Evaluation of Eptam (EPTC) in Fallowed Sugarcane Fields

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In fallowed sugarcane fields glyphosate products are used to control perennial weeds including bermudagrass, johnsongrass, and nutsedges. In some cases multiple applications of glyphosate can be effective for weed control, but timing of application can be difficult depending on weather conditions. There is interest in using a preemergence herbicide in conjunction with glyphosate to help control troublesome perennial weeds. This research evaluated Eptam at two locations. Since Eptam is extremely volatile it must be incorporated immediately after application to maintain effectiveness. The herbicide was applied at 2, 3, 4, and 5 pt/A on June 8 at St. Gabriel, LA and on June 11 at Welcome Farms, St. James, LA. Eptam was incorporated on pre-formed beds using a Lilliston rolling cultivator and a hipper/bedder at St. Gabriel but only a hipper/bedder was used at Welcome Farms.

Bermudagrass control in early July at St. Gabriel was greater when the Lilliston was used for incorporation (91% for 2 pts/A for the Lilliston vs. 55% for the hipper/bedder) (Table 1). When the hipper/bedder was used at Welcome Farms, nutsedge (purple and yellow) was controlled in early July 61% at 2 pts/A and 91% at 5 pts/A. The cost of Eptam 7E in 2007 was around $4.00 per pint. In Table 2 cost comparisons are made for Eptam at various rates followed by Roundup Original Max and for programs of two Roundup Original Max applications where either Yukon or Envoke is applied with the first application to help with nutsedge control. All of these programs provided at least 96% bermudagrass control when evaluated in early August. Based on 2007 prices the cost for Roundup Original Max applied at 46.5 oz/A following Eptam at 3 pt/A would be $19.30/A. This would compare with $14.60 for two applications of Roundup Original Max and $25.40 and $31.10 if Envoke or Yukon is added. Gowan Company is currently pursuing label changes to allow for Eptam use in fallowed sugarcane fields. Eptam could offer a means to reduce re-infestation of bermudagrass and nutsedge in fallowed fields when used in conjunction with a glyphosate product. With the increase in the cost of glyphosate for 2008 use of preemergence herbicides in fallowed fields may be a viable option.

Table 1. Bermudagrass and nutsedge ground cover and control with Eptam as affected by incorporation using a Lilliston rolling cultivator and hipper/bedder at St. Gabriel, LA and a hipper/bedder at Welcome Farms, St. James, LA.

	Bermudagrass ground cover and % control based on ground cover - July 9		**Nutsedge ground cover and % control based on ground cover - July 11**
Herbicide rate/A	**Hipper/bedder incorporation**	**Lilliston cultivator incorporation**	**Hipper/bedder incorporation**
Eptam @ 2pt	10 (55%)	2 (91%)	18 (61%)
Eptam @ 3pt	8 (64%)	2 (91%)	13 (72%)
Eptam @ 4pt	10 (55%)	4 (82%)	8 (83%)
Eptam @ 5pt	7 (68%)	2 (91%)	4 (91%)
No herbicide	22	22	46

Table 2. Cost comparisons of Eptam and glyphosate programs compared with two applications of glyphosate or two applications of glyphosate with Yukon or Envoke applied with glyphosate at the first application.[1]

First application	Cost $/A	Follow-up application (s)	Cost $/A	Total cost $/A
Eptam @ 2pt	$8.00	Roundup OM @ 46.5 oz	$7.30	**$15.30**
Eptam @ 3pt	$12.00	Roundup OM @ 46.5 oz	$7.30	**$19.30**
Eptam @ 4pt	$16.00	Roundup OM @ 46.5 oz	$7.30	**$23.30**
Eptam @ 5pt	$20.00	Roundup OM @ 46.5 oz	$7.30	**$27.30**
--	--	Roundup OM @ 46.5 oz fb Roundup OM @ 46.5 oz	$7.30 + $7.30	**$14.60**
--	--	Roundup OM @ 46.5 oz + Yukon @ 6 oz fb Roundup OM @ 46.5 oz	$7.30 + $16.50 fb $7.30	**$31.10**
--	--	Roundup OM @ 46.5 oz + Envoke @ 0.15 oz fb Roundup OM @ 46.5 oz	$7.30 + $10.80 fb $7.30	**$25.40**

[1]Herbicide costs for 2007: Eptam 7E @ $4.00/pt; Roundup Original Max @ $20/gallon; Yukon @ 6 oz/A = 1.0 oz/A Permit and 6 oz/A Clarity (dicamba); Cost = $16.50 (Note: Permit @ 1 oz/A; Cost $18.00/oz); Envoke @ $72/oz

COMPARISONS OF SUGARCANE VARIETIES FOR GROWTH AND SHADING POTENTIAL

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Sugarcane that emerges rapidly in the spring and that produces a high population of stalks with leaves less upright in growth habit should be more competitive with weeds due to shading. Our interest is in comparing sugarcane varieties in respect to their ability to be competitive with weeds. Of specific interest is how the shade environment changes within the sugarcane canopy across the growing season and how this may differ depending on variety. The sugarcane varieties, LCP 85-384, L 97-128, HoCP 96-540, Ho 95-988, L 99-226, and L 99-233 were planted at St. Gabriel in 2006.

