

LR (Lalit-Raman) Compost Pit

Due to continuous burning of crop residues in India, the problem of air pollution was increasing. Farmers were the biggest culprit of this, because farmers used to burn the remains of paddy and sugarcane after harvesting, which not only increased air pollution but also destroyed the micro-organisms of the soil. While its other adverse effects were being seen on human health, the amount of carbon dioxide in the atmosphere was increasing due to burning of crop residues. After understanding the root of this problem, we made an innovation to solve it. While farmers are also benefiting from this innovation, carbon dioxide is also not being released into the atmosphere. We have named this innovation Lalit-Raman Compost Pit.

We have been working with farmers for the last 20 years. Meanwhile we saw this problem. Understanding the depth of this problem, we started searching for solutions. From the pit made by us, the farmer gets liquid and solid organic fertilizer and saves his money.

With the help of Endo Global Social Service Society, UNDP-CEE and HCL, this innovation has been successfully constructed in about 400 farmers of Meerut and Gautam Buddha Nagar. While farmers are getting economic benefits from this, the farmers' share in polluting the environment is also starting to reduce. If our innovation receives the award, it will help in taking this mission forward.

After doing LR Compost Pit innovation, we first made it on the fields of 50 farmers of Meerut district with the help of Indo Global Social Service Society. These 50 farmers made it at the homes of 25 other farmers with the remaining money from the compost obtained from it.

After this, with the help of UNDP-CEE, it was built at the homes of 50 other farmers in Meerut district. After this, with the help of HCL, this innovation has been implemented in about 100 farmers in Gautam Buddha Nagar district. Today these pits have been built in the homes of about 400 farmers.

Farmers are the biggest beneficiaries of this project. About 400 farmers from Meerut and Gautam Buddha Nagar districts are taking advantage of it and gradually this innovation is being implemented in other districts also. This innovation has already been described as an excellent effort by the Ministry of

Agriculture and Welfare, Government of India. Efforts are being made by the Uttar Pradesh government to implement this innovation among all the farmers.

While this project was prepared by us, money has been spent by Indo Global Social Service Society, UNDP-CEE and HCL to take this innovation forward. The farmer who gets the profit must spend 25 percent of the total cost of making this one model in the beginning itself, whereas after three years, another farmer must get this pit made with his own money. This is its business model. The farmer in whose place this pit is built must build it in another farmer's house because that farmer saves so much money in three years from the liquid and solid fertilizers obtained from this pit.

Of all the pits we have built for farmers, 33 percent have been built for women farmers. In all the other pits built by male farmers, mostly women do the work of making manure.

Most of the farmers doing agricultural work in India are men. While this project has been implemented in Meerut and Gautam Buddha Nagar districts, the participation of women is not much. Here, because sugarcane is cultivated on about 70 percent of the agricultural land, male farmers are involved in it.

When we implement a project, we keep in mind that minorities should also participate in it. Because the minority does not have much land here, we have still tried to provide 15 to 20 percent profit to the minority farmers.

In this area, because such people do not have land, we have tried to include one or two percent of those farmers who are sowing on some farmer's land on contract.

Description of LR (Lalit-Raman) Compost Pit

Project Title: A Pilot Project – Alternate practices to control and check biomass and crop residue burning in open field in Western Uttar Pradesh

Goal of the project:

To stop the burning practice of sugarcane leaves and paddy waste and instead provide the farmers with rich organic manure for improvement in field soil, human health and environment.

Purpose/Objectives of the project:

The project aims to have the following objectives:

- To stop emission of CO₂ into the atmosphere from burning of sugarcane leaves and paddy waste.
- To establish the LR compost pit as the model between the farmers of this region growing sugarcane and rice.
- To provide the farmers with a technique to produce rich quality of manure through this pilot project.
- To improve the soil quality and aid in financial upliftment of the farmers.
- To generate interest of the farmers in the farming techniques.
- Act as innovative model in a high agriculture productive area.
- To scale up the pilot into a large scale program in partnership with communities and different stakeholders.

Project Outputs:

Community mobilization and institution building for established LR Compost.

- Selection of area, block, villages and households.
- Participatory rural appraisals in villages establishing the selection of farmers.
- Selection and training local community organizers for management/operations of the LR compost.

