

Phosphate Rich Organic Manure (PROM) – A Future Fertilizer

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26, Gayatri Nagar-B, Farm, Durgarpura,
Jaipur-302018, Rajasthan

Preamble

Declining fertilizer use efficiency, especially of phosphorus, and continuous building of insoluble phosphorus reserve in soils is a growing concern world over and efforts are being made to replace the use of 100% water soluble phosphorus with that of organic carbon linked phosphorus. PROM technology, in which natural rock-phosphate is being integrated with organic manures during composting process, has emerged as suitable alternative to our needs. PROM has been found to be completely replacing the need for phosphatic fertilizers. To demonstrate the benefits of using PROM, large numbers of field demonstrations were conducted on farmer's fields in 4 districts of Rajasthan. This paper briefly describes the impact of PROM technology on total yield and net gains as studied in 8 representative demonstrations.

Methodology used for making PROM

For making PROM sufficient for one ha area 200 kg high grade rock phosphate (containing about 30% P_2O_5) was mixed with 5 ton of cow dung and crop residue mixture. For enhancing the microbial activity 1 kg of Azotobacter, 1 kg of Phosphate Solubilizing Bacteria (PSB) and 0.5 kg of Decomposing culture was also added to the mixture as slurry. The mixture was allowed to decompose for 90 days in a pit. After 90 days, approximately 3.0 tons of mature PROM was harvested, comprising about 30 kg N and 60 kg P_2O_5 . This entire quantity of PROM was broadcast spread in the field followed by ploughing with tractor 15 days prior to sowing. A parallel control plot was maintained at each demonstration site having an area of 0.25 ha. The control plot

was treated with either 150 kg DAP or 400 kg SSP + 60 kg urea/ha for comparison. Post sowing treatments were similar in control as well PROM treated field.

Results

As is evident from Table 1, the PROM has yielded higher yields compared to 100% NPK control. The increase in yield was ranging from minimum 3% to maximum 10.52%. Net gains in terms of additional income in PROM treated plots over control plots were ranging between Rs. 320 and 1850 per ha.

As the comparison was between PROM and equivalent grade of chemical fertilizer, it was established that PROM can be an ideal substitute for DAP. Study besides providing an alternative to DAP also opens up the scope for reducing the cost on costly chemical fertilizers. The rock phosphate available indigenously can very well serve as phosphate resource.

Integration of phosphorus with organic carbon not only ensures higher use efficiency of applied phosphorus but also add to the biological life of the soil besides saving precious foreign currency and burdening subsidy.

Table 1. Effect of PROM on yield and net gains in Groundnut crop in comparison with chemical fertilizer control.

Sl. No.	Name & Address	Yield in Kg/ha		% increase over control	Net profit over chemical Fertilizer in Rs/ hector
		Control	PROM		
1.	Shri Kailash Choudhary Village and Post-Kiratpura, Kotputli Jaipur	1650	1820	10.30	1820/-
2.	Shri Girdhari Lal Jat Village and Post-Kiratpura, Kotputli, Jaipur	1650	1750	06.06	1080/-
3.	Shri Lal Chand Yadav Village-kasli, Post-kiratpura, Kotputli Jaipur	1950	2150	10.25	1850/-
4.	Shri Dharm Singh Village and Post-Kiratpura, Kotputli Jaipur	1700	1750	02.90	320/-
5.	Shri Shivram Village and Post-Kiratpura Kotputli Jaipur	1600	1750	09.37	1620/-
6.	Shri Kailash Village-Jeetpura, Post-Kallawas Lalsoth Dausa	2200	2400	09.09	1500/-
7.	Shri Prabhu Village-Jeetpura, Post-Kallawas Lalsoth Dausa	2100	2300	09.52	1580/-
8.	Shri Pusushottam Village-Jeetpura, Post-Kallawas Lalsoth Dausa	1900	2100	10.52	1850/-