intensive agriculture characterized by mechanization and use of agro-chemicals (mineral fertilizers, herbicides, pesticides) and reliance on high external inputs (chemicals, irrigation, fossil fuels) have led to high environmental and social costs, including contributing to climate change, that may undermine future capacity to maintain required levels of food production. However, there is a large mitigation potential that can change agriculture from being the second largest emitter of greenhouse gases (GHGs) to a much smaller emitter or even a net sink, while small-scale farmers and agro-ecological methods provide the way forward. Sustainable agriculture, that includes Organic Agriculture, is an effective approach to the mitigation of climate change, and at the same time an appropriate adaptation measure. This paper provides arguments, based on some studies, about the potential of organic, small scale, and agro-ecological farming approaches as win-win solutions for climate change mitigation and adaptation, as well as a productive means to ensure food security and for the promotion of rural sustainable livelihoods. It concludes that there is a need to scientifically document the best practices in Organic Agriculture and to provide resources, policy and overall support for these practices.

What can Organic Agriculture contribute to sustainable development; long-term farming system comparisons in the tropics

M. W. Musyoka[1], Ch. Zundel[2], A. Chabi-Olaye[1], B. Vanlauwe[3], A. Muriuki[4], and M. Mucheru[5]

[1]International Centre for Insect Physiology and Ecology, icipe; [2]Institute of Organic Agriculture; [3]Tropical Soil Biology and Fertility institute of CIAT; [4]Kenya National Horticultural Research Centre Thika; [5]Kenyatta University, Department of Environmental Science

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Abstract

In Europe, numerous studies have proven the advantages of Organic Agriculture in terms of ecosystem services and economic impacts. Organic Farming is now increasingly being taken up by farmers, NGOs, national

programmes and agricultural development agencies in tropical countries as a means to improve food security and rural livelihoods in a sustainable way. Demand for reliable data on the environmental and socio- economic performance of Organic Agriculture is high, but up to now, only few attempts have been made to systematically assess and compare organic and conventional farming system with respect to performance and profitability alongside conventional practices.

To fill this gap, the Research Institute of Organic Agriculture (FiBL) and its partners in Kenya are running long-term farming system comparison field trials of 10 ± 20 years duration. The impacts of Organic Agriculture on livelihood systems i.e. on farm income, education, health, gender relations and farmers' social mobility will be studied in farm surveys. The overall objective is to assess the contribution of Organic Agriculture to food security, poverty alleviation and environmental protection. The project seeks to gather data on (i) how Organic Farming affects yield and yield stability, especially in seasons with extreme weather conditions (drought, flood), product quality and product storability, compared to the conventional system; (ii) how Organic Farming affects the stability of the agro-ecological system, with emphasis on soil fertility, beneficial organisms and biodiversity, compared to the conventional system; (iii) natural and economic resource efficiency (output/input relationships) of the organic system compared to the conventional system; (iv) to identify the challenges for Organic Agriculture in tropical countries and thus gain the ability to address them in a targeted way and (v) to contribute to the development of organic and sustainable agriculture in developing countries.

The long-term field trials were set up in the sub-humid highlands of central Kenya. where the Organic Farming system is being compared with the conventional farming system at two input levels, resulting in four treatments: Conventional High Input, Organic High Input, Conventional Low Input and Organic Low Input. While the input level in the low-input treatments is driven by the availability of farm-owned resources, the input level in the high treatments is driven by crop requirements and profitability. The 'Conventional High Input' treatment is based on data and recommendations of the Kenyan Ministry of Agriculture while the 'Organic High Input' treatment is based on recommendations for Organic Agriculture in the tropics of the International Federation of Organic Agriculture Movements (IFOAM).

The trial features a 3-year rotation with maize and vegetables. Various parameters are being monitored including yield, biomass, soil properties (chemical, physical and biological), plant health, gross margins, nutrient content of inputs and harvested crop products, weeds coverage and biodiversity and product quality e.g. flavour and pesticide residue levels.

The strategic, administrative, operational and scientific aspects of the trial are managed by a local steering committee consisting partner institutions. These include the Institute of Insect Physiology and Ecology (ICIPE), the Tropical Soil Biology and Fertility Institute of CIAT (TSBF-CIAT), the Kenya Agricultural Research Institute (KARI), the School of Environmental Studies and Human Sciences at Kenyatta University (KU) and the Research Institute of Organic Farming (FiBL). The project is funded by Biovision Foundation, Coop Sustainability Fund, Swiss Development Cooperation (SDC) and Liechtenstein Development Service (LED).

The Role of Organic Agriculture in combating climate change

B. Freyer[1], E. K. Bett[1], R. Birech[2], D. Heese[1], J. N. Malinga[3], J. K. Lagat[2], D. W. Kyalo[2], K. Ngetich[2], P. Pali[4], F. Place[5], C. Walaga[6]

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Key words: climate change, organic farming, trees, market

Abstract

Conventional agriculture embedded on the 'so-called Green revolution` contributes greatly to climate change. Lack of organic management is a recipe for enhancing effects of climate change. Rapid deforestation in the tropics to make more land available for crops further compounds the problem. That agriculture relies on the climate is obvious especially under the rainfed systems. The converse that the climate depends on the agriculture is true. Agriculture, especially in the tropics is already under threats of climate change.. However, with pro-active strategies agriculture is also able to contribute in reducing the negative effects of Climate Change.. Because agriculture provides the basics for human survival it must be adopted to be in tandem with the climate. Against this background this study aimed at addressing the following key questions: which are the potentials and specific strategies and contributions of Organic Agriculture towards alleviation of climate change effects? And how can the Organic Agriculture value chain play a specific role in this context in future?

Based on our research experiences, this presentation focuses on the relationship between organic agriculture and climate change under tropical climate and socio-economic conditions. First, we introduce in the conflicts which are related with land use and climate change. Second we summarize the societal and political environment of organic agriculture. Third we demonstrate the concrete and practical potential of organic farms. It is based on several fields trials, farm analysis, consumer studies and future scenarios undertaken in the recent past.

Worldwide, besides industry, traffic and private households, climate change is the result of non adapted land use systems, expressed in a decrease of soil fertility and biodiversity. Farm management deficits which often results in increased green house gas emissions are discussed as a complex of techniques which all affect the carbon cycle. They are manifested in these regions as lack of legumes as well as legume green manure in the short rains, lack or low density of alley farming, crop rotations and Agroforestry, hedges and forests, compost, stable manure and water management and alternative energy sources. On the other hand the increasing population, the economic and labour situation of small holder farmers with limited land, low access to

market because of transport restrictions are demonstrating the challenges for optimising farming systems. Policies keep in mind the organic farming approach, but this farming method is not in the centre of political activities, which is also the case at all educational level. Private companies are not interested into natural resource management or human capital, while NGOs strengthen knowledge transfer by supporting local farmer groups. Linking organic farmers to international markets is an important impulse to stabilise sustainable farm management. However, the approach as a unique strategy makes farmers dependant from international trade, is limited to a group of farmers and could affect the supply for covering family and local demand (local food security). Our marketing analysis underlines that there is a second but also limited market for organic products in tourism, hotels and restaurants, which is not used. For local markets an organic price is not realistic but to convince people with quality and therefore to find a ready market. Preconditions for all these market activities with focus on mitigating climate change effects is to optimise all organic and tree farming techniques to ensure a marketable quality, which could be organised mainly independent by farmers with low budget. Farmer field schools and other local adapted training and educational approaches, combined with education at school and the university sector with demonstration farms, practise oriented lectures and research activities, the training of the trainers are a must. Based of these findings we conclude with future perspectives with focus on farm practises, policies, as well as research and teaching.