Construction LR compost pits

- To get the farmers to share the cost of their pits.
- To guide the farmers on the construction design of the pits.
- To visit the pits time to time to check the ongoing work.
- To train the farmers on the maintenance of the pits, as and when required.

LR compost pit established.

- This would put a check on the practice of burning sugarcane leaves by the farming community of the region. This in turn would put a stop to CO₂ emission. One pit would produce best quality compost sufficient for one acre farm. Promotion of organic farming and usage of organic compost by the farmers instead of chemical inputs. Pest control management would be ensured.

Major Activities

In western Uttar Pradesh, nearly 22 districts mainly grow sugarcane and rice, which results in lot of agricultural wastage comprising of sugarcane leaves and paddy waste. It leaves no choice to farmer than to burn it to clear the fields for new crops. This burning practice harms the soil and rips it off its natural organic and also releases harmful greenhouse gases such as carbon dioxide in the air.

Lalit – Raman compost method is a simple technique of composting which can be easily prepared by the farmer himself. The farmer receives solid as well as liquid manure through this technique. In this method, the farmer has to construct a permanent structure at the field. This structure will sustain 20 – 25 years easily. This technique has been especially designed to end the burning practice of sugarcane leaves and paddy waste.

Due to heavy reliance on chemicals for farming, the field soil has lost its natural organics and nutrients, resulting in reduced growing power. The carbon content is also decreasing in soil highly. In these circumstances, the farmer is not able to make natural manure to mix with the soil to increase its nutrient level.

In this pit structure, sugarcane leaves, water, cow dung, soil and other agricultural wastage can be put at one time or daily or time to time, as per farmer's convenience. In this way, the farmer doesn't have to put many efforts. Once the pit is completely filled, the solid manure takes three months time to get ready where as liquid manure can be taken out frequently only after a week. By using this pit, the farmer gets solid manure for the field. The liquid manure can either be used during irrigation or strained and sprayed on the crops in place of pesticides.

The organization will establish 50 LR compost pits in 50 different farmer's fields of Meerut district.

Details of LR Compost pits –

Size of the Pit

- Outer dimensions: 8 x 3 x 1 meter (24 sqm)
- Inner dimensions: 7.1 x 2.1 x 1 meter (14.91 sqm)

Ingredients used in filling the LR compost pit:

- Sugarcane leaves / Paddy waste and green grass (before seedlings come) – 15 quintals
- Cow dung – 15 quintals
- Field soil – 05 quintal

- Water – 10,000 litres (2500 litres after every ten days)

One time cost of ingredients required to fill the pit:

- Sugarcane leaves / Paddy waste and green grass (before seedlings come) –
15 x 10 = Rs.1500
 - Cow dung – 15 x 10 = Rs.1500
 - Field soil – 5 x 100 = Rs. 500
 - Water – 10,000 litres (2500 litres after every ten days)
 - Labour – 2 labour for 2 days (2 x 2 x 300) = Rs. 1200
- Total = Rs. 4700**

Quantity of manure ready in the pit after the four month period:

- Solid manure: 25 quintals
 - Liquid manure: 8,000 litres (2,000 litres after every month, for 4 months)
- **Required quantity of manure for one acre (4000 sqm) of land for one year: 80 quintals.**
- **Available quantity of sugarcane leaves or paddy waste from one acre (4000 sqm) of land: Nearly 30 quintals (30,000 kilos)**

Method of filling the LR compost pit: To fill the pit, one requires cow dung, sugar cane leaves/paddy waste, green grass, and field soil. By spreading every content in 4-inch-thick layer one by one, repeating till the height is nearly one meter. Now it is to be filled by water. It will require 2 days time to fill the pit completely. Due to large size of the pit, it can be easily filled and the after the solid manure is ready, it can be easily taken out of the pit for usage. The liquid manure can be given along with irrigation water in every 20 days time and can also be sprayed on the crops.

Key Risks:

The project is first of its kind in the region it is being proposed for. The technology is new for the region and will take some time for acceptance. Hence, there are no risks involved in the project at this stage.

Justification for the project:

This composting pit technique has been designed especially for fulfilling the manure needs of local farmers, available agriculture waste and environment

preservation. The farmer's growing need of compost manure for agricultural use was felt in this region and also the percentage of organic carbon present in soil has degraded to just 0.3% which is quite less than the necessary quantity. Therefore, the need for composting in large quantities has arisen.

