Use of manure in a field with stone bunds pierreux. (PATECORE)

Use of organic matter (manure and compost) (布基纳法索)

Apport de matière organique (French)

描述

Soils treated with compost or manure produce better yields, because they retain water better and are more fertile.

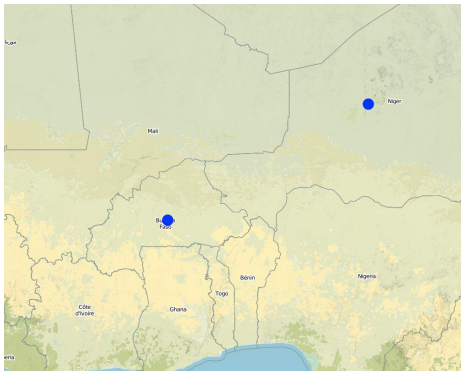
The regular application of manure and/or compost in sufficient quantities makes farming more intensive and reduces the need to bring more land under cultivation. Manure is used on cropland and compost is recommended particularly for market gardening.

Purpose of the Technology: The use of organic matter on cropland has three major effects: it reactivates biological activity, increases soil fertility by providing nutrients and improves soil structure by increasing the amount of organic matter in it. The improved soil structure also increases the infiltration of water into the soil. These effects favour crop growth and increase yields. The denser vegetation and improved soil structure make the land more resistant to water and wind erosion.

Establishment / maintenance activities and inputs: There are two methods for obtaining organic matter for use as a fertiliser: the production of compost and the collection of manure. Manure is collected from improved livestock pens or sheds where livestock is kept on litter or bedding. Compost can be made in the dry season or in the rainy season. Biodegradable matter is mixed with animal waste for rapid decomposition or just with millet, sorghum or other plant stalks for slow decomposition. Both types of compost can be enriched with ash and/or natural phosphate. The biodegradable matter is placed in a pit. In the dry season, it is regularly sprinkled with water until decomposition is complete. It is then spread evenly over the land before sowing or planting.
Unlike compost, manure collected from improved pens or livestock sheds is not completely decomposed, and the decomposition process continues over several years.
The recommended amount varies depending on the type of soil the availability of manure and compost: 6 t/ha every third year (heavy clayey soils), 3t/ha every two years (sandy-clayey soils) or 2t/ha every year (light soils).

Natural / human environment: The use of compost and manure is recommended in conjunction with all other SWC/SPR measures to achieve the maximum benefit from investments in land improvement.

地点



地点: Burkina Faso, Niger, 布基纳法索

分析的技术场所数量:

选定地点的地理参考
- -1.56408, 12.24202
- 8.08182, 17.61167

技术传播: 均匀地分布在一个区域

在永久保护区？:

实施日期: 10-50年前

介绍类型
- ☐ 通过土地使用者的创新
- ☐ 作为传统系统的一部分（> 50 年）
- ☐ 在实验/研究期间
- ☑ 通过项目/外部干预

技术分类

主要目的
- ☑ 改良生产
- ☐ 减少、预防、恢复土地退化
- ☐ 保护生态系统
- ☐ 结合其他技术保护流域/下游区域
- ☐ 保持/提高生物多样性
- ☐ 降低灾害风险
- ☐ 适应气候变化/极端天气及其影响

