



MAJOR BUSINESS OPPORTUNITIES

There is a pressing need for locally adapted and manufactured equipment. This represents a major business opportunity.

- The job planter technology has been generally accepted by smallholder farmers who can appreciate the benefits of direct planting and fertilizing in one pass. As a response to the demand for the implement there has already been some small-scale batch production of job planters in several countries, which needs to be nurtured.

- Draught animal powered equipment (ripper, planter, knife roller and sprayer) has been greeted enthusiastically, but there is always the problem of the cost of obtaining the technology. Knife rollers are being manufactured in Uganda and Tanzania, and no-till planters in Tanzania but, to date, these technologies has not been widely adopted.

- Tractor powered CA technology is currently only suitable for larger scale, commercial farmers due, principally, to the high level of investment required. Opportunities are emerging to switch utilisation of the clusters of two wheeled tractors (power tillers) to CA and acquiring no till seeders for existing tractors.

CA Expansion in Southern Africa: What Can Policy Makers Do?

Efforts to adapt the CA principles and technological aspects to suit various agro-ecological, socio-economic and farming systems in the region started a few decades ago. Greater support from policy and decision makers at the local, national and regional levels will facilitate expansion of CA and help farmers to reap more benefits from the technology.

Some of the ways in which policy makers can enhance expansion of CA in the region are described below.

Sensitize and educate the public

There is an urgent need to increase awareness of the social, economic and environmental benefits of CA amongst the general population. Appropriate CA promotional and awareness materials and approaches should be used by the policy and decision makers to sensitize, advocate and lobby for CA among communities, national governments, regional intergovernmental institutions, private sector, development actors, researchers and other stakeholders.

Conservation agriculture should also be discussed in relevant high-level meetings such as parliamentary committee meetings, sectoral and inter-sectoral meetings, round table dialogues, and Ministerial and Heads of State Summits such as for those for Agriculture, Environment, Industry and Trade. Policy and decision makers can also facilitate CA expansion and uptake by supporting establishment and management of demonstration sites in suitable local areas for advocacy.

Support training on CA

Policy and decision makers are encouraged to support training on CA at all levels. CA should be included in curricula from primary school to university levels.

Efforts to adequately train all new and existing extension personnel on CA should be made in relevant departments. Consideration to extension approaches such as the Lead Farmer Approach should also be made as a way to mitigate extension shortages at the local level.

Institutionalize CA

CA has to be mainstreamed in relevant ministries, departments or institutions and supported by adequate provision of material, human and financial resources to ensure that farmers receive effective and timely support from well trained and motivated extension staff. Key local, national and regional (e.g. SADC, AU-NEPAD) institutions should have dedicated CA champions among their staff who will help to ensure that relevant plans, programmes and policies embrace CA.

In the short to medium term, policy makers could support activities of the national and regional CA taskforces to ensure that relevant thematic (research, technical, extension, training, education, inputs and output markets, policy) areas are covered by various CA programmes. Institutionalizing CA into relevant government ministries and departments and regional institutions is required for sustainability of the technology.

Local, national and regional policy and decision makers could spearhead and support

the formulation and development of strategies and mechanisms for scaling up the technology. CA could be integrated into interventions such as seed, fertilizer and tillage and draft power support programmes.

Support the adaptation and validation of CA technologies under local environments

Adaptive research is required to tailor make CA principles and practices for local conditions. This should be done in collaboration with local communities and other stakeholders.

Topics that should be covered are those of crop species, selection and management of crop and cover crop associations and rotations, maintenance of soil cover and production of fodder and CA equipment.

Support the development of CA equipment and ensure its availability

Whilst some countries produce CA equipment, most of the available implements and equipment are imported.

In the short term, considerations could be made on removing or reducing tariffs on imported CA equipment and implements to encourage and promote their availability. In the medium to long run, local manufacture of these will increase availability, ensure that equipment is adapted to local conditions, increase employment opportunities and reduce costs.

The larger and more complex equipment is expensive users may have to hire it. There is an opportunity to develop a local hire service industry by providing equipment, and



training on machine maintenance and business skills. Where governments support land preparation schemes using ploughs, there is scope to change the equipment to rippers or direct seeders to reduce the cost and make the schemes more to CA approaches.

