

Legume Logic and Green Manuring Green manuring an easiest, fastest, and cheapest way for rice culture.

B.N. NANDEESH

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Author's Background

I am an organic farmer, writer, Director for an organic producer co, conducted on farm workshops, presentations at international seminars, activist, as an organic farmer delegate to 17th IFOAM OWC and to BioFach 2012 Germany.

Summary

Brown plant hopper pests showed me the way into organic farming. Started this practices with logic of legumes in 2001, just to cut down the 45 percent expenses of my paddy on fertilizers, pesticides and herbicides. Later as realized each and every plant carries it's own nutrients, medicinal values and characters. Plants like millets, oil seeds, spices, di-cots, monocots and weeds all being used as a green manure. For all my agriculture problems and crop demands, looked for the answers only through green manures and found almost. Any kind of prepared manure, bio pesticides, fungicides are not being used. Past from 15 years, still growing paddy in 15 acres with over 45 percent less inputs, 20 – 25 quintals of paddy yield per acre and my profit has grown 10 times in last 10 years. Sustainable organic rice production needs to cut down in unnecessary regular work, labour, input and time. Green manuring with legumes weeds, millets, oilseeds, spices, pulses is the best practices.

Background

Legume logic is a simple word; it is the culture of using legumes for sustainable agriculture. Herbs, shrubs, creepers, bushes and trees which are annuals, bi annuals and also perennials being used according to land, crop, season, crop demands & problems. Apart from biological nitrogen fixation they also provide food, fodder, fuel wood, fibre, natural dyes, medicines, and acts as trap plants. Legumes as live fences act as wind breakers, pest repellents, biomass, erosion control and alkaline land reclamation. Some legumes can be slightly and highly toxic ones to the animals. The unique characters of the plants can be used according to the need and found that in addition to legumes every plant has its contribution to enriching the soil. Like legumes fix nitrogen, other plants have different minerals and also act as host for various soil micro organisms thereby enriching it. Cultivation using the simple logic of legumes and green manuring to sustain paddy cultivation inexpensively and without external inputs and have been experiencing high yields.

Main chapter

Started farming in 1998 with one goal to show high yield results to my family. But the 'brown plant hopper' pests that attacked paddy fields in Karnataka in 2000 affected my paddy crop as well and my yields were reduced to 50%, felt very dejected and felt like a total failure in front of my family. Fed up with the lot of unnecessary work and expensive inputs required for conventional paddy farming. All this prompted to go in search of alternative methods in farming. Realized low external input is the key for sustainability and began transition by spending a whole night making a list of expenses that incurred in 15 acres paddy during that season. List said that 45 percent of the expenses were for fertilizers, pesticides, herbicides, so decided to cut out these white elephants. Then went in search of sources for fertilizers, tried to understand about pests, root causes for diseases, and sought a permanent solutions. During this search, came across logic of legumes.

Started changing paddy practices using this understanding of the simple logic of legumes and green manuring to sustain my paddy cultivation inexpensively and without external inputs and have been experiencing high yields. Paddy yield of 20-25 quintals per acre were recored depending on the verity used. Any kind of prepared manure, bio pesticides, fungicides are not being used, only 5-7 kg of paddy seeds per acre used in nursery to raise the seedlings. Seedlings of 13-18 days used for manual transplanting. Now my paddy income rose to 10 times in the last 10 years.

Pre –Rice green manuring

Grown green manures before paddy for 45 -60 days & practice of incorporating them during flowering called Pre–Rice green manuring. 15-20 kgs of Sunhemp seeds per acre as it's a drought tolerance variety useful for rain fed areas and 12-15 kgs of Daincha a Sesbania variety good for water logging areas. These two are the popular legumes being used. 10-12 kgs of any one or in mix ed green gram, black gram, fodder cowpea, horse gram were used. Apart from legumes, 4-5 kgs of niger as potash rich manures, 4kgs of horse gram creeper were used or any climbers along with any of the above green manures acts as a first floor by climbing them, that doubles the green production & BNF. Any fast growing leguminous & non leguminous together in 1:2 ratio is ideal for pre-rice green manuring.

