POAST RESISTANT SWEET CORN AND OTHER HERBICIDE DEVELOPMENTS

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Introduction

Postemergence grass weed control options are limited in sweet corn. Accent is labeled to control annual grasses in approved processing sweet corn hybrids. The list of Accent-approved hybrids has been continually updated by DuPont (Table 1). Accent is not recommended for use on other hybrids because the risk of crop injury may not be known. Accent has only been labeled for use on processing sweet corn. However, an Accent label for fresh market sweet corn is expected in 2006. It will be important to know which fresh market hybrids have good tolerance to Accent. A multi-state study was conducted in 2005 to test the tolerance of 114 hybrids, which provides a preliminary indication of Accent tolerance (Table 2).

Table 1. Processing sweet corn hybrids that may be treated with Accent.

ABCO Var. #610	Empire	GG 455*	Lumina
Basin*	Excalibur	GH 0937	Prelude*
Bonus	GG 8	GH 2547	Reward
Challenger	GG 22	GH 2690	Sheba
Chase	GG 43	GH 9589	Sockeye
Climax	GG 57	GH 9597*	Spirit
Cornucopia	GG 63*	GSS 8357	Sprint
Crisp'N Sweet 710	GG 202	GSS 8388	Stetson
Crisp'N Sweet 710A	GG 214	GSS 9299	Suregold
DMC 20-04	GG 246	Harvest Gold	Wht 2801
DMC 20-35	GG 255	HM 701	Zenith
Dynamo	GG 435	Kokanee	781 Ultra
Eliminator	GG 445	Lancaster*	
Excellency	GG 446*	Legacy	

* Hybrids added to the recommended list for 2006.

Poast

A new alternative grass herbicide option in sweet corn is Poast in Poast Protected sweet corn. Poast, which is distributed by Microflo Company, has a supplemental label allowing use on Poast Protected sweet corn. (Poast Plus is a different formulation of sethoxydim and is not registered for use on sweet corn.) Poast Protected is the commercial name for sweet corn that is resistant to sethoxydim and Rogers has a few commercial hybrids available (GH 2042, GH 6333, and GH 6631). This resistance is conferred by a mutation in the ACCase enzyme, which is sethoxydim's site of action. The mutation prevents sethoxydim from binding to ACCase and blocking the enzyme. As a consequence, sweet corn hybrids with this trait are resistant. Sethoxydim resistance in corn was selected as a mutation that occurred during tissue culture. As such, this form of herbicide resistance is not the result of transgenic engineering and should not raise concerns in individuals who are opposed to genetically engineered crops.

Poast can only be applied to Poast Protected sweet corn hybrids. Other hybrids will be severely injured or killed. Poast will control most annual grass weeds and suppress quackgrass.

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However, Poast has no activity on broadleaf weeds and has essentially no residual soil activity. The labeled use rates for Poast are 0.5 to 1.5 pt/a. Crop oil concentrate must be added at 1 qt/a and the addition of 2.5 lb/a ammonium sulfate or 2 to 4 qt/a 28% nitrogen solution may improve control of certain grass weeds. Poast is labeled at 0.5 pt/a to control wild proso millet up to 10 inches tall; at 1 pt/a for crabgrass up to 6 inches tall and foxtails up to 8 inches tall; and at 1.5 pt/a for quackgrass when 8 inches tall. Tank mixtures with atrazine, Basagran, or Laddok S-12 are labeled to control emerged broadleaf weeds. Labeled tank mixtures with Outlook or G-Max Lite would provide residual weed control. Poast applications can be made from emergence until before pollen shed, but tank mixtures with atrazine must be applied before sweet corn exceeds 12 inches. Up to two Poast applications can be made at a minimal interval of 10 days. Rain within 1 hour may reduce the effectiveness of Poast on grass weeds. Sweet corn can be harvested as soon as 30 days after application. Crops on which Poast is labeled can be planted anytime after a Poast application; other crops can be planted 30 days after application.

