



**Prospects of sustainable food security in tribal areas
with improvement in soil health by adopting
practices of summer green gram cultivation**

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Soil Health in Tribal Areas

- The tribal farmers are dependent on agriculture having very small piece of land (0.2-0.4 ha) – small & marginal farmers.
- The topography of agriculture fields is undulated located at the terrain of sloppy lands exposed to heavy spells of rainfalls, resulting in soil erosion.
- The soil quality and texture is deteriorating as to practising exhaustive cropping patterns like cereals after cereals and also faulty imbalanced application of fertilizers.
- Soil organic carbon content (0.3%) is also depleting due to improper farming practices and low microbial activities.



Measures for Improving Soil Health



Farmyard Manure



Compost



Jeevamrut



Green Manure

Crops like legumes are preferred over manure in tribal areas as leguminous crops provide not only the nutrients but the produce as well in a short time, with no cost involved.

- Legume crops can fix nitrogen from the air, and flourish on nitrogen- deficient soils with help of rhizobium bacteria.
- Has capability to supply most of its personal nitrogen wants and can provide up to 90% of its nitrogen, when inoculated with Rhizobia bacteria.
- Agricultural science indicates that inclusion of one leguminous crop in a crop rotation is an effective tool for improving soil health.

Role of Leguminous Crops

- Grant a low cost approach of fixing nitrogen in the soil (increasing bacterial nodulation) and increases per unit crop yields.
- Helps in improving soil structure and fertility by adding soil natural matter, improving soil porosity, recycling of nutrients, increasing soil microbial activities and decreasing soil pH.
- **Supplementary roles** – supplying protein rich produce (help in improving nutrition status), quality fodder for grazing animals and increasing economic conditions of farmers by reducing cost of cultivation.

Cultivation of Green Gram in Summer Season



- Summer season is favorable for green gram cultivation as per agro-climatic conditions of tribal areas of Western India.
- It can be done successfully using limited resources.
- Administrative actions required for cultivation in summer season: -
 - *Ensure supply of irrigation water to crops available in ponds, tanks, canals and rivers.*
 - *Management of grazing animals*
 - *Provision of quality seeds*
 - *Technical know-how*

Green Gram in Summer - *Captivating for Tribal Farmers*

- Improvement in physical condition and fertility of soil by adopting leguminous in crop rotation.
- Increase in crop intensity by taking three crops (Kharif, Rabi & Summer) in a year.
- Provides sustainable agro-ecosystem.
- Increases income of the marginalized farmers.
- Helpful in addressing malnutrition problem.
- Farmers can be prevented from migration cycle.

Pilot of Green Gram in Summer Season

- A pilot of "summer green gram" cultivation conducted in the year 2016-17 by Vaagdhara in collaboration with the Tribal Area Development Department, Rajasthan State.
- Supported 1000 women farmers of the tribal area of Banswara district with seeds and technical know-how.



Key Results

1. Summer green gram cultivation helped in **seed germination, plant growth** and **yield of next *kharif* crops** like maize and paddy.
2. It worked as cover crop and **help retained moisture content** in the soil; with easy ploughing.
3. Experiment played an important role in **improving cropping system** of the area.

Subsidiary Results

4. About 1-1.5 quintals of summer green gram production by each woman in summer season.
5. Increase in the family income of the women of each group (approx. 100\$-110\$ to in 70-75 days crop)
6. Availability of green gram for household consumption increased from 3-4 months to 12 months.
7. Cultivation of green gram also provided fodder for animals.

Follow up action

- ✓ Considering the positive results of the initiative by Vaagdhara, regular cultivation of green gram in summer season is being done in Banswara in an organised way.
- ✓ The sowing area has now increased up to 3000 hectare which was nominal earlier.

Conclusion

- A low cost effort in collaboration with the community and the government, which has yielded very effective results.
- Cultivation of “Green Gram” in summers can provide a multi-dimensional result to the farmers.
- Cultivation of green gram in summer season helps in:-
 - *sustaining food security,*
 - *supplement nutritional requirements of the family,*
 - *improve livelihood,*
 - *addressing farmers’ migration,*
 - ***more importantly improve soil health.***
- Green Gram cultivation plays an important role in strengthening the family farming system and sustainability.



Thank you !



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