Conservation Agriculture Principles and Practices

Objectives

Participants

..appreciate the key constraints to production for Small holder farmers and the rationale for CA

….have knowledge of the principles and practices of CA and able to adapt to local situations

……understand the role of GMCCs in CA

…. can share knowledge with and learn from farmers

The case of Conservation Agriculture

Why?

- Low fertility soils
- Population pressure
- Shortages of farm power - labor and draft animals
- Low investment in legumes
- Degradation of natural resource base
- Low & unreliable rainfall
- Input /output markets
- Recurring Food Insecurity

Food Insecurity

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WHAT IS CA?

…Farming that requires a lot of hard work so that one gets a better yield?

…..Farming God's way

Way of farming that conserves, improves and make more efficient use of natural resources through integrated management of available soil, water and biological resources combined with external inputs (FAO, 2012)

The key Principles of Conservation Agriculture

1. ***Disturb the soil as little as possible***
2. ***Keep the soil covered as much as possible***
3. ***Diversify crops***
4. ***Good management- timeliness, precision***

Principle 1- Minimum Tillage- Hand Tools

Planting basins

Planting stations dug before the rains

Application of nutrient directly on the station- very precise

Acceptable in areas where the hand hoe is the main tool for tilling the land

Jab planter

Simple hand tool

Planting and fertilizer application

Can be used by women

Requires skill to operate

Can plant a hectare in two days on average (FAO)

Clogs in heavy soils

Dibble stick and Li-seeder

Haraka Planter

Simple tool than can also be used by women

Hand planting

Growing nations Leostho developed and promoting it with local smallholder farmers

More on http://www.growingnations.co.za/our-work/haraka-planter/

Animal Powered Minimum Tillage

Ripping

Widely accepted in areas where the plough has been used

Easy to assembly to the plough beam

Does not represent a major change to normal way of planting

Animal Drawn Direct Seeder

Farmers would prefer implement to ripper

Fast and easier to operate

Applicable for well off farmers

Cost prohibitive

Tractor Drawn Two-wheel Planter

Minimum Tillage Benefits

- ✓Reduces soil erosion
- ✓Slower mineralization of organic matter
- ✓Saves time and energy
- ✓Protects soil structure
- ✓Reduces compaction
- ✓Less destruction of soil life

Principle 2:Soil Cover

At least 30% cover recommended
Use of crop residues, grass and tree leaves

Benefits of Soil Cover

- ✓Reduces direct raindrop impact
- ✓Soil erosion control
- ✓Moisture conservation
- ✓Organic matter build up
- ✓Weed suppression

How Much is Enough Soil Cover?

Principle 3: Crop Rotations and Associations

Benefits of Crop Rotations with Legumes

- ✓Improve soil fertility
- ✓Biological tillage through exploration of different soil layers
- ✓Pest and disease control
- ✓Crop diversity hedges farmers against climatic risks

Conservation Agriculture and Farming God's Way

FARMING GOD'S WAY

Biblical+ Technology +Management

Creation Care

For the poor

Emphasis on organic nutrients mainly compost

100% mulch (God's blanket)

Main tillage method- planting basins

Discourage intercropping

CONSERVATION AGRICULTURE

Technology + management

Tillage method based on farming system and farmer status

At least 30% mulch

Encourage external inputs eg herbicides, fertilizer etc

Role of Green Manure and Cover Crops in CA

What are Green Manure and Cover Crops (GMCCs)

Cover crops are plants that provide living cover

Green manures are crops that may be grown with the main crop or in rotation, or relayed mainly for soil fertility improvement

