drier areas of Zimbabwe. Farmers are establishing and managing demonstration plots. Community interest is growing rapidly. But one concern still remains – will farmers invest the labor needed, first for basin preparation and then for weed control (an essential part of the package)? There is an acute shortage of labor in most smallholder communities, not only during the cropping season, but also in the off-season (when family members are away, working in the towns). The project partners believe the problem can be solved – and so do farmers and community leaders who have seen the results – results from more than 300,000 households in Zimbabwe that speaks volumes about the success.

The benefits of conservation agriculture are hugely evident when compared to untreated plots.

About ICRISAT

ICRISAT
Science with a human face

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that does innovative agricultural research and capacity building for sustainable development with a wide array of partners across the globe. ICRISAT's mission is to help empower 644 million poor people to overcome hunger, poverty and a degraded environment in the dry tropics through better agriculture. ICRISAT belongs to the Alliance of Centers of the Consultative Group on International Agricultural Research (CGIAR).

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Conservation Agriculture

Maintains soil nutrients, stops erosion, leads to increased yields

ICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS
Science with a human face

Introduction

It is said that poor soil fertility is a greater constraint to food production in sub-Saharan Africa than drought. Scientists of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) have been researching the problem for years, and have developed simple and successful solutions to the constraints faced by smallholder farmers.

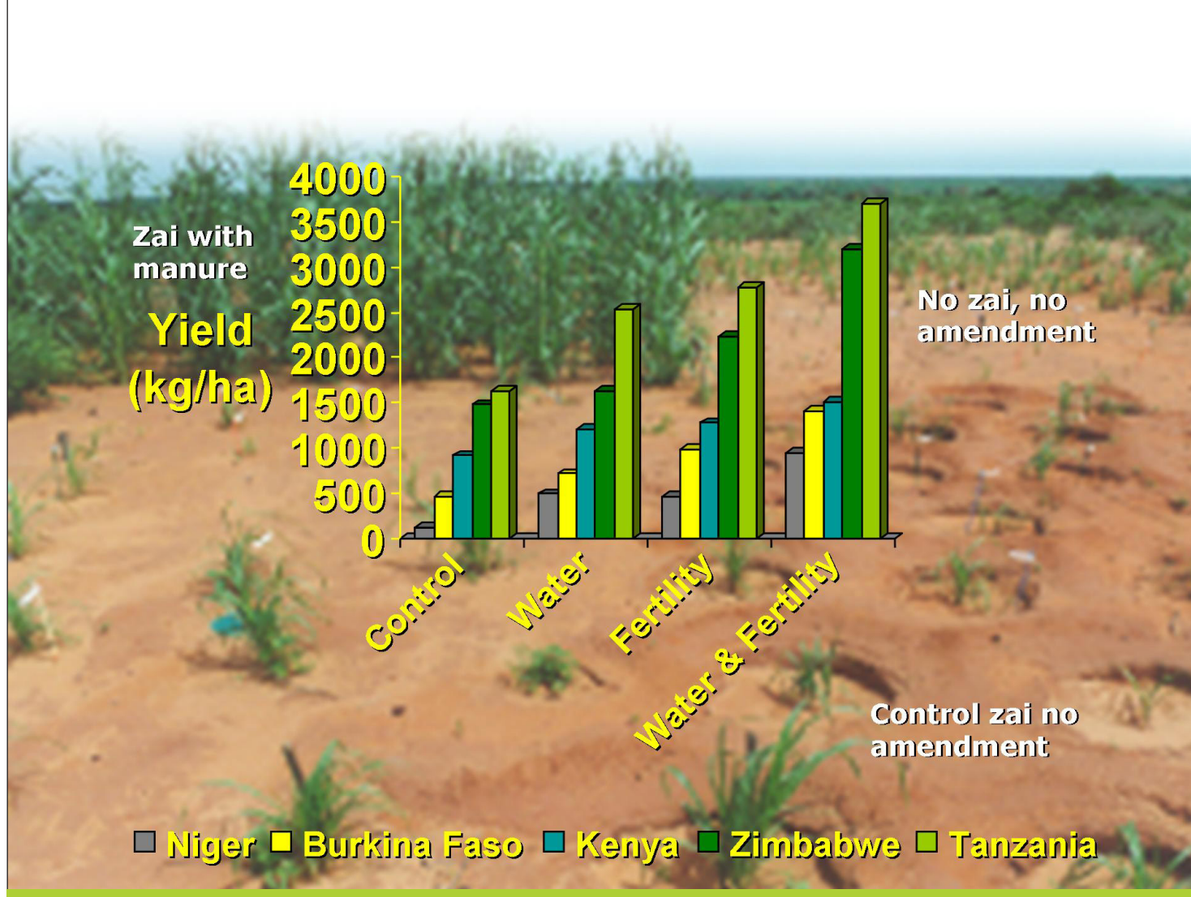
Conservation agriculture sounds like old hat, but it has breathed new life into African smallholder farming. Broadly, it's a suite of land and crop management practices to improve productivity, profitability, and sustainability. Conservation agriculture builds a more integrated and holistic approach onto soil management and soil productivity, fertilizer, organic matter, water management and field preparation. ICRISAT is working with NGO partners in Zimbabwe to promote an easy-to-implement conservation agriculture package, ideally suited to smallholder farmers in drought-prone areas. The program is supported by the Department for International Development (DFID), UK, and is practiced across 48 districts.

Techniques

The central component in the package is the planting basin. Seeds are planted not along the usual furrow, but in small basins – simple pits, (also called zai pits), about 15 cm across and 15 cm deep. These basins can be dug without having to plough the field – remember that the majority of smallholder farmers struggle to plough their fields because they lack draft animals.

The principle is straightforward: rather than spreading nutrients and water uniformly over the field, concentrate them in the basins to maximize yield for a given level of inputs. Basins are prepared during the dry season, when demands on family labor are relatively low. When the rains begin, the basins are soon flooded with water – if you plant at this time, you are ensured of good germination and a healthy crop stand, even if a dry spell follows.

Women preparing the zai pits before the rains.



Additive impacts of water and fertility management to combat declining crop yields.

The planting basin is maintained by other crop/soil management practices:

- Use of crop residues: spreading residues over the field protects against loss of topsoil, and enriches the soil with nutrients.
- Fertilizer microdosing: even small quantities of fertilizer – as little as half a Coke bottle cap-full per basin – can dramatically increase yields, provided you know how. The trick is to concentrate the fertilizer near the plant (eg, in the basins), and apply it at the right time (the 5-6 leaf stage).
- Application of fertilizer: mineral basal and top dressing.
- Manure treatment: manure is 'cured' or partly composted for a few weeks before application to minimize nutrient loss and improve effectiveness.
- Timely weeding: it is essential to weed in both summer and winter.
- Crop rotation: Alternating legumes with cereals ensures the replenishment of soil nutrients.

Impact

Farmers practicing this technology have realized yield advantages exceeding those of conventional practices by between 10 and 100 percent, depending on input levels, the experience of the farm household and seasonal rainfall. A study conducted to better understand the impacts of conservation farming has concluded that this technology contributes to increased yields across all agroecological zones and can thus make a major contribution to household food security.

The basin technology was field-tested and is now being scaled out across several districts in the

Conservation Agriculture