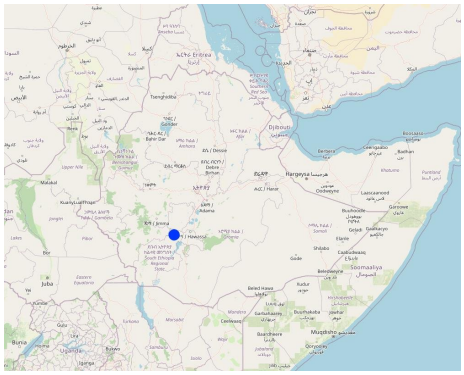
Desmodium as a cover crop in maize field in Kuto Sorfela Kebele of Sodo Zuria district (Abiyot Kebede)

Cover crops ( )

Yeshifan Sebil (in Amharic)

Cover crops are crops grown on bare, fallow farmland or under a main crop to cover and conserve the soil by protecting it from exposure to the sun, wind, and direct impact of rain. It fixes nitrogen (if a legume), improves soil fertility, supplies livestock fodder, and helps manage both pests and weeds.

Cover crops are planted to conserve the soil on bare, fallow farmland or under a main crop. They can be grown on their own or between rows of annual and perennial crops such as maize, coffee, and fruits. The main purposes of growing cover crops are to cover the soil with low-growing vegetation, protect the soil from exposure to sun and rain, suppress weeds, improve soil fertility, supply livestock feed, and manage insect pests. Cover crops may be nitrogen fixing (if legumes), and they make productive use of spaces between crop rows, as well as controlling wind and water erosion. They also have the potential to restore soil fertility and help in climate change adaptation, as well as sequestration of atmospheric carbon above and below soil surface. Furthermore, cover crops can be fed to livestock, helping to bridge periods of shortage of feed when grazing lands are not available – which is an increasing problem because of growing population pressure and expansion of croplands. Land users give huge credit for its role as a pesticide by deterring armyworm and stalk borer when used as a border, and stopping their advance into the maize crop.
Desmodium is an example of a leguminous cover crop, improving soil fertility via fixing atmospheric nitrogen, increasing infiltration and productive use of soil moisture, and catering for livestock via a "cut-and-carry" fodder system. Desmodium is planted between rows of maize crops as well as between grass hedgerows around the farm. For its establishment, access to desmodium seed is essential. Once established, it remains to serve as a permanent source of planting material. Nevertheless, there are some disadvantages of desmodium: seed collection is difficult, it may trap honey bees and it can compete with the crop for light and space if allowed to grow too tall. Thus, efficient management of desmodium is essential.
Nevertheless, as part of an agro-ecological intervention, cover crops like desmodium deliver multiple benefits to resource-poor farmers and can be viewed as an investment in improving soil fertility as well as soil health. Overall, cover crops improve productivity, and help ensure yield stability and contribute to a healthier ecosystem.



: Kuto Sorfela kebele, Sodo Zuria, SNNPR,

:

- 37.69179, 6.90513

: (approx. < 0.1 2 (10))

?:

: 2022

(> 50)

/

Desmodium (cover crop) grown between hedgerows of grass at the periphery of maize plot to serve as push-and-pull technology against insect pects. (GERBA LETA)

✓
✓ ,
✓
/

/

/

✓
✓

/

- : - , Desmodium.