The impact of participatory guarantee systems, farm group adoption of ICS and group marketing on household Income

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Abstract

Organic Agricultural continues to be a leading viable option to link small holder farmers to sustainable markets both at domestic and export levels.

In many developing countries, access to market by small holder farmers is largely constrained by the poor organization of small holder farmers, low volumes, inconsistent qualities and high cost of individual farm certification. Organic agriculture has been at the forefront of innovation through mobilizing thousands and thousands of small holder farmers to be linked to markets through group certification and group marketing that has been possible with the development and establishment of Internal Control Systems (ICS) and more recently the Participatory Guarantee Systems (PGSs). The impact of applying these systems, on increasing household incomes in the grassroots communities has been tremendous and has contributed highly to improving livelihoods of millions of resource poor smallholder farmers across Africa and around the world.

This paper looks at the benefits and impact of group marketing realized through establishing ICS (for export marketing) and PGS (for domestic and regional marketing), and highlights cases that have been successful in linking thousands of smallholder organic farmers to markets in East Africa through implementing group ICS and PGS.

Contribution of Organic Agriculture to improving household incomes

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Abstract

Organic Agriculture advocates for practices that promote the natural build up of soil chemical, physical and biological fertility. By adopting such prudent management practices, organic farms in Africa have often registered higher yields than those from conventional systems. This way, organic farmers have been able to grow enough food for their families and to spare surplus for the market, thus contributing to household income (where income is defined as total revenue minus fixed and variable costs). Even in areas that were once entirely reliant on emergency food aid (e.g. South-West Ethiopia) and those previously threatened by desertification (e.g. parts of South Nyanza, Kenya), organic farmers are now, not only able to feed themselves, but have left-over to contribute to surplus and a decent income to meet other dire family needs. Secondly, Organic Agriculture promotes the use of locally available, naturally occurring substances for pest and disease control. The cash that would have been used to purchase of synthetic chemicals is saved and it contributes to a reduction in variable costs thus increasing enterprise profitability. Thirdly, certified organic farms in Africa that engage in product export are reported to be significantly more profitable than conventional products in terms of net farm income. Price premiums for most tropical certified organic products range from 19% and 150% relative to conventional products. Long-term organic trials at Egerton University, under different farmyard, green manure, legume intercropping and 20 kg ha^{-1} of phosphorus (P) in the form of rock phosphate gave an average maize and wheat output of 4720 and 3900 kg ha^{-1} respectively. Conventional yields obtained from adjacent farm gave 1900 and 2500 kg ha-1 for maize and wheat respectively. Due to higher yields, all organic enterprises tested gave up to two times more gross margins compared to conventional enterprises, even when there were no organic premium prices. To sum it up, increased yields, more total sales (of surplus), higher premium prices (where applicable), reduced variable costs and shorter conversion periods are features that characterize the organic systems in Africa. All these together translate to overall increase in income that has been estimated to range from 30%-200% higher than in conventional agriculture. Furthermore, evidence shows that organic agriculture can build up natural resources, increase knowledge of farmers, increase food security, reduce poverty, improve health, improve nutrition and increase employment to the local labour force. Non-certified organic production remains a realistic means to food and income security to small-scale farmers in Africa. If markets remain to be available, certified organic production is a promising trade opportunity, whose profound benefits may lead to sustainable development.

Challenges in meeting European Consumer demands for Organic products from Africa

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Abstract

The demand for organic products at high value food markets in Europe and North America has increased by 10-25% per year and is the fastest growing market segment, much of which is based on imports[1]. This creates a potential for linking African smallholder farmers to high value markets given the right organizational framework.

The continued demand in Europe for imported organic products is part of a consumer mega-trend where the focus has shifted from size (more food at still cheaper prices) towards 'meaning', 'healthy food' and 'decent food'. Thus, the demand for organic food is connected with symbolic aspects and a relatively large consumer segment feels a global responsibility for choosing food produced in sustainable food systems. Many of the imported organic products are sold with "stories" of the benefits that the certified production has for farmers and the environment and the consumers have a fundamental trust in the organic actors[2]. Therefore, it is important to maintain the integrity of organic food chains, which means that the organic chain should reflect the organic principles in terms of improving health, ecology, faimess and care.

Therefore, companies and NGO's should make sure that development of the organic high value market chains goes hand in hand with adoption of organic principles and development of improved knowledge and empowerment among the participating smallholder farmers. This requires training and engaging farmers and local extension workers in the adaptation of agro-ecological methods[3].

Through contract production farmers can get access to inputs and training, which improves their market orientation and agricultural knowledge and use of agro-ecological methods. This has been demonstrated by the so-called EPOPA program (Export Promotion of Organic Products from Africa, supported by SIDA since 1997), which has supported local business partners in creating links between farmers in Uganda and Tanzania and export markets. Approximately 80000 farmers have been involved in certified cash crop production with a value of app. 15 Mio US$ yearly generating a total export value of more than 30 Mio US$[4]. The farm families involved have benefited from price premiums and improved productivity due to training in organic methods and general capacity building. Many of the EPOPA supported projects have also established local processing factories for drying, canning etc. of primary products into high value processed food. This has created employment opportunities for a large number of young women in the villages. However, the Epopa report also documents the difficulties in developing the local processing companies and securing the market links to the export

markets. The report stresses the need for support to the entrepreneurs and for training in business development and management.

In conclusion, there is a potential for increased investment by African governments, donors and other stakeholders in the development of organic production and processing for export markets. But such a positive scenario depends on well-designed training and extension focusing on building human, natural and financial capital

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Developing a sound and sustainable local markets: A case study of Kenya

Eustace Kiarii Gacanja

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Abstract

Despite the widespread and continued growth of organic markets, majority of small holder farmers in Africa have neither accessed these markets nor benefitted from the growth. Until recently, over 90% of all certified organic produce from East Africa was exported. Promotion of organic agriculture among small holder farmers in the region was mainly focused on food security, environmental conservation or for export under the out-grower schemes. However, over the years and as local consumers become conscious of their health, more are demanding organic produce leading to emerging local markets. This paper describes some innovative approaches that have been used in Kenya to develop local markets and how to empower smallholder farmers within the production chain to improve their competitiveness in modern markets.

The paper evaluates why small holder farmers rarely access markets and explains why national markets are important. It presents the Kenyan case where they have the most organic outlets in East Africa including organic restaurants, organic green groceries, organic sections in supermarkets among others. It concludes with some lessons learnt and the opportunities in national and regional markets that African small holder farmers can to take advantage of.

Harmonized regional standards ensure better provision of healthy organic products: EAOS

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Abstract

The stakeholders in East Africa developed a regional standard for Organic Farming in the period 2005 to 2007. This was facilitated by the IFOAM project Regional Cooperation for Organic Standards and Certification Capacity in East Africa (OSEA) and the UNEP/UNCTAD Capacity Building Task Force on Trade, Environment and Development (CBTF) project Promoting Production and trading opportunities for Organic Agricultural Products in East Africa.

The East African Organic Products Standard was adopted by the East African Community as an East African standard, which means it became publicly recognized in Burundi, Kenya, Rwanda, Tanzania and Uganda. In addition, the National Organic Agriculture Movements of Kenya, Tanzania and Uganda established a common organic label to be used on organic products in the region. Other accomplishments were:

The development of a joint inspection protocol for verification of compliance with the standard concept development for Participatory Guarantee Systems as an alternative way of conformity assessment production of information tools and materials and training of media.

Both labelling and the standards were launched in Dar es Salaam, Tanzania by the Prime Minister of Tanzania at the East African Organic Conference in May 2007. The launch was attended by more than 250 people, including the Swedish Ambassador, the Minister of Agriculture of Tanzania and the Minister of Trade of Uganda. The OSEA project has been a real success both in its actual accomplishments and in the general boost it has provided to the sector. It has offerd a good foundation for the future development of the organic markets locally, regionally and internationally. It has also provided the organic sector in East Africa with a common platform for international negotiations and recognition. Further, a working regional collaboration has developed on the governmental level, in the form of the East African Community, and between the national Organic Agriculture movements around market development and the management of the East African Organic Mark. A dialogue has also been established between the government and the private sector on policy.