A logical use for Poast would be to control wild proso millet in sweet corn or other late season grass escapes. However, several factors should be considered. A preemergence grass herbicide would be beneficial for the initial grass weed control. Then, Poast could be applied later in the season to control late emerging wild proso millet. If a preemergence grass herbicide is not applied, Poast would need to be applied early in the season for general grass control, to control early emerging wild proso millet, and to protect the sweet corn from early season weed competition. Because Poast lacks residual control, millet control may be poor by the end of the season without a second Poast application. In previous studies that compared Poast Plus with Accent for wild proso millet control, control was similar between the herbicides, but Poast may have less risk of injuring Poast Protected sweet corn hybrids than Accent's risk of injuring other hybrids. The potential for broadleaf herbicides to antagonize Poast's activity on grass weeds exists. In 2005, giant foxtail control was reduced when Callisto plus atrazine were tank mixed with Poast, but not when Callisto was tank mixed alone with Poast. Antagonism from these tank mixtures was not observed on wild proso millet control in the same trial. At this time, tank mixtures of Poast with Callisto are not being recommended.

Impact

Impact (topramezone) has been registered for use on sweet corn by AMVAC, but the label has not been distributed at the time this article is being written. Therefore, specific details on Impact's application directions cannot be provided. Impact is primarily a postemergence broadleaf herbicide. It has some postemergence grass activity, but consistent grass control should not be expected at the anticipated labeled rates. Therefore, a preemergence grass herbicide should be applied for grass control. Impact's mode of action is a HPPD-inhibitor, which is the same as Callisto and Impact is synergized by atrazine. Options for rotational crops may be limited to corn with higher use rates of Impact. Be sure to review the label for rotational crop restrictions before use.

Mesotrione

For postemergence broadleaf weed control, Callisto (mesotrione) was labeled on all sweet corn types in 2005 and testing of hybrid tolerance is continuing (Table 2). In addition to postemergence applications of Callisto, Camix (premix of Callisto and Dual II Magnum) and Lumax (premix of Callisto, atrazine, and Dual II Magum) are expected to be labeled for preemergence use in sweet corn in 2006.

Table 2. Response of 114 sweet corn hybrids to postemergence applications of Accent, Option (not currently labeled for use on sweet corn), and Callisto at twice labeled rates. A single replication of each hybrid was evaluated at seven locations in Idaho (2), Colorado (1), Wisconsin (3), and Delaware (1). Sweet corn was treated at the V3 growth stage. The adjuvants used with Accent, Option, and Callisto were 1% crop oil concentrate plus 2 lb/a AMS, 1.5 pt/a methylated seed oil plus 2 lb/a AMS, and 1% crop oil concentrate respectively. The average, standard deviation, minimum, and maximum responses are listed. Western sites had no or low injury and Delaware generally had the greatest injury.

Sweet Corn Hybrid Tolerance Evaluation 2005
(7 day after treatment summary)

