

Innovations in Agriculture developed by

Mr. SundaraRaman

Mr. Sundara Raman (73) is a farmer in Sathyamangalam town in Erode District. He studied Diploma in Electrical Engineering and he did not go for job and looks after farming due to his family situation. His family owns about 12 acres of garden land irrigated through two open wells . He is one of very active advisors on organic farming techniques in Tamil Nadu and there are many followers for him in Tamil Nadu and other states.

He recently installed drip irrigation system in order to overcome the problem of frequent power cut and labour availability/shortage he faced nowadays. He has been motivated to find out green solution when he realised that external chemical inputs are not only costlier but also harmful to soil and environment. Over the last 20 years he experimented alternative ways of manuring , pest control and standardized them . By seeing the success he also motivated thousands of farmers in Tamil Nadu and neighbouring states to adopt alternative agricultural practices which are cost effective and also increase the profit from farming he claims.

i). Using Bio gas for fumigation of turmeric storage pests

For the last 25 years he has been using bio gas of 3.5 Cu M (350 cubic feet) . It is a khadi type model with movable drum and it is fed with cow dug slurry daily. He is always keeping 5 – 6 cattle in his farm. He is taking the bio gas through an extra outlet system into a room where turmeric is stored in gunny bags. The gas pipe is passed through silicagel system(usually existing in electricity board) to absorb moisture in the bio gas. The dried bio gas is allowed to the storage unit of turmeric which is inturn covered through tarpauline sheet. It is allowed to release methane gas for about half an hour. It is released twice in a month for half an hour . This method is very effective and the turmeric is free from storage pests. So far he has released gas for 22 times and he claims that it is cost effective method of protecting turmeric rhizomes from pest infestation during storage period.

Organic preparation for providing immunity and nutrition to crops.

Mr. Sundararaman has developed a system of alternative manure application, pest and disease control by his own experimentation over the last 15 years. He adopted various

methods or preparation of organic liquid fertilizers and standardized them after making alterations through trial and error process.

ii) Thollyuri Karaisal (Organic solution with anaerobic bacteria)

Ingredients needed :

Cow dung - 5 kg.

Jaggery – 250 gms.

Kadukkai seed powder (*Terminalia chebula*)– 25 gm.

Athimathuram Powder (*Jamaica liquorice*) – 25gm

Papaya Fruit – 3 kg.

Water – 50 litre

Take a 50 liter plastic barrel with provision for closing the lid. First dissolve the cow dung in water and it is added into the drum.

Then dissolve jaggery, kadukkai powder, Athimathura podi together in water and mix it thoroughly and added into the barrel ;papaya fruit is mixed with water and made into gruel like thick solution and added into the barrel . The barrel has to be closed airtight and kept it for 10 days as such. The drum will be bulging due to production of methane gas and within 1 or 2 days the lid has to be opened slightly to release the gas and again closed and kept for another 8 days or so .

Now if one smells the liquid it will be the odourless. It is ready for mixing with irrigation water or spraying crops at 10 percent dilution i.e. 1 liter solution in 10 lit. of water.

The solution contains only aerobic bacteria ; and aerobic bacterial killed. This technique has been learned from Mr. G. Balakrishnan Thirukattupalli and later he standardized it with and correct dosage Mr. Sundararaman has been using this anaerobic bacterial solution and it helps the farmer by following ways.

-It increases the fertility of soil by multiplication of microorganisms in soil.

-In increase the leaf canopy and then by more photosynthesis.

-It induces root growth and acts as plant growth enhancer.

Now more than 1000 farmers have adopted this technique in Tamilnadu, Kerala and Karnataka. This technology though it is available the credit is Mr Sundararaman has standardized it and spread to many farmers .

iii) *Amirtha* Karaisal

Ingredients needed :

Cow dung – 1 kg.

Cow uring – 1 litre

Jaggery – 100 gm.

Fruit mixture solution -1 lit (with papaya and other waste fruits)

Water – 10 lit

Take a one plastic container of 15 litre capacity then dissolve. Cow dung with water and added to the container. Add Jaggery after making it powder and cow urine and fruit mixture (made into thick solution by adding water) and stir it thoroughly and close the container. This has to be kept for 5 days and then it is ready for use. Take 500 ml of the solution and dilute it in 10 lit. water and sprayed to crops at 15 – 30 days interval for crops.

This method is being practiced now by more than 10,000 farmers in Tamil Nadu, Kerala & Karnataka.

iv) Developing a solution for crop protection, nutrition and to mitigate salinity in irrigation water.





