

## **Different organic fertilizers improve the normalized enzyme activity of flue-cured tobacco soil under chemical fertilizers reduction**

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### **Abstract:**

This research was aimed to determine the effects of different organic fertilizers (OF), bio-organic fertilizers (BIO) on the soil enzyme activity of flue-cured tobacco under chemical fertilizers reduction through four years of field experiment. Normalized enzyme activity was used to discuss the relationship between soil enzyme activity and the soil available nutrient and the relationship between soil enzyme activity and soil organic carbon. The results showed that, under four years chemical fertilizer 20% reduction, combined application with different organic fertilizers could increase the yield and the quality of flue-cured tobacco. It helped increased the soil organic matter, soil labile organic carbon and soil enzymes activity significantly. In comparison with the conventional fertilization (CF, 100% chemical fertilizer), the activities of soil urease, alkaline phosphatase, dehydrogenase and invertase of OF treatment increased by 27.72%、11.11%、51.39% and 14.12% respectively. The activities of soil urease, alkaline phosphatase, dehydrogenase and invertase of BIO treatment increased by 27.72%、27.78%、58.51% and 26.52% respectively. The normalized enzyme activity of OF and BIO increased by 11.88% and 19.88% respectively. The normalized enzyme activity of BIO was 7.15% higher than that of OF. Pearson correlation analysis showed that soil normalized enzyme activity of flue-cured tobacco was extremely significantly related to soil available nutrient and soil organic carbon. In conclusion, 20% chemical fertilizer reduction combined with bio-organic fertilizer is a better practice for improving soil fertility, yield and quality of flue-cured tobacco.

**Keywords:** chemical fertilizers reduction, organic fertilizer, normalized enzyme activity, labile organic carbon, soil of flue-cured tobacco