Sucrose Accumulation Maturity Curves for CP 80-1743

Hardev S. Sandhu, Maninder P. Singh, Robert A. Gilbert, James M. Shine, Jr., and Ronald W. Rice

Introduction

Sugarcane (a complex hybrid of Saccharum spp.) is harvested during a five-month period (October to March) in south Florida. “Early maturing” cultivars milled in October or November may not have reached their peak sucrose content, but may have higher sugar per ton (SPT, lb of sucrose per ton of sugarcane biomass) than other cultivars at the onset of milling operations (Miller and James 1977). Under current industry milling capacities, harvesting the 425,000 acres of Florida sugarcane takes roughly five months. Unavoidably, sugarcane plants harvested during the early harvest period have not yet achieved maximum sugar content. Consequently, the sugar content for any given cultivar will change over the course of the harvest season, which can impact the profitability of the harvest. Maturity curves of SPT vs. time have been developed for sugarcane cultivars in South Africa (Bond 1982), Louisiana (Legendre and Fanguy 1975; Legendre 1985; Richard et al. 1981) and Mauritius (Mamet and Galwey 1999). Although it is known that sucrose accumulation rates vary between varieties, maturity curves for recently released “CP” sugarcane cultivars (those developed at the USDA-ARS Sugarcane Field Station in Canal Point, Florida) have not been reported since 1977 (Rice 1974; Miller and James 1977). CP cultivars occupy greater than 80 percent of Florida sugarcane acreage (Rice et al. 2013), and are also economically important (Tew 2003) in many countries including Argentina (25% of total acreage), Belize (16%), El Salvador (50%), Guatemala (65%), Honduras (47%), Mexico (15%), Morocco (54%), Nicaragua (75%), Senegal (9%), and Venezuela (9%). Since most sugarcane growers in Florida plant a diverse selection of cultivars, these maturity curves are needed as tools to help growers make informed choices regarding harvest scheduling decisions.

This publication presents the sucrose accumulation maturity curves for different crop ages (plant cane, first ratoon, and second ratoon) of CP 80-1743. CP 80-1743 harvest samples were collected at two-week intervals at five locations over four harvest seasons in the Everglades Agricultural Area. Biomass and sugar yields were determined on all samples in order to generate SPT trends over time. A full comparison of CP 80-1743 SPT trends with 12 other CP cultivars may be found in EDIS publication SC069, Maturity Curves and Harvest Schedule Recommendations for CP Sugarcane Varieties (http://edis.ifas.ufl.edu/sc069).

1. This document is SS-AGR-216, one of a series of the Agronomy Department, UF/IFAS Extension. Original publication date April 2004. Reviewed October 2014. This publication is also a part of the Florida Sugarcane Handbook, an electronic publication of the Agronomy Department. For more information, contact the editor of the Sugarcane Handbook, Hardev Sandhu (hsandhu@ufl.edu). Visit the EDIS website at http://edis.ifas.ufl.edu.

2. H. S. Sandhu, assistant professor, Agronomy Department, UF/IFAS Everglades Research and Education Center, Belle Glade, FL; Maninder P. Singh, assistant scientist, Agronomy Department, UF/IFAS Everglades REC, Belle Glade, FL; Robert A. Gilbert, professor and chair, Agronomy Department; J. M. Shine, Jr., Sugar Cane Grower’s Cooperative of Florida, 1500 W. Sugar House Rd, Belle Glade, FL 33430; and R. W. Rice, UF/IFAS Extension Palm Beach County, 2976 State Road 15, Belle Glade, FL 33430; UF/IFAS Extension, Gainesville, FL 32611.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county’s UF/IFAS Extension office.

U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.
Cultivar Description

CP 80-1743 is grown on 5.1% of the EAA sugarcane acreage (Rice et al. 2013). The acreage under CP 80-1743 cultivar is declined rapidly in last 4–5 years due to its high orange rust susceptibility, but it is still among the top 10 widely grown sugarcane cultivars in Florida.

Maturity Curves

Figure 1 presents the sugar per ton (SPT, lb sugar/ton sugarcane biomass) for CP 80-1743 from mid-October to mid-March. Separate curves are presented for plant cane, first ratoon, second ratoon, and the entire data set.

Research has shown that older ratoon crops generally have higher SPT values but lower tonnage (Glaz et al. 1989; MacColl 1976). Thus, growers should generally expect the SPT of their sugarcane crop to increase with crop age (see Figure 1). The mean SPT of CP 80-1743 averaged 258 lb/ton in plant cane and first ratoon, increasing to 270 lb/ton in second ratoon. The overall mean across crop ages ranked fifth out of 13 CP cultivars.

Grower recommendations are based on the entire data set across all crop ages. Early-season predicted SPT for CP 80-1743 at the onset of harvest on Oct. 14 was 219 lb/ton (ranked second out of 13 cultivars), and maximum predicted SPT was 274 lb/ton on Jan. 26 (ranked ninth out of 13 cultivars). In comparison to other CP cultivars, CP 80-1743 matures quickly and is also prone to deterioration following freeze events. This cultivar is also susceptible to leaf scald which becomes more severe later in the harvest season. For all these reasons, CP 80-1743 should be harvested during the first 50 days of the harvest season (see http://edis.ifas.ufl.edu/sc069).

References


