LARGE SCALE RIPENER EVALUATION

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At the onset of the sugarcane harvest season in mid-September in Louisiana, sugarcane maturity in terms of sucrose accumulation is at its lowest and increases as the season progresses through natural ripening. Application of ripening agents target biochemical processes within the sugarcane plant, resulting in a redistribution of fixed carbon and a shifting of resources into sucrose storage. Use of chemical ripening agents to improve early season sucrose concentration is of critical importance to Louisiana sugarcane processors through improve efficiency and increased daily mill capacity.

Glyphosate has been used as a ripener in Louisiana since 1980 and has become a valuable component of sugarcane production systems. In recent years, however, sugarcane producers have become increasingly concerned with the possible deleterious effects of glyphosate ripener on subsequent ratoon crops; mainly, retardation of regrowth, leaf chlorosis, and reduced shoot population. Furthermore, there is interest in evaluating alternatives to glyphosate for use in sugarcane production programs.

In 2012, the United States Environmental Protection Agency (EPA) granted registration of trinexapac-ethyl (Moddus 2EC®) as a sugarcane ripener. The label states that sugarcane should be harvested 28 to 60 days after trinexapac-ethyl application. For glyphosate sugarcane should be harvested 21 to 49 days after application. Trinexapac-ethyl has been an effective ripener in Brazil and Australia. Unlike glyphosate, trinexapac-ethyl is classified as a plant growth regulator targeting gibberellin biosynthesis.

A large scale study (25 acres) was conducted on a second stubble field of HoCP 96-540 at Blackberry Farms in Vacherie. A randomized complete block (RCB) experimental design was used to evaluate the ripener treatments. Treatments were replicated 3 times. Aerial application of Moddus (19 oz/A) was applied on August 27, 2014, and Roundup PowerMax (5.3 oz/A) on September 24, 2014. Plots were harvested October 22, 2014, resulting in a ripener treatment duration of 57 days for Moddus and 29 days for Roundup PowerMax. Two tractor-trailer loads were harvested from each treatment by combine. The harvested area for tractor-trailer loads varied from 0.55 to 0.70 acres. Harvested area and scale weights obtained from Lafourche Sugar Factory were used to calculate sugarcane yield (tonnage). Core sample analyses for obtaining the yield of theoretical recoverable sugar per ton of cane (TRS) were obtained from both front and rear compartments of all trucks that were part of the experiment. Both Moddus and Roundup PowerMax increased TRS by 11.8 and 13.9% above the nontreated control, respectively (Table 1). Sugarcane yield was negatively impacted by Moddus which reduced sugarcane yield by 4.4 tons/A. Roundup PowerMax sugarcane yield was equivalent to the nontreated control. Sugar yield was not statically improved regardless of ripener treatment.

Table 1. Large scale field experiment means comparing the efficacy of the ripeners Roundup PowerMax and Moddus to nontreated second stubble HoCP 96-540 at Blackberry Farms, Vacherie, LA in 2014.

Ripener Treatment	TRS lb/ton	% TRS Increase	Sugarcane Yield Tons/A	% Sugarcane Yield Decrease	Sugar Yield lb/A	% Fiber
Nontreated	197 b		47.4 a		9307 a	17.3 a
Moddus (19 oz./ac)	220 a	11.8	42.0 b	11.4	9216 a	18.1 a
PowerMax (5.3 oz./ac)	224 a	13.9	44.3 ab	6.4	9917 a	17.6 a
P-value	0.0157		0.0407		0.1334	0.7707