Special sessions (Symposia, workshops, short course)

Symposia

Two symposia will be part of the Conference program. In each symposium two to three invited keynote speakers will present their insights and share their experience on the topic. Following the presentations, there will be an open flow for discussions. Themes of the symposia include: (1) Impacts and adaptation to climate change in African agriculture and (2) Linking crop science research to policy, practice and people.

Symposium # 1 - Impact and adaptation to Climate Change in Agriculture

Global warming is projected to have significant impacts on conditions affecting agriculture, including temperature, carbon dioxide, precipitation and the interaction of elements. In its Fourth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) indicates that climate change will have considerable impact on crop production and water management systems in coming decades. On the other hand, agriculture has been shown to produce significant effects on climate change, primarily through the production and release of greenhouse gases (carbon dioxide, methane and nitrous oxide), but also by altering the Earth's land cover. Thus a critical analysis of the effects of global climate changes on agriculture might help to properly anticipate and adapt farming to maximize agriculture production.

Climate change will superimpose itself by modifying and increasing future risk and vulnerability of crop production in terms of water supply and its availability in so called “critical regions”. These regions include the developing countries which rely on agriculture and are vulnerable to climate change. Addressing climate change in agriculture is an integrative issue. In fact, dealing with climate change in agriculture means not only adjusting agronomic techniques, but also the look into the value chain of the main products, agro-processing techniques and alternative and diverse farming systems.

The symposium on ***Impact and Adaptation to Climate Change in Agriculture*** intends to provide a platform of experts to discuss and share the on-going research results and challenges in this field. It will address the different angles of climate change in agriculture such as: the interactive feedback of agriculture and climate change, the importance of alternative livelihood systems to deal with uncertainty in agriculture, challenges of dealing with risky and uncertain conditions, ways of adapting and mitigating the effects of climate change to agriculture, capacity building of smallholder farmers to deal with new challenges and improving ways of monitoring environmental changes to agricultural systems.

Symposium # 2 – Linking crop science research to policy, practice and people

Crop science research plays a critical role in shaping global and national policies as well as in informing the livelihoods of people at local levels around the world. On one hand, crop science research provides knowledge and best practices to increase agrarian production and productivity, while one the other, it informs key decision makers and producers on how to attain a sustainable production. Policy makers and producers on their turn shape the research agenda through financing policies and practices or, in case of producers, by dictating what is of their best interest for research. A smooth and well coordinated link between these different actors allows agrarian markets stability, social order and the development of nations. It is mainly though a well conceived link between those actors that most of the Millennium Development Goals, with particular focus on 1 and 7, can be attained.

Recent trends on food shortages, increases in food prices, instability in agrarian markets and the overall findings that most of the poor countries in Africa are unlike to achieve the Millennium Development Goals related to crop science, reveals that the link between crop science research, policy makers and producers needs to be critically re-addressed. The 10th Conference of the African Crop Science Society (ACSS) to be held in Maputo offers a good ground to discuss the issue. The aim of the symposium is, then, to discuss issues hampering the link and to address ways forward to improve the interconnection between those actors. By bringing together actors from those different areas, the conference in general and the symposium in particular, provide a platform for a deep interaction and analysis of the strengths, weaknesses and challenges of the current linkages.

Workshops

Several workshops are part of the Conference program. The workshops will create opportunities to share key research achievements as well as for discussions, sharing of experiences and drawing of proposals and recommendations on common issues and problems in African agriculture.

Each workshop will be a ½ day event and will be organized in two parts:

1. An initial session devoted to presentations where leading scientists in the field are invited to submit papers.
2. A final panel session dedicated to discussion of current constraints and problems and the drawing of recommendations and future evolutions.

All interested participants are invited to attend, but they will need to register for an workshop during registration at the first day of the Conference.

The following workshops are planned:

Workshop # 1 - Advances in the research, utilization and commercialization of neglected and underutilized species: a new push to bring them to the center stage

In recent times Neglected and Underutilized Species (NUS) have been subject of lively debates due to the realization of the role that they can play in the livelihoods of the African families, beyond the subsistence. In the course of the history of the humankind the NUS have been used for multiple purposes, such as food, medicine and as ornamentals. However, the visibility of this species is still low so little of their potential has been realized. There are still hurdles to be overcome, such as harmonization of criteria to define neglected or underutilized species, prioritization of research activities with regard to domestication, production, processing and commercialization in order to raise the relevance and visibility of these species.

Recently a seminar was held in Nairobi, Kenya, where participating countries from Eastern and Southern Africa reviewed the status of the research and development of the NUS. Participants drafted working plans and pledged to push for more comprehensive work on NUS.

