The cheers and challenges of Conservation Agriculture programs

Angela Boss and Stephan Lutz, summarized by ECHO staff

Angela Boss and Stephan Lutz, both working with World Renew, spoke at ECHO's November 2015 International Agriculture Conference about Conservation Agriculture (CA). CA is an ecological, resource-saving approach to farming in which soils are maintained through the application of three main principles: 1) minimum tillage; 2) permanent organic soil cover; and 3) diversification of crop species.

Angela and Stephan emphasized the difference between CA principles (the "why") and practices (the "how"). CA does not include a prescribed set of practices; rather, experimentation and adaptation are encouraged. Some practices for small farmers that are consistent with the principles of CA include: 1) planting into basins and/or permanent ridges; 2) mulching the ground with crop residues and/or green manure/cover crops (gm/cc); and 3) interplanting and/or crop rotation. CA can even include the judicious use of herbicides and fertilizer, and the use of appropriate tools.

The system referred to as Foundations for Farming (FfF) or Farming God's Way (FGW) presents very specific practices to fulfill CA principles, and adds the use of permanent planting stations. Sometimes this system can be a good starting point for small-scale farmers. However, this is not always the case. Angela and Stephan shared several situations in which the introduction of CA has been particularly challenging, for a variety of reasons.

Eastern Zambia

With FfF as the model, CA was introduced in an area of Eastern Zambia characterized by low rainfall, poor soils, and recurring drought. Adoption of the system was poor, with farmers generally having no more than a quarter acre (1/10 of a hectare) of land planted using FfF.

Angela suggested that part of the reason for low adoption might have been the initial "all or nothing" approach. Other constraints included a limited supply of manure; lack of mulch; and a high requirement for labour in the form of hoeing/weeding, especially for women.

Factors that helped to drive adoption included increased yield and soil moisture; availability of CA technologies (e.g. the chakka hoe, a relatively wide and heavy hoe designed by farmers to create planting basins; also the Magoye ripper, used for minimum tillage and helpful for breaking through the hard/plough pan); a supportive policy environment; and heavy promotion by multiple organizations.

Mozambique - Niassa Province

Niassa Province in Mozambique has good rainfall but poor soil fertility. CA was introduced there (via FGW), but with improper spacing/density. As a result, basins flooded. The area has a strong tradition of ridging and intercropping. People fear that mulch will attract termites.

Angela encourages change promoters to emphasize "why" rather than "how" when it comes to CA. In Niassa Province, farmer groups are designing and experimenting on 10 m X 10 m or 20 m X 20 m plots (e.g. one plot with traditional methods, one using CA with traditional seed, and one using CA with improved seed; see Figure 5). They are building on traditional systems and incorporating minimum tillage.

Figure 5. Niassa province in Mosambioque: Traditional maize cultivation (left) and CA maize cultivation (right). *Source: Juvencio Mataria*

Kenya

In Kenya, chronic food insecurity has led to a growing dependence on food aid. Incidences of drought and flooding are occurring with increasing frequency, and 93% of land is degraded (according to an FAO report).

World Renew partners with Anglican Development Services (ADS), the relief and development arm of the Anglican Church of Kenya. World Renew also works through champion farmers.

For lasting change, Stephan commented that the community needs to be empowered, to create an environment in which farmers can succeed with CA. He described the characteristics of an empowered community in which members do the following:

- discuss their issues without fear
- implement what they have learned
- identify, mobilize and use their local resources to the fullest extent
- organize themselves and work together to achieve their own community plans
- confidently speak out against injustices that are encountered
- hold themselves and stakeholders mutually accountable.

Participatory rural appraisal is an important tool used within communities in Kenya to identify the crops that are grown and to prioritize them according to use, yield, taste, marketability and other criteria the community has identified. Where CA is used in Kenya, it often results in a better product and more marketable food crop, which typically translates into more income.

A Few More Principles

A document from the Canadian Foodgrains Bank, "Principles to Guide Conservation Agriculture Programming (http://assets.echocommunity.org/book/PDF/CA-principles-2.0.pdf)," shares principles that include but are not limited to agronomic aspects of CA. The principles include the following:

1. Recognize that CA works better in some contexts than in others
2. Adapt CA to the local context
3. Invest in developing a good project design
4. Invest in project participant selection
5. Pay attention to gender issues
6. Emphasize good staffing
7. Have effective extension/promotion strategies in place
8. Use inputs judiciously

Conclusion

CA has much to offer. Where it is implemented, farmers' crops are more likely to produce a harvest, with improvements in both quantity and quality of yields. These yield gains, as well as improvements to the soil, can be achieved using local resources, with savings in cost (of inputs) and time (through reductions in tillage and weeding).

However, the challenges are real. CA requires behaviour change. Mulch can be extremely difficult to come by, and technical support is often lacking.

Some interventions/introductions compliment the introduction of CA. These include animal husbandry (especially of indigenous poultry, goats, rabbits and bees); water and irrigation; and community participation, ownership and adoption of technology. As an example of community participation, Figure 6 shows a gm/cc decision tree developed in a participatory process in Mozambique to meet needs in one specific context.

