

Post-harvest trash removal effects on soil temperature and ratoon growth in green harvested sugarcane

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Abstract

Thick trash (harvest residue) layer left on soil surface after sugarcane green harvesting lowers soil temperature and slows down early ratoon growth on organic soils in Florida. These negative effects of trash may be minimized or avoided through partial or complete removal of trash immediately after harvesting. Additionally, the removed trash may be used for electricity or second-generation ethanol production.

To evaluate the effects of trash removal on soil temperature and sugarcane growth, a field experiment was conducted on organic soils (Histosols) with four treatments: 0%, 33%, 66% and 100% trash removal. The following data were collected: soil temperatures at 5 cm and 15 cm soil depths, number of tillers during early growth season, and final yield parameters at the time of harvest in first and second ratoon crops.

Results showed that the maximum soil temperature at 5 cm depth in first ratoon was significantly greater in 100% trash removal than all other treatments early in the season [<50 days after harvest (DAH)] with marginal or no difference later in the season. Tiller count also increased with 100% trash removal early in the season (<75 DAH), but there was no difference between the treatments later in the season (151 DAH). Soil temperatures and tiller counts in partial trash removal (33% and 66%) were similar to 0% trash removal. There was no significant treatment difference in tons of cane per hectare (TCH), sugar per ton of cane (SPT) and tons of sugar per hectare either in first or second ratoon.

Overall, only complete (100%) trash removal was helpful in increasing soil temperatures and improving early season growth in green harvested field but there was no effect on final sugarcane yield. Therefore, trash can potentially be left on soil surface as a mulch for soil conservation purposes or removed (partially or completely) for its alternate use without effecting sugarcane yields in ratoon crops.

Key words: harvest residue, microclimate, yield, harvest system