Organic Farming in Africa– between global food markets and food sovereignty

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Abstract

Organic Farming is a worldwide harmonized concept (IFOAM standards 2005, FAO/WHO codex alimentarius 2008) to ensure the environmentally sound and socially fair production and consumption of agricultural products. Organic production is done in more than 110 countries (total 197 countries) on 32 million hectare (0.7 % of total agricultural land use) by more than 650.000 farms (total 700 million farms) (Willer & Yussefi 2008). The consumption is mainly done in developed western world countries – the market has a value of more than 40 billion US-$ and grows more than 10 % annually (organic monitor 2008). The global organic market is attractive for developing countries to sell high premium product.

Only 0.1 % of the farm land in Africa (900,000 ha or 3 % of the world organic farm land) is certified as Organic Farming. About 130,000 farms practice Organic Farming. Some countries dominate Organic Farming in Africa. Only Uganda, Tanzania and Kenya comprise 400,000 ha on 90,000 organic farms. 60,000 ha of the organic land in Africa are arable land (7 %), 300,000 ha are permanent crops (33 %) and 35,000 ha are pasture (4 %). No information is available for 450,000 ha (50 %). Coffee, tea, tropical fruits, herbs, drugs and cotton are the main products and most of them sold to Europe. Only in some African cities labelled organic products are sold on the local, national market – mainly to foreigners and wealthy people. There is a big market for wild collected food in Africa. This is mainly used for local consumption. Some wild crops are for global markets as well (roibush, Harpagophytum spp). The exploitation of natural resources by wild collection can be severe. The export focused organic market has many aspects of ecocolonialism: defining the standards, the price and the markets. Participation and fair food sovereignty are not fulfilled in this sector as well as in the conventional sector. Beside the global market Organic Farming is able to fulfil the demand of food self sufficiency and food sovereignty. Particularly in Africa the food crises is severe and critical in the future (FAO 2008). Climate change, increasing population and natural (droughts, floods) and man made (wars, desertification, degradation, de-forestation, diseases) disasters led to hunger, migration and critical economic and social situations. Organic Farming measures can improve land use management and increase production yields in low input and self sufficiency farming systems. The organic movement must define the role of Organic Farming development in Africa.

Policy advancements and issues for Organic Agriculture in East Africa

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In East Africa, as in most countries around the world, the early drivers of the organic agricultural sector have been non-governmental organizations and the private sector. Government policies and programmes have generally focused more on promoting conventional agriculture, including through education, extension and provision of subsidized inputs. As Governments become more aware of the many economic, environmental, social benefits organic agriculture offers, they start to develop policies and programmes that are supportive, or at the least less detrimental, to the development of the organic sector. Due to its many benefits, Organic Agriculture can be considered as a public good and a good candidate for government support

When the UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development (CBTF) began its work in East Africa in 2004, public and private stakeholders in the region requested CBTF to draw out lessons learnt from around the world on the most effective means for Governments to promote the development of their organic sectors. The CBTF study on Best Practices for Organic Policy (UNCTAD/DITC/TED/2007/3) is the result.

Some of the main findings of that report are as follows: Countries with a unified organic movement develop the sector quicker. Governments are advised to work in close cooperation with the stakeholders and their organization when developing organic policies. Any organic policy and action plan should be linked to the overarching objectives of the country's agriculture policies in order to make them mutually supportive. The contribution of organic agriculture to these objectives needs to be highlighted. Similarly, the current policies should be assessed to understand their impact on organic agriculture ideally leading to that all obstacles and biases against organic agriculture be removed.

A starting point for government engagement is to give recognition and encouragement to the organic sector. Governments should take an enabling and facilitating role rather than a controlling one. In particular, Governments should not embark on premature domestic organic market regulations which may stifle the development instead of stimulating it.

A policy process needs to be participatory and be based on clear objectives. Action plans, programmes and projects should develop from the overall policy. Critical for the development is that bottlenecks will be identified and that all the various aspects of development – production, marketing, supply chain, training, research etc. – are considered. Training both civil servants and private sector actors should have high priority. The adaptation of policy measures to the conditions in the country and the stage of development and the proper sequencing of measures are vital for a successful development of Organic Agriculture.

The report gives a number of recommendations for:

- General Policy;
- Standards and regulation;
- Markets;
- Production; and
- Other, including training, education and research.

Over the past few years in East Africa, a number of policy initiatives have been taken. For example, Uganda is currently engaging in final consultations on its draft organic policy and Tanzania has developed a National Organic Agriculture Development Programme and mentioned Organic Agriculture for the first time in its overall agricultural policy. Both of these are very much in line with the recommendations in the Best Practices study and should produce good results if properly implemented and resourced. It is important that East African Governments now make also budgetary allocations to support the further development of the Organic Agriculture sector.

Current organic market trends and emerging policy environment impact on meeting MDGs

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Key words: Organic, East Africa, Markets, EPOPA, MDGs

Abstract

The Export Promotion of Organic Products from Africa (EPOPA) programme supported the development of the organic export sector in Uganda and Tanzania between 1995 and 2008. The programme was supported by the Swedish International Development Agency (Sida) and was implemented by Agro Eco Louis Bolk Institute (NL) and Grolink (Sw). It's aim was to work through exporting companies to link small-holder producers to premium priced organic markets under the motto "Development through Trade". The experiences of EPOPA are used as a reference point to build up linkages between the promotion of organic trade to meet current market trends and the Millennium Development Goals (MDGs). Special note is made of how these developments were influenced by policy development within East Africa, policies controlling the global market and those instituted by importing countries. The MDGs impacted through the development of organic trade are considered on a case by case basis and recommendations are made as to how a synergies between organic trade, policy development and the MDGs can be improved.

Long-term performance of organic crop rotations in the tropics: First results from a high and a medium potential site in sub-humid Central Kenya

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Abstract

Organic Agriculture is perceived by many stakeholders as a promising approach to increase food security in developing countries. However, only few attempts have been made so far to assess agronomic and economic performance of Organic Agriculture in these regions in a systematic way. The Research Institute of Organic Farming (FiBL), together with its partners, is presently establishing long-term comparisons of farming systems in various agro-ecological and socio-economic contexts to study the different parameters that are essential for sustainable development. To date, three study areas have been selected: (a) a sub-humid area in Kenya where farming is subsistence-oriented; (b) a semi-arid area in India where cotton is produced for the export market; and (c) a humid area in Bolivia where cacao and other perennial products are produced for the export and domestic markets. The key elements are replicated long-term field trials. These are complemented by farm surveys and short-term trials under on-farm conditions. This network of comparison of farming systems in the tropics is expected to (1) put the discussion on the benefits and drawbacks of Organic Agriculture on a rational basis; (2) help to identify challenges for Organic Agriculture that can then be addressed systematically; (3) provide physical reference points for stakeholders in agricultural research and development and thus support agricultural policy dialogue at different levels.

