

## Why MCA over MCF?

Farmers are being encouraged to adopt MCA to take advantage of the following benefits:

- Use of machinery enables cultivation of larger areas of land.
- Increased production and productivity.
- Minimum time is spent on fields as most operations are done mechanically, efficiently and effectively.
- Increases farm assets base, due to the ownership of machinery and implements.
- Household food and nutrition security is enhanced.
- Income secure through the sale of excess produce thereby improved standard of living.

## Conclusion

With the erratic rains that our country, Zambia, and other Southern African countries are now experiencing the adoption of CA cannot be over-emphasized. We are already feeling the effects of droughts and to some extent floods. It is a challenge to all the farmers now to adopt appropriate mitigatory measures to overcome the effects of climate change. The only way is by adopting climate smart agriculture practices.

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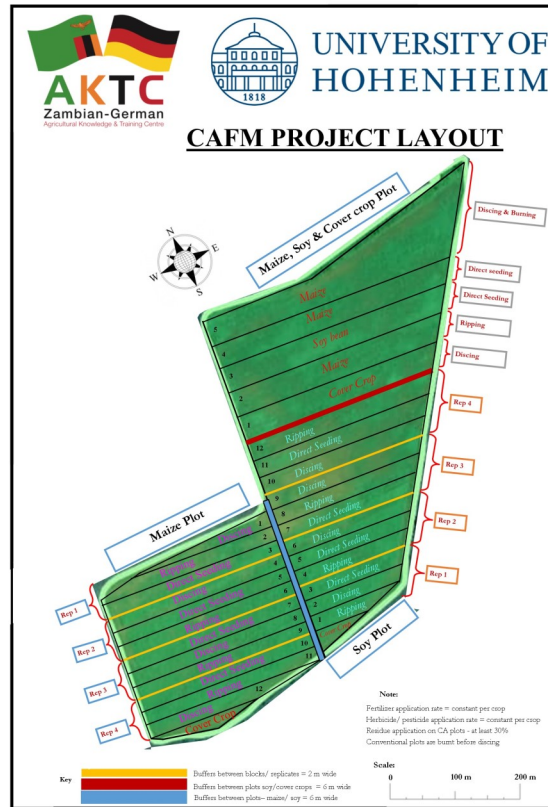


Promoting Sustainable Agriculture



by decision of the German Bundestag

## CAFM PROJECT FIELD LAYOUT



## AKTC CAFM TEAM

Helmut Anschuetz - *Team Leader*

Willis Mhlanga - *CAFM Project Coordinator*

Godfrey Omulo - *PhD Researcher from the University of Hohenheim, Germany*

Leslie De Jager - *Crops Specialist*

Martin Sikanyika - *Machinery Specialist*

**For further information, please visit**

Website: [www.aktczambia.com](http://www.aktczambia.com)

Phone: +260-979-999-740

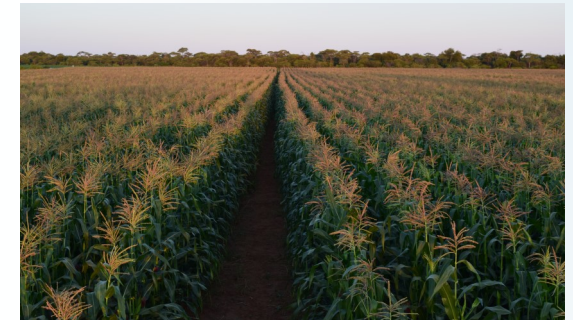
E-mail: [Helmut.Anschuetz@afci.de](mailto:Helmut.Anschuetz@afci.de)

*Written by: Willis Mhlanga, Designed by: Godfrey Omulo, Edited by: H. Anschuetz*



## Agricultural Knowledge and Training Centre

*Implementing the*  
**Climate Adapted Farming Methods (CAFM)**  
Project in Zambia



**CAFM MAIZE AND SOYBEAN FIELDS**

## Climate Change

**Climate change** is now a phrase in everyone's vocabulary, be it a farmer or not. This is because the effects of climate change, drought and floods, are being felt and experienced currently more than ever before. In Southern African countries there has been alternating seasons of floods and droughts and these calamities are causing the suffering of many people.

