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Self Introduction

- Started farming in 1998
- PUC (Discontinued)...
- Inspired by Fukuoka
- Started natural farming from 2000
- Paddy in 15 acres, horticulture in 5 acres
- Paddy, green gram, arecanut, banana, turmeric, ginger, black gram, mango, coconut are my crops
- No tillage, weeding, manures, bio-pesticides
- Over 100 green manures used along, before and after the crops
- Solutions through green manures only
- Getting above average yield of my place
- Mine is green culture instead of usual clean culture



Clean V/S Green culture

Clean

- Need Machinery
- Labor oriented
- Manures/microbial mixtures needed
- Weeds emerge again after cultivation
- Pest-fungus defends to the crops for food
- Soil erosion
- Loss of moisture
- No food chain/negative action
- Moreover its an do everything culture



Green

- No need of much time, money and hard work
- All we need is to accept, feel, love & live with the green
- Fulfills need of all creatures
- Solutions for farm and crop demands
- Dream, apply thoughts & green will deliver
- Mind preparation needed to change clean into green culture



Legume logic

- This is legume culture for sustainable agriculture
- Welcome to the world of legumes and you are entering to the text of free biological nitrogen fixing factory
- One hectare of atmosphere contains 75,000 to 80,000 tons of nitrogen
- Almost 80% of air contains nitrogen
- Nitrogen is the first, must nutrient required in large quantity for plants.
- Rhizobium bacteria's fix free of cost biological nitrogen
- Over 550 genera, 12,000 species in the world
- Annuals, Bi-annuals and perennials
- Herbs, shrubs, twines, creepers, bush, trees
- Plants for all seasons and zonal conditions.
- Apart from BNF, some they provide, food, fodder, timber, fuel wood, natural dyes, medicinal, wind breaker, live fence, pest repellents, trap plants, highly toxic, fire resistant, biomass, oil seeds, slightly toxic, nematicidal properties, fibers, erosion control, gum, alkaline land reclamation



Index of our Soil

- **WEEDS** are the index of our soil
- Diversity and biomass of weeds shows the richness of our soil
- Clean culture destroys diversity & results in hardy perennial grasses
- One or two varieties of mono-cot weeds are perennial grasses doesn't enrich the soil faster are increase the crop yield.
- Destroying the weeds like grasses is impossible, job of non-sense also positively harm full
- Mixture of species covers the soil completely, annuals come to control in 2-3 years
Perennials come to control in 3-4 years
- Diversity helps the soil to work for itself



Roots till the soil

- Vegetal macro-organisms of the soil
- Penetrate hardened layers deeper
- Some tree roots as deep as above the ground
- 60 m deeper roots observed
- Roots have much greater volume than the aerial parts.
- Tap roots pump up the nutrients from sub soil
- Roots get decompose by leaving organic matter
- Passage of roots helps flow of air and water
- Tuber crops like,
Arrow root, tapioca, sweet potato, elephant foot yam,
weed carrot, arum and others make big holes in the soil.
- Field mice dig tunnels in a roller coaster way like no
other man-made machines can do.
- Cultivation is to remove the weeds and to aerate the
soil, cover crops do the purpose.



MoNOcultures in mind

- Vigorous, huge bio mass producing perennial creepers to be avoided in the farm, eg., Pueraria, Mucuna bracteata, Mimosa invisa and others
- They suppress other plants and monocrop will be established.
- Once settled its hard to remove
- No food for chain
- Its better to avoid those perennial creepers
- Once get established its hard to remove from the farm so it is better to avoid those perennial creepers.