In Kenya, the two trials sites are located in a high potential zone in Meru South District (Chuka) and in a medium potential zone in Maragua District (Thika). They consist of four treatments: conventional and organic, each at a low and a high input level, representing subsistence oriented and commercial farming, respectively. Maize, brassicas and maize were planted during the first, second and third season respectively in both organic and conventional plots. In the first three seasons, we found the following results: in Chuka, organic yields of the low input treatments were on average 4% lower than conventional yields. On the high input level, organic yields were 6% lower. In Thika, organic yields were on average 57% (low input level) and 33% (high input level) lower than conventional yields. It is assumed that the organic crops in Chuka could benefit from N and P mobilisation from the soil. In Thika, where N and P were

probably less available, the crop depended on the easily soluble nutrients applied in the conventional treatments. The effect of lower nutrient availability in the organic treatments in Thika was possibly aggravated by serious drought spells during the second and third season. The questions of interest are a) whether the organic treatments can keep the yield level of the conventional treatments in Chuka or if they will go through a depression typical for conversion from conventional to Organic Agriculture; and b) if the organic treatments can improve soil fertility and thus the organic yield levels in Thika in the coming years.

Organic Agriculture research needs in Africa: A case of Uganda

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Key words: Organic Agriculture, Research Needs, Poverty Alleviation, Environmental Conservation

Abstract

Organic Agriculture offers a wide range of economic, environmental, social, and health opportunities, especially for resource poor smallholder farmers, who comprise the majority of Africa's poor. It has a considerable potential to contribute to poverty alleviation and environment conservation with minimum investment. Researchers in Uganda however, have not yet put much emphasis on issues concerned with Organic Agriculture. Most of the previous research activities by research organizations have been based on conventional agriculture.

The general practice of agriculture in Uganda is based on organic agricultural principles of crop diversity, soil health and fertility and recycling of nutrients. Even the traditional agricultural practices that have sustained generations in Uganda were based on cultural practices that can be more adapted to organic than conventional agriculture. This shows that there is a virgin area of research that can be explored to generate useful information for development of agriculture in Uganda.

Organic Agriculture research needs in Uganda are diverse and require an integrated approach to address two major issues:

Increasing and stabilizing yields and raising incomes with low-cost and locally available technologies and inputs

Increasing productivity without causing environmental degradation

Addressing these research needs will however require overcoming the constraints that have limited research in Organic Agriculture over decades.

Application of biotechnology in Organic Agriculture in Africa, a myth or an oversight

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Key words: Attitude, IK, Technology Adoption, Genetics, engineering, Organics

Abstract

Biotechnology is simply scientific methods and practices based on biological systems or their components. It is applicable to all stages of commodity value chains. Biotechnological applications vary in nature from very simple system or organ based applications to amino acids (deoxyribonucleic acid/DNA, Ribonucleic acid/RNA) based applications. System and organ based applications of biotechnology are very much understood, and seem to have evolved with life. Many of these are indigenous knowledge based. They are also very well articulated by early advances in bio-science.

Current scientific advancements have gone to deeper levels of scientific innovation. Most of these deal with a cell, chromosome, nucleotide, and DNA/RNA or a gene. Genes determine cellular functions which influence organism behaviour and inheritance. Any biotechnological method applied at this level would therefore be very sensitive, since it might result into alterations in organism traits and behaviour. A living example of this method is genetic engineering, which results into genetically modified organisms (GMOs). The terminator gene is a result of genetic engineering, and disables reproductive potential of plant off springs (F1). Such a technology is a cause for worry, and reason for detesting advanced biotechnological innovations among the Organic Agriculture community in Africa.

The paper explores the possibility for application of biotechnological methods in future development of Organic Agriculture in Africa.

Practical, sustainable and economical implementation of biotechnology in Organic Agriculture

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Key words: bioremediation, biotransmutation, beyond organic

Abstract

The practical applications and uses of bio technology in Organic Agriculture involves bioremediation and biotransmutation of soil and water. The bio technology being discussed here is a complex process using biology and physics but the end products are simple and practical to implement. Use of bio technology promotes sustainable and Organic Agriculture that evolves towards greater utility, efficient use of resources and contribute towards an environmental balance.

There is a consensus that, agriculture must increase in productivity and efficient use of resources. There must also be a reduction in the use of pesticide and commercial fertilizer, as well as an increase of biological processes. Nutrient cycles within the farm must be closed to avoid run off and contamination of soil and water sheds.

An incredible diversity of organisms make up the soil food web. This community of organisms live all or part of their lives in the soil. Bacteria are the simplest form of life. There are beneficial and detrimental species within these organisms. The application and use of beneficial microbes in Organic Agriculture is termed beyond organic. A broad spectrum of introduced beneficial microbes and its practical and economic implementation is in most part bio technology. Equally important is acquiring the knowledge of how and what it takes to sustain these microbes in the soil and water.

Commercially produced microbiological products are available to enhance Organic Farming. Application of these broad spectrum beneficial microbes help the soil and water to break down toxins, organic debris, increase mineral availability, improve soil tilt and promote healthy vigorous root growth.

The advantage of using bio technology is evident in cleaner water, healthier plant growth and increasing the normal production for all the crops. Bio technology has been introduced to the market place and into various fields of application with proven effectiveness.

Indigenous biodiversity as a potential source of crops for future satisfaction of consumer demand

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Abstract

The African continent is rather poor in plant biodiversity when compared to the other continents in the South. Nevertheless, a fair number of useful plant species have been domesticated from Sub-Sahara Africa botanicals. Ethnobotanical research offers the possibility to collect information on use and utility of wild plant species from traditional people often living in challenging ecosystems and environments. This type of information allows us to find new candidates for domestication and subsequent development for income generation and increased food security, and thus a wider satisfaction of consumer demand. The presentation will highlight the case of *Gnetum africanum*, RDC, to illustrate theory through practice.

Relationship between the rich biodiversity in Organic Farming and best conservation practices: soil productivity approach

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Abstract

Soil fertility seems to act as the central nervous system of crop production. Successful and sustainable Organic Agriculture development hinges on how agricultural soils are handled. Consequently, fast tracking sustainable development of Organic Agriculture in Africa depends on how productive the African farmers' soils are during the production periods. Tropical soils (of which most African soils belong) are generally poor in soil fertility which often limits the soils' productivity. This general problem in Africa has pushed many farmers and national governments to consider the use of chemical fertilizers as the most effective solution to their soils' poor fertility status. However, the use chemical fertilizer is not sustainable in Africa due to the fact that most African farmers are resource poor and find it difficult to cope with high price of these synthetic fertilizers. Since chemical fertilizers have no place in Organic Agriculture, solving the problem of poor soil fertility and productivity in Africa is therefore imminent if Organic Agriculture would be fast tracked in Africa. This presentation therefore looks into problems of poor soil fertility/ productivity in Organic Agriculture practice in Africa and offers solutions based on African rich biodiversity.

Potential and research needs for home made bio-pesticides for African Organic Agriculture

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Abstract

In Organic Agriculture the use of pesticides is restricted by guidelines and sometimes by missing availability or affordability of suitable products. However, even production systems using preventive measures to reduce pest and disease pressure, e.g. wide crop rotations, may suffer from serious attacks and subsequent yield losses. Using home made bio-pesticides is an interesting option to cope with potential crop protection problems. Home made bio-pesticides include the use of botanicals, i.e. plant extracts, and other agents such as rock powder or compost extracts. The successful use of these agents requires a practical and a scientific view on the optimal application and an adequate system of knowledge transfer to farmers. The main requirement to home made bio-pesticide is a sufficient efficacy able to significantly reduce pest or disease pressure in a defined range of crops. In the case of botanicals a decisive factor for successful application is a clear understanding of the growing and harvesting conditions including an estimation of the biomass needed for application. The subsequent processing has to be focused on maximising the efficacy of the ready-to-use solution, while considering the on-site availability of necessary equipment and potential negative effects such as phytotoxicity. Farmers would benefit from clear and short prescriptions that inform on the availability of the raw material, the mode of preparation and indications, i.e. the target pests. This task requires systematic support by research institutions. Some botanicals such as extracts of the neem tree (*Azadirachta indica*), chrysanthemum (*Tanacetum cineriaefolium*), quassia wood (*Quassia amara*) and derris (*Derris elliptica* and other tropical legumes) are commercial products sold all over the world. The potential of some other botanicals for commercial use still requires more research. The list of potential candidates includes lemon grass, citronella grass, African marigold, the Kosso tree, black pepper, caraway, bishop weed, black cumin and bitter gourd. Research on homemade bio-pesticides has to consider various objectives including the screening of new agents, the systematic analysis of the mode of action, the identification of target pests, dose calculations and empirical knowledge on how to produce the required raw materials. Once basic empiric knowledge on a new agent is available, a systematic evaluation targeted on the economic utilisation has to be carried out. Practical solutions for crop protection problems have to be disseminated among farmers mainly by oral communication (advisers and radio), but also by leaflets. New botanicals suitable for the development of commercial pesticides have to be investigated on a larger scale including extensive lab and field experiments. International collaboration might be needed integrating researchers in a network.