Post-rice green manuring : Growing green manures after harvesting kharif paddy, standing for 6-7 months until puddling the soil for kharif paddy called post rice green manuring. Monocots, dicots, oil seeds, millets, spices all mixed together grown for green manuring. Road side weeds like indigos, crotalarias and cassias were used and found to be the best for this practice. Daincha grows up to 14 feet and sunhemp up to 8 feet and the root zone of them will be in two feet radius. During monsoon season again broadcasted 4 kgs of horse gram creeper; they occupied the remaining space by climbing the green manures standing in the field. The perennial hardy grasses in the field started withering due to

lack of sunlight. Produced over 10 tons of huge biomass with 3-4 inches of the soil filled with organic matter when incorporated the green manures in this practice. This is three times more effective than Pre-rice green manuring. In 2-3 years degraded soils can be improved to fertile soil. This is the easiest, fastest, cheapest source to enrich our soil, which is only possible for the paddy growers. It is wise to puddle the soil with green manures than the empty lands.

Zero tillage: First, flooded the field with water then broadcast the seeds, continued the flooding for 24-36 hours, depending on the soil, weather to germinate the seeds and then drains out the water so that the roots can enter the smooth, puffy, moist layer of soil easily. The green manure seeds established well even in dry & harsh climates of november february. Broadcasted a little more than the usual requirement of the seeds, seed costs less than the tillage.

Green Manuring along with summer crops: Broadcasted 5 to 7 kgs of fox gram in the standing paddy crop at the time of final watering. It is a fast growing, semi aquatic plant and thrives well in these conditions. This is particularly useful during summer crop as it gets enough time to grow as green manure as well as fodder. Fast growing ones like daincha, sunhemp avoided along with semi irrigated summer crops like green gram, black gram, cowpea, horse gram, jowar etc., these crops being harvested in 3 months and left the green manures to grow maximum until we puddle the soil.

Glyricidia and Adulsa : Grown glyricidia and adulsa on the bunds of paddy fields as a live fence, wind breaker and as a green manure. Both are not eaten by animals. In Greek Gliiri means rats, cedia means kills, so the activity of field mice is very less in and around the root zone of Glyricidia. Adulsa forms scum after incorporation and helps in checking germination of aquatic weeds in the paddy fields.

Green manure incorporation: Used 15-20 kgs of sunhemp per acre as a pre-paddy green manure is the easiest way to puddle the field. This is very useful especially for bullock users and very easiest, cheapest way to puddle the soil.

Seeds for change: Seeds produced along with vegetables in raised beds, alleys, along with dry land crops, and also separately as a crop. Collected weed seeds from the besides roads, ponds, wastelands and forests, a lot of cassias, crotalarias and indigo seeds freely available.

Sheep folding: During November to February will result in a lot of seeds in nature, as they leave a lot of green manure seeds along with their dung. Those seeds are properly treated as well as coated safely by the sheep's dung. They have a very good germination rate and show vigor in growth. They germinate and grow when they receive enough moisture either through rains or when we flood the field with water. This is a simple process, easy and cheap as well.

Core messages and conclusions

Uses of green manure plants

- Free biological nitrogen fixation
- Every plant hosts microbes, carries nutrients of their own, has medicinal properties and also their different characters used according to our need
- Acts as live fence
- Niger in the border keeps the cattle away
- Gliricedia as live fence checks the activity of field mice and Adulsa in reducing aquatic weeds
- Perennial grasses reduced to minimum due to lack of sunlight and balanced mixture of green manures reduces aquatic weeds
- Puddling become easy
- No machines needed to puddle the soil
- Over 10 tons of huge biomass per acre can be produced
- Added humus saves the water
- Seedlings rise earlier and it reduces problems in seedling numbers, depth & wider spacing with manual transplanters
- Saves fertilizers, pesticides & fungicides
- Cheapest, easiest, fastest way to enrich soil

Sustainable organic rice production needs to cut down in unnecessary regular work, labour, input and time. Green manuring with legumes weeds, millets, oilseeds, spices, pulses is the best practices to overcome with the crop demands and agricultural problems