Diversity hits our soil

- Apart from BNF through legumes,
 - Gini grasses hosts VAM fungus
 - Niger, cockscomb are potash rich
- Eupatorium carries boron
- Each and every plant carries different nutrients and medicinal values of their own
- Hosts all the creatures
- Food chain
- Suppress hardy perennial grasses
- Micro climate
- Plants send the roots at various depths
- Humus / less water requirement
- Variety for the pests and fungus



Mulching with our weeds

- Along roadsides, waste lands, river-poolsides, forests
- Right mixture of monocot and dicot herbs, creepers, bushy and tree varieties will find
- During Nov-Feb collect the available seeds
- For new farms, collect from the open areas
- For old farms, collect from that percentage of shade as in your farm
- Weeds like cassias, croton, indigos, desmodium, sesbanias & Wild varieties like mung, black gram, horse gram, cluster bean, lab lab are useful for mulching.



Dressing up our garden

- To broadcast the seeds collected during in the month of march
- Creepers to be avoided in the new farms
- Curcubits, velvet beans, lab lab, fodder cowpea, sweet potato can be grown in farms with more shade and to suppress the hardy grasses
- Seed brought by pests, birds, animals has very good germination and vigor in growth than compare to our broadcasted seeds
- If we provide some food they bring a lot for our farm
- Some hard coated seeds continue to germinate in the next season
- Bamboo is the poor man's teak, fastest growing grass in the world.
4-5 grooves/acre helps to maintain ideal micro climate by regulating the temperatures in hot sunny days
- Gini grass settles well in the partial shades of the farm and host plant for vam fungus.
- Sweet potato, tapioca, calliandra, gliricedias and others can be grown in the snail problem areas.



Catch plants

- Plants like, Caster, hibiscus, sun hemp, lab lab, velvet beans, indigo, lantana, sorghum, cassias just to say few have trap-catch-host ability, controls-repels pests and some have nematicidal properties.



Alley Cropping

- This is like first Floor in live mulching.
- Fast growing trees, shrubs like, Gliricedias, ethrina species, subabul, calliandra, Sesbania species like grandiflora, farmosa, sesban, egyptica are some among over 300 varieties
- Sown in the alleys between the rows as continues fallow in a east-west direction.
- Grows 15-20 feet in 2 years, pruned at a height of 3 feet in every early monsoon every year.
- It helps the creepers to climb them
- Produce more biomass in the same space.
- Acts as a wind breaker .
- Sun scorching of the plants will be avoided.



Sun scorching

- In between month of November to February.
- Starts with eastwards and ends up with westward winds.
- Only south western parts of the plant will be damaged
- While earth is nearer to the sun it loses the moisture in these days and eastward dry wind lifts the remaining moisture so the real stress period begins in this period.
- Tall trees in south and west borders, alley cropping will avoid loss of moisture.
- Some climbers like velvet beans, lablab, abrus will avoid sun scorching by covering plants stem with their plenty of leaves.
- In this period water requirement is more than that of in summer.



Green guard for Animals

- Some crops served as a live repellents to cattle and wild animals.
- Leaves yielding milky sap, having disgusting and bitter taste like Niger, Sesbanias, Gliricedia, Ipomea can be grown.
- Sunhemp seeds and pods are toxic to cattle's
- *Mucuna bracteata*, some wild lablab species which animals wont like to eat.
- *Mimosa invisa* highly toxic that can kill the sheep in few hours and cattle's in a day or two.
- Live fencing with fast growing shrubs and trees.
- Live fencing with thorny species
- Every plant has its own characters & we must make use of them



Live V/S Straw mulching

▪ Straw (dead Mulching)

- Useful in raised bed (aerobic) techniques
- As a soil cover
- Stops erosion
- Controls weeds
- Retain moisture
- Shade for microbes
- Some nutrients from the straw to soil.



▪ Live mulching

- Apart from straw mulch uses
 - Live mulching fixes BNF
 - Host plants for the microbes
 - Roots till the soil
 - Aeration
 - Catch plants
- And many more...



Foot prints

- Leave the plants to produce seeds in beginning
- Diversity develops balance eco system and none creature get dominated here
- Forest kind of appearance makes man to stand out side
- Path ways and every alternate line to be cleaned only few days before harvest
- Remaining lines left soil cover for seed production
- Forest gardens (silvi horticulture) fulfill our needs than that of well dressed, neat, clean, and lawn cultured gardens.