Cornell University's CA web page (CA: Global Research and Resources (http://conservationagriculture.mannlib.cornell.edu/pages/aboutca/advantages.html)) summarizes a flexible approach to CA as follows: "Rather than being a fixed technology to be adopted in blueprint-like fashion, CA should be seen as a set of sound agricultural principles and practices that can be applied either individually or together, based on resource availability and other factors. For this reason, farmers are encouraged to experiment with the methods and to evaluate the results for themselves- not just to "adopt" CA technologies."

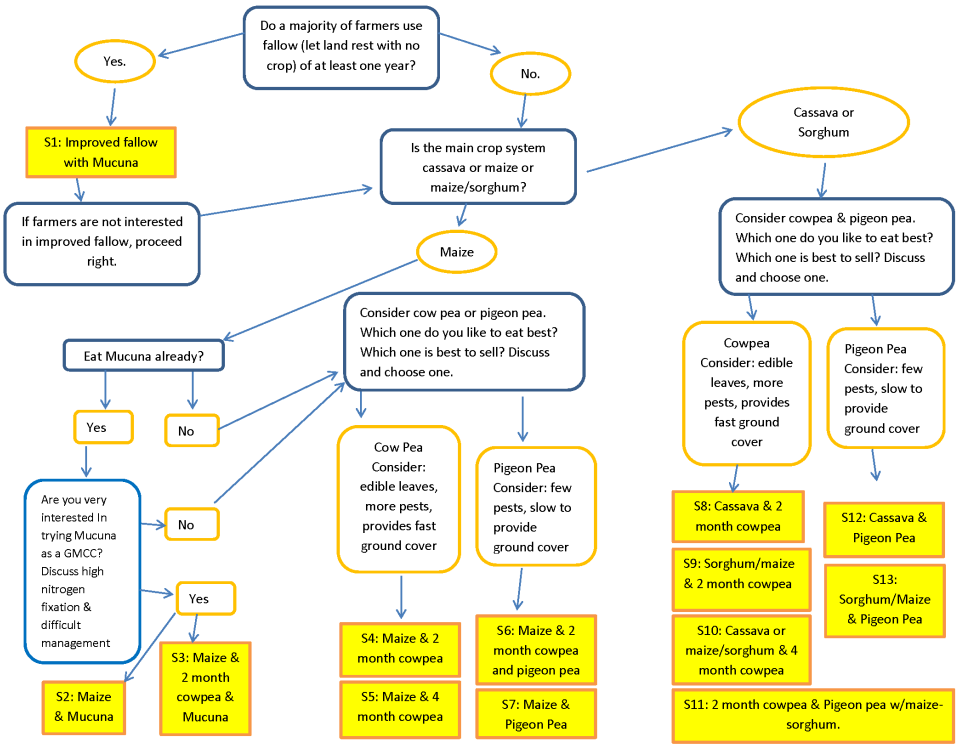

Figure 6. GMCC decision tree developed through a participatory process with farmers to meet the needs of a particular context. This is an example of what can be developed in participation with farmers to help guide decision making. *Source: Angela Boss*

Helpful Resources

Designing and implementing conservation agriculture in sub-Saharan Africa: Environment and climate change

- Teaser (https://www.ifad.org/documents/10180/8ded6d87-615c-46d8-8dba-8f4cae486503) (8 pages)
- How to Do (https://www.ifad.org/documents/10180/d9b6c0af-9a1b-4428-8cf9-cd54876e0fe4) (24 pages)
- Lessons Learned (https://www.ifad.org/documents/10180/8f4cceb3-d99f-4583-bbaa-d376d7937d60) (24 pages)

Conservation Agriculture Facilitators' Guidebook (https://www.echocommunity.org/resources/41fd270a-b6ab-4510-823e-94019d0f15dd)

Conservation Agriculture: A manual for farmers and extension workers in Afric (http://www.act-africa.org/lib.php?com=2&res_id=191)a (the full version of this book is available for purchase on Amazon (https://www.amazon.com/Conservation-Agriculture-farmers-extension-workers/dp/9966970592#reader_9966970592))

Principles to Guide Conservation Agriculture Programming (https://assets.echocommunity.org/book/PDF/CA-principles-2.0.pdf)

Tools helpful for Conservation Agriculture:

- The Chakka hoe, a wide, heavy hoe used to make planting basins. See page 18 in the guide titled "Conservation Farming and Conservation Agriculture Handbook for HOE Farmers in Agro-Ecological Regions I & IIa-Flat Culture (http://www.fsnnetwork.org/sites/default/files/conservation_agriculture__cf_handbook_for_hoe_farmers_zambia.pdf)."
- The Magoye ripper, a tool used for minimum tillage, that helps break through the hard pan (plough pan). See an article titled "The Magoye Ripper: Preliminary Findings on Adoption, Benefits and

Constraints (http://fsg.afre.msu.edu/zambia/GartYearbookdraftarticle_ripper.pdf)" for details on its use in Zambia.

- In Mali, a ripper called the Kassine is use to ease the creation of zai holes.