Mr. Sundararaman has been preparing different preparations individually using cow product, waste fruits etc but due to labour problem and frequent power cut he has recently designed a trough system of putting all preparations together and mixing it in irrigation water through drip system of irrigation. He has constructed a trough of 3' x 12' x 5'). The trough has different layers vi bottom layer with stone pebbles for 3'' height, followed by sand bed of 9'' and dried leaves/ plant waste of 6'' height. It is filled with water. In the trough fruit mixture. (waste fruits including Jack, Papaya fruits) of 10 kg is placed in a gunny bag and hanged through a wooden stick. In another two bags *Tholluyirkaraisal*, *Amirtha karaisal*, *Panchagaya* can be hanged. In another gunny bag Rhizobium, Azospirillum, Azotobacter ½ kg each and Trichoderma viride , Trichoderma spp. Bacillus, Metarrhizum cultures each ½ kg. are placed and immersed in the trough by hanging system.



They are allowed to ferment for 7 days then the water percolate down and through bottom outlet pipe it is taken to drip system attached thus nutrient solution reaches the rootzone whenever water is irrigated to crops. This system of irrigation has following advantages :

- It improve the quality of irrigation water and reduces the pH value from salinity to normal level.
- It controls soil pests especially root grubs.
- It is also providing immunity to crops against pests & diseases.
- It reduces the cost of labour.

This type of irrigation system has been replicated more than 10 farmers surrounding his village and we are showing the list of benefitted farmers as below.

Mr Satheesh - Ganapathypalayam (9842651456), Mrs Parvathy - Pallathuthottam (9442370620), Dr. Rajamanikkam - Gobi (9486406679), Gnanasambandan – Gobi (9487566065), Devaraj

v. Herbal Pesticide :



Picture of *Ocimum basilicum*

He is using the following ingredients :

Neem leaves, Nochi (*Vitex negundo*), Aloe vera, Seetha leaves (*Annona squamosa*),

Tulsi, Thiruneetru pachilai (*Ocimum basilicum*), Oonjal Marathalai (*Albizzia amara*)-all together 2kilos , butter milk – 10 liters,turmeric powder – 100 gm.Perungayam (*Asafoedita*) – 20 gm.

These ingredients are to be mixed in 200 litres of water and sprayed to control disease at weekly interval. Grape vine branches can be dipped in the solution for protection of powdery mildew disease.

If above formula is replaced with cow urine instead of buttermilk then it will be useful for control of insect pests he claims.

During vegetative phase of crops he is mixing this solution with 1 lit of tender coconut in order to enhance the growth of crops.

vi) Sustaining the productivity of soil by rotational cropping system.

There are various techniques prescribed by experts to sustain the productivity of soil viz. double digging method or Dr Dabolkar's method of intensive cropping with ideal spacing system. However Mr. Sundararaman has developed a simple method which he is following for the past ten years to claim his adoptability.

In this method he is utilizing the space available under his coconut garden ; he has taken 2 plots of 10 cents each. One plot is raised with green manure plants viz. sun hemp and daincha and incorporated in soil by 45th day of sowing. Then he again stir the soil and sow the same green manure crop seeds second time and incorporated in soil on 45th day. After two crops he goes for raising vegetable crops as third crop .

In the second plot he raises vegetables first and after harvest of vegetables in about 3 months he goes for raising green manure crops . If the fist plot is raised with vegetable then second plot is grown with green manure and vice versa. This ensures supply of vegetables throughout the year while the soil is not losing the productivity and suits of intensive cropping system under organic condition.

Income from maize cultivation



He has recently (25 March 2014) harvested Maize crop sown during Dec. 2013 in 2 acres of land. He has sown hybrid maize (seeds obtained from Private Company). Seed rate was 8 kg. per acre. He obtained 65 quintals from 2 acres. He followed spacing of 3'x2'x1'. He irrigated through driplines. The water is mixed with organic preparations in a trough as explained in item no. iv. He incurred cost of cultivation of Rs. 62,000. His income by sale of 65 quintal of seeds was @ Rs. 1,500 per quintal i.e. Rs. 97,500 as gross income. He obtained net income Rs. 30,000 or Rs. 15,000 / acre in one cropping season of 90 days. He says that a farmer can obtain good profit by intensifying different nutrient preparations as described above. He has been keeping records of expenses incurred and income particulars on daily basis.

He is also raising trees like *Melia azadirach*, *Casuarina*, soft wood trees like *Gmelina arborea*, *Peenari* as it is less labour oriented and source of good income for farmers in few years. He has also left few plots of lands for cultivating hybrid maize for purpose of cutting them as green fodder for feeding his cows. He grows banana, sugarcane organically for more than 10 years.

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