

Effects of Harvest Method on Microclimate in Florida Sugarcane¹

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The production systems for sugarcane (a complex hybrid of *Saccharum* spp.) include either green cane or burnt cane harvesting operations. In burnt cane harvesting, sugarcane fields are set on fire in order to burn off leafy material before harvesting in order to reduce transportation costs to the mill, improve harvesting efficiencies, and enhance sugar recoveries at the mill. In green cane harvesting, sugarcane is harvested without burning, and a thick leafy residue (commonly called “trash blanket” or trash) remains on the soil surface.

Sugarcane trash blanket has both negative and positive effects on the emergence and growth of the next sugarcane crop (i.e., ratoon crop). Common negative effects are lower soil temperatures (Oliveira et al. 2001) that delay regrowth of ratoon cane and put young regrowth at risk during subfreezing weather events. Trash blanket also interferes with tillage operations and fertilizer applications. In contrast, positive effects of mulches formed by unburned trash include increased soil carbon, nutrient conservation, reduced weed growth (Samuels and Lopes 1952), and conserved soil water (Ball-Coelho et al. 1993).

Sugarcane in Florida is typically harvested with burnt cane mechanical harvesting. Nonetheless, there is a growing interest to better understand the effects of trash blanket on microclimate conditions for sugarcane growing on both muck (organic soil with >80% organic matter) and sand (mineral soil with <2% organic matter) soils of Florida. A three-year study conducted on muck and sand in the Everglades Agricultural Area (EAA) determined that the effects of harvest method on soil (at 3/4-inch and 4-inch depths) and air temperatures (at 4-inch height from the soil surface) could be different in muck versus sand (Sandhu et al. 2013).

Trash (Harvest Residue)

The amount of trash declined during the multi-year crop cycle, whereby plant cane had the greatest trash followed by progressively less trash for the first ratoon and second ratoon crops (Fig. 1). As expected, green cane harvesting produced much more trash than burnt cane harvesting. The average amount of green cane trash on muck soil (7.7 tons/acre) was comparatively greater than sand (7.2 t/acre), which is attributed to higher sugarcane yields on muck soils. Burning prior to harvest did not completely remove all leafy material and still left some trash on the ground.

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