

ANNEX 7

CONSERVATION AGRICULTURE ‘BEST-PRACTICE’ APPROACHES

Conservation Agriculture Implementation in the FISRI Project

Sepo Marongwe, Conservation Agriculture Specialist (Zambia)

1. CA Concept, Theory and Practice

CA comprises three key principles namely: minimum soil disturbance, maintenance of at least 30% soil organic cover and the inclusion of suitable crop rotations and/or interaction. Applying all three principles simultaneously will optimize benefits from the CA system. In the project areas visited, the two principles of minimum soil disturbance and crop rotations and interaction were largely being applied by the farmers. Communal grazing regimes in most of the areas and wild fires were in most cases cited by the farmers as the major constraints to maintaining soil cover in their CA fields. However, when questioned on their understanding of CA, the farmers would mostly list the activities that they go through when implementing CA such as digging basins, ripping, rotations, manure application, herbicide application, timely planting, etc. The principle of mulching or maintenance of soil cover was mentioned in very few cases. It is evident from the interactions with the farmers and the training material available that the training is largely activity-based. The danger of the activity-based training is that as long as farmers do not understand and appreciate the underlying principles of CA, they are likely to go back to conventional farming methods when the project ends and the support is withdrawn. The activity-based training needs to be continuously complemented with the key CA principles and messages. A comprehensive CA field training guideline or manual could enhance the effectiveness of the training.

The use of herbicides as weed control measure has been part of the FISRI. The herbicides are acquired from agro-dealers under the e-voucher scheme. The farmers have been very receptive to the herbicides mainly because it addresses labour, which is a major constraint in the small holder farming system. The use of herbicides has greatly impacted on the women who are generally burdened with weeding activities, with one polygamist farmer in Sinazeze (Sinazongwe), declaring, “My three wives who were extremely thin as a result of the weeding, have now gained some weight since we started using herbicide”. This and many other similar statements from the farmers indicate that the use of herbicides has made a tremendous impact in their farming activities.

This high confidence in the herbicides and the dependence that may arise, present a danger of CA becoming synonymous with the use of herbicides. Over dependence on herbicides as the only weed control measure has been known to cause resistance in certain weed species if the same herbicides and the same rates are used on the same field over and over again. Environmental consequences of herbicides or chemicals need to be communicated. In view of the above, it may be necessary to come up with an integrated weed management strategy which can be part of the CA training. The use of mulch or soil cover as a weed suppressant, correct plant population to ensure that the plant canopy quickly covers the ground to block the light, intercropping and the use of certain plants in rotation to suppress specific weeds are some of the options that can be availed to the farmers. Presenting a basket of weed control options will cater for farmers of different social and economic status, i.e., those who cannot afford the herbicides should employ other measures that complement manual weeding, and those who simply do not want to use chemicals can still apply the CA principles and successfully control the weeds in their CA fields. Unsuccessful weed control in CA may result in frustration and eventual abandonment of the no-till principle, i.e. farmers will resume conventional ploughing.

CA Demonstrations

The majority of the lead farmers that we interacted with during the evaluation mission had managed to establish their demonstration plots. The lead farmer approach is very ideal in such situations where the extension networks are sparse and have mobility problems. With adequately trained lead farmers, the extension officer is able to indirectly reach a larger number of “follower farmers”. The failure to understand the link between the inputs or vouchers received and the duties and obligations of the lead farmer at the implementation level affected the state of some demonstration plots, whose state were not adequately portraying the potential for CA. If lead farmers understand and appreciate that the inputs are an “incentive” for managing the demonstration and linking with the follower farmer, there should be an effort to portray CA with all the three principles where ever possible, more so on demonstration plots managed by lead farmers. This will ensure that the correct CA message gets across to the follower farmers.