土地利用

农田
- 一年一作

每年的生长季节数: 1

供水
- ☐ 雨养
- ☐ 混合雨水灌溉

- [ ] 减缓气候变化及其影响
- [ ] 创造有益的经济影响
- [ ] 创造有益的社会影响
- [x] improve fertility

- [ ] 充分灌溉

土地退化相关的目的

- [ ] 防止土地退化
- [x] 减少土地退化
- [x] 修复/恢复严重退化的土地
- [ ] 适应土地退化
- [ ] 不适用

解决的退化问题


土壤水蚀 - Wt：表土流失/地表侵蚀


土壤风蚀 - Et：表土流失


化学性土壤退化 - Cn：肥力下降和有机质含量下降（非侵蚀所致）


生物性退化 - Bq：数量/生物量减少, Bl：土壤寿命损失


水质恶化 - Ha：干旱化

SLM组

- 土壤肥力综合管理

SLM措施


农艺措施 - A2：有机质/土壤肥力

技术图纸

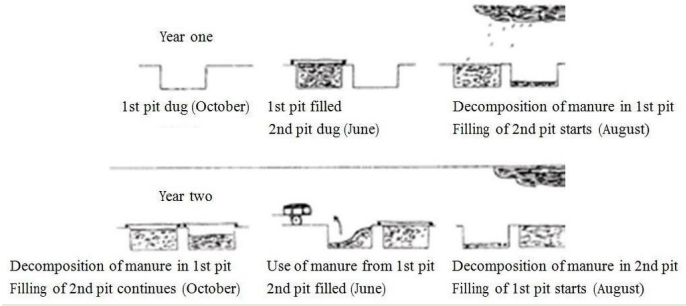
技术规范

Biodegradable matter is mixed with animal waste for rapid decomposition or just with millet, sorghum or other plant stalks for slow decomposition. The biodegradable matter is placed in a pit. In the dry season, it is regularly sprinkled with water until decomposition is complete. It is then spread evenly over the land before sowing or planting.

Technical knowledge required for field staff / advisors: moderate
Technical knowledge required for land users: low

Main technical functions: improvement of ground cover, improvement of surface structure (crusting, sealing), improvement of topsoil structure (compaction), increase in organic matter, increase in nutrient availability (supply, recycling,...), increase of infiltration, increase / maintain water stored in soil, increase of biomass (quantity), promotion of vegetation species and varieties (quality, eg palatable fodder)
Secondary technical functions: water harvesting / increase water supply, sediment retention / trapping, sediment harvesting, reduction in wind speed

Manure / compost / residues
Material/ species: Biodegradable matter, animal waste, plant stalks, ash and/or natural phosphate, manure collected



Author: PASP

技术建立与维护：活动、投入和费用

投入和成本的计算

- 计算的成本为：
- 成本计算使用的货币：**不适用**
- 汇率（换算为美元）：1 美元 = 不适用
- 雇用劳工的每日平均工资成本：不适用

影响成本的最重要因素

Production of compost: • constructing pits or basins • water • equipment (shovel, wheelbarrow, etc.). Use of compost: • transportation to plot by cart (100 kg of manure per donkey cartload) • transportation to plot in head baskets (20 kg of manure per basket) • spreading the compost on the plot (labour).

技术建立活动

n.a.

技术维护活动

1. Biodegradable matter is mixed with animal waste for rapid decomposition or just with millet, sorghum or other plant stalks for slow decomposition (时间/频率: None)
2. The biodegradable matter is placed in a pit. (时间/频率: None)
3. In the dry season, it is regularly sprinkled with water until decomposition is complete (时间/频率: None)
4. It is then spread evenly over the land before sowing or planting. (时间/频率: None)

自然环境

年平均降雨量
- [ ] < 250毫米
- [ ] 251-500毫米
- [x] 501-750毫米
- [x] 751-1,000毫米
- [ ] 1,001-1,500毫米
- [ ] 1,501-2,000毫米
- [ ] 2,001-3,000毫米
- [ ] 3,001-4,000毫米
- [ ] > 4,000毫米

农业气候带
- [ ] 潮湿的
- [ ] 半湿润
- [x] 半干旱
- [ ] 干旱

关于气候的规范
Thermal climate class: subtropics

斜坡
- [ ] 水平（0-2%）
- [x] 缓降（3-5%）
- [x] 平缓（6-10%）
- [ ] 滚坡（11-15%）
- [ ] 崎岖（16-30%）
- [ ] 陡峭（31-60%）
- [ ] 非常陡峭（>60%）

