



Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program

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Trip Report: Zambia

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Purpose of the Trip:

The overall goal of the trip was to implement the organic soil amendments study within the COMACO regions in Lundazi and Mfuwe, and in Mpika.

Specific objectives included:

- (i) investigate under which environmental conditions Conservation Farming (CF) works best, and the reasons why better yields are achieved
- (ii) the types (qualities) of organic amendments best for improving production potential under CF
- (iii) examine the traditional system of farming (*chitemene*) practiced widely in Zambia
- (iv) train the COMACO field staff and farmers in composting and implementation of soil amendment trials

Sites Visited:

- WCS/COMACO Lusaka, Lundazi and Mfuwe offices.
- Agriculture Support Program (ASP-SIDA) in Lusaka and Mpika in Northern Province.
- Farmers' fields throughout the region.

Description of Activities:

To achieve the above goal, COMACO field assistants at the Mfuwe and Lundazi COMACO offices were trained for four days. The aim was to review basic soil science and get a better understanding of Conservation Farming. The training also involved familiarization of the soil experimental trials by visiting several fields and also working out the plan of implementation. The assistants facilitated developing a comprehensive understanding of farming practices in the region and provided groundwork for interacting with the farmers and arranging farmer field days.

The trials were set up in more than 500 fields covering a range of agroecosystems: valley, plateau, and escarpment. The test areas also had different amounts of rainfall, from 500 mm to 1,500 mm annually. Each farm selected had six plots devoted to testing traditional and Conservation Farming soil and crop management practices. This research takes into account not only the three types of landscape but also variables such as soil type and landscape position, both of which affect how much moisture and nutrients are available to crops.

The visits to the field started with farms in Mpika followed by Lundazi and finally Mfuwe. This order was chosen because the rain first starts falling in the higher elevation regions such as Mpika. Farmers in the area were involved in the demonstrations of the field plots. Discussion forums were held with the farmers and field assistants to have a better understanding of farming strategies. For example, why do farmers maintain that Conservation Farming yields are higher than traditional farming, yet often continue with the traditional system? Labor intensity was one of the main reasons farmers cited to have an effect on the choice of how much land to cultivate. Demonstrations and training of the field assistants were done in the field with the farmer present.

Organic amendments for improving production potential were gathered locally. This includes gliricidia leaves (*Gliricidia sepium*) from the Masumba Research Station agroforestry plantation in Mfuwe (Ministry of Agriculture and Cooperatives), cow manure and rice husks (from Lundazi and Mfuwe Trading Centers) for making charcoal (*bio-char*).

Findings and Recommendations:

Conservation Farming (CF) involves a package of several key practices: dry-season land preparation using minimum tillage systems; crop residue retention; seeding and input application in fixed planting stations (pothole farming); and nitrogen-fixing crop rotations. Through crop rotations and buildup of soil organic material, implementation of CF recommendations cut chemical fertilizer use to roughly half of conventional norms. For hand hoe farmers, CF revolves around dry-season preparation of a precise grid of 15,600 permanent planting basins per hectare. This enables farmers to plant with the first rains, when seeds will benefit from the initial nitrogen flush in the soil, improved water infiltration, water retention, and plant root development. It also enables farmers to locate fertilizer and organic material close to the plants, where they will provide greatest benefits. However, more than 80% of farmers did not prepare their lands as recommended by COMACO in June- July because of their involvement with other activities like grass harvesting for thatching, or cotton and rice harvesting during that time.

Although Conservation Farming is currently taught as a single set of practices, the landscapes of the COMACO region (plateau, escarpment and valley) are in diverse agroecological zones. The valley falls in the agroecological zone I with low rainfall (500-700mm pa); and plateau (800-1000) in zone II. Lack of data on rainfall in these regions is a major limitation in the study. Our project is trying to collect those data.

List of Contacts:

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