Conservation Agriculture

A farming revolution that replenishes soils, conserves water and boosts profits

SNV

Center of Excellence for Crop Rotation

The story is the same in fields across almost all of Kenya's fertile farmland: erratic rainfall coupled with growing the same crops year after year is having a devastating effect on productivity. Soils that were once healthy are now depleted of crucial nutrients. Moisture that was once kept in the earth to nourish crops runs straight off to rivers. Weeds and diseases that were contained run rampant. As result farmers are earning less and less from their harvests.

Conservation Agriculture is an ecologically-sound, environmentally-sustainable solution to these challenges. Conservation Agriculture boost farmers' earnings with a few principles so straightforward most commercial farmers adopt them minimise soil disturbance. Farmers are already reporting significantly boosted yields and profits.

THE 3 KEY STEPS

TO CONSERVATION AGRICULTURE (CA) SUCCESS

1 – Rotate crops

THE PROBLEM – Repetitively planting the same crops ruins soil health and sustains weeds and pests.
THE CA ANSWER – A standard four-year rotation works best, with a quarter of available acreage planted with each of the following crops rotating in this order: wheat » canola » barley » field peas. Legumes fix nitrogen for cereal crops that follow, and crop variety means differing root systems plumb different depths of soil, increasing soil health and efficiency, which keeps more moisture in soil too. Pests and weeds struggle to find a foothold as crops change regularly. Even rotating two crops can help.

2 – Minimise tilling and control traffic

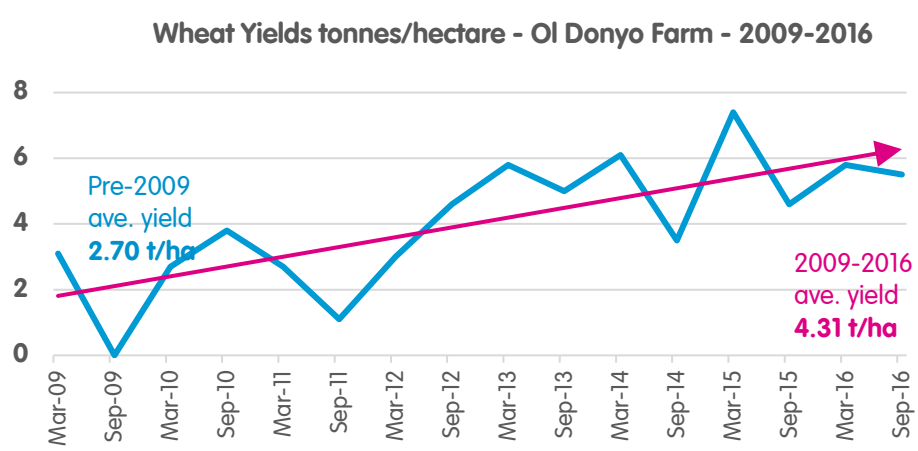
THE PROBLEM - Using machinery to till the soil after harvesting creates a compacted layer of solid earth below the surface, called a plough pan. On top of that there is a thin layer of poor-quality soil that has few nutrients and is vulnerable to run-off when it rains.
THE CA ANSWER – Plant the next crop directly into the soil left from harvesting the last one. Cutting tilling protects soil against wind and rain erosion, reduces fuel, time and labour costs, improves the soil's ability to hold moisture, significantly increases root depth and boosts yield per unit of fertiliser. At the same time, keep vehicle movements across fields to a minimum.

3 – Maintain organic soil cover with previous crop residue

THE PROBLEM – Stripping fields bare encourages wind and rain erosion, means more moisture evaporates and prevents helpful soil fauna from developing. Weeds also find it easier to germinate.
THE CA ANSWER – Leave the last harvest's stubble lying on the soil, to create a cover layer of organic material. This protects against erosion, allows rainwater to trickle into soil instead of running off, reduces weeds and helps nutrients recycle into the soil mass. Keeping just 40% cover limits soil loss to less than 10 tonnes per hectare, compared to 30 tonnes per hectare with no residue.

DOES IT WORK?

"One very dry season, we had only 75mm of rain but I harvested 4.6 tonnes of wheat per hectare. That tells me we're on the right path" – Bryn Llewelyn, Ol Donyo Farm, Timau



SNV

Center of Excellence for Crop Rotation

A Tale of Two Farms: Bryn and Duncan

"It's our first trial of this idea: so far, so good. The weeds are dying, the soil is already healthier. I am very optimistic."
– Duncan Gikandi

Duncan manages a 5,000-acre farm planted mostly with wheat high in Kenya's central Mau hills. For years, he watched helpless as weeds like rye grass thrived in each season's crop.