地形
- [ ] 高原/平原
- [ ] 山脊
- [ ] 山坡
- [ ] 山地斜坡
- [x] 麓坡
- [ ] 谷底

海拔
- [ ] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [x] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [ ] 1,501-2,000 m a.s.l.
- [ ] 2,001-2,500 m a.s.l.
- [ ] 2,501-3,000 m a.s.l.
- [ ] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

.....应用的技术
- [ ] 凸形情况
- [ ] 凹陷情况
- [ ] 不相关

土壤深度
- [x] 非常浅（0-20厘米）
- [x] 浅（21-50厘米）
- [ ] 中等深度（51-80厘米）
- [ ] 深（81-120厘米）
- [ ] 非常深（> 120厘米）

土壤质地（表土）
- [ ] 粗粒/轻（砂质）
- [x] 中粒（壤土、粉土）
- [x] 细粒/重质（粘土）

土壤质地（地表以下>20厘米）
- [ ] 粗粒/轻（砂质）
- [ ] 中粒（壤土、粉土）
- [ ] 细粒/重质（粘土）

表土有机质含量
- [ ] 高（>3%）
- [ ] 中（1-3%）
- [ ] 低（<1%）

地下水位
- [ ] 表面上
- [ ] < 5米
- [x] 5-50米
- [ ] > 50米

地表水的可用性
- [ ] 过量
- [ ] 好
- [x] 中等
- [ ] 匮乏/没有

水质（未处理）
- [ ] 良好饮用水
- [ ] 不良饮用水（需要处理）
- [ ] 仅供农业使用（灌溉）
- [ ] 不可用

水质请参考：

盐度是个问题吗？
- [ ] 是
- [ ] 否

洪水发生
- [ ] 是
- [ ] 否

物种多样性
- [ ] 高
- [ ] 中等
- [x] 低

栖息地多样性
- [ ] 高
- [ ] 中等
- [ ] 低

应用该技术的土地使用者的特征

市场定位
- [ ] 生计（自给）
- [ ] 混合（生计/商业）
- [ ] 商业/市场

非农收入
- [ ] 低于全部收入的10%
- [ ] 收入的10-50%
- [ ] > 收入的50%

相对财富水平
- [x] 非常贫瘠
- [x] 贫瘠
- [ ] 平均水平
- [ ] 丰富
- [ ] 非常丰富

机械化水平
- [ ] 手工作业
- [ ] 畜力牵引
- [ ] 机械化/电动

定栖或游牧
- [ ] 定栖的
- [ ] 半游牧的
- [ ] 游牧的

个人或集体
- [ ] 个人/家庭
- [ ] 团体/社区
- [ ] 合作社
- [ ] 员工（公司、政府）

性别
- [ ] 女人
- [x] 男人

年龄
- [ ] 儿童
- [ ] 青年人
- [ ] 中年人
- [ ] 老年人

每户使用面积
- [ ] < 0.5 公顷
- [ ] 0.5-1 公顷
- [ ] 1-2 公顷
- [ ] 2-5公顷
- [ ] 5-15公顷
- [ ] 15-50公顷
- [ ] 50-100公顷
- [ ] 100-500公顷
- [ ] 500-1,000公顷
- [ ] 1,000-10,000公顷
- [ ] > 10,000公顷

规模
- [x] 小规模的
- [ ] 中等规模的
- [ ] 大规模的

土地所有权
- [x] 州
- [ ] 公司
- [ ] 社区/村庄
- [ ] 团体
- [ ] 个人，未命名
- [ ] 个人，有命名

土地使用权
- [ ] 自由进入（无组织）
- [x] 社区（有组织）
- [ ] 租赁
- [ ] 个人

用水权
- [ ] 自由进入（无组织）
- [x] 社区（有组织）
- [ ] 租赁
- [ ] 个人

进入服务和基础设施的通道

健康	贫瘠 ✓	好
教育	贫瘠 ✓	好
技术援助	贫瘠 ✓	好
就业（例如非农）	贫瘠 ✓	好

市场	贫瘠	好
能源	贫瘠	好
道路和交通	贫瘠	好
饮用水和卫生设施	贫瘠	好
金融服务	贫瘠	好

影响

社会经济影响

作物生产	降低	增加
农业投入费用	增加	降低
农业收入	降低	增加
工作量	增加	降低

社会文化影响

食品安全/自给自足	减少	改良
SLM/土地退化知识	减少	改良
livelihood and human well-being	reduced	improved