Gliricedia

- In Greek
Gliri= Rats cedia=kills
- On the bunds of paddy fields only in a east west direction
- Shade will fall on paddy in north-south direction
- As a live fence
- As a green manure
- Activity of the field mice and crabs is very less in and around the root zone of gliricedia.



Pre-Rice Green Manuring

- Before Paddy
- 45-60 days standing crop.
- Incorporated during flowering
- Sun Hemp for rainfed areas with bullock users.
- Diancha for water logging and heavy rain fall areas.
- Mung, black gram, fodder cowpea, horse gram can be grown
- Niger and cocks comb as potash rich green manures.



Post-Rice Green Manuring

- After paddy
- Green manure grown along with the summer crops like Mung, black gram, cowpea, sesame etc.,
- 6-7 months standing
- Diancha grow 14 feet, sun hemp up to 10 feet but tractors needed for incorporation.
- Monocots, dicots , spices, oil seeds, millets all mixed can be grown along with the summer semi irrigated crops
- Road side weeds like indigos, crotalaria straita, cassias are found to be the best.
- One post rice = 3 times of pre rice green manuring
- In 2- 3 years any degraded soils can be conditioned.
- One post rice can fill 4 inches of soil with organic matter.
- This is the easiest, fastest, cheapest way to enrich the soil which is only possible for the paddy growers only



U Dream green will deliver

- Fertilizer
- Pests-Fungus
- Weed
- Cultivation
- Water
- Aeration
- Food
- Micro climate
- Humus
- Erosion
- Fencing
- Fire
- Wind
- Sun scorching
- Snails
- Alkalinity
- Rats-crabs & more



Feel all your senses

- Cover crops always should feed our home needs , food for birds and animals
- Income must bear the expenses of the farm
- It should minimize the maintenance cost, labour and time.
- Target to get main crop with least maintenance, labour and time
- Entering into an **Ideal farm** we should always feel,
conditioned air
aroma of soil, flowers , fruits
colorful creatures
varieties of seeds, vegetables, fruits to taste
noise of bees, pest, birds, animals, as in the forest



tak tak --- Zeakh h Zeakh.....

In one sentence

“U should feel all your senses”



Some leguminous species

- Calliandra, centrosema, crotalaris, desmodium, dolichos lab lab, gliricedia, indigofera, mucuna utilis (velvet bean), phaseolus, sesbanias (over 300 varieties), Stylosanthes, tephrosia, vignas just to say a few
- Flame of forest, Dalbergia sissoo, Dalbergia latifolia (Rose wood), Red sandal wood, Indian kino, pongamia pinnata are some among leguminous trees.
- Clitoria ternata, liquorice root, abrus pruriens, mucuna pruriens, pueraria tuberosa, babchi, sesbania grandiflora, desmodium gangetium, psuedarthrea viscida, desmodium motorum, desmodium trifolium, indigofera tinctoria are some of the leguminous medicinal varieties.
- Fenugreek one among the spices
- Velvet beans and sunhemp are found to be the most important tools in green manuring.

Seed sources

IGFRI

Indian grassland and fodder research institute
Gwalior road
Jhansi-284 003. U.P.

Regional stations at near Dharwad(Kar), Aviknagar(Raj), Palampur(Hp), Srinagar(J&K).

BAIF

Dr.Manibhai desai nagar,
National Highway No.4,warze,
Pune-411029,Maharashtra.

National research centre for weed sciences

Maharajpur
Adhartal
Jabalpur-482 004,M.P.

Rubber board,
Kottayam-686 002.
Kerala state.

Kerala live stock development board
Seed unit, Dhoni P.O,
Palakkad-678 009
kerala



My Address....

- **Best time to visit my farm**

Horticulture

July-August

Paddy

Green manure - June-July

Paddy crop - Nov-Dec

Summertime with green manures

Mar – Apr



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