Environment & Ecology 29 (3B) : 1470—1471, 2011
 ISSN 0970-0420

Cow Based Innovative Technology : Jeevamrutha

A. RAJESH GAVAL, B. NARENDRA BABU, D. H. ROOPASHREE AND MUKUND JOSHI

Department of Agronomy, University of Agricultural Sciences, GKVK
Bangalore 560065, India
E-mail : gavalraj@gmail.com

Abstract

Jeevamrutha is an innovative practice of organic farmers to use naturally available waste to improve the soil fertility. It is mixture of cow dung, cattle urine, pulse flour and jaggery incubated for five to seven days in a large quantity of water. It is not a liquid manure to supply large quantity of nutrients but it is an enriched liquid bacterial culture along with small quantities of nutrients like nitrogen, phosphorus, potassium and many micro nutrients. The initial level of useful bacteria like N-fixing and P-solubilizing bacteria get proliferated four-five times during the incubation. Repeated application jeevamrutha enhances the biological activity in the soil and helps faster decomposition of carbonaceous materials releasing the plant nutrients. Thereby, jeevamrutha application improves the soil fertility and other physical characters of the soil and ensures the sustainable crop yields in long run.

Key words : Jeevamrutha, Dung, Urine, Soil fertility.

Cow is considered as "Kamadhenu", as it provides all the necessities of man. Its significance in the support of mankind is well documented in many mythological and historical documents. However, in present day life, we have reduced the importance of cow only in terms of its milk yielding capacity. The importance of dung and urine of cows is seldom recognized and used in day to day life, although use of dung and urine in preparation of manure is a technology of many centuries. Neither the farmers collect all the cattle urine and dung nor do they use it effectively. In fact, these excreted wastes of cows are of great importance in sustaining the agricultural productivity. The nutrients and useful bacteria contained in dung and urine are useful in preparing the rich manures, which are ultimately used to improve the fertility of soil and increasing the productivity.

Jeevamrutha' is an innovative technology to effectively make use of microbial population of cow's dung and cow's urine and improve the soil fertility. Jeevamrutha was essentially developed by the organic farmers, who have successfully used it as a natural method of soil fertility improvement. Historical evidences suggest that more than 1000 years back a technology called 'Kunapa Jala' was evolved and used in India. Kunapa Jala was later transformed in to 'Sasyagavya' by Ayaangarya (1) Jeevamrutha is a modified version of sasyagavya.

India, being a country with a largest cattle population in the world, has a great potentiality to use the cow's urine in many ways besides the regular manure preparation. The annual cow dung and urine production in the country calculated at the rate of 5.5 and 3.3 kg/day per animal respectively is as high as 1,020 million kg and 673 million liter (Table 1). This works out to nutrient contribution of 48.2 lakh tons of nitrogen, 11.2 lakh tons of phosphorus and 52 lakh tonnes of potassium.

The cow's urine also has got 165×10^2 cfu/ml of N fixing and 85×10^2 cfu/ml of P solubilizing bacteria. Similarly, the dung also endowed with microbiological count of 122×10^2 cfu/ml of N fixing and 85×10^2 cfu/ml of P solubilizing bacteria. Jeevamrutha is an attempt to effectively make use of this natural microbial resource to improve the soil fertility.

Methods

Conventionally dung and urine are used as starter materials for manure preparation due to bacterial content. The organic farmers in India used the technology of jeevamrutha by providing ideal conditions to proliferate the bacterial count in the cow's dung and urine. It was prepared by mixing cow's dung

Table 1. Potential dung and urine available from Indian live stock and their manurial value. *Anonymous (2), **Gaur et al. (3).

Type of animal	Population (million)*	Daily production (kg)**		Nutrient content (%)**						Annual potentional nutrient contribution (lakh t/yr)		
				Dung			Urine					
		Dung	Urine	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Cattle	204.50	5.0	3.30	0.5	0.3	0.9	1.2	0.2	0.75	48.23	11.20	52.0
Buffalo	83.50	6.20	3.80	0.7	0.4	0.4	1.8	0.3	0.2	34.07	11.03	9.88

and urine with jaggery (a source of carbohydrate) and pulse flour (a source of nitrogen) in Jarge quantity of water. This innovative method to make use of bacterial content in urine and dung developed by farmers, however, did not have standards and scientific validation. The work of scientific validation and standardization was taken up in the Department of Agronomy, UAS, Bangalore during 2007 to 2009. After trying out several combinations, it was concluded during the study jeevamrutha can be prepared by incubation of 10 kg fresh dung, 15 liters of cattle urine, 6 kg powdered jaggery and 2 kg pulse flour in 200 liters of water after thorough mixing 2—3 times every day in a closed container for 7 days. The bacterial count and nutrient analysis were assessed at the end of incubation.

Results and Discussion

It was recorded in the study that jeevamrutha incubated for 5—7 days had a bacterial load of 46×10^6 cfu/ml of N fixing and 76×10^6 cfu/ml of P solubilizing bacteria. It was also found that jeevamrutha contained the nutrients like N, P_2O_5 and K_2O (to the tune of 0.17%, 0.032% and 0.052% respectively) (Table 1). This accounts for proliferation of bacteria from initial level before incubation to 5 to 7 folds in jeevamrutha. For this reason jeevamrutha is considered as a bacteria rich liquid culture suitable for application to agricultural lands. Repeated application of jeevamrutha will increase the bacterial activity in the soil and therefore forms as the basis of improvement of fertility.

The bacterial count in jeevamrutha was multiplied in many folds because the supply of carbohydrates (as sucrose in jaggery) and nitrogen (as pulse flour) in presence of adequate water provided ideal conditions for growth of bacteria. The repeated stirring provided necessary oxygen for bacterial growth.

It is concluded that the cow's urine and dung can be effectively used to prepare a bacteria rich liquid culture, whose repeated application improves the biological activity in soil and there by leads to improved soil fertility.

References

1. Ayangarya. 2004. Herbal *Kunapa. Asian Agri-Hist.* 8 : 315—317.
2. Anonymous. 1997. Directory of Indian agriculture. CMIE Publ. 233—236 pp.
3. Gaur A. C., S. Neelakantamma and K. S. Dargan. 1990. Live stock and human wastes-characteristics and manurial value. *In organic manures*. Pub. ICAR. 13—95 pp.