### What is CAFM all about?

The CAFM project is coming in as a mitigatory measure to one of the climate change effects, in this instance—drought. CAFM aims to reduce the impact of climate-related revenue losses and ensure income for market-oriented farmers through the application of climate-smart farming methods in Zambia. The goal is to make sure that market-oriented farmers are capable of practicing climate-adapted conservation tillage methods be it under irrigation or dry land farming conditions.

### Conservation Agriculture (CA)

CA can be defined as an agronomic practice for growing crops without disturbing much of the soil through tillage and can be done:

- a. **Manual** – This is highly laborious as all operations are done manually. Although the benefits of CA can be achieved, a farmer is limited to cultivating a small area of land.
- b. **Draught power** – Animal power is used for farm operations like land preparation, planting, weeding or even transportation. If the animals are not in good shape, say because of drought effects all the operations will be affected.
- c. **Mechanized** – Tractors are used for planting/direct seeding. Thus opening the soil, drop seed, fertilizer and cover them in one pass and are also used for weed control when applying herbicides. Tractors are faster, more efficient and more accurate. The use of tractors is what the CAFM project is encouraging farmers to adopt.

## Principles of Conservation Agriculture and their advantages

### Minimum soil disturbance

- ◆ Less labour and time is demanded since only a small area has to be tilled.
- ◆ Reduces destruction of soil structure.
- ◆ Minimizes soil exposure to wind and water erosion.
- ◆ Soil microbial activity is not much interrupted.

### Optimal crop cover – mulching

- ◆ Improves soil structure, texture and soil nutrient status by increased organic matter content.
- ◆ Improves water holding capacity and percolation by lessening water run-off.
- ◆ Reduces evapotranspiration.
- ◆ Weeds are suppressed therefore reducing crop-weed nutrient competition.

### Crop Rotation/Diversification or Inter-Cropping

Rotating or inter-cropping cereals with legume crops:

- ◆ Replenishing soil fertility - legumes add 'top-dressing fertilizer' to the soil by fixing atmospheric nitrogen in the soil.
- ◆ Enables crops to use the nutrients in the soil more effectively: different crops have different feeding zones.
- ◆ Controlling weeds, pests and diseases by breaking their life cycles through the introduction of a new crop.
- ◆ Inter-cropping reduces the risk of total crop failure in cases of drought, disease and pests outbreak.

### Management Techniques

Management is not a CA principle but it is an important aspect of CA; since all operations need timely implementations. This means:

- ◆ **Timely implementation of all operations:** carrying out all operations at the right time of the season, i.e. preparation, planting, fertilizer application, controlling of weeds, pests and diseases.
- ◆ **Precise operations:** paying attention to detail and doing all tasks carefully and completely.
- ◆ **Efficient use of inputs:** not wasting any resource thus labour, time, seeds, stover, fertilizer and water.

## Mechanized Conservation Agriculture (MCA) vs Mechanized Conventional Farming (MCF)

MCA starts with the use of a two-wheel tractor going up to the biggest machinery used in agriculture. There are a number of implements that have been specifically designed to conform with CA practices.

On the other hand, the MCF is practicing agriculture in what most farmers call the "normal" way. This is when the farm implements are used to till all, 100%, of the field in readiness for planting. Now, with MCA farmers are being encouraged to adopt the more advanced climate-smart way of farming by adopting machinery use.

MCA out performs MCF in terms of yields achieved and returns under any rainfall conditions, even when equal amounts of fertilizer are applied in both systems.

The benefits of MCA accumulate over time and there are significantly greater improvements in the second and subsequent seasons of implementation.

### Tillage Methods

A farmer can choose from a wide range of tillage methods when practicing MCA depending on what suits him/her. The commonly used tillage methods are:

- ◆ No-tillage or slot planting;
- ◆ Strip till or zonal tillage;
- ◆ Reduced or minimum tillage;

To add to the above, other tillage methods are:

- ◆ Mulch tillage or stubble mulch; and
- ◆ Ridge till (including no-till on ridges).