In this workshop participants agreed to use major events to build awareness on the opportunities that the NUS offer to the researchers, development agents, businesses and the farming communities. The 10th African Crop Science Society Conference offers a unique opportunity for scientists to exchange views and to highlight the unrealized potential of NUS in agreement with the core of conference theme. Participants can also use this event to build/ enlarge partnerships among scientists interested on the subject.

The general objective of the workshop is to raise the profile of the NUS in the context of agriculture and livelihoods. Specifically the workshop is designed to:

1. Harmonize terminology and research procedures on NUS;
2. Allow scientists to share recent research results on domestication, production, processing and utilization of NUS;
3. Discuss the constraints to the development of NUS and recommend possible solutions.

Workshop # 2 - Women in Agriculture: strategies for promoting the empowerment of rural women

integral part of farming households. On a global basis, nearly one-half of all farmers are women, and in most rural areas women carry out many specialized production activities, including, planting, weeding, post harvest handling and managing small animals (World Bank, 2004). In many developing countries, women bear most responsibility for household food security, and contribute to household well-being through their income-generating activities. Furthermore, Millennium Development Goals (MDGs) foresee gender equality. Yet, women's essential role in agriculture-led poverty reduction strategies and food security is still not recognized. Usually, women have more limited access to resources and opportunities, and their productivity remains low relative to their potential.

Analysis on gender differences in agricultural productivity points to the importance of empowering women; by increasing their human capital and by improving their access to, as well as the ownership of land and other physical and financial inputs.

The general objective of the workshop is to provide a platform to discuss strategies for promoting the empowerment of rural women in agriculture

Workshop # 3 - Management of invasive pests: lessons from the recent accidental introduction of fruit flies in Africa

Invasion of native habitats by non-native species (plants, arthropods, pathogens) is an important factor in agriculture and food. Many introduced species have caused extensive damage to natural resources in both natural and cultivated ecosystems.

Since 1881, biological control (the use of living organisms to control herbivores) has been considered one of the potential strategies used to control introduced pests (plants, arthropods, pathogens). Properly conducted biological control works because it uses carefully selected and tested natural enemies (insects, mites, or pathogens) of the target pest species. The strategies rely on detailed knowledge of the ecology, the life cycles, and the food chains in each system, developing highly target-specific control strategies that leave the non-target plants, insects, or other animals unharmed.

Most of the invasive species are not problematic in their area of origin. However, once in the area of invasion, free of their natural enemies that naturally limit their population growth, they can establish and spread rapidly, causing enormous losses to crops and the environment. By introducing the pest's natural enemies from the pest's home region the natural enemies can control the pest's population growth and reduce their impact on crop losses (Classical Biological Control).

Classical biological control is recognized as one of the potential strategies for the control of established invasive pest species, as it has the capacity to control pests over wide areas with little economic cost once a successful program has been implemented. In Africa, biological control is viewed as a potential strategy for the control of agricultural pests, since most farmers work on very small plots and have little cash income. Thus, the use of chemical control is little or null. Thus, there is a need to develop systems that are sustainable, affordable, and easy to use or maintain.

Recent cases of accidentally introduced fruit flies (Diptera, Tephritidae) in several African countries have been causing considerable losses in commercial and wild fruits and vegetables production, affecting farmers income and food security. So far, four Asian species belonging to the genus *Bactrocera* invaded Africa. Two of these were introduced in recent years and the risk for other introductions is great. There is, therefore, an urgent need to draw lessons from these recent cases, discussing research and development constraints to biological control as well as the need to strengthening of the human and physical quarantine and monitoring infrastructures in Africa, in order to avoid any further unwanted introductions.

The main goal of the workshop is to bring together leading specialists to discuss critical issues of invasive pests including biological control approaches and issues that policy makers, regulatory and pest risk assessment specialists, and others face in avoiding and reducing invasive pest population impact.

This session will allow discussions critical factors and ways forward on issues related to the scientific and decision making processes to strengthen quarantine, monitoring and biological control actions and associated decision-making processes in Africa.

Workshop # 4 - Advancing research on weed science in Africa

Weeds are major biological constraints to many crops in Africa. In subsistence agriculture (by far the largest portion of land under agricultural production in Africa) weeding is mostly carried out by hand and this consumes a lot of time and energy and consequently weighs heavily on farmer households. Efficient and socially/economically acceptable weed management technologies are scarcely available to those subsistence farmers. Despite the fact that weeds often form the number one constraint in agricultural production in Africa, the continent has very few weed scientists that also lack an efficient platform and network to exchange ideas and research results and to organize/fund the necessary training for more professionals in this field of expertise. We believe that such platforms for exchange (e.g. workshops. conferences and a weed science network) would improve the efficiency and speed of finding solid and acceptable solutions to weed problems that famers in Africa are currently facing. The current workshop would be a good first opportunity, not only to meet and exchange but also to discuss the establishment of an, currently non-existent, African Weed Science Society.

