



## Effect of Different Carbon-based Soil Conditioners on Different Fertility Soil

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**Background** The application of carbon source materials as a functional material in agricultural soil has caused extensive research. The three kinds of carbon-based soil conditioners used in this experiment was prepared by my research group. **Objective** To explore the effects of three carbon-based soil conditioners on different kinds of soils. **Method** Four test sites in Yunnan Province, China were selected for field experiments. The soil type of test site are purple soil ,yellow soil , high-fertility paddy soil. Conditioner I was formulated on the basis of rice bran and oil cake, conditioner II was formulated on the basis of rice bran and zeolite powder, and conditioner III was formulated on the basis of rice bran and biochar. The experimental crop is flue-cured tobacco. The field experiment set 5 treatments and 3 random repeats. Namely: CK0, no fertilizer; CK1 chemical fertilizer+commercial organic fertilizer; T1, chemical fertilizer+carbon-based conditioner I; T2: chemical fertilizer+carbon-based conditioner II; T3: chemical fertilizer+carbon-based conditioner III. **Result** Three carbon-based soil conditioners have different conditioning effects on different fertility soils, especially in the vigorous stage of flue-cured tobacco season. The supply of soil nitrogen is continuous and stable in T1 soil conditioner, which effectively increases the nitrogen content and improves the nitrogen content and absorption of tobacco roots and leaves. T2 soil conditioners could increase N fertilizer utilization and beneficial to yields and quality formation in tobacco. T3 conditioner has a higher carbon to nitrogen ratio, and the nitrogen supply is weak in the early stage and strong in the topping stage of tobacco. After applying carbon-based conditioners, the leaching loss of soil nitrogen is effectively reduced. **Conclusion** T1 soil conditioner can be used for increasing low-fertility in purple soil of Yunnan Hot Area; T2 soil conditioner can increase the content of soil organic matter and regulate nutrient supply in yellow soil in cold mountainous area of zhaotong; T3 soil conditioner can effectively regulate high-fertility paddy soil nutrients, especially reducing nitrogen absorption of tobacco.