

Summer Institute of Agronomy

Non-credit Certificate Field Course for Development Agronomists and Graduate Students

July 22-24, 2019

University of Manitoba Carman and Region Campus

Background

“Agroecology is based on applying ecological concepts and principles to optimize interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system” (FAO). One tactic within agroecology is Conservation Agriculture (CA), a practice that combines the principles of minimal soil disturbance with soil cover and plant diversity (FAO).

The University of Manitoba has been working with the Canadian Foodgrains Bank and their international partners on Agroecology and Conservation Agriculture in Asia and Africa since 2009. Martin Entz led the Asian project and a 4 year IDRC funded project in Zimbabwe. Mario Tenuta, Marla Reikman (Man Agric), Martin Entz and Plant Science graduate student April Stainsby are now working on CA programs in Eastern Africa (Tanzania, Kenya, Ethiopia). We use a diversity of tools; working together with partners in host countries, webinars and other media, and joint publication of results at conferences and workshops. Last summer, we held our first “Summer Institute for Development Agronomists” where Asian visitors spent one week at the University of Manitoba Carman Campus Farm learning about the theory and practice of CA and Agroecology in a hands-on format.

Graduate student non-credit certificate course

This July, we will host approximately 10 African agronomists plus a number of agronomists from Canadian-based development organizations for a 3-day Summer Institute of Agronomy. This summer institute will focus on the principles of Agroecology with a focus on the application of Conservation Agriculture in different agricultural contexts around the world.

Graduate students are invited to participate in this institute alongside our international visitors. The 3-day course will provide U of M students with a certificate in “Development Agronomy: Agroecology and Conservation Agriculture”. But perhaps more importantly, U of M and other graduate students will gain valuable experience from International agronomists, learn more about issues of food security in Africa, and join the worldwide network of agronomists working to develop sustainable food production systems.



Curriculum Format

The three day curriculum will include a combination of hands-on field activities (60%) and theory, including the principles of soil health, soil nutrient management, sustainable crop production systems, crop physiology and agroecology (40%). A reading list and paper copies will be made available to all participants.



Images from 2018 summer institute

Main themes for each day

Day 1, June 22

Introduction and overview of 3-day program – Martin Entz (University of Manitoba)

Principles of Conservation Agriculture (CA), a global perspective – Martin Entz (University of Manitoba). Includes:

- Evolution of conservation agriculture around the world
- Resource use considerations

Conservation agriculture basics: Lessons from Southern African research – Alden Brault (Hemp Genetics). Includes:

- Experiences from 6 years of research and development in Zimbabwe
- In-field demonstrations of CA crops

The art and science of intercropping legumes – Katherine Stanley (University of Manitoba). Includes:

- Intercropping combinations in the field
- CA Maize intercropping demonstrations
- Root systems in various intercrop legume species
- Double up legume intercrops

Soil carbon basics – Cynthia Kallenbach (McGill University). Includes:

- The C cycle in the agroecosystem
- Toward a new understanding of how carbon is actually sequestered in soils

Day 2, July 23

Legume N fixation and the soil microbiome– Newton Lupwayi (AAFC Lethbridge Research Centre). Includes:

- What is the soil microbiome and how can we best manage it in tropical systems?
- The role of N fixing bacteria African legumes.

Ecological soil health management – Mario Tenuta (University of Manitoba). Includes:

- With our new knowledge of soil ecosystem function, how do we design cropping systems to maximize soil health benefits

Measuring soil health in the field – Marla Riekman (Manitoba Agriculture). Includes:

- The Cornell soil health test
- Other indicators including the spade drop test
- Use long-term land use studies at Carman to demonstrate

Soil aggregate stability – April Stainsby (University of Manitoba). Includes:

- Hands on aggregate stability analysis

Day 3, July 24

How animal diet affects manure quality and how crops respond to these different manures – Emma McGeough and Don Flaten (University of Manitoba). Includes:

- Dr. McGeough's project involves feeding beef cattle diets with a range of different nutrient concentrations
- Understand model of animal diet–to–manure nutrient content–to–soil nutrient status–toplant response
- Priming manure using different N fertilizer strategies

Soil testing for nutrients – Don Flaten (University of Manitoba). Includes:

- What are soil testing approaches for temperate and tropical soils.
- How to interpret soil test result

Plant stresses – what we need to know. – TBD (University of Manitoba). Includes:

- What do agronomists need to know about how plants respond to stresses such as drought, heat, flooding, soil acidity, etc.

Agroecological learning systems for small-holder farmers: Experiences from Malawi and Tanzania – Rachel Bezner Kerr (Cornell University)

- Rachel Bezner Kerr is involved in a long-term collaborative research project in Malawi in partnership with the nonprofit [Soils, Food and Healthy Communities](https://soilandfood.org/) (<https://soilandfood.org/>). She is now scaling up this work as part of the Malawi Farmer-to-Farmer Agroecology project, in collaboration with the University of Malawi and several Canadian universities.

Next Steps for Graduate Students

1. Registration (limited to 20 graduate students)
 - a. Register by sending an email to Dr. Martin Entz m.entz@umanitoba.ca
 - b. Please include one or two sentences indicating your interest in this institute.
2. Plan for travel to and from Carman for the 3 days
 - a. Graduate students will have to find their own transportation to and from Carman each day. If you require transport, please let me know in an email and we will do our best to assist.
3. Cost: The cost is \$40 per graduate student – the cost includes lunch and refreshments