The objectives of this workshop is exchanging ideas and research results, establishing contacts and synergies, discussing/establishing/creating a pan-African Weed Science Society.

Workshop # 5 - Responding to the demand for high value perishable commodities in fast growing urban areas in Africa: opportunities and challenges for urban and peri-urban agriculture

Urban and peri-urban agriculture (UPA) is rapidly growing in Africa, corresponding to the rapidly increasing of urban population (it is projected that urban population will be more than double by 2030). UPA is becoming an important contributor to urban poverty alleviation, providing major benefits and contributing to the development of sustainable cities. It provides good access to food and a source of income and good-quality food at low cost. In most UPA areas, most commonly cultivated crops are vegetables (cabbage, lettuce, carrots, etc.) and fruits that are consumed on a daily basis. Poultry is also an important activity in urban and peri-urban settings.

Although the rapid grow and successes stories of UPA in Africa, several constraints are faced by most countries and cities including: land tenure arrangements, water management

and contamination of water sources, pests and diseases, extension and marketing systems and infra-structures. Advancing UPA in Africa will require state sanctioned interventions, including the development of enabling policies, programs and relevant institutional structures.

The 10th African Crop Science Society Conference offers a unique opportunity for scientists and stakeholders from different African countries to exchange research results, information and experiences in solving common problems faced in UPA agriculture.

The main goal of the workshop is to bring together leading specialists to present current research and discuss and draw recommendations on critical issues regarding the sustainable development of urban and peri-urban agriculture including crop, water and soil management, pest and disease integrated management, policies and infrastructure development.

Workshop # 6 – Biomass and agriculture energy: opportunities and challenges for African agricultural

Energy is an important factor in the development of a country and in particular of its agricultural sector. In this sector, it is used to operate agricultural machinery and irrigation systems and also in the conservation, processing and commercialization of agricultural products. Due to the increase of oil prices, many countries are struggling to meet their energy needs and access to low cost energy is a major constraint for the development of the agricultural sector and increase of productivity in most African countries. The agricultural sector is not only an emerging important energy consumer but also a potential energy producer. The production of renewable biomass resources is seen as a way to solve global warming problems and ensure sustainable development. A range of crops produced in Africa could be used to produce bioenergy (sugar cane, jatropha, palm oil and many others). Several bio-energy production initiates are happening in Africa today. There is a need to review and discuss these experiences in order to formulate strategies and policies that take into account the production technologies and practices as well as the socio-economic factors and environmental implications.

The general objective of the workshop is to draw attention to and discuss the potential production opportunities and impacts of energy crops in Africa. Specifically the workshop is designed to:

1. Share recent research results on energy crops production technologies (type of crops, varieties, agronomic packages);
2. Discuss socio-economic and environmental impacts and implications for the development of a sustainable African agriculture;
3. Discuss constraints and research and policy development needs to advance energy crop production.

Workshop # 7 – Positioning Nematology in Africa – Now and the Future

Often a nematode problem is a warning that a farming system has become unsustainable. Losses to plant-parasitic nematodes are estimated at 5% to 12% annually worldwide. Greater losses are observed in the tropics and subtropics because the growing seasons are longer and often continuous; there is limited awareness of nematode problems in the farming communities; and soil fertility levels are low and moisture is often limiting, making plants less tolerant to nematode attack. However, Nematology in Africa is under-funded; lacks equipment and research support, and it is difficult to conduct relevant research and publish results in international journals. Besides, there is shortage of Nematologists to work on the problem. Trained Nematologists leave discipline despite demand; they rarely work full time on nematode problems; and usually work alone.