Opportunities for utilising biological control in Organic Farming in Africa

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Biological control of invertebrate pests and weeds of economic importance in crop production provides a great opportunity that is appropriate for small holder farmers in developing countries due to the prohibitive costs associated with chemical use. Utilisation of biological control as an environmentally sound pest control option in crop production has been a long practiced phenomenon. The implementation environment that is required to enhance this pest control option at the scientific-research and production level in the field, based on experiences generated from past biological control programmes implemented in the last 30 years in Africa are being discussed. This paper also identifies some of the challenges that may be faced, but also discusses the opportunities that can be seized to further integrate biological control of both exotic and endemic pest species in the organic farming system of small holder farmers in Africa.

Antimicrobial properties of some plant extracts against organisms associated with fish spoilage

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Key words: Antimicrobial activity, cup plate diffusion, *Piper guineese*, *Citrus paradisa*, *Carica papaya*, inhibition zone, fish spoilage

Abstract

Antimicrobial activities of five concentrations (0.1, 0.2. 0.3, 0.4 and 0.5g/ml) each of ethanolic, cold and hot water extracts of Black pepper (*Piper guineese*), Grape (*Citrus paradisa*) peel and pawpaw (*Carica papaya*) seed against spoilage organisms of catfish, *Clarias gariepinus* (Burchell, 1822) were assessed by measuring inhibition zones, using the cup plate diffusion method. Inhibition zones were significantly different ($P < 0.001$) based on extraction method; plant material extracted and extract concentration. Results indicated that the best extraction method was hot water with a mean inhibition zone of 4.42 ± 0.38mm; followed by ethanolic and cold water extraction methods with 3.55 ± 0.47mm and 0.60 ± 0.15mm respectively. Among the plant materials evaluated, grape peel had the best antimicrobial activity with a mean inhibition zone of 3.70 ± 0.40mm against all microorganisms tested, followed by black pepper (2.68 ± 0.42mm) and pawpaw seed (2.19 ± 0.32mm) respectively. Microbial inhibition was in the order *Enterobacter cloacae* (5.24 ± 1.18mm); Klebsiella pneumoniae (4.69 ± 1.15mm); *Citrobacter freundii* (2.87 ± 0.43mm); *Proteus mirabilis* (2.84 ± 0.49mm); *Staphylococcus aureus* (2.47 ± 0.60mm); *Acinetobacter species* (2.44 ± 0.75mm); *Klebsiella oxytoca* (2.29 ± 0.53mm); *Bacillus megaterium* (2.16 ± 0.67mm); *Bacillus subtilis* (2.16 ± 0.50mm); *Escherichia coli* (2.13 ± 0.69mm) and *Pseudomonas lundensis* (2.13 ± 0.48mm) respectively. This study confirms the efficacy of some plant extracts as natural antimicrobials and suggests the possibility of employing them in fish preservation where spoilage is caused mainly by microbial activity.

Sesame: The under exploited organic soil seed crop

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Key words: oil content, seed export, seed colour, seed yield, 1000 seed weight

Abstract

Sesame (*Sesamum indicum* L.) is an important oilseed crop that ranks sixth in the world among vegetable oils. Nigeria is the second largest producer of sesame in Africa after Sudan. At present sesame seed export ranks second after cocoa in terms of value and volume of crop export. Nigeria currently earns US$150 million from sesame seed export. Unfortunately, the entire sesame export constitutes conventionally produced sesame. However, majority of the primary growers of sesame in the Middle Belt region (major producing area) of the country produce non-certified organic sesame which can readily meet the specific requirements for organic sesame. Recently released sesame varieties: NCRIBEN-01M and NCRIBEN-02M, and Ex-Sudan (exotic variety) readily meet the premium quality requirements for sesame export (1000 seed weight >3.0 g, 40-50% oil content and pearly-white seed colour). Data on the agronomic performance of these new varieties are presented in this paper.

Post harvest handling and export market quality issues for organic products in Africa

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Abstract

There is post harvest handling done on the farm, or in the village by farmers themselves, and there is processing-value addition done in centralised, more urban settings. Experience shows that African farmers are able to produce good quantities of good quality raw materials for competitive prices once they are organised and achieve economy of scale. They normally need to be assisted by in-house staff and/or external service providers that know and train the farmers in buyer expectations, international quality requirements and the measures to avoid contamination by microorganisms. In most countries this expertise is locally available, but not always accessible.

For obvious socio economic reasons it is interesting to go beyond raw materials, to add value through processing. There is a history of value addition projects that were started without a market demand. Even when the processing itself appears simple, there is a whole set of additional difficulties in understanding and addressing the requirements that the business opportunity puts on the processor-exporter and the supply chain: in the sourcing of sufficient volumes of certified organic raw materials, of sourcing-importing organic processing ingredients, of importing modern packaging materials, the need for energy efficient, modern equipment.

For newcomers it may take up to five years to develop and commercialise export volumes of a finished product, attaining the right quality, and certifications necessary to enter the market. Anticipating and planning for changes in market and consumer preferences requires a fast response and flexible producer conditions.

For some processed products, Africa has a comparative advantage in terms of being cost and product competitive, in others it has not. This is related to the poor infrastructure and support systems, and until recently the market protection that might have protected the position of processors in their home market, but has made them uncompetitive in the international arena.

The challenge is to improve the management capacity of participating companies, leverage resources and goodwill of other stakeholders to systematically address institutional and other business environment aspects that affect the food-processing sector. The paper concludes that though these challenges are also reflected in other interventions supporting export of agricultural products from Africa, addressing these challenges properly can go a long way in enabling the export of organic, processed products from Africa to achieve better cost and product competitiveness, so that the business delivers benefits to the exporters and the smallholder farmers supplying the raw materials.

Quality Systems Approach to Organic Production – From the Plate to the Paddock

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Key words: Organic Tropical Fruits, Quality Systems, Systems Approach

Abstract

Supplying a good quality product is the key to higher returns. This quality has to be determined by a compromise between the costs of production and price the customer is prepared to pay. Often in these days of mass marketing the emphasis is on quantity sold, resulting in lower quality produce being sold at low prices. This is not always profitable for the grower.

A smaller quantity of a higher quality can often return a better profit.

Successful post harvest systems start with the production system.. The farmer needs to have production and harvest systems to ensure that quality is maintained to the market.

This paper looks at whole value chain quality systems that start with the farm and include harvest systems, post harvest, packaging and transport and marketing systems.

The emphasis is on simple robust on farm systems that can be done easily with very little documentation. These systems are suitable for grower groups consisting of small growers.

Organic Research Centres Alliance (ORCA)

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Abstract

The Organic Research Centres Alliance (ORCA) concept has been developed jointly by the Food and Agriculture Organization of the United Nations (Italy), Tufts University (USA) the Research Institute of Organic Agriculture (Switzerland) and the International Centre for Research in Organic Food Systems (Denmark).

