

ABSTRACT

Food waste (FW) generation is increasing worldwide. FW composting converts waste into valuable product resulting into zero waste. Composting is important for FW recycling but ammonia emissions during composting puts environmental and health issues. Tackling with these issues is essential for composting Technology advancement and supporting sustainable waste management (SWM) practices. This study investigates the impact of acetic acid and lactic acid on ammonia emissions during composting. Fourteen compost piles were made and experiment lasted for 40 days. Mature compost as bulking agent with the additives produced nutrient rich final compost as compared to sawdust. The study also explains that how compost quality and maturity is affected with the use of these additives. The study resulted that adjusting pH of compost treatments to 5, 6 and 7 reduces ammonia emission to 55%, 45% and 20%, respectively, compared with control piles that are not treated with acids. Final compost had electrical conductivity of 2.5mS/cm, Carbon to Nitrogen ratio (C/N) of 14-18, Organic matter (OM) 45%, 15-20% moisture content (MC), 20-30% lignin content and 40% cellulose content. Germination Index (GI) was more than 80% for tomato seeds. Germination rate was 100% for all seeds. When compost was applied to the soil it improved the total phosphorus (TP) by 2%, total nitrogen (TN) by 1.4% and total potassium by 2.4%. Bulk density was 1.2gcm⁻³ for good compost. This study successfully used the chemical additives for ammonia reduction also enhanced the compost maturity and quality by improving OM degradation, Cellulose, lignin degradation water holding capacity, porosity, and GI. The research can be helpful at larger scale to make the nutrient rich compost in a sustainable and eco-friendly