CONSERVATION FARMING - SOME RESULTS 2001/2 SEASON

Conservation Farming Unit
Welcome
CT/CF Flat Culture Agro-regions I & II

- The retention of crops residues (as opposed to the widespread practice of burning).
- Restricting tillage to the precise area where the crop is to be sown, i.e. only 10-12% of the surface area of the land is tilled to establish crops.
- The completion of land preparation in the dry season.
- The establishment of a precise and permanent grid of oblong planting basins, which are dug deep enough to fracture underlying plough or hoe pans and which capture moisture from the early rains.
- The measured application of inorganic and organic basal fertilizers to the basins before the rainy season and the seeding of the basins immediately after the first planting rain.
- Rotations or inter-cropping with nitrogen fixing legumes that occupy a minimum of 30% of the cultivated basins. (CF).
The principle aim of this approach as it can be seen, is to restore and maintain the fertility of the land in the 12% surface area and associated rooting zone occupied by the planted crop. The intervening area (88% of inter-rows) can remain relatively infertile as competitive weeds occupy this area.
Some Immediate Benefits

- Reduces sheet erosion. Moisture from rainfall retained in field.
- Enables precise application of organic or inorganic basal nutrients where they are needed by the plant.
- Allows accurate and timely seeding of crops the day after 1st planting rains.
- Basins retain moisture enabling rapid and even emergence of crops.
- Substantial increases in yield for a wide range of crops.
- More cost effective and productive use of all resources.
- Farmer can organize and sequence critical tasks.
- Farmers less prone to total crop failure in seasons of poor rainfall.
Some Medium Term Benefits

- Restoration of degraded (lifeless) soils.
- Weed bank in the soil declines reducing labour inputs for weeding.
- CT/CF should enable sedentary farming in perpetuity.
- Cycle of soil degradation, migration and encroachment into virgin woodland reduced.
- Improvement in household and national food security.
Placement of Basal Nutrients and Lime CT/CF
The Results

Benefits from CT Tillage Practices

Hoe: IFPRI/MSU Study
CLUSMA maize farmers (205)

- produced 3,000kgs/ha on their CT plots and 1,500kgs/ha on their conventional plots.
  - Of this increase 1048 kg/ha was attributable CT and 422kg/ha from improved seeds and fertiliser.
  - The increased yield is attributed to early planting (14 days earlier on average), rainwater harvesting, precision of seeding, rapid and full emergence of crop.
  - CT alone contributed 72% of the total increment.
Dunavant Cotton Farmers (99)

* Dunavant cotton farmers produced 500kg more on their CT plots

▲ 60% increase in yield than on their conventional plots.

▲ Fertiliser was not used by this sample.
The Results

Benefits from CT Hoe Practice: CFU study
CFU Demonstration Trials

- 80 plots in Monze, Choma, Mumbwa, Chibombo

- Maize yields from CT/CF demo plots was 153% higher than on conventional plots.
- Conventional plot yield: 1.6 tons/ha,
- CF plot yield: 4 tons/ha.
  - Increase of 2.4 tons/ha
  - Loss of 1.4% yield per day late planting
  - Fertilizer/seed contributed 1.4 tons
CFU maize and soya bean lime trials with CT/CF

- **CFU Trials**
  - 30 CLUSA farmers in Mumbwa.
  - Maize and Soya Beans.
  - 250 kgs Lime/ha.

- **Soya Beans**
  - Increased yields by 17%
  - Profits by $46/ha.
  - Return on investment was 329%

- **Maize**
  - Increased yields by 13.5%
  - Profits by $76/ha
  - Return on investment more than 500%
CFU lime and fertiliser cotton trial

- **Fertiliser Response Trials**
- **150 Dunavant Cotton Farmers**
  - **Mumbwa**
    - Lime application alone (without fertiliser) increased yields by 17.9% or 188 kg/ha worth US$41
    - Return on investment is 158%.
  - **Chibombo**
    - Lime application alone increased yield by 10.65% or 112 kg/ha worth US$24.
    - Return on investment is 54%.
- **Monze/Choma**
  - Lime application did not show significant responses and was not financially viable.
Responses to Fertilizer by Cotton

- Significant responses to fertiliser on cotton were found

  - Monze: 54% increase in yield
    - Return to investment of 7.75%
  - Mumbwa: 69% increase in yield
    - Return to investment of 36%
Agro-ecological Region III: acid leached soils

- 25 long-term on-farm trials in Mpika to enable sedentary culture with the use of lime
- Compare permanent CT/CF ridge culture and CT/CF permanent basin culture with farmer’s conventional practice
- Preliminary results
  - Sole-cropped maize yields increase by 61% using CF basins
  - Sole-cropped maize yields increase by 53% on CF ridges
  - No important yield difference between CF basins and CF ridges
  - CF basins or CF ridges increase groundnut yields by more than 75%
- 28 more trials to be undertaken in Copperbelt in 2002/3
Conservation Farming

The beginning