Fundamental science and applied research are crucial requirements for the development of Organic Agriculture, especially in developing countries. The proposed alliance therefore intends to internationally network and strengthen existing institutions with scientific credentials and empower them to become centers of excellence in transdisciplinary Organic Agriculture research.

The objective is to ensure that environmental, economic, and social benefits accruing from organic research are shared worldwide. The ORCA concept is designed following a research paradigm that heavily draws on traditional knowledge, improves it with scientific investigation and shares it widely. Research centres may be physical laboratories or “institutions without walls”, formed through alliances between producers and scientists, as well as twinning between developing and developed countries’ institutions.

The ORCA conveners are currently seeking to understand the degree to which research institutions and donors are involved in Organic Agriculture research in Africa. Over the past months, we have been seeking information on academic and informal research efforts, existing partnerships within the continent, and donors’ support for advancing organic agricultural research. The intention is to pool intellectual expertise and resources for establishing a first ORCA centre – or network - in Sub-Saharan Africa. Synergistic outcomes can be achieved by working towards a common objective, either bilaterally or multi-laterally.

POSTER CONTRIBUTIONS

Molecular characterization of tomato leaf curl disease causing viruses in Uganda

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Key words: Tomato, begomoviruses, genome, co-evolution, recombination

Abstract

Symptom-bearing samples were collected from both dry savannah (Eastern and Northern) and wet equatorial/tall grass savannah (Central and Western) agro-climatic zones of Uganda. Total DNA was extracted using a modified Dellaporta protocol (Nakhla et al., 1993). Virus DNA was amplified with five different primer pairs for Tomato yellow leaf curl virus (TYLCV), Tomato yellow leaf curl Sardinia virus (TYLCSV-Sic), and Tomato leaf curl Uganda virus (TLCUV), as well as their combinations. Our results indicated wide variation in tomato leaf curl viruses in Uganda, which were grouped into 24 categories. Three distinct virus genomes, that is Tomato leaf curl Uganda virus-Soroti, Tomato leaf curl Uganda virus- Iganga (Pallisa) and Tomato leaf curl Arusha virus-Mubende, were characterized. Partial results indicated occurrence of viruses related to TYLCV and TYLCSV-Sic in wet agro-climatic zones. Genomic variation was detected with-in isolates, and recombination is suspected.

Efficacy of indigenous botanicals in the management of cabbage pests in an Organic Farming system

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Key words: Biological control, Botanicals, Cabbage, Concoctions, Pests

Abstract

Cabbage is an economically important crop in Uganda. Pests are number one constraint limiting qualitative and quantitative production. Organic cabbage production is picking up and farmers use botanicals to control pests. Used botanicals are not evaluated scientifically, though there is a rich indigenous knowledge about pest management. This has resulted into misuse of

botanicals, and as such, pest management is labour intensive and uneconomical. Therefore, a study was conducted during two growing seasons to evaluate farmer used botanicals against major cabbage pests. Pests usually found on cabbage were recorded. Note was taken of percentage number of leaves damaged by the diamond back moth, aphids and the cabbage lopper per plant per treatment. Yield was also noted at harvest stage. Generated data was evaluated by ANOVA using SPSS programme. Use of Tephrosia powder and solution was found to be the most effective treatment against cabbage pests. This treatment was better than a mixture of citronella, chili, and tephrosia solution. Tephrosia powder and solution, as well as chili solution spray are recommended for use against cabbage pests in the Organic Farming system.

Growth, nutrient uptake and dry matter yield of maize as influenced by composted organic residues

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Key words: Compost, Mucuna husk, Rice straw, Leaf litter, Nutrient uptake

Abstract

Scarcity of chemical fertilizers has prompted the use of compost by farmers in Nigeria. However, response of crops to compost differs based on the components of the compost. This study therefore evaluated the influence of differently composted organic residues on the growth, nutrient uptake and dry matter yield of maize.

The potentials of five different compost types; Poultry manure + Mucuna husk (PmMh), Poultry manure + Leaf litter (PmLl), Poultry manure + Rice straw (PmRs), Poultry manure + Leaf litter + Rice straw (PmLlRs) and Poultry manure + Leaf litter + Mucuna husk (PmLlMh) were studied. The investigation was done in a greenhouse potted experiment using two varieties of maize TZE COMP4C2 (V_1) and ACR 9931-DMRSR (V_2) as test crop treated with different rates of the compost treatments in a completely randomized design. Significant differences ($P< 0.05$) were found in plant PmLlMh and these were significantly ($p< 0.05$) higher than that of NPK treatment. Thus, from the study PmLlMh at 1.5 t hacould be effective compost for maize production. height and dry matter yield of maize. N, P and K uptake of maize V_1 and V_2 were 20.4, 6.2, 21.9 mg^{-1} pot and 14.8, 4.1, 17.7 mg^{-1} pot respectively with 1.5 t ha^{-1-1}

Organic material decomposition by microorganisms in Agro-forestry systems

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Abstract

A study was conducted to determine the rate of organic material, decomposition by two groups of microorganisms, bacteria and fungi in agroforestry system. Isolates of bacteria and fungi from Gmelina plantation, commercial nursery and maize farm were screened for their ability to utilize cellulose in media containing carboxyl methyl cellulose as carbon source. Seven bacteria isolates including *corynebacterium*, *Clostridium*, *Slaphylococcns aureiis*, *Shigella. Streptococcus faecalis*, *Norcadia* and *Streptomyces* species were selected due to high cellulolytic activity. Seven fungi isolates selected include, *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus ochraceous*, *Phomophis, fusarium*, *Penicillim* and *Rhizopus* species. The bacteria and fungi isolates were used in composting fresh *Gmelina arborea* leaves. At 2 weeks bacteria isolates *corynebacteriltm* and *Clostridium* species were able to degrade the organic material, faster with rates of decomposition of 44.7% and 46.9% respectively *Aspergillus niger* and *Aspergillus flavus* were able to decompose the organic material, by 45.3% and 50%. By the end of the fourth week, *Staphylococus aureus* and *Streptomyces* took over and decompose (the organic material, faster with decomposition rate of I3.3% and 13.8% producing dark brown compost The rate of decomposition by *Aspergillus* species ranged between 19.7 % and 22 .3%

The results showed that the bacteria isolates decomposed *Gmelina arborea* leaves faster than the fungi isolates. The bacteria were abundant in this plantation, compared to commercial nursery and maize farm.

Determinants of integrated soil fertility management in the Mau catchment in Kenya

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Abstract

Only about 20% of Kenya's land mass is medium to high potential agricultural land. This coupled with the high population density has forced farmers to practice continuous cropping on existing medium to high potential agricultural land and to extend farming to areas that are too fragile like water catchment areas. Most farmers however have low resources and can not afford expensive inputs required for management of these areas. In addition, the soils are inherently infertile and require specialized management for sustainable production. Integrated soil fertility management (ISFM) has been recommended as ideal for these farmers. Mau, a recently settled area is an important catchment for many rivers and lakes within East Africa. A study was carried out in 2007 in 292 farmers' fields to determine the intensity of ISFM and the factors determining the practice in the Mau region. It was noted that soil fertility management included inorganic fertilizer di-ammonium phosphate applied at an average rate of 57 kg ha-1 and organic manures applied at a rate of 578 kg ha-1 (on dry matter basis). Cattle manure was the most utilized on-farm organic resource in terms of quantity, followed by crop residues, shoat (sheep and goat) manure and poultry droppings in that order. There is limited use of legume fallows, instead legumes are used in an intercrop systems. Farmers strongly perceive the need to revert to organic management. There is limited legume integration and organic manure use is below the capacity that can be generated by the farms. Logistic regression showed that labour status, tropical livestock units (TLUs), off-farm income, land area per household and land tenure system, and ethnicity significantly influenced soil fertility and crop management. The paper discusses options of enhancing organic soil fertility management skills and practices as a key management tool to sustainable conservation and utilization of water catchment environments.