In lieu of above reasons, the member of the foundation, Mr. Lalit Kumar and Mr. Raman Kant has developed a composting technique by which a farmer can produce qualitative compost in less time. Also this composting technique will promote environment preservation. In this region, almost 70% of the available agricultural land is used for growing sugarcane, which leads to burning large quantities of sugarcane leaves to clear the lands.

The pit can easily sustain for over two decades, i.e. 20-25 years with easy maintenance. It can contain leaves of one acre land to produce manure for one care of land only. In this method, where there is no release of greenhouse gases in the air, and no burning of the natural nutrients present in the soil. It also helps save the expenses of buying chemicals as natural compost is ready for the fields which not only helped save money to the farmer but also increase the soil quality and its growing power. It indirectly helps in conservation of environment and groundwater as the fields using natural manure require less water for irrigation. Also, the ground water is saved from chemical substances entering the water table through crop fields and environment is saved too. It directly results in healthy crops which does not aide in diseases and helps in saving money. The organization is promoting this technique as it is helpful in climate change.

Examples:

1. Due to large size of the pit, it can be easily filled and the after the solid manure is ready, it can be easily taken out of the pit for usage. The liquid manure can be given along with irrigation water in every 20 days time and can also be sprayed on the crops.
2. To fill the LR compost pit for one year, biomass is required from one care of land (4,000 sqm) hence one can get 75 quintals of good quality solid manure and 24,000 litres liquid manure from the pit in one year. Alongside, **one puts an end to releasing 45,000 kg of CO₂ in the environment.**
3. Therefore, by establishing 50 pits at 50 different farmer's fields in Meerut, 3,750 quintals of solid and 12,00,000 litres of liquid manure will be produced, and **22,50,000 kg of CO₂ will stopped from entering into the environment.**

National and Global Environment Impact of the project:

To fill the LR compost pit for one year, biomass is required from one care of land (4,000 sqm), hence one can get 75 quintals of good quality solid manure and 24,000 liters liquid manure from the pit in one year. **Alongside, one puts an end to releasing 45,000 kilos of CO₂ in the environment every year.**

Quantity of Carbon di oxide (CO₂) released during burning of biomass:

- From burning of one kilogram of sugarcane leaves/paddy waste/other biomass: 1.5 kg CO₂
- Biomass of one acre of land (4,000 sqm) in **one** year period (30,000 kilograms) when burnt: $30,000 \times 1.5 = 45,000$ kg CO₂
- Biomass of one acre of land (4,000 sqm) in **two** year period (60,000 kilograms) when burnt: $60,000 \times 1.5 = 90,000$ kg CO₂

Replicability of the project:

The project can certainly be replicated in any region which has large quantities of sugarcane leaves waste, or any other agricultural wastage. These pits are easy to use and with the guidance on the design during construction of the pit, the pits are long sustainable and can be handled by farmers.

Once the LR compost pits are established and filled, they do not need high maintenance as they can be easily used by the farmer for making manure. Every year, the farmer can make the solid manure for three times using the pit alongside liquid manure numerous times. This would be an asset for the farmers. Once the project gets over, the community would sustain the deliverables of the project.

According to scientific view, manure made from cow dung and other natural sources when used in field soil, usually takes around 3 years' time to fully dissolve. Only 30-35 % of the particles of this manure dissolve in the field in the first year. Even in the second year about same percentage is dissolved again. Finally in the third year, it dissolves fully. This property of this manure makes it more stable in the field. Keeping this in view, to obtain the best results from the LR compost pit technique, it is required to conduct research for 3 years' time.

- Reduction in Co2 emission.
- High- and better-quality agriculture production.
- Integrated farming systems approach.
- Authentic firsthand information through field research.
- Decreased cost of inputs and increased income for the farmers.

