

## 猪粪麦秸反应器好氧堆肥工艺参数优化

吕黄珍 韩鲁佳 杨增玲

中国农业大学

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摘要: 为了探讨不同初始工艺参数(初始碳氮比、通风速率和初始含水率)对猪粪好氧堆肥过程可挥发性固体降解率 $\eta$ 、相对热产量HR以及堆体温度超过灭菌温度时间 $t$ 的影响,以干麦秸作调理剂,选择初始碳氮比分别为20、25、30、35,通风速率分别为0.18、0.26、0.34、0.42 L/(min $\cdot$ kg),初始含水率分别为55%、60%、65%、70%,进行强制通风好氧堆肥单因素重复试验。在单因素试验基础上,进行了三因素三水平正交优化堆肥试验L9(3<sup>4</sup>)。试验结果表明:不同初始碳氮比对 $\eta$ 和HR影响显著,对 $t$ 影响极显著,通风速率和初始含水率对堆肥过程 $\eta$ 有一定影响,但对HR及 $t$ 影响不显著。结合正交试验结果,猪粪麦秸强制通风好氧堆肥优选工艺参数组合为:初始碳氮比20、通风速率0.34 L/(min $\cdot$ kg)、初始含水率65%。To study the effects of different parameters such as initial C/N ratio, aeration rate and initial water content on volatile solid reduction, relative heat generation HR and the continue time  $t$  of the compost temperature above 50 $^{\circ}$ C during pig slurry-wheat straw composting, the successive single factor composting tests and the orthogonal composting tests were carried out to optimize the composting process, respectively. The dry wheat straw was chosen as bulking agent, successively single factor composting tests were conducted on with the initial C/N ratio of 20, 25, 30 and 35, with the aeration rate of 0.18, 0.26, 0.34 and 0.42 L/(min $\cdot$ kg), and with the initial water content of 55%, 60%, 65% and 70%, respectively. Based on the single factor tests, the orthogonal composting tests of L9(3<sup>4</sup>) were designed. The experimental results showed that the initial C/N ratio had obvious influence on volatile solid reduction rate  $\eta$  and HR, especially on  $t$ , but the aeration rate and water content had not. According to the results of orthogonal composting tests, the optimal parameters for pig slurry-wheat straw composting were obtained as the initial C/N ratio of 20, the aeration rate of 0.34 L/(min $\cdot$ kg) and the initial water content of 65%.

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