The role of Organic Farming technology adoption on household poverty eradication: The case of small-scale farmers in East Mau Catchment, Kenya

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Key words: Absolute poverty, Organic Farming and endogeneity

Abstract

Poverty in Kenya and most developing countries is mainly rural area based, where over 70% of the population live and actively engaged in agricultural activities. This has called for intensified efforts within governmental and Non-governmental Organizations (NGOs) circles to design and implement strategies for rural poverty eradication and wealth creation. Sustainable agricultural production technologies such as Organic Farming, is one of the strategies proposed. This is in recognition that Organic Farming can be a main source of growth for the agriculture-based countries and can reduce poverty, improve the environment and enhance sustainable development. The outcome of such important efforts warrants keen research. It is therefore imperative to assess the impact that an adoption of these technologies may play on the levels of household absolute poverty so as to draw lessons for future actions.

This study applied a two stage method that takes the endogeneity of Organic Farming technology adoption into account in order to estimate the effect of adoption of Organic Farming technology of the level of household absolute poverty. Based on data collected from 120 small scale farmers at different levels of Organic Farming adoption, 48.7 % were below the absolute poverty line of Ksh. 70 (1 US$) per person per day. Preliminary results confirm the premise that adoption of the technology is correlated to the level of poverty and improves the probability of the household to ascend out of poverty. We conclude that although Organic Farming is a viable option for poverty alleviation, it cannot achieve this objective as a "stand alone" strategy. We therefore draw vital policy implications on the preconditions for the success of Organic Farming technology as a tool for poverty eradication.

Organic Edunet Network for worldwide knowledge community in Organic Agriculture

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Abstract

Organic.Edunet (ECP-2006-EDU-410012 Organic.Edunet) aims to facilitate access, usage and exploitation of digital educational content related to Organic Agriculture (OA) and Agroecology. It will deploy a multilingual online federation of learning repositories, populated with quality content from various content producers. In addition, it will deploy a multilingual online environment (the Organic.Edunet Web portal) that will facilitate end-users' search, retrieval, access and use of the content in the learning repositories.

Organic.Edunet focuses on achieving interoperability between the digital collections of OA and Agroecology content that producers in various EU countries have developed, as well as facilitating publication, access, and use of this content in multilingual learning contexts through a single European reference point. In this way, digital content that can be used to educate European youth about the benefits of OA and Agroecology, will become easily accessible, usable and exploitable.

The project studies educational scenarios that introduce the use of the Organic.Edunet portal and content to support teaching of topics related to OA and Agroecology in two cases of formal educational systems, i.e., high-schools and agricultural universities.

Furthermore, it will evaluate project results in the context of pilot demonstrators in pilot educational institutions, as well as through open validation events where external interested stakeholders will be invited. This way of wide knowledge network formation can be spread into worldwide. The joining organisations may use the Confolio based Organic.Edunet portal for different types of learning activities. Affiliated organisations or user groups may upload their own contents and make them searchable for any user of Organic.Edunet portal.

The system wants to provide up-to-date learning and information content for any users who need information on different and specific parts of Organic Farming. We offer a digital and user defined portfolio even for regular learning systems or life *long learners*.

Potentials of wealth creation through the conversion of cocoa pod husk into cocoa pod husk organic manure in Nigeria

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Key words: Cocoa Pod Husk (CPH), Income, Wealth

Abstract

Cocoa production in Nigeria is one of the most important export earning tree crops grossing over $4.6 billion dollars a year. However the source of this income is primarily from the sale of the produce crop, which is cocoa bean. Cocoa pod husk presently constitutes a form of waste to farmers and has the capability of storing pathogens on farms which are later destructive to the crop and the entire farm, most farmers do not properly dispose of the husk in an appropriate manner. A recent national survey conducted by the cocoa research institute of Nigeria in the 14 cocoa producing states in Nigeria showed that cocoa pod husk waste accumulated to well over 450,000 tonnes dry weight which on converting to cocoa pod husk organic fertilizer has the potential of generating an added value of between $20million and $27 million USdollars to the national income yearly.

Adoption of Organic Farming techniques: Evidence from a semi-arid region of Ethiopia

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Abstract

In the wake of the resource constraints for external farm inputs faced by farmers in developing countries, sustainable agriculture that relies on renewable local or farm resources offers desirable options for enhancing agricultural productivity. In this study, we used plot-level data from the semi-arid Tigray region of Ethiopia to investigate the factors influencing farmers' decisions to adopt sustainable agricultural production practices, with a particular focus on conservation tillage and compost. While there is heterogeneity with regard to the factors that influence the choice to use either

tillage or compost, results from a multinomial logit analysis underscored the importance of both plot and household characteristics on adoption decisions. In particular, we found that poverty and access to information, among other factors, impact the choice of farming practices significantly. We also found evidence that the impact of gender on technology adoption is technology-specific, while the significance of plot characteristics indicated that the decision to adopt particular technologies is location-specific. Furthermore, the use of stochastic dominance analysis supported the contention that sustainable farming practices enhance productivity. They even proved to be superior to use of chemical fertilizers – justifying the need to investigate factors that influence adoption of these practices and to use this knowledge to formulate policies that encourage adoption.

Antimicrobial activity and phytochemical screening of crude extracts from *Ficus exasperata* root bark

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Key words: *Ficus exasperata*, antibacterial activity, phytochemical analysis

Abstract

The aim of this study was to evaluate the antibacterial activity of water and methanolic extracts from root bark of *Ficus exasperata*. The crude extracts were screened against *Staphylococcus aureus*, *Echerichia coli*, *Samonella typhimurium* and *Shigella spp* at different concentrations (500µg/ml,250µg/ml and 125µg/ml) using agar well diffusion. The methanolic extracts had more inhibitory effect on test organisms than water extracts. Antibacterial activity observed with water extract ranged between (10 -15mm) with no detectable activity at 125µg/ml on *Staphylococcus aureus*, *Echerichia coli* and *Samonella typhimurium*. Better antibacterial activity was observed with the methanolic crude extracts at all concentrations with all test organisms. The activity ranged between (25 - 35 mm). Preliminary phytochemical screening of *Ficus exasperata* root bark showed that it contains saponin, alkaloids, cardiac glycoside and reducing sugar with no traces of tannin and anthraquinone. The results of the study provide scientific basis for developing a novel broad spectrum of antimicrobial herbal formulation in future.

An estimation of the time for decomposition of fresh cowpea clipped fodder under an innovative clipping management approach for soil fertility conservation

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Key words: innovative clipping management, fresh fodder, decomposition, sustainable agriculture, food security

Abstract

Climate, particularly temperature and moisture conditions are known to determine the rate of decomposition of SOM. Under tropical and sub – tropical climate, the rate of decomposition which affects the amount of plant nutrients released into the soil has been estimated for a number of crops. However, for the leguminous dual purpose cowpea, *Vigna unguiculata* (L) Walp, little or virtually no studies on this aspect has been documented; in spite of the significant contributions of legume crops to soil – N enrichment. Good soil fertilization is a prerequisite for good plant health. But high doses of nitrogen fertilizers lead to high nitrogen content in the crop with potential health hazards. However, this danger is less when fertilization is organic; as organic matter when decomposed releases nutrient gradually. Results of studies in Samaru, Zaria – Nigeria, on cowpea sown at high population densities, and under clipping management, with time, showed that mean fodder yields of 14 – 15 t ha^{1} were produced and about 62% fresh fodder was obtained when plants were clipped at 74 days after planting - DAP than at 64 DAP. It took 18 – 24 and 27 – 35 days for the leaves and stems added on the soil surface, and 32 – 40 and 43 – 53 days for the leaves and stems buried into the soil to decompose respectively. The ability of cowpea fresh fodder to decompose when incorporated into the soil could facilitate the release of an appreciable amount of stored plant nutrients such as N; and more so improve the health of the soil through an increase in soil – OC, OM, and CEC contents. This innovative farming practice could hold the key to rejuvenating the degraded soils in Africa and other tropical regions0; creating hope in the effort towards the eradication of poverty and ensuring food security through sustainable agricultural production.