Facilitate development and strengthening of input-output markets

Policy and decision makers can further support CA expansion by promoting opportunities and mechanisms for direct sale or processing of surplus produce. In some countries farmers are required to sell surpluses to national grain marketing boards and the prices may not be sufficiently high to encourage farmers to put in the extra inputs or labour to produce surplus. Food aid and distributions by governments and NGOs may also undermine the local market for produce.

The private sector should be encouraged to establish and run , supply chains incorporating input suppliers, rural workshops, machinery supply and hire services etc.

Promote Payments for Environmental Services (PES)

Market based opportunities such as carbon trading, eco-tourism, bio-energy, agro-fuels, green/organic labels and certification could fund CA. PES is a concept whereby it is recognized that users of the land have a great impact on the quality of life for all.

Adopters of CA improve the environment through carbon sequestration, prevention of soil erosion or the encouragement of groundwater recharge.

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Produced in collaboration with USAID, SIDA and The Norwegian Ministry of Foreign Affairs



The Status of Conservation Agriculture in Southern Africa: What Can Policy Makers Do?

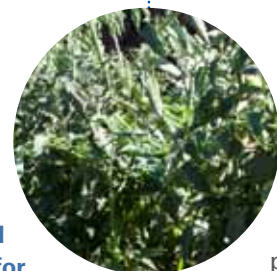
REOSA Technical Brief

03

Food and Agriculture Organization of the United Nations (FAO)
Regional Emergency Office for Southern Africa (REOSA)

July 2010

This technical brief provides information on the status of conservation agriculture and recommendations for policy makers in southern Africa. It is the last of a series of three on the subject. Technical brief 01 describes the principles of conservation agriculture and its benefits. Technical brief 02 is an analysis of the socioeconomic impacts of conservation agriculture in the region.



Achieving food security remains central to many national and regional programmes and policies in southern Africa. Although agricultural productivity has increased in some countries in the region, many countries remain net importers of food and are thus exposed to environmental and economic factors prevailing in the food exporting countries. Average maize yields for the region have not changed much over the past 50 years. Poor farming methods, high levels of soil degradation and consequent desertification are some of the causes of this low productivity. Droughts and/or prolonged dry spells often worsen the situation by resulting in severe crop damage or complete crop failures. With the majority of the population in southern Africa dependant on agriculture for their livelihoods, technological options that increase agricultural productivity and help to buffer farmers against the negative impacts of climate related and other constraints should be promoted. One such option is conservation agriculture (CA). Conservation agriculture is a resource saving agricultural crop production concept that strives to achieve acceptable profits together with high and sustained productivity levels while concurrently conserving the environment. The CA intervention aims to boost agricultural productivity by embracing three basic principles. These are:

- Minimal soil disturbance;
- Maintenance of a permanent soil cover with mulch or cover crops;
- Practising crop associations or rotations.

By increasing and stabilizing yields, CA can help alleviate household food insecurity and poverty. Despite the proven benefits from CA, the technology is still practiced on a very small area in the region due to limited support from national governments.



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AFRICA'S LEVEL OF CA PRACTICE

Compared to other regions, Africa is still lagging behind in the extent of CA practice. The estimated areas (ha) under CA for some African countries are:

South Africa	368,000
Zambia	40,000
Ghana	30,000
Kenya	15,000
Sudan	10,000
Mozambique	9,000
Zimbabwe	7,500
Tanzania	6,000
Morocco	4,000

Source: Derpsch et al. 2010

While support on CA is still low, countries in the region are at various stages of incorporating CA in their national development programmes and relevant policies. To help promote and coordinate CA, 12 countries in the region have identified a CA Focal Point (Angola, Botswana, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe) and the majority of these have gone on to establish National Conservation Agriculture Task Forces (NCATFs) to spearhead the CA agenda. The NCATFs comprise of a wide range of stakeholders including governments, faith-based organizations, government departments, NGOs, academic and research institutions, and other development partners. Coordination activities at the regional level are being undertaken by the Conservation Agriculture Working Group (CARWG). It is however important that countries and regional economic institutions institutionalize CA as this will facilitate resource allocation to the technology.

