

Annexure - 4

PROGRESS REPORT

1.	Project number	:	DCM/CBE/ENS/SOA/2018/CP062
2.	Project title	:	On farm resource quantification and utilization under zero budget natural farming system (low external input organic farming)
3.	Name of the department / Station	:	Department of Sustainable Organic Agriculture, TNAU, Coimbatore
4.	Name (s) of the Scientist (s) with designation		Dr. R. Sunitha Asst. Prof. (Environmental Sciences) Dr. E. Somasundaram Professor and Head
5.	Project Period		October 2018 – September 2020
6.	Budget	:	Rs. 2,50,000 Rs. 77,000 (expenditure)
7.	Objectives	:	i. To quantify farm resources for low external input organic crop production ii. Assessing the efficiency of organic inputs of different farming systems viz., zero budget natural farming , organic farming and conventional farming iii. Assessing the economic feasibility of the different farming systems
8.	Work done	:	1. The work has been carried out with <i>insitu</i> -composting during June 2018 2. The ZBNF experiment initiated during February 2020

9. Work carried out during the review period:

Two kinds of experiments were initiated in this core project. The experiment-I was conducted about farm waste quantification and *in-situ* composting. Followed by the experiment II was carried out with seven treatments as

Randomized design at field no. NA2, Eastern Block Farm, TNAU, Coimbatore during 2019-20. The sowing of the crop was done on 03.02.2020 with the Sorghum (CO30) and Cowpea (CO-CP7). The experimental results and compost characteristics are given below. The treatments were rescheduled and formed new treatments as per ICAR guidance with approval of Director of Research the ZBNF scientific validation trail was carried out.

Experiment I

Treatment details

T₁- Compost of farm wastes with cow dung (Cow dung @ 40kg/t of wastes)

T₂– Compost of farm wastes with cow urine (@ 20 litres/t of wastes)

T₃ - Compost of farm wastes with Enriched Effective microorganism (EEM) culture (EEM @ 5% dose)

T₄ - Compost of farm wastes with Biomineralizer (@ 2kg /t of wastes)

T₅ - Compost of farm wastes with waste decomposer (20 l/t of wastes)

Table 1. Initial characterization of bio-inputs

Treatments	Organic carbon (%)	Total N (%)	Total P (%)	Total K (%)
Crop residues alone (Initial)	31.1	1.25	0.65	0.72
Cow dung	22.8	1.9	0.89	0.90
Cow urine	-	1.7	0.56	0.42
Bio-mineralizer	15.3	1.31	0.18	0.15
Waste decomposer	-	1.5	0.28	0.20

Table 2. Characterization of composting materials in different treatments @ 30th day

Treatments	Organic carbon (%)	Total N (%)	Total P (%)	Total K (%)
T ₁ (Cow dung alone)	28.1	1.25	0.40	0.38
T ₂ (Cow urine alone)	23.7	1.20	0.39	0.37

T ₃ (2 % EEM)	22.0	0.90	0.45	0.45
T ₄ (2% Bio-mineralizer)	21.2	1.12	0.44	0.42
T ₅ (2% Waste decomposer)	20.5	1.20	0.48	0.48

Table 3. Characterization of composting materials in different treatments @ 60th day

Treatments	Organic carbon (%)	Total N (%)	Total P (%)	Total K (%)
T ₁ (Cow dung alone)	21.9	1.32	0.43	0.52
T ₂ (Cow urine alone)	22.4	1.28	0.41	0.55
T ₃ (2 % EEM)	18.5	1.38	0.39	0.65
T ₄ (2% Biomineralizer)	18.9	1.48	0.49	0.68
T ₅ (2% Waste decomposer)	16.2	1.50	0.50	0.71

Experiment II

Treatment details

T₁ – Control (No addition of any inputs except labour for operations including weeding)

T₂ – Complete ZBNF practices (Bijamirth + Gnanajeevamirth + Jeevamirth + Crop residue mulching + Intercropping + Whapasa)

T₃ – Natural Farming practices 1 (Intercropping + Bijamirth + Gnanajeevamirth + Jeevamirth)

T₄ – Natural Farming practices 2 - T₂ + T₃ (Intercropping + Crop residue mulching alone)

T₅ – All India NPOF package

T₆ – ICM (50 % organic + 50 % inorganic with need based pesticide)

T₇ – ICM (50 % organic + 50 % inorganic with need based Neemastra, Agniastra, Brahmastra and Dasapani)

In this above treatments the seeds were coated with Bijamirth and Soil mulching followed by Jeevamirth application practices were followed. The aphids are entered in cowpea plants and based on pest occurrence we sprayed Agniastra and other treatment oriented pesticides. The initial characteristics of bioinputs and soil were analyzed and given below (Table.4). The results of aphids affected plants are given in table 5.

Table 4 Characteristics of organic inputs

ZBNF inputs	pH	EC (dSm⁻¹)	Total N (%)	Total P (%)	Total K (%)	Organic carbon (%)
Bijamirth	7.08	8.26	2.38	0.127	0.485	0.93
Jeevamiruth	4.10	2.28	1.8	0.42	1.1	1.53
Ganajeevamiruth	7.20	2.68	2	0.46	0.1	17.29
Soil (Initial)	7.74	0.22	75.27 kg/ha (Avail. N)	38.00 kg/ha (Avail. P)	92.4 kg/ha (Avail. K)	0.87

Table 5. Effect of Bio-pesticide and pesticide on cowpea plants (one week interval)

Treatmen ts	Before pesticide / bio- pesticide application		After pesticide / bio- pesticide application	
	No of plants per plot	No of plants affected per plant	No of plants per plot	No of plants affected per plant
T ₁	94	93	94	94
T ₂	105	102	105	101
T ₃	111	109	111	103
T ₄	97	96	97	72
T ₅	102	101	102	84
T ₆	96	95	96	37
T ₇	90	90	90	14

10.	Salient Findings	:	<ul style="list-style-type: none"> • Evaluation of <i>in-situ</i> composting experiments were carried out. Among the different treatments, compost maturity and nutrient status was found. Application of waste decomposer is effective method for early composting than other inputs application. • ZBNF scientific validation work is in under progress
11.	Remarks of the Technical Director based on the pre-review	:	Nil

Experiment I



Fig. 1 Shredding of waste materials and Heap formation



Fig. 2 Turning of waste material and watering

Experiment II

Fig.3 Scientific field evaluation on ZBNF trial

