

Profitability of appropriately mechanized Conservation Agriculture: a case of Lengetia Farm

Description of Laikipia County and Lengetia Farm

Laikipia County is one of the Counties in Kenya characterized by a predominantly semi-arid climate (Jaetzold and Schmidt 1983; Kaumbutho *et al.*, 2007) with a rainfall pattern varying from unimodal on the western side to a tropical bimodal pattern on the eastern side (Gichuki *et al.* 1998). Annual rainfall ranges from about 500 mm in the extreme west to about 900 mm near Mt Kenya. Being on the lee-ward side of Mt Kenya, crop production has generally been low due to inadequate and unreliable rainfall and low soil fertility due to land degradation and use of inappropriate farming technologies. The adoption of CA technology in the region is dominated by large- and medium-scale farmers, mainly because of high land-to-labour ratio that calls for mechanization to reduce production costs and increase profitability of their farms.

In this region, among the large scale farmers who have adopted Conservation Agriculture include Lengetia farm, Wangu Investment and Kisima farms (Kaumbutho *et al.*, 2007), These farms have used conventional agriculture in their wheat and barley farms for almost four decades and regard Conservation Agriculture as a farming practice lying between zero tillage and minimum tillage but with the additional benefit of incorporating crop rotation and fallow systems. These farms have invested in agricultural machinery that only minimally disturbs the soil, and they share crop residue between mulch and livestock. (Kaumbutho *et al.*, 2007).

Lengetia Farm is located in NaroMoru area and is owned and managed by Mr and Mrs Laurie Sessions. It borders large wild game and livestock ranches and has realised tremendous change in crop production and improvement in soil quality. Mr. Sessions own 278.8 ha of land and rent some 1800 ha from the Olpajeta Ranch. The farm falls within zone 5 (lower highland ranching zone) where rainfall ranges between 450 and 600 mm. The soil on the farm is red and black volcanic soils. Wheat and barley are the main crops, and canola and sunflower are rotational crops.

What farm operations are mechanised

All operations in the farm are mechanised namely planting, spraying (for weed control, pest/disease control/prevention) and harvesting. The farmer owns assorted machinery for these operations which include disc ploughs, disc harrows, chisel ploughs (most of these are no longer in use after converting to CA), direct seeders, precision planters, hay balers, combine harvesters (fitted with forage choppers), boom sprayers, tractor rippers, trailers, oil press among others. He also owns smaller equipment like walking and 2WT tractor planters cum sprayers for hire to small scale farmers. Others are jab planters, shallow weeders and Zamwipe mainly for use by the small scale farmers and training.



LF refers to Lengetia Farm which is about 20 km from NaroMoru. Hence travel time is about 3hrs 20 minutes from Nairobi



Figure 1: Mr Session showing visitors at his Lengetia farm the assortment of equipment that he uses in the farm

What the switch to CA has meant to him?

When asked about his vision the farmer responds, *“Our (the family) vision is to produce more food for this country. We also wish to maintain soil conditions, conserve and improve rather than degrade. We will reach there if we remain persistent and industrious”*.

Mr Sessions had used conventional tillage to produce wheat and barley for 25 years and faced a myriad problems, including declining soil fertility, high fertilizer requirements and high production costs associated with high oil prices, increased soil erosion, emergence of plough pans translating to high production costs (Kaumbutho *et al.*, 2007).

For the last 14 years he converted to Conservation Agriculture and improved his returns drastically which has enabled him to graduate to precision farming with fully computerised mechanised systems which continue to give him a competitive edge on low production costs and high produce prices. To date he is one of the few CA adopters in the region who has fully exploited the advantages of CA practice. To date, he is one of the few CA adopters in the region who has fully exploited the advantages of CA technology. This has enabled him to reduce the break-even point for wheat from 2.5 t/ha to 1.3 t/ha, and increase yields from 3 t/ha to 4.4 t/ha.

Mr Sessions confirms that soil quality has improved since he began using CA which he attributes to the decomposition of crop residues. He conducts soil analysis which has enabled him to track the soil fertility improvement in various fields. His inorganic fertilizer use has progressively reduced over the years and he now uses between 60 to 85 kg of fertilizer per hectare to supply sufficient nutrients for his crop growth depending on the soil analysis results. Soil moisture has been retained all through the years and soil fertility improved. He says the use of controlled traffic for farm machinery have reduced soil compaction considerably and the soil structure has increased the presence of microorganisms in the soil.

He maintains a planting calendar where he starts his planting one month before the expected rainfall time and the crops germinate using the moisture conserved in the soil way ahead of the rains. This has always assured him of a guaranteed harvest for the period he has been applying CA in his farm



Figure 2: Laurie Session addressing small scale CA model farmers and service providers

Mr. Session through his open desire to influence small-scale farmers to adopt Conservation Agriculture, which he believed was the only viable option available for crop farmers in that region, has talked about Conservation Agriculture with small-scale farmers and influenced the Ol Pejeta Conservancy to establish and offer Conservation Agriculture advisory and mechanized services to the small-scale farmers. The

conservancy employed a full-time extension officer to assist the small scale farmers in the neighbourhood.

Challenges, opportunities, way forward

The major challenge in the farm is resistant weeds (broadleaf and lately some grasses). The farmer is addressing this by rotating different 'Active Ingredient' herbicides to change modes of attack to the weeds, integrating chemical control with manual removal for specific broadleaf weeds, occasionally incorporating light tillage in a few problematic areas.

The farmer notes that to get all farmers in Laikipia to practice CA, awareness creation is the key. The county Government should get more involved in creating awareness.

His parting shot is that the Government should consider supporting farmers to adopt Conservation Agriculture as this is the sure way to attain food security in the country.

Photo Story