As the lead farmers realize the benefits initially in terms of yield (sometimes after the first year), they quickly expand and the large field will not receive the same level of management. It is therefore important to maintain these “initial” demonstrations in order to observe the long term benefits of CA, where possible. Alternatively, if farmer field schools are adequately funded, these would serve as permanent demonstration or research sites where data could be collected over the long term and documentation of the “best agriculture practices” could be a reality.

Farmer field schools were used by the CEOs as a platform for training lead farmers. In most areas visited the farmer field schools were not running very effectively as they had no budget allocation. The CEOs in most camps used the vouchers which they received from the programme to source inputs for the farmer field schools, while others complemented these with contributions from the farmers themselves. The inputs from the CEOs voucher could only cover one or two schools but there was a need to set up more schools (preferably, one farmer field school per zone) to reduce the distance that the lead farmers will have to travel.

The mobility of the lead farmers in the FISRI was affected by the poor quality of bicycles received, many of which were no longer functional. Farmer field schools if used may require initial funding before they can sustainably function independently. The use of farmer field schools will also provide a source of long term data for CA development and adaptation, as well as evidence for CA impact.

Benefits from implementing CA as highlighted by farmers

Farmer testimonies and observations in the field indicate that there are tremendous benefits that farmers are getting from implementing CA, with farmers getting higher yields in their CA systems. Many of the benefits cannot necessarily be defined as CA principles but they are coming as added benefits which are enhanced through application of the CA principles. The following are some of the benefits highlighted by the farmers:

- Ability to plant early: Farmers using manual CA systems (basins) are able to prepare their land well before the onset of the seasonal rains. Farmers who rely on hired animals for ripping are still facing delayed plantings as animal owners appear to be reluctant to hire out their animal while the ground is still dry and hard.
- More efficient use of manure, fertilizers and lime due to the precise placement of these in the field (as opposed to broadcasting which covers even areas away from the plant).
- Use of fertility enhancing plants in rotation: There was evidence of maize crops doing fairly well without any top dressing in fields where the preceding crop was a legume.
- Reduced labour in ripping systems : Larger areas can be covered over shorter periods
- Reduced labour for weeding when herbicide is used: Effective use of herbicides has resulted in weed free fields but ineffective use may have negative consequences.
- Increased resilience to dry spells for crops under CA: Farmers have observed more resilience to dry spells in CA crops compared to those under conventional.

Continuous identification of these and other emerging “best agriculture practices” and their documentation is key to successful up scaling of CA.

Challenges to CA adoption

Apart from the labour for manual weeding, labour requirements for land preparation in manual CA systems were identified by those farmers that are not implementing CA as major deterrents. The project should therefore be commended for the introduction of the CA mechanization component which has generated a lot of interest among the farmers. Continuous interaction with the farmers will assist in designing suitable mechanization models for different socio-economic and bio-physical settings.

The introduction of non-traditional crops for rotations presents a challenge in terms of sourcing seed and markets for the harvested crop. Poor quality seed and unavailability of markets have forced some CA farmers to maintain smaller areas for the legume crops or abandoning the legume altogether. This presents a challenge for the rotation and interaction principle.

The promotion of CA without linking it with livestock issues may be an obstacle to adoption. There may be need to develop aspects of pasture availability for CA farmers with livestock in order to address the problem of mulch in relation to livestock feed.

Limited interaction between researchers and agencies implementing CA presents a challenge for the academia who due to lack of credible localized research evidence may not easily embrace CA, which may be a problem in terms of long term policy, institutionalization and decision making.

The benefits of CA in terms of environmental conservation are not very visible in the project. Gathering evidence in this aspect will assist in developing and adapting CA within the framework of global issue of climate change and environmental degradation. The concept of CA presents an important solution to environment degradation, not only in terms of soil quality but also through the cultivation of smaller land units, and availing more fertile lands for pastures and for natural conservation.

Lastly, issues of mindset should also be recognized as an obstacle to CA adoption. It is therefore important to include evidence on socio-economic and cultural indicators as we tell the CA story, be they successful or unsuccessful.