They can be leguminous on non-leguminous

Can be annual or perennial

Importance of GMCCs

Improve soil through nitrogen fixation and organic matter build up

Some are edible

Important where is it not possible to fallow

Can be used as fodder

Weed suppression- provide live cover

Crop diversity

Common GMCCs Promoted

Principle 4: Good Management

- Optimum plant population
- Timely planting

Good Management

Precision and timely application of nutrients

Pest and disease control

Timely weed management

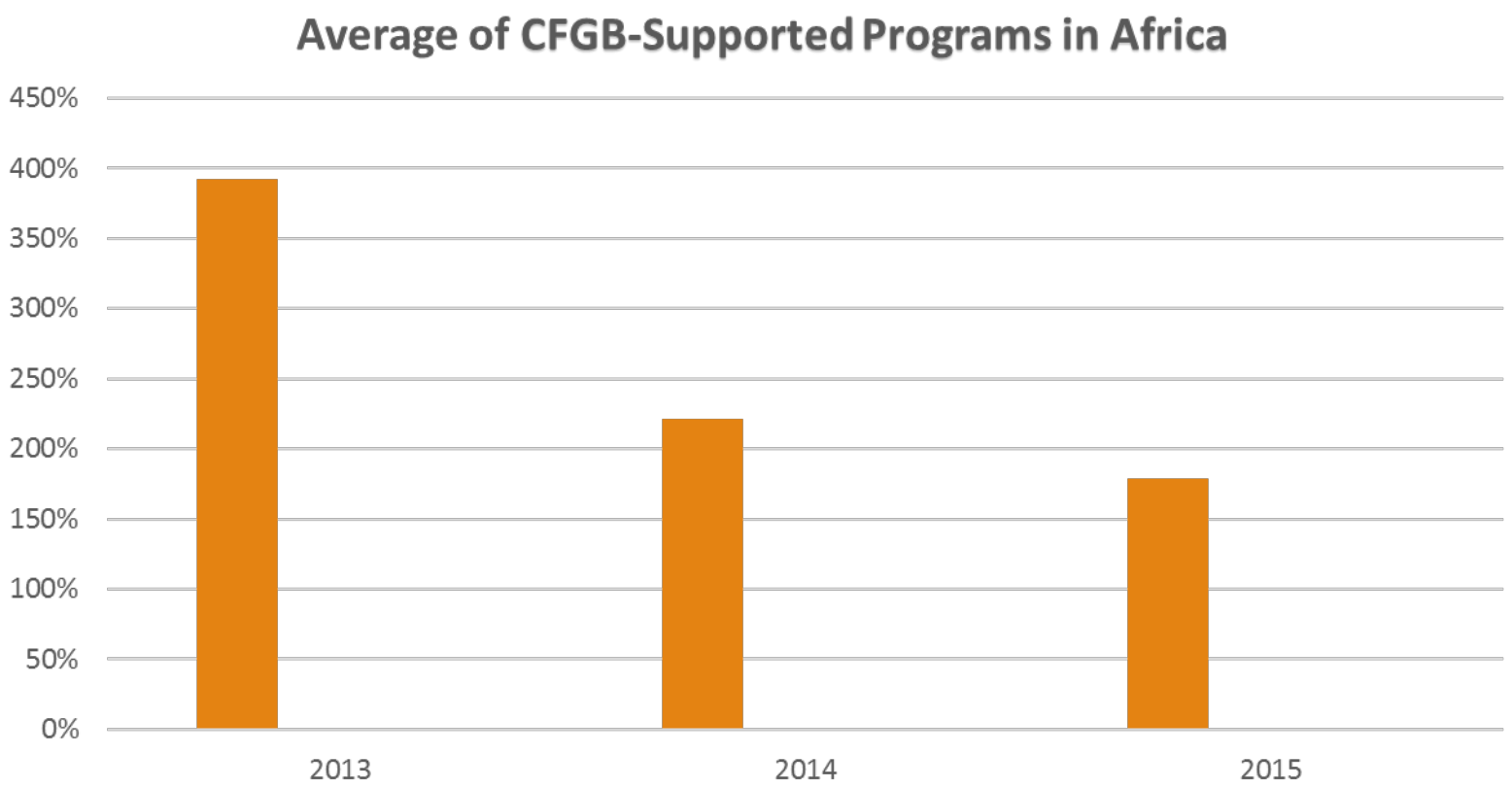
Benefits of Applying CA Principles

Soil conservation

Water conservation

Organic matter build up

Yield Increases in CA



Questions and Comments