Conservation agriculture adapted to specific conditions
No tillage for smallholder farmers in semi-arid areas
(Cameroon and Madagascar)

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Semi-arid area
Semi-arid area

Les définitions des zones semi-arides sont nombreuses. Elle se caractérisent toutes par a negative water balance a large part of the year.

Specific constraints of the semi-arid areas for CA

- Shortness of the growing season,

- Heavy competition for the limited biomass between farmers and cattle raisers

- Farmers’ limited investment capacity and poor access to market.
SCV : Direct seeding on permanent plant cover

- Soil is never tilled, permanently kept covered by a dead or living mulch.
- Mulch comes from plants that are used as "biological pumps". This plants have strong and deep root systems, can recycle nutrients and have a high and fast biomass production.

3 main ways of implementing SCV

- Importing a mulch from surrounding areas.
- Producing the mulch locally, using natural vegetation, crop residues or a cover crop grown in the field.
- Using a cover crop kept alive but controlled during the main crop cycle.
SCV in semi-arid areas

3 main options

- Reclaiming fallow land, using natural vegetation
- Improving the fallow lands with, or cultivating, for at least one year, perennial legumes or grasses
- Associating, at least one year over two, a cover crop to the main crop.
Madagascar

• Carte avec zone semi-arides de Mada
• à trouver cf D. Rollin

South West Madagascar
Rainfall  Sakara (1995-2001)

Average 1995-2001
95-96 dry year
98-99 rainy year

Average : 800 mm
Dry year (95-96) : 475 mm - Rainy year (98-99) : 1 015 mm

Madagascar

Association and rotation

- Cereals associated with legumes or grasses

Or within rotation 1 year with Cotton, Groundnut

High biomass production > 10 t/ha d. M.

Madagascar results

Maize yield (kg/ha)

- Ploughing, full fertilisation
- Direct seeding, full fertilisation
- Ploughing, Half fertilisation
- Direct seeding, Half fertilisation

Year

Documents obtained from the Cirad network [http://agroecologie.cirad.fr]
Cameroon

In station experiment
Far Nord province

North province

50 kilometers

In station experiment
On farm experiment
Blue: cotton culture area

North cameroon Rainfall
Kaélé (1950-2001)

Average: 840 mm
Dry year (1/5 year): 700 mm
Rainy year (1/5 year): 930 mm
Cameroon Rotation
(exemple)

Year 1
- Cereal + Mucuna pruriens
- Cereal + Crotalaria retusa
- Cereal + Brachiaria ruziziensis

Year 2
- Cotton under mulch

Cameroon
On farm experiment 2002

<table>
<thead>
<tr>
<th>Yield Difference (%)</th>
<th>Number of Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40% to -10%</td>
<td>1</td>
</tr>
<tr>
<td>-9% to +10%</td>
<td>5</td>
</tr>
<tr>
<td>+30% to +50%</td>
<td>4</td>
</tr>
<tr>
<td>+51% to +100%</td>
<td>3</td>
</tr>
<tr>
<td>+190% to 270%</td>
<td>3</td>
</tr>
</tbody>
</table>

Coton, yield difference in % between conventional and SCV
Conclusion

SCV :
• Early sowing,
• Reducing labor force bottleneck,
• Reducing production costs,
• Weeds control,
• Increasing water use efficiency,
• Stopping soil fertility degradation,
• Better integration between crops and livestock,
• Improving the quality and the quantity of the produced biomass.