Does Mulching Make Sense In Semi-Arid Areas?

ECHO Inc.

Thanks to Tony Rinaudo with SIM in Niger and Arnie Schlissel, Administrative Coordinator, IPALAC, in Israel for sharing their recent e-mail correspondence on this interesting topic. Listen in on their conversation.

Arnie wrote, “I read your message about mulching again, and I am in a state of shock because there must be a hidden factor I am not taking into account. Almost every response I get from the scientific community says: a) there is not sufficient biomass is semi-arid Sahel for mulching; b) farmers have higher priority uses for crop residue–primarily animal feed; c) even if farmers see benefits of mulching, they stick to their priorities as above.

"Along comes Tony and says he uses crop residues, sometimes with dramatic results. How can this be? Aren’t you in a low rainfall zone? Don’t your farmers maintain livestock? Are the practices you describe limited to an experimental site? And if not, what was the secret to acceptance by farmers? Where is the catch?”

Tony replied, “It’s important to look at recent history and also look at the context in which the Maradi Integrated Development Program (MIDP) is introducing mulching. The Maradi area (and much of Niger) is experiencing hunger with increasing frequency. Soils are worn out, erosion is very high and people are not only worried about the present, they cannot comprehend where this is all leading. Our program has worked alongside farmers since 1973. We have a good relationship of trust, having been involved in famine relief work on several occasions. There is an assumption that MIDP is there for the people’s good.

"Please note also that despite benefits the majority of farmers do not use mulch. But it is a method that is gaining popularity. It is difficult, if not impossible near the city of Maradi (population approx. 70,000) or near other centers, where millet stalks can be sold, where poor townspeople scavenge even twigs 15cm long and less than 2.5 mm in diameter and where grazing pressure is extreme.

"However, in village situations it is happening, first with non-usable parts such as millet husks and heads which have had the grain removed. In the past the husks were usually burnt on-site and the heads used for cooking fuel. But today farmers are even using the millet stalks. We found that some already knew the benefits of mulching–both on hardpan sites and on sandy sites (water retention, stop soil loss, trap wind blown sand etc.) They did not practice it however because village women

would come looking for fuel and take the stalks they had left. Culturally, it was easier to ignore them than to fight them. Practically, it was better for them to collect the stalks themselves than to have them stolen.

"Over the last 15 years, Farmer Managed Natural Regeneration (FMNR) has been gaining momentum. There are well over 2 million trees out there that weren't there 15 years ago. [Ed: see Tony's article in EDN 58]. One of the spinoffs of FMNR is that many African tree species bear pods which make very good animal fodder. When this work was started much of the area consisted of desert-like, barren plains. There was a severe shortage of organic matter and, yes, food for livestock was very scarce. The trees not only provide fodder; they naturally shed leaves that blow onto the fields. In addition, when branches are harvested, farmers have started putting them on hardpan sites to dry out. This attracts termites that break up hard crusts. They convert the leaves and smaller twigs to rich soil/humus and the branches, which cause turbulence in wind currents, force winds to drop their silt load on the site as well. Many sites, which have been unproductive for 20+ years, have been restored in one year, and give bountiful crops.

"In regions where hardpan formation is common we started to promote the digging of zai holes [Ed: see A-Z p. 133]. This is very effective but extremely hard work. In these regions, using mulches has proven much more popular. The farmers were getting into a tight corner, with some having lost 20-50% of their land to hardpan formation. They believed that it was irreversible. All the time food production was declining. To them I guess, the need for grain outweighed the needs of their livestock. In good and bad years, grain yields on mulch-treated fields were far superior to yields on non-treated fields.

"These farmers now spend hundreds of hours each dry season mulching their fields. They even carry stalks on their heads from distant fields to restore degraded land. "It should be noted that not all fields are mulched each year. There just isn't enough to go round. But the benefits of mulching last several years. Thus, we encourage farmers to work on their worst sites first and move onto other sites sequentially.

Arnie asked, "What about some Acacia species that might be grown as mulch crops?"

Tony replies that "planting trees is good, but in our situation it is an uphill battle. Low survival rates (<30%) are common. It is very, very hard work planting and ensuring survival of trees. Only the truly committed farmer will succeed. They are in a minority here. If there are native species that will regrow if just protected from slashing, this is a much easier way of getting mulch material. I am not talking about treeplanting projects that both fund and enforce planting of trees. These will work, but only for as long as funding is available. I am talking about a popular, voluntary farmers' movement. After 15 years this has not happened here. (Though there is growing interest in acacias for human food-it is hardly a people movement yet.) In any case, it is increasingly difficult to find funds for big tree schemes–they have a poor track record and donors are wary."

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