Global CA Adoption

By 2009, it was estimated that CA in the form of no-tillage¹ had been adopted on more than 115 million ha worldwide. No-tillage involves at least two of the CA principles i.e. reduced or no soil disturbance and the retention of at least 30% residue cover soon after planting.

It is worth noting that more than 85% of this area is in North and South America and a mere 0.3% (368,000 ha) is in Africa (see table below).

It took Brazil 20 years to adopt the first million hectares under no-till (see figure below). The adoption rate has grown to 25.5 million hectares today. Worldwide, it is estimated that no-tillage technology has expanded at an average rate of 6 million ha per year in the last 10 years.

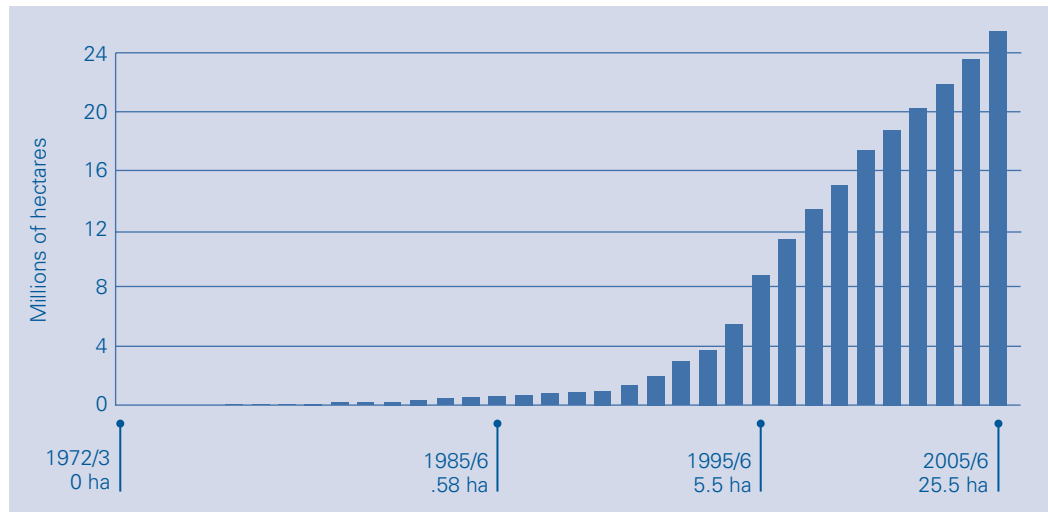
1 No-tillage is defined as a system of planting (seeding) crops into untilled soil by opening a narrow slot, trench or band only of sufficient width and depth to obtain proper seed coverage. No other soil tillage is done (Phillips and Young, 1973).

Area under no-tillage by continent

Continent	Area ('000 ha)	%
South America	49,579	46.8
North America	40,074	37.8
Australia & N. Zealand	17,162	11.5
Asia	2,530	2.3
Europe	1,150	1.1
Africa	368	0.3
World total	115,863	100

Source: Derpsch et al. 2010

Adoption of no-till planting in Brazil between 1972 and 2006



Adaped from: <http://www.febrapdp.org.br/>



By adopting the no-tillage system Brazil increased its grain production by 67.2 million tons in 15 years, which, assuming conservative average prices of US\$ 150/t, means additional revenue of about 10 billion dollars (Derpsch, 2003).

The Status of CA in Southern Africa

The promotion of conservation agriculture practice in southern Africa began during the 1970s with the main focus being on minimum tillage. Since then, various stakeholders including faith based organizations, government, NGOs, private sector, research organizations and others have been promoting CA for smallholder and large scale farmers.

Due to limited data it is currently difficult to give a reliable assessment of the extent of CA adoption in southern Africa. However, it is estimated that on average, less than one per cent of the cultivated land is under CA. Likewise, the policy environment differs greatly from one country to another. The table shows levels of CA practice using basin planting, ripping and no-till (direct seeding) planting (Derpsch et. al. 2010). Most of the smallholder CA farmers in southern Africa currently use planting basins e.g. in Zambia, Zimbabwe and Lesotho. In South Africa, most of the CA, no-till, is currently practiced on large scale commercial farms. The minimum tillage methods have been used with varying levels of crop associations and soil cover.