Construction cost of a Pit:

- Bricks: 4000 units x 5000 Rs. = Rs. 20,000
- Cement: 20 (50 kg bags) x 250 Rs. = Rs. 5000
- Sand: 60 cubic foot x 30 Rs. = Rs. 1800
- Corsent/Dust: Rs. 1800
- Labour: 4 labour x 4 days x 400 Rs. = Rs. 6400

Total = Rs. 35,000

Price of manure available from the pit one time:

- Solid manure: 25 quintals x 300 = Rs. 7,500
- Liquid manure: 8,000 litres x 1 = Rs. 8,000

Total = Rs. 15,500

Price of manure available from the pit for one year:

- Solid manure: 25 quintals x 3 x 300 = Rs. 22,500
- Liquid manure: 8,000 litres x 3 x 1 = Rs. 24,000

Total = Rs. 46,500

Sustainability of the project activities:

Once the LR compost pits are established and filled, they do not need high maintenance as they can be easily used by the farmer for making manure. Every year, the farmer can make the solid manure for three times using the pit alongside liquid manure numerous times. This would be an asset for the farmers. Once the project gets over, the community would sustain the deliverables of the project.

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Scientific and Technical Content:

Technical assistance on the construction and establishment of the compost pit will be given by the project team to the farmer. Time to time guidance will be provided

alongside field trips to check on the construction and help the farmer fill the pit in right manner and understand all its ways well.

- To fill the LR compost pit for one year, biomass is required from one care of land (4,000 sqm) hence one can get 75 quintals of good quality solid manure and 24,000 liquid manure from the pit in one year. Alongside, one puts an end to releasing 45,000 kilos of CO₂ in the environment.
- Therefore, by establishing 50 pits at 50 different farmer's fields in Meerut, 3,750 quintals of solid and 12,00,000 litres of liquid manure will be produced, and 22,50,000 kilos of CO₂ will stopped from entering into the environment.

Networks/ Links with Government / Line departments / scientific institutions/ academic Institutions, etc.:

- ❖ The LR composting pit has already received its approval for inclusion of the technique from Ministry of Agriculture, Department of Agriculture & Cooperation, Organic Farming Cell, Govt. of India.

The project will involve collaboration with –Government Departments including Irrigation Dept., Groundwater Dept., Soil Conservation Department, Agriculture Dept., Horticulture Dept., Soil Analysis Dept., Agriculture University, Potato Research Institute, Crop Training and Research Institute, Banks, Sugar mills, Seed Dept., Forest Dept., Village Heads and the community.

What impacts it will create in terms of Policy/ Advocacy/ Sustainability/ and Replicability in long term:

- Reduction in Co₂ emission.
- High and better quality agriculture production.
- Integrated farming systems approach.
- Authentic firsthand information through field researches.
- Decreased cost of inputs and increased income for the farmers.

Future plans of NEER Foundation for LR Compost pit technique:

- To improvise the liquid and solid manure in the pit, research will be conducted on the pit at one farmer's field, which will be carried out along with Dept of Agricultural, Dept of Horticulture and Agricultural University.
- To work to reduce the cost of this pit by at least 10-20 %.
- To organize meetings with sugarcane mills and various state and national govt. depts. for reaching out to large number of farmers.

- To also mobilize testing of the crops produced on which liquid and solid manure received from this pit has been used.
- A model of this pit will be created using wood so that the structure and method of the pit can also be easily explained at the organization's office. It will also allow showcasing the model at Farmer's fairs and other such events.
- A documentary shall be composed of few minutes which will show the problem of burning waste leaves, need of the environment, solution proposed, method and technique of the pit as well as results of the manure use in the field. This will allow reaching out to farmers and community members in a better way.
- A brochure will be composed and printed for distribution among the farming community for information and awareness purposes.

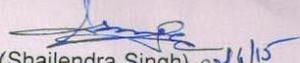
No.7-5/2015- Org. Fmg.
Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation
INM Division
Organic Farming Cell

Krishi Bhawan, New Delhi,
Dated: 22nd June, 2015

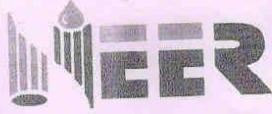
OFFICE MEMORANDUM

Subject:- Request for inclusion of LR(Lalit – Raman) Compost pit technique for farmer's benefits in the agricultural schemes".

The undersigned is directed to refer to your letter No. Nil dated 02.03.2015 on the above cited subject and to say that the Department of Agriculture and Cooperation has no objection for promotion of this compost .