Uganda Cotton Industry: Which system benefits farmers most?

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Key words: stochastic budget analysis, organic cotton, GM cotton

Abstract

Cotton production has the potential to improve the welfare of approximately 250,000 low income households in Uganda. To achieve its full potential however the cotton sectors needs a drastic increase in productivity. The Ugandan government is evaluating the potential of genetically modified (GM) cotton. Confined trials of GM cotton varieties are been implemented in two main cotton producing areas in the country (Lira and Kasese). On the other hand, organic cotton cultivation has been expanding since 1994, mainly in areas with limited economic alternatives. This study compares the benefits of the different cotton systems, the traditional low input system, the organic production system, and the conventional system using GM cotton seed. The results of a stochastic budget analysis show that the profitability of cotton production is very low for all the systems evaluated. In addition, the downside risk is very high under all production systems, including the organic system. This high risk is mainly related to the extremely high yield variability across observations, so any technology that reduces this variability will contribute to improve farmers' livelihoods. The vertical integration of the cotton value chain facilitates the dissemination of a technology, but the availability of seed and inputs of good quality, suitable extension support, and appropriate economic incentives have to be guaranteed. Currently, the co-existence of organic production and conventional production using GM seed is favored by geographic location of organic producers. However, this situation can change in the future if the organic area keeps expanding as the latest trends show.

Losses of citrus fruits in organic-based citrus orchard: Proposal for way forward

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Key words: Organo-mineral, Fertilizers, Sweet orange, fruit yield, fruit losses

Abstract

Mineral fertilizers used in crop production have become more expensive, often unavailable to peasant farmers in developing countries and risky in fragile tropical soils. Readily available animal wastes such as poultry manure can serve as alternative and cheaper organic fertilizers in citrus farms. Thus, this paper investigated the effects of poultry manure with or without mineral fertilizers on yield and fruit losses in organic-based sweet orange (*Citrus sinensis* L. Osbeck var. Agege 1) orchard. This is with the hope of suggesting way forward towards curtailing future losses. The treatments consisted of: (1). 10 tha^{-1} poultry manure (PM), (2) 15 tha^{-1} PM, (3) 20 tha^{-1} PM, (4) 0.45 tha^{-1} NPK, (5) 10 tha^{-1} PM + 0.2 tha^{-1} NPK, (6) 15 tha^{-1} PM + 0.15 tha^{-1} NPK, (7) No fertilizer (control). These were applied in two split-doses for two years. It was a factorial experiment layout in randomized complete block design. Data were collected on fruit losses at 6-months intervals and fruit yield yearly. Data generated were analyzed statistically using analyses of variance procedure and means were separated using LSD at 5% probability levels. Results indicated that trees that received 15 t ha^{-1} PM, 15 t ha^{-1} PM + 0.15 t ha^{-1} NPK had significantly ($P< 0.05$) higher percent increase in fruit yield as compared to the control. Fruit losses (due to fruit drop) range from 30-70% of total annual yields (4-15t/ha) were recorded between 2006 to date under the various fertilizer treatments. Proposed solutions (among others) include regular farm sanitation (weeding/slashing/pruning), cutting down of trees (serving as alternate host to fruit flies and other fruit pests), avoid delay harvesting as soon as fruits are physiologically ripe, regular picking and burying of dropped citrus fruits.

Potential of *Moringa oleifera* (Lam.) fresh root-Bark extract as organic piscicide in aquaculture pond management

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Key words: Moringa oleifera, Toxicity, Oreochromis niloticus, Aquaculture, Organic Piscicide

Abstract

Globally, the use of organic piscicides is being encouraged in aquaculture to control predatory fishes prior to stocking of desirable fingerlings. They are biodegradable, less expensive and environmentally friendly, compared to non-biodegradable types that cause bioaccumulation effects in tissues of food fishes. This study examined the effectiveness of *Moringa oleifera* fresh root-bark extract (FRBE) as an organic piscicide to control predatory fishes in pond. Acute-lethal toxicity LC_{50} of Moringa oleifera FRBE for 96-h exposure was determined on *Oreochromis niloticus* fingerlings. The extract was bioassayed for 96-h using ten *O.niloticus* fingerings, each was exposed to 0, 10, 17, 31, 56, and 100mgl^{-1} of FRBE. The 96-h acute-lethal toxicity (LC_{50}) of FRBE exposed to the fingerlings was 26.45mgl^{-1}. *Moringa oleifera* FRBE exerted a more toxic effect on *Oreochromis niloticus* fingerlings at higher concentration of 100 mgl^{-1} showing abnormal swimming, restlessness and uncoordinated behaviour before death. *Moringa oleifera* could be used as organic piscicide in aquaculture pond management and baseline information on its toxicity to fish could served as a tool in fisheries management to wipe out predatory fishes in pond prior to stocking.

Organic Agriculture in food production sustainability, soil fertility improvement and maintenance in the tropics

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Key words: soil fertility improvement, leguminous fodder, sustainable practices, healthier soils and consumption

Abstract

Africa has a large population of small and medium-scale farmers for whom the application of chemical fertilizers to improve yield is a luxury; yet, it is believed that to improve food security, Africa must increase her fertilizer use because of the problem of low soil fertility and soil degradation. Recent results at Zaria, Nigeria indicate that fodder from legume crops sown at high population densities at the beginning of the growing season and incorporated into the soil or as a companion crop enhances soil fertility, improves the soil's physical and biological properties and reduces the amounts of inorganic fertilizer inputs. The level of soil fertility enhancement by these legumes is often higher than the optimal status considered most suitable for crop production in many tropical countries. Thus small and medium-scale farmers can optimize food production without resort to chemical fertilizer use. For instance clipped cowpea fodder increased soil-N by over 70% in four years - equivalent to adding about 140 to 180 kg N per hectare; while soil-OC and OM exceeded the control plots by 41%. Also, when thinned soyabean fodder was added to a maize companion crop at various N-levels; 60kg N and 90kg N + the thinned fodder gave significantly higher cob and grain yields than pure maize stand supplied with 120kg N/ha (LER values of 1.05 and 1.38 respectively). Thus farm yard manure (FYM) can be used at the start of the growing season before enough leguminous fodder is produced to meet the soil's fertility requirement. The practice will give rise to healthier soils and consumption, sustainable production, and ensure food security in Africa without chemical fertilizers.

Improving rural livelihoods in the Kamuli district of eastern Uganda through organic grain amaranth production

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Abstract

Grain amaranth is an underutilized crop of the genus *Amaranthus* with high protein content and quality and therefore has the potential to alleviate protein malnutrition in developing countries, particularly sub-Saharan Africa. Grain amaranth was introduced into the Kamuli district of eastern Uganda in 2006 through a partnership between Iowa State University's (USA) Center for Sustainable Rural Livelihoods, Makerere University and Ugandan NGO Volunteer Efforts for Development Concerns (VEDCO). In lieu of a VEDCO survey on amaranth production in Kamuli, the study will evaluate organic production of grain amaranth for improving health and rural livelihoods in Uganda by obtaining baseline data on yield, protein content, and optimal agronomic practices, especially focusing on the use of organic soil amendments in rural areas where chemical inputs are unavailable or uneconomical.