CA practices employed

Country	Basins	Ripping	Direct seeding
Malawi	•		•
Lesotho	•		•
S. Africa			•
Madagascar			•
Zimbabwe	•	•	•
Angola			•
Zambia	•	•	•
Mozambique	•	•	•

Adapted from: FAO, 2010. *Analysis of the Status and Potential of Conservation Agriculture in Southern Africa.*



A comparison between conventional farming and farming with planting basins showed consistently increased average cereal yields by fifty to 200 per cent in more than 40,000 farm households in Zimbabwe between 2004 and 2008 (Twomlow et al., 2008).



Challenges of CA practice and possible solutions

Mind-set: For many people (farmers, extension and policy makers) crop growing is synonymous with ploughing, as good agronomic practice has meant, in the past, keeping fields “clean”. That the clean seedbeds are the cause of soil degradation and yield reduction has not been a restraint, as there have hitherto been few viable alternatives. There is also a perception that preparing fields in the off-season is odd (see ‘weed control’ below). A change in mind-set is therefore required. It is important that stakeholders are sensitized and educated on CA through electronic and print media as well as setting up CA demonstration plots at strategic sites.

Inadequate CA Knowledge and skills: Most of the extension agents and farmers lack adequate skills and knowledge on CA. Training at various levels is therefore required.

Retaining residues: Retention of crop residues in the field is a serious challenge for many farmers who operate in communal grazing systems. There are also competing uses for crop residues such as fodder, fencing, handicrafts, roofing and fuel. Traditions of uncontrolled grazing of livestock on stubble and the lack of appropriate winter tolerant cover crops for the drier areas are key issues, as are bush fires (accidental or deliberate). Education, in conjunction with amending of local by-laws to protect CA farmers is important components of approaches to address this constraint.

Weed control: Elimination of ploughing, which plays a role in controlling weeds, increases weed infestation initially. In CA, winter weeding and prevention of weeds from seeding helps to reduce the seed bank

reservoir in the soil and thus subsequently reduces weed pressure in CA. Farmers often do not appreciate the importance of winter weeding, and may also be reluctant to carry it out because of labour constraints. The workload associated with weeding can be reduced through several ways, e.g. use of herbicides and forming work parties. In the long term, the suppressing effect of mulches and cover crops or crop associations will help to reduce the need for weeding.

Availability of equipment and inputs: The more sophisticated forms of CA require specialised planting equipment and other inputs such herbicides. Affordability and accessibility of these inputs to farmers can greatly hinder adoption. Some CA equipment is being manufactured in the region (e.g. in Tanzania, Kenya, South Africa, Zambia and Zimbabwe), but it is insufficient to meet projected demand. There is also a lack of draught power for small-scale farmers, and a limited supply of suitable cover and rotation crop seed. Efforts to ensure farmer access to suitable and affordable equipment must be made. This could include encouraging the development of local manufacture and supply of equipment and inputs or cattle restocking programmes to avail draft power to vulnerable households.

Land tenure systems: Farmers may be reluctant to invest in improvement of the status of the soils they cultivate if they do not have clear rights to the land. One way of incentivising households to increase investments on the land that they occupy is for governments to review the land ownership laws and make them more favourable.

A NEED FOR POLICY DEVELOPMENT

Decision-makers can advocate for the necessary CA enabling environment through lobbying for policy changes in parliament, cabinet meetings and other forums within their own governments. Policy makers should ensure that CA is adequately supported by the overall agricultural policies as well as other relevant policies such as education, environment and trade. CA should be institutionalized in schools, tertiary colleges and universities. It could also ensure there is adequate funding allocated to research and extension of CA by national bodies. Policy incentives could include, for example, subsidies on CA equipment and chemicals e.g. herbicides. Farmers producing using CA could also get special concessions e.g. tax exemptions on certain purchases, special prizes for their commodities etc.

Other areas where there is a necessity to improve the policy environment to stimulate CA uptake include:

- Village land use planning
- Arable farming expansion versus maintenance of rangeland
- Environmental policies