(Shailendra Singh) 22/6/15
Deputy Commissioner(INM)

Shri Raman Tyagi,
Manager,
NEER Foundation, 1st Floor,
Samrat Shopping Mall, Garh Road,
Meerut – 250002.



Foundation

Registered under the Indian Society Act. 1860

11.03.2015

To,

Shri Pankaj Yadav

District Magistrate, Meerut

Subject - "Request for inclusion of LR (Lalit-Raman) Compost pit technique for farmer's benefits in the agricultural schemes."

Respected Sir,

NEER foundation has been engaged in water conservation and protection of natural water bodies including rivers in the state of Uttar Pradesh since its inception in 2004.

It is well known that Western Uttar Pradesh is the hub for sugarcane agriculture. After the sugarcane harvest, the waste leaves are burned down. This is a common practice. In the sugarcane season, gas balls are seen releasing in the atmosphere erupted from burning sugarcane leaves. Along with the poisonous gases being added to environment, the field soil also loses its natural organism culture. During the leaves burning, 4-5 cases have also shown up of adjoining crops burning down along.

NEER Foundation has made an innovative solution to tackle this harmful practice. With the LR compost pit, utilizing sugarcane waste leaves of one acre land, liquid and solid bio compost is produced for one acre of land itself. In this method, the farmer gets rich manure for free of cost and also saves the environment from poisonous gases. The compost pit is a very easy way to follow for the farming community. The pit can easily sustain for about 25-30 years without any maintenance cost.

This innovative technique has been promoted by Indo Global Social Service Society, Germany, which has also helped NEER in establishing 08 model pits in four villages of Meerut district. The farmers have successfully built the pits and already using the manure in their fields.

We seek to reach out to more and more farmers through our Indian government agricultural schemes and therefore inclusion of this LR compost technique. This new technique will provide financial savings to farmers, but also contribute to clean environment of Uttar Pradesh. It will bring a wave of revolution in farming community of the state.

We at NEER Foundation seek your approval and successful inclusion. Information related to LR Compost Pit is attached along for your reference.

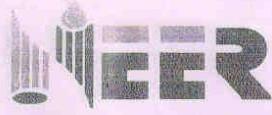
Sincerely Yours


(Raman Tyagi)

Manager

+91 9411676951





NEER Foundation

Registered under the Indian Society Act. 1860

11.03.2015

To,

Hon'ble Prof. Hari Shankar Gaur ji

Vice-Chancellor

Sardar Vallabh Bhai Patel University of Agriculture and Technology

Meerut

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We seek to reach out to more and more farmers through our SVBP University of agriculture and technology, Meerut agricultural schemes and therefore inclusion of this LR compost technique. This new technique will provide financial savings to farmers, but also contribute to clean environment of Uttar Pradesh. It will bring a wave of revolution in farming community of the state.

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Sincerely Yours


(Raman Tyagi)

Manager

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g/c
SVBP
SVB.P. Ag. University
Meerut.

Green enthusiasts in city develop new composting technique

Pankul Sharma | TNN

Meerut: Two city-based environmentalists have come up with an innovative and effective method of making compost which would boost soil quality in lesser time.

This procedure has been named RL after Raman Tyagi and Lalit Kumar. In this method, the biomass produced after harvest is processed with manure to create both solid and liquid forms of fertilizer. The pit is constructed in the ground near a tube well so as to allow the liquid form to pass through to the fields.

Chief minister Akhilesh Yadav has instructed special secretary (agriculture) Amit Mohan Prasad to take a look at the innovation and estimate its potential for usefulness.

Speaking with TOI, Tyagi and Kumar said they had set up pits in April 2014 at eight different fields with support from Indo Global Social Service Society, New Delhi, a non-profit development organization.

Soil samples of the eight fields were sent for testing at Agriculture Extension Directorate, Meerut. A second set of soil testing was sent after crops were cultivated using compost



One of the biomass pits in the city

CM Akhilesh Yadav has instructed special secretary (agriculture) Amit Mohan Prasad to take a look at the innovation and assess its utility

from these pits. Manure samples were also tested at the Central Potato Research Institute Campus and the Indian Council of Agricultural Research.

The results of these tests have proved the quality of manure produced was enhanced. There was significant increase in the levels of organic carbon, phosphate, zinc, iron and copper and hazardous chemicals like potassium and manganese were significantly low.