The use of compost and manure improves yields and output, thereby improving food security. The sale of surplus production also increases household income

生态影响

水的回收/收集（径流、露水、雪等）	减少	改良
地表径流	增加	降低
土壤水分	降低	增加
土壤覆盖层	减少	改良
土壤流失	增加	降低
土壤结壳/密封	增加	减少
养分循环/补给	降低	增加
生物量/地上C	降低	增加
害虫/疾病控制	降低	增加

The use of partially decomposed manure also exposes crops to certain pests and to the risk of being scorched

风速	增加	降低

场外影响

下游洪水（不希望）	增加	减少
下游淤积	增加	降低
风力搬运沉积物	增加	减少

成本效益分析

与技术建立成本相比的效益

短期回报	非常消极	非常积极
长期回报	非常消极	非常积极

与技术维护成本相比的效益

短期回报	非常消极	非常积极
长期回报	非常消极	非常积极

气候变化

渐变气候

年温度 增加	非常不好	非常好

气候有关的极端情况（灾害）

局地暴雨	非常不好	非常好
局地风暴	非常不好	非常好
干旱	非常不好	非常好
比较和缓的（河道）洪水	非常不好	非常好

其他气候相关的后果

缩短生长期	非常不好	非常好

采用和适应

采用该技术的地区内土地使用者的百分比

- 单例/实验
- 1-10%
- 11-50%
- > 50%

在所有采用这种技术的人当中，有多少人在没有获得物质奖励的情况下采用了这种技术?

- 0-10%
- 11-50%
- 51-90%
- 91-100%

最近是否对该技术进行了修改以适应不断变化的条件？

- 是
- 否

什么样的变化条件？

- 气候变化/极端气候
- 不断变化的市场
- 劳动力可用性（例如，由于迁移）

结论和吸取的教训

长处: 土地使用者的观点

长处: 编制者或其他关键资源人员的观点

- reactivates biological activity, increases soil fertility by providing nutrients and improves soil structure by increasing the amount of organic matter in it
- The improved soil structure also increases the infiltration of water into the soil
- The use of compost and manure improves yields and output, thereby improving food security. The sale of surplus production also increases household income.
- The denser vegetation and improved soil structure make the land more resistant to water and wind erosion.

弱点/缺点/风险: 土地使用者的观点如何克服

弱点/缺点/风险: 编制者或其他关键资源人员的观点如何克服

- Manure and compost are often not available in sufficient quantities In spite of these drawbacks, manure is the form of fertilisation most commonly used by farmers, as it requires less work than compost.
- Water is required to moisten compost during the dry season in order to ensure that it is kept at the right temperature for the decomposition of the biomass
- transporting manure and compost poses a major hurdle for poor farmers who do not have a cart. This is a particularly serious problem when plots are at a distance from the village (outfields).
- farmers are deterred from composting in the dry season because a nearby supply of water is needed and it involves a considerable amount of work
- The use of manure on farmland entails some risks and disadvantages. As the manure is only partially decomposed – decomposition starts after the first rains begin – crops do not have enough nitrogen for a time. The use of partially decomposed manure also exposes crops to certain pests and to the risk of being scorched.

参考文献

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WOCAT数据库中的完整描述
https://qcat.wocat.net/zh/wocat/technologies/view/technologies_1220/

链接的SLM数据
不适用

文件编制者

机构
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (GIZ) - 德国
- Misereor - 德国

项目
- Programme d'Appui à l'agriculture Productive (GIZ / PROMAP)

主要参考文献

- Good Practices in Soil and Water Conservation. A contribution to adaptation and farmers´ resilience towards climate change in the Sahel. Published by GIZ in 2012.: http://agriwaterpedia.info/wiki/Main_Page