Cropping system:
/sorghum/millet

: 2
? /
? /

✓

✓ /

- Wt:

- Cn:
(
)

- Pc:

SLM

-
-
- (
)

SLM

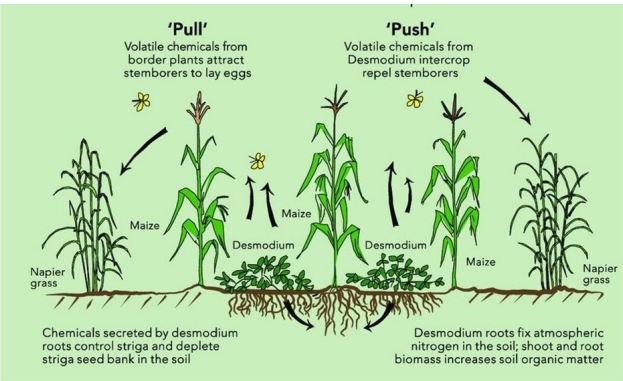
- A2: /

- V2:
2

- S4:

- M2: /

Desmodium and the grass (Brachiaria species) serving as push-pull technology to the pest. Adopted from https://www.linkedin.com/pulse/desmodium-legume-cover-crop-solution-food-insecurity-africa-ndiritu/. In this particular case, Brachiaria play the "pull" function on the periphery of the maize farm.



Author: Africa Sustainable Agriculture Biweekly Newsletter, ICIPE Push Pull Project

- (**Timad = 0.25 ha** = 1 ha = 4 Timad)
- **ETB**
- ( ) 1 USD = 53.6283 ETB
- 250

The prevailing economic crisis and rising of inflation in the country contributes to inputs and other services price uncertainty.

n.a.

1. Land preparation and planting (/ : Before and at planting)
2. Cutting desmodium to use as feed for cattle (/ : During the growing season)
3. Harvesting desmodium biomass and /or seed (/ : At harvest maturity)
4. Access to planting materials, if newly started (/ : Anytime in the offseason)

			(ETB)	(ETB)	%
Land preparation	PDs	4,0	500,0	2000,0	100,0
Cutting for use as feed	PDs	8,0	250,0	2000,0	100,0
Harvesting total biomass and /or seed	PDs	5,0	250,0	1250,0	100,0
Desmodium seed	kg	3,0	120,0	360,0	
				5'610.0	
				104.61	

- [ ] < 250
- [ ] 251-500
- [ ] 501-750
- [ ] 751-1,000
- [x] 1,001-1,500
- [ ] 1,501-2,000
- [ ] 2,001-3,000
- [ ] 3,001-4,000
- [ ] > 4,000

- [ ]
- [x]
- [ ]
- [ ]

Rainfall distribution is uniform except in El Nino cases or recurrent drought experienced in the country and the region.

- [x] (0-2%)
- [ ] (3-5%)
- [ ] (6-10%)
- [ ] (11-15%)
- [ ] (16-30%)
- [ ] (31-60%)
- [ ] (>60%)

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

- [ ] 0-100
- [ ] 101-500
- [ ] 501-1,000
- [ ] 1,001-1,500
- [x] 1,501-2,000
- [ ] 2,001-2,500
- [ ] 2,501-3,000
- [ ] 3,001-4,000

- [ ]
- [ ]
- [x]

> 4,000

(0-20)
(21-50)
(51-80)
(81-120)
(> 120)

(
)
/ ( )
(,)
/ ( )

(> 20
)
/ ( )
(,)
/ ( )

(>3%)
(1-3%)
(<1%)

< 5
5-50
> 50

/

(
)
(
)
( )

?
/

/

SLM

( )
(
/
)
/

10%
10-50%
50%

/

/
/
(,
)

< 0.5
0.5-1
1-2
2-5
5-15
15-50
50-100
100-500
500-1,000
1,000-10,000
> 10,000

(.
)

The land user accessed electricity in rural areas. She also used biogas for energy production.

Increase with proper management of the companion crops on a gradual basis.

Simultaneously increase with good harvest per unit of land

as the integration allows to combat against pests.

Desmodium gives high biomass production. So it supplies more fodder if timely trimmed and supplied to the livestock.

Believed to increase with the application of appropriate management practices.

Desmodium fixes atmospheric nitrogen that improves the fertility of the soil in addition to the production of large biomass that supplies organic matter to the soil.

Slightly decrease as desmodium fix atmospheric nitrogen in the long run and partly complements urea fertilizer.