Networking, cross-learning and peer support among practising nematologists in Africa can facilitate an active and interactive support that can overcome the lack of a critical mass

of nematologists in any one country and link the network to information services available in the north through partner scientist from the north. The Nematology Initiative for Eastern and Southern Africa (NIESA) was formed in 2005 as a network of nematologists from various institutions in Malawi, Kenya, Tanzania, Uganda and Zimbabwe and partner scientists from University of Reading, CABI Bioscience and Rothamsted Research in the UK with grant funding from the Gatsby Charitable Foundation. NIESA seeks to raise the profile of nematology in the region by:

- Facilitating provision of peer support among nematologists in research and training;
- Facilitating provision of tailor-made nematology training within the region so as to support sustainability of capacities and practices developed;
- Selflessly sharing information and expertise, and developing joint research initiatives that will provide practical benefits for local communities, especially in food security;
- Creating awareness among farmers and communities about the importance of nematodes as agricultural production constraints;

This workshop is the first step towards regular Nematology presence at the African Crop Science Society meetings. Participation at the ACSS meetings as a "Nematology" block will enhance Nematology visibility; provide more interaction with other scientists; and improve understanding and raise profile of nematology with the society and Africa as a whole.

The objectives of this workshop are:

1. To highlight the importance of nematodes as agricultural production constraints requiring attention: research, training and extension and as model organisms for biological investigations
2. To improve the understanding and raise the profile of Nematology within the agricultural training, research and development arena
3. To facilitate networking, cross learning and peer support among practising nematologists in Africa

Workshop # 8 – Pesticidal plants as alternatives to synthetic pesticides for crop, storage and livestock protection in Africa: optimization, conservation and commercialization

Crop productivity is hindered by numerous biotic and abiotic constraints but arthropods (including insects and mites) are perhaps the most important since they are so widespread, damaging and visible and even low input farmers can have some control over them. Synthetic pesticides are usually effective but may have irregular distribution, are frequently adulterated or inappropriately applied and are often ineffective because the pest insect has become resistant to the limited number of insecticides available, particularly to poorer remote farmers. When they are available insecticides are applied with little serious protection placing farm workers at risk while there is no process for ensuring the safety of food for consumers or for assessing chronic outcomes from exposure despite guidance on correct use from manufacturers. In environmental terms the impact on wildlife, natural enemies and pollinators is a serious problem, and finally, the cost of pesticides can be prohibitive. Alternative management strategies for controlling insect pests of crops and livestock are essential since severe losses in most field crops and storage are otherwise guaranteed and the impact on poor farmers can be catastrophic.

Pesticidal plants are an effective alternative and their promotion, particularly with optimized application protocols and effective extension services, would have enormous impact on the ability of farmer's to manage insect pests. In this workshop we consider pesticidal plants as crude materials requiring limited processing that can be carried out by

farmers. Farmers are familiar with the concept of plant materials as pesticides and recognize that they are environmentally benign, less toxic and cost-effective than synthetic pesticides and their cost to farmers is simply calculated in time rather than cash or credit.

The technology is ancient and so familiar, trusted and acceptable, but their prioritization in agricultural policy is low so, despite the interest, few farmers actually use them. This may also be due to knowledge gaps or because there is inadequate policy to drive commercialization. Never the less, some plant species are effective at controlling some pests and so help secure crop production, storage and livestock production. Optimizing their full potential, however, especially for poor farmers, is constrained by inadequate evaluation and development of materials which is required to increase the reliable options available to farmers. This workshop aims to identify the hurdles to the successful deployment of plants as pesticides in Africa and ways to overcome them.

Objectives

The overall objective of the workshop is to promote the wide-scale deployment of pesticidal plants as a viable and environmentally benign alternative to synthetic products in Africa particularly for resource poor farmers.

1. Identify scientific knowledge gaps and research hurdles to the optimization of application and use of pesticidal plant products

2. Discuss policy issues that hinder the commercialization and product development for small and medium enterprises.

3. Develop conservation strategies based on optimised harvesting techniques and the propagation and cultivation of elite material.

Short courses

One short course is in the Conference program

Environmental effects of plant protection products and its mitigation measures

Objectives and expected outputs of the short course

- Understand environmental consequences of pesticide application while considering all relevant factors (e.g., types of terrain, drainage patterns, soil, presence of non-target organisms and endangered species, drift, weather, groundwater and surface water).
- Understand how to prevent pesticide drift, runoff, or loss to unintended areas of the environment.
- Know how to identify potentially sensitive areas that could be adversely affected by pesticide application, mixing and loading, storage, disposal, and equipment washing.
- Effectiveness of mitigation measures (wetlands, field margins, biobeds)

Organizer

ECOTRAC (Ecotoxicological Risk Assessment and Communication)

Format of the course

The course will use interactive learning methodologies presented by organizer. A

course manual will be provided upfront. However, depending on registered delegates other presentations or interests can be included or the course. The course will take half a day

Outline of the course

- Impact on environment
- Case studies
- Factors influencing pesticide input
- Research on mitigation strategies
- International importance of risk reduction strategies