LARGE SCALE RIPENER EVALUATION

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Introduction

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 (Palisade 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.

Study

A large scale field experiment was treated with glyphosate at 0.187 lb/A (210 g ae/ha) and Palisade at 0.312 lb/A (350 g ai/ha) and compared to the untreated control and harvest at 28 and 56 days after treatment, respectively, in 2012 (Table 1). Treatments were applied aerially to second stubble HoCP 96-540. Ripener treatments were applied at 3 gallons of spray mixture per acre. At each location, ripener treatments were applied once, and are considered a single replicate. The three locations were Blackberry Farms, Vacherie, LA, Hebert Brothers Farm, Thibodaux, LA, and Ronald Hebert Farms, Jeanerette, LA. Palisade treatment was applied at approximately 56 days before harvest while glyphosate treatment was applied at approximately 28 days before harvest. Both glyphosate and Palisade treatments, as well as, the untreated control were harvested on the same day for a given location. Cane was harvested by combine and scale weights were obtained from the factories where the cane was processed. 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.

Results

Mean values for Blackberry Farms, Ronald Herbert Farms, and Hebert Brothers Farm are presented in Tables 2, 3, and 4, respectively. Data were analyzed as a randomized complete block experiment, with each location representing one replication.

Both glyphosate and Palisade increased sugar per acre (Table 5); however, the increase for glyphosate came from increasing TRS by 10.2% while not affecting tonnage, and the increase for Palisade came from a reduced increase in TRS (4.9%) and a large increase in cane tonnage. It is interesting to note that Palisade is not as effective as glyphosate in increasing TRS even given the extra two weeks from treatment to harvest. However, from this experiment, Palisade actually accounted for a significant increase in tons of cane per acre when compared to the untreated control.

Table 1. Large scale field experiment comparing efficacy of glyphosate and Palisade to untreated control at Blackberry Farms (Vacherie), Ronald Hebert Farms (Jeanerette) and Hebert Brothers Farm (Thibodaux).

Farm	Treatment	App. Date	Harvest Date	Harvest Int.
Blackberry	Glyphosate	9/11/2012	10/8/2012	27
Blackberry	Palisade	8/13/2012	10/8/2012	56
Blackberry	Control		10/8/2012	
Ronald Hebert	Glyphosate	9/13/2012	10/11/2012	28
Ronald Hebert	Palisade	8/11/2012	10/11/2012	61
Ronald Hebert	Control		10/11/2012	
Hebert Brothers	Glyphosate	9/14/2012	10/15/2012	31
Hebert Brothers	Palisade	8/17/2012	10/15/2012	59
Hebert Brothers	Control		10/15/2012	

Table 2. Results from Blackberry Farms at Vacherie.

Treatment	Acres Harvested	Mean TRS (lbs)	Mean Tons/A (tons)	Sugar/A (lbs)
Glyphosate	1.68	200	46.6	9311
Palisade	1.47	186	52.1	9703
Control	1.60	180	49.5	8934

Table 3. Results from Ronald Hebert Farms at Jeanerette.

Treatment	Acres Harvested	Mean TRS (lbs)	Mean Tons/A (tons)	Sugar/A (lbs)
Glyphosate	2.77	210	35.2	7404
Palisade	2.52	203	39.1	7922
Control	2.91	190	32.8	6229

Table 4. Results from Hebert Brothers Farm at Thibodaux.

Treatment	Acres Harvested	Mean TRS (lbs)	Mean Tons/A (tons)	Sugar/A (lbs)
Glyphosate	2.23	193	45.4	8777
Palisade	1.96	184	52.4	9628
Control	2.20	177	44.7	7917

Table 5. Combined analyses for three locations

Treatment	TRS (lbs)	Increase (%)	Tons/A (tons)	Sugar/A (lbs)
Glyphosate	201 a	10.4	42.4 b	8497 a
Palisade	190 b	4.4	47.9 a	9084 a
Control	182 c	--	42.4 b	7693 b
F-Value	0.0014		0.0251	0.0107