It demands follow-up and frequently monitors and manages the growth of desmodium to reduce its competition with the main crops.

/

SLM /

As it creates evidence-based learning, it improves land user's SLM knowledge.

High biomass production and the ground covering traits of desmodium assist to slow down surface runoff and promote infiltration deep into the soil.

/

As the companion crop fixes atmospheric nitrogen, it improves nutrient cycling.

/

/

Land users suggested the pesticidal role of desmodium as compared to the hidden contribution to the improvement of soil fertility through its natural traits of fixing atmospheric nitrogen.

It increases biomass production that absorbs carbon above and below the surface of the soil.

(-springs)

Contributes to groundwater recharge by reducing surface runoff.

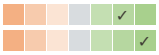
( )

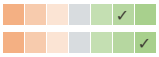
Facts are not available to complement this allegation since the implementation is on smaller areas of farmland.

(

)

It breaks the speed of flood that overflow and damage neighboring areas.





The benefit from desmodium can be made in the short term. Its high biomass production to enrich grass fodder and suppression of weeds and pests are promptly seen as compared to some other SLM technologies.

:

( )

/

- [ ]
- [x] 1-10%
- [ ] 11-50%
- [ ] > 50%

?

- [x] 0-10%
- [ ] 11-50%
- [ ] 51-90%
- [ ] 91-100%

?

- [ ] /
- [x]

?

- [ ] /
- [ ]
- [ ] ( )

:

- The technology improves soil fertility.
- It manages insect pests and stops their advance and negative consequence they might causes on the main crops.
- Supply protein-rich feed to the animals.

:

- Cover crops provide multiple benefits to the family farmers such as the best uses of land between the rows of maize crops.
- It smothers weeds and improves soil fertility and crop productivity which have a positive contribution to the livelihoods of family farmers.
- Cover crops and the practice itself have a beneficial role in agroecology intervention and improvement of the ecosystem functioning.

/ / :

- Fast growing and overwhelming the main crops (competition for space). Applying intensive management such as cutting and feeding to the animals.
- Feeding the animals with fresh harvest is not friendly to the livestock. As it is a protein-rich fodder crop the harvest must be slightly dry and mixed with grass fodder that reduces the adverse effects of either bloating or diarrhea.

/ / :

- Difficulty to manage and harvesting desmodium seeds. 1. Intensify the management of desmodium and reduce harvesting inconvenience on main crop.
  2. Replace desmodium with other farmer's friendly legume species such as Dolichos lablab...as cover crops.
- Hooky nature of the seed that sticks to the clothes. -Wear nylon wears/clothes that reduces the effects of hooky seeds.
  - Produce seeds on separate plots.
- Quick growth and climbing traits that dominate the main crops. - Apply intensive management and use the above-ground parts as fodder for the livestock by adopting cut-and-carry feeding system. Also, needs to keep the green parts under frequent management practices.

GERBA LETA	**Editors** Julia Doldt Kidist Yilma Noel Templer Tabitha Nekesa Ahmadou Gaye Siagbé Golli	William Critchley Rima Mekdaschi Studer Sally Bunning

: 26 2023 : 22 2024

Fanaye Falaha -

https://qcat.wocat.net/km/wocat/technologies/view/technologies_6628/

SLM
Approaches: Integrated Soil Fertility Management (ISFM) https://qcat.wocat.net/km/wocat/approaches/view/approaches_6732/

- Alliance Bioversity and International Center for Tropical Agriculture (Alliance Bioversity-CIAT) -
- Soil protection and rehabilitation for food security (ProSo(i)l)

- Cover Crops for Sustainable Crop Rotations. Clark, Andy. 2015: https://www.sare.org/resources/cover-crops/
- Greenleaf desmodium. A Fact sheet index describing about the cover crop: https://keys.lucidcentral.org/keys/v3/pastures/Html/Greenleaf_desmodium.htm