Extended Summaries : 5th International Agronomy Congress, November 23-27, 2021, India

Bio-conversion of rice straw waste in to high quality organic fertilizer

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In India, 353 Mt crop stubble annually generated from rice and wheat crops respectively. About 84 Mt (23.86%) of the stubble is being burnt on-field by the farmers every year (Abdurrahman *et al.,* 2020). Use of these unused crop residues (stubbles) for generating compost, incorporation into soil, biochar etc. will result in benefit to farmers by enhanced soil health and to environment by reduced pollution (Jain *et al.,* 2014). Thus, the paddy straw was used to decompose it with the help of aerobic composting and the results are shared in this paper.

It is evident from the above table that rice straw good source of nutrient. About 40% of the N, 30-35% of the P, 80-85% of the K and 40-45% of the S absorbed by rice remain in the vegetative parts at maturity. Therefore, one ton of rice straw contains 5-8 Kg N, 0.7-1.2 Kg P, 12-17 Kg K, 0.5-1 Kg S, 3-4 Kg Ca, 1-3 Kg Mg and 40-70 Kg Si (Dobermann and Wilt 2000).

METHODOLOGY

The demonstrations on aerobic composting were conducted in Khordha district, Odisha state, India. Paddy straw was used along with green biomass (grasses), cow dung, Madhyam culture (microbial consortium for rapid composting). Paddy straw was mixed with green biomass in 70:30 proportion to adjust the C:N ratio for better decomposition as the C:N ratio of Paddy straw is 80-100 (Shukla et al., 2018). The biomass has been prepared into heap with 4×4 feet (width × height), for every 1 feet height layer of cow dung cow dung slurry has been applied along with Madhyam culture @ 200 kg cow dung for 1000 kg biomass. The compost heaps have been irrigated on alternative days and turning over has been conducted for every 10 days (Chander et al., 2018). The compost samples (KH1 to 18) were analyzed for organic carbon by Walkley black method and other parameters like N, P, K have been analyzed by ICPMS.

RESULTS AND DISCUSSION

Paddy straw-based biomass were converted into compost within 90 days using aerobic composting. The KH 1 to KH 18 composting samples were collected from different demonstrations conducted in farmers' fields and the compost obtained from these samples were having organic carbon content varying from 5 to 11.6 %. Nitrogen content of the samples ranged from 0.7 to 1.5 % whereas phosphorus and potassium were low in some samples (Table 2). The results revealed that the Paddy straw could be efficiently converted into a good quality compost using rapid aerobic composting mediated by microbial consortium (for instance Madhyam culture) and the rapid aerobic composting technology could be scaled out to at community level to ensure enhanced organics availability for maintaining soil health.

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Table 1. Nutrients present in rice straw

Nutrient	Content (%)	Nutrient	Content (%)
Nitrogen (N)	0.65	Magnesium (Mg)	0.20
Phosphorus (P)	0.10	Calcium (Ca)	0.30
Pattasium (K)	1.40	Iron (Fe)	0.035
Zinc (Zn)	0.003	Manganese (Mn)	0.045
Sulphur (S)	0.075	Copper (Cu)	0.0003
Silicon	5.5	Boron (B)	0.0010

Table 2. Analysis of compost samples

Samples	Organic Carbon %	Total-N %	Total-P %	Total-K %
KH 1	9.75	1.5176	0.5067	0.4997
KH 2	11.20	1.1731	0.3855	0.6056
KH 3	10.14	1.2244	0.3936	0.5782
KH 4	9.02	1.4382	0.4822	0.6242
KH 5	10.89	1.2859	0.4540	0.4817
KH 6	8.91	1.2060	0.1921	0.5210
KH 7	8.79	1.4326	0.2162	0.5654
KH 8	5.10	0.7882	0.4094	0.4477
KH 9	5.43	0.7647	0.4121	0.4482
KH10	6.44	0.8049	0.3009	0.4855
KH11	7.98	0.6531	0.0833	0.3099
KH 12	7.57	0.6837	0.0815	0.3211
KH 13	7.40	0.8302	0.0928	0.3344
KH 14	8.15	0.7066	0.0838	0.3206
KH 15	8.34	0.9555	0.1	0.3518
KH 16	11.60	1.7456	0.2284	0.5226
KH 17	10.77	1.7636	0.1616	0.6726
KH 18	11.19	1.5812	0.1785	0.3639

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Influence of Natural Farming inputs on yield and enzyme activities of *rainfed* groundnut

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Among the different oilseeds grown, groundnut is the second most important annual oilseed crop. It is an important crop around the globe for its nutritional and trade values. Being an oilseed crop, it has 40 to 49 per cent oil depending upon the cultivar and management practices. In addition to oil, groundnut kernels contain vitamins E, K and small amounts of vitamin B complex and minerals *viz*., phosphorus, calcium, iron, zinc and boron along with 25 per