"We tried every chemical we could find, we left fields fallow for a year, we did everything," he said. The weeds took a beating, but always returned. Now, with technical advice from **Agventure**, he's using Conservation Agriculture methods. He has planted 92 acres with canola as a rotation crops. When he harvests, he'll minimise his tilling and leave the stubble on the field.

"I had heard about the theory of Conservation Agriculture, and I saw no reason not to try it in practice," Duncan says. "All we have done is plant, and add one dose of fertiliser. The canola is growing well and the weeds are dying off. If this pilot goes well and the next wheat crop is good, we will expand on our own farm, and also invite others to come to see and encourage them to copy us."
Jason says this is crucial: "Other farmers need not just to be told that Conservation Agriculture works, but actually to see it working."

He and his colleagues at **Agventure** are on hand to support farmers as they begin to adopt the concept's key principles. "We really needed the help they gave us," says Duncan. "They showed us how to handle these new crops, and are finding us a market, too."

After planning canola, farm manager Duncan Gikandi's weed problem is finally under control

"We have 25% more moisture in our soil now, which means when there is drought, I have that head start to see me through. Our wheat yields have almost doubled."
– Bryn Llewelyn

Some 200km east across the Rift Valley, Bryn Llewelyn testifies to the success of Conservation Agriculture.

"We're five years ahead of everyone else on this. It's been a lot of hard work, and at the start there was a lot of scepticism. But we're really seeing it take off now," he says.

At his Ol Donyo Farm on the slopes of Mount Kenya, he adopted the key principles – rotating crops, minimal tilling, leaving crop residue – in 2008. Today, he says his soil is hugely improved, which is crucial because his rainfall is increasingly erratic.

"We have 25% more moisture retained in the top metre of soil, which means when there's drought, I have that head start to see me through, and when there's heavy rain, we have much more absorbency before waterlogging limits growth," he says. "The roots are going deeper, and the soil's much healthier. Once the crops are in, they are much more resilient to weeds, insects, diseases, low rainfall. They just keep going." Bryn's wheat yield has almost doubled since he switched to Conservation Agriculture.

Farmers keen to copy Bryn should be cautious, Jason warns. Like Duncan, they should "start small". "If you have 50 acres, just try with 10 acres first. Learn, gain confidence, see the benefits, then you can increase your speed," he says.

Bags of canola wait for shipping

SNV

Center of Excellence for Crop Rotation

Why Conservation Agriculture?

THE ECONOMIC BENEFITS

1. Higher produce yields and profits
2. Reduced labour, machinery, fertiliser and pesticide costs
3. More diversified risks compared to planting mono-crop
4. Long-term investment in soil health

Why Conservation Agriculture?

THE ENVIRONMENTAL BENEFITS

1. Healthier soils and crops
2. Significantly reduced erosion
3. Higher moisture retention
4. Fewer weeds, pests and diseases

Don White,
Managing Director

Expanding the Conservation Agriculture revolution to farms across Kenya

Conservation Agriculture is not rocket science. It needs no major new expensive equipment, and it can bring benefits to a farmer small and big.

The **Center for Excellence in Crop Rotation** is here to explain the theory and show you the basic steps to take. We adapt our advice to farm size, climate, and location within Kenya. We are already operating near Nakuru, Naivasha, Athi River, Rumuruti, Nanyuki and Timau.

It takes time to overcome scepticism to change the way things have always been done. But continuing to do what's always been done is a fast road to ruin while the economy and climate change.

Rainfall is no longer reliable: Conservation Agriculture helps soils retain their moisture. Farm inputs and machinery are expensive: Conservation Agriculture reduces labour, chemicals, and machinery costs. Pollution is increasing and weeds are more resilient. Conservation Agriculture provides solutions to both those problems.

We are ready to talk with any farmer who wants to give it a try. We can help you start small, and expand bit by bit. We really do think this is a revolution in agriculture in Kenya. **Come and join us!**

SNV

Finding farmers new markets for their rotational crops

SNV Netherlands Development Organisation works to improve food security and boost the businesses of small and medium sized entrepreneurial farmers in Kenya. An innovative way to achieve this is by working with **Agventure** to increase the number of outgrowers planting crops including canola. **SNV** has formed partnerships with major buyers including **Unilever**, in order to expand the market for the farmers' new produce. That significantly boosts farmers' motivation to invest time and farmland to plant these novel crops. It is part of **SNV**'s global goal to reduce poverty and improve livelihoods through innovative solutions that address food and nutrition security, sustainable markets, climate smart agriculture and equality of opportunity for women and youth in employment and business.

www.snv.org/sector/agriculture

Find out more about Conservation Agriculture

croprotation@agvke.com
www.croprotation.co.ke
T: 0720 494 937
T: 0725 886 721

SNV

Center of Excellence for Crop Rotation