

Production of compost from ginnery waste

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Ginning is the first mechanical operation that the seed cotton undergoes during which the lint is separated from seed. Indian cottons fetch lesser price even in the domestic market as they contain large amounts of trash in baled lint. Foreign cottons being less trashy and contaminant free, Indian mills are resorting to cotton imports. This definitely affects the price of cotton and recently it has been observed that farmers are inclined to switch over to other crops. The sincere efforts of Government of India to modernize market yards and ginning and pressing industries under Mini Mission III and IV of Technology Mission on Cotton have already started showing positive results in producing clean cotton bales on par with international standards.

The introduction of pre and post cleaners coupled with other best management practices of machine handling conveying and of cotton produce different kinds of unspinnable cotton wastes and trash in modernized ginning and pressing factories. These units need not be alarmed by this increased waste generated during processing. In fact, the following are the advantages:

- (a) Modernised G & P factories are producing clean cotton which can definitely fetch better price.
- (b) The loss incurred during the process, i.e. short fibres and trash can be put to better value addition.

PREPARATION OF COMPOST

Composting is an aerobic process and based on field trials it has been shown to be possible to produce good quality compost from ginnery waste. The proximate chemical composition of ginnery waste is given in Table 1.

Table 1. Proximate chemical composition of willow-dust and cattle waste

| Constituent | Willow dust (%) | Cattle waste (%) |
|----------------------|-----------------|------------------|
| Ash (including sand) | 10-12 | 15-18 |
| Cellulose | 24-28 | 27-29 |
| Hemicellulose | 15-18 | 25-26 |
| Lignin | 14-16 | 16-18 |
| Nitrogen | 1.0-1.5 | 1.0-1.2 |
| Ether extractives | 4-6 | 3-4 |
| Water soluble | 22-25 | 9-10 |
| C/N | 28-30 | 30-32 |

The process is simple which involves mixing of the waste with dilute alkaline solution and microbial consortium, heaping, turning every week and a stabilised compost production at the end of four weeks. The economics are detailed below:

- (a) Quantity of ginnery waste to be processed weekly = 12 tonnes (Rs 1200)
- (b) Requirement of land 7 m x 3 m (54m³ for a batch of 12 tonnes heap size) (the cost of land has not been taken into account)
- (c) Construction of water tank to hold 10000 litres of water (Rs 60000)
- (d) Concrete mixer with 5 HP motor (Rs 120000)

Running Cost

| | Rs. |
|--|------|
| (i) Water (7200 litres) | 72 |
| (ii) Alkali (12 kg) commercial grade | 144 |
| (iii) Labourers (4) @ Rs 100/day | 400 |
| (iv) Mixer running time (Rs 125/8 hr) | 125 |
| (v) 2 HP pumpset running time (Rs 90/8 hr) | 90 |
| (vi) Miscellaneous expenses | 849 |
| Depreciation @ 10% | 320 |
| Total | 2000 |

Expected manure production - 6 tonnes/heap
Expected income - Rs 12000/heap
Net profit (per week) - Rs 10000/heap

The compost prepared from ginnery waste was found to be good quality and analysis of compost is given in Table 2.

Table 2. Analysis of compost

| Parameters | From ginnery trash (%) | From cow-dung (%) |
|---|------------------------|-------------------|
| Nitrogen | 1.80-2.00 | 1.22-1.30 |
| Phosphorus (P ₂ O ₅) | 0.80-1.00 | 0.62-0.70 |
| Potassium (K ₂ O) | 1.70-2.00 | 1.20-1.40 |

It is worthwhile to emphasize the urgent need to encourage the application of organic manure in view of the fast depletion of micronutrients in Indian cropped soils on account of continued application of synthetic fertilizers. Soils have become either acidic or alkaline/sodic apart from underground water being polluted due to heavy application of fertilizers. Organic farming is increasingly becoming popular to maintain the soil health which also improves water-holding capacity, nutrient build-up and soil erosion. The present process of conversion of ginnery trash to compost is one step forward in providing organic manure for crop raising.