

Legume Logic & Green Manuring!

Nandeesh Basavanagowda Nagabhushana

I began 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%. I felt very dejected and felt like a total failure in front of my family. I was also fed up with the unnecessary work and expensive inputs required for conventional paddy farming. All this prompted me to go in search of alternative methods in farming. I realized low external input is the key for sustainability and I began my transition by spending a whole night making a list of expenses that I incurred in 15 acres for my paddy during that season. List said that 45% of the expenses were for fertilizers, pesticides, herbicides, so I decided to cut out these white elephants. Then I went in search of sources for fertilizers, tried to understand about pests, root causes for diseases, and sought a permanent solutions. During this search, I came across logic of legumes.

Legume logic: Welcome to the world of legumes, it is the culture of using legumes for sustainable agriculture. Herbs, shrubs, creepers, bushes and trees which are annuals, bi annuals & also perennials being used according to land, crop, season, crop demands & problems. Apart from biological nitrogen fixation they also provide food, fodder, fuel wood, fiber, 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 used according to the need

Green Manure: After discovering legume logic I continued my explorations 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 microbes. I began changing my paddy practices using this understanding. I used the simple logic of legumes and green manuring to sustain my paddy cultivation inexpensively and without external inputs and have been experiencing high yields. I get yields of 20-25 quintals of paddy per acre depending on the variety 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. My income rose to 10 times in the last 10 years.

Pre –Rice green manuring: Growing 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, like green gram, black gram, fodder cowpea, horse gram can be used. Apart from legumes, 4-5 kgs of Niger as potash rich manures, 4kgs of horse gram creeper 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 khariff paddy, standing for 6-7 months until puddling the soil for khariff paddy called post rice green manuring. Monocots, dicots, oil seeds, millets, spices all mixed together grown for green manuring. Road side weeds like indigos, crotalaris and cassias are found to be the best for this practice. Daincha grows upto 14 feet and sun hemp to 8 feet and the root zone of them will be in two feet radius. During monsoon again we broadcast 4 kgs of horse gram creeper; they will occupy the remaining space by climbing the green manures standing in the field. The perennial hardy grasses in the field start withering due to lack of sunlight. , over 10 tons of huge biomass produced, 3-4 inches of the soil will filled with organic matter when we 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 conditioned. 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, we flood the field with water then broadcast the seeds, continue flooding for 24-36 hours, depending on the soil, weather to germinate the seeds and then drain the water so that the roots can enter the smooth, puffy, moist layer of soil easily. The green manure seeds get established well even in dry & harsh climates of Nov – Feb as well. We broadcast a little more than the usual requirement of the seeds. The seeds cost less than tillage.

Green Manuring along with summer crops: 5 to 7 kgs of fox gram broadcasted 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 & we leave the green manures to grow maximum until we puddle the soil.

Gliricedia & 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 Gliri means rats, cedia means kills, so the activity of field mice is very less in and around the root zone of Gliricedia. Adulsa forms scum after incorporation and helps in checking germination of aquatic weeds in the paddy fields.

Green manure incorporation: 15-20 kgs of Sun hemp 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. We also collect the seeds from the besides roads, ponds, wastelands and forests, a lot of cassias, crotalaris 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.