Shoot population in April in 2007 was highest for L 99-226 and shoot population was 35% less for HoCP 96-540, 26% less for Ho 95-988, 19% less for L 99-233, 11% less for LCP 85-384, and 7% less for LCP 97-128. In mid-May plant height was greatest for LCP 97-128 and L 99-233. Another measure of crop competitiveness would be canopy width. L99-226 had the greatest canopy width (40 inches) in mid-May. In the end of June and July plant height was greatest for LCP 97-128 and L 99-233. In the end of June the shade level in the row middles determined by the percent reduction in photosynthetically active radiation (PAR) was highest for L 99-226 (97%) and lowest for HoCP 96-540 (80%). Results indicate that HoCP 96-540 would be more susceptible to late season weed emergence. By using data collected on seasonal emergence and response to shading of weeds common in sugarcane production in Louisiana we hope to customize weed control programs based on variety selection and also to recommend varieties that would that would be most productive where specific weed problems exist.

Table 1. Growth of LCP 85-384, LCP 97-128, HoCP 96-540, Ho 95-988, L 99-226, L 99-233 sugarcane from April, May, and June and reduction in photosynthetically active radiation (PAR) in late June. [1]

	Shoots (no./40 ft)		Height (inches)	Width (inches)	Height (inches)	PAR % reduction
Variety	**April 11**	**May 15**	**May 15**	**May 15**	**June 27 / July 24**	**June 27**
LCP 85-384	217	381	33	32	44 / 66	87
LCP 97-128	227	342	37	36	57 / 78	87
HoCP 96-540	158	346	29	30	47 / 73	80
Ho 95-988	181	352	30	36	46 / 66	86
L 99-226	244	392	30	40	47 / 67	97
L 99-233	198	337	38	37	59 / 80	91
LSD (0.05)	43	NS	4	4	5 / 7	6

[1]PAR measured at ground level in the row middle and expressed as percent reduction compared with full sunlight.

BERMUDAGRASS GROWTH RESPONSE TO SHADE

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A study was conducted at the Ben Hur Research Farm using shade boxes that produced shade levels of 90, 70, 50, and 30%. A full sun (0 shade treatment) was also included. An area with bermudagrass was tilled and shade boxes were placed in the field to simulate a layby tillage timing. At 32 days after the shade boxes were placed in the field, bermudagrass ground cover under full sun was 72% and increased to 88% at 55 days (Table 1). Under the 90% shade environment, ground cover was 23% at 32 days and 15% at 55 days, indicating that bermudagrass was able to regrow and persist under shade. Bermudagrass in many cases was taller under shade compared with full sun and would be expected as a natural plant response to light deficiency. At 55 days all plant material was harvested under each shade box. All shade levels reduced bermudagrass dry weight biomass compared with the full sun treatment. Finding indicate that bermudagrass could persist under a sugarcane canopy late into the growing season and based on previous research comparing varieties, bermudagrass could potentially be a greater problem in stubble crops of HoCP 96-540 compared with some of the other varieties.

Previous research has determined the shading response of red morningglory and purple nutsedge. Other research is underway to investigate shade response of itchgrass and johnsongrass. It may be possible to customize weed control programs based on variety selection.

Table 1. Bermudagrass ground cover, height, and biomass response to varying shade levels.

Shade level (%)	Ground cover (%)			Height (cm)			Biomass (g)	
	32 days	42 days	55 days	32 days	42 days	55 days	Fresh weight 55 days	Dry weight 55 days
90	23 b	19 b	15 d	24 b	28 a	34 ab	34 b	14 c
70	34 b	30 b	30 c	29 a	33 a	40 a	68 b	25 c
50	54 a	64 a	66 b	27 ab	35 a	41 a	260 a	121 b
30	56 a	60 a	73 b	26 ab	33 a	37 ab	327 a	152 b
0 (full sun)	72 a	76 a	88 a	16 c	27 a	30 b	320 a	220 a