			Accent (1.33 oz/a) Stunting %				Option (3 oz/a) Stunting %				Callisto (6 oz/a) Chlorosis %			
Company	**Entry Name**	**Genotype**	**Ave**	**Std**	**Min**	**Max**	**Ave**	**Std Dev**	**Min**	**Max**	**Ave**	**Std**	**Min**	**Max**
Crookham	Alexis	Synergistic	1.4	2.4	0	5	7.1	14.7	0	40	7.0	12.8	0	5
Crookham	Ambrosia	Se	2.1	5.7	0	15	8.6	9.9	0	25	2.4	4.6	0	15
Crookham	Argent	Se	13.6	14.4	0	40	8.6	12.5	0	35	22.1	24.3	0	40
Crookham	Bodacious	Se	8.6	10.7	0	30	8.6	14.1	0	40	2.1	5.7	0	30
Crookham	Bojangles	Synergistic	4.3	7.9	0	20	7.1	10.4	0	30	2.4	5.6	0	20
Crookham	Cameo	Synergistic	7.1	14.7	0	40	14.3	14.0	0	40	4.9	9.2	0	40
Crookham	Captivate	Synergistic	6.4	11.1	0	25	7.1	10.7	0	30	6.0	11.2	0	25
Crookham	Celestial	Synergistic	7.1	15.0	0	40	12.1	12.2	0	35	14.6	19.1	0	40
Crookham	Charmed	Synergistic	6.4	9.4	0	20	9.3	13.4	0	35	4.9	11.1	0	20
Crookham	Cinderella	Synergistic	4.3	5.3	0	15	9.3	12.7	0	35	7.1	10.7	0	15
Crookham	CNS710 rust	Sh2	5.7	11.3	0	30	9.3	11.3	0	30	2.9	5.7	0	30
Crookham	CSEYP1-3	Se	5.0	9.1	0	25	5.7	8.9	0	25	2.9	7.6	0	25
Crookham	CSHYP2-57	Sh2	7.1	10.7	0	30	7.1	12.5	0	35	2.1	5.7	0	30
Crookham	CSUWP1-7	Su	13.6	13.5	0	35	17.1	10.4	5	35	9.0	14.4	0	35
Crookham	CSUYP2-28	Su	7.9	12.2	0	30	8.9	12.1	0	35	3.6	7.5	0	30
Crookham	Delectable	Se	6.4	11.1	0	30	13.6	16.0	0	45	4.6	9.2	0	30
Crookham	Eliminator	Su	12.1	15.5	0	40	11.4	13.8	0	35	4.1	9.2	0	40
Crookham	Fleet	Se	7.9	9.9	0	30	12.9	12.2	0	30	1.7	4.5	0	30
Crookham	Holiday	Sh2	5.7	9.3	0	25	11.4	10.7	5	35	3.6	7.5	0	25
Crookham	How Sweet It Is	Sh2	11.4	10.3	0	25	9.3	14.0	0	40	8.3	11.8	0	25
Crookham	Incredible	Se	7.9	14.4	0	40	5.7	11.0	0	30	6.1	12.9	0	40
Crookham	Kristine	Synergistic	5.7	8.4	0	20	7.1	14.7	0	40	6.0	8.7	0	20

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Crookham	Maestro	Su	10.0	11.2	0	30	9.3	11.3	0	25	6.4	11.1	0	30
Crookham	Marvel	Sh2	7.9	10.4	0	25	12.1	11.5	5	35	1.7	3.0	0	25
Crookham	Miracle	Se	6.4	9.4	0	25	6.4	12.8	0	35	6.3	9.0	0	25
Crookham	Optimum	Sh2	3.9	6.3	0	17	6.4	12.8	0	35	4.5	5.6	0	17
Crookham	Polka	Synergistic	5.0	6.5	0	15	16.4	16.0	0	35	2.4	3.1	0	15
Crookham	Sugar Buns	Se	2.9	3.9	0	10	4.3	7.3	0	20	3.1	7.5	0	10
Crookham	Venus	Se	5.7	9.3	0	25	7.1	12.9	0	35	3.1	5.6	0	25
Harris Moran	Cavalry	Sh2	11.4	14.4	0	40	18.6	31.1	0	85	1.4	3.8	0	40
Harris Moran	Coho	Su	12.9	11.9	0	35	15.0	10.8	0	30	6.0	9.5	0	35
Harris Moran	Dynamo	Su	20.0	12.6	5	40	15.7	8.4	5	30	20.0	21.8	5	40
Harris Moran	Early Gold	Su	8.6	8.5	0	20	13.6	9.9	5	35	6.9	16.9	0	20
Harris Moran	HM 2390	Su	3.6	6.3	0	15	7.9	9.5	0	25	1.4	3.8	0	15
Harris Moran	HMX 4380BES	Se	3.6	9.4	0	25	16.4	21.0	0	60	2.9	5.7	0	25
Harris Moran	HMX 4383S	Sh2	10.0	14.1	0	35	10.7	10.2	0	30	5.6	9.0	0	35
Harris Moran	HMX 4387WS	Sh2	9.3	14.8	0	40	5.0	5.8	0	15	7.1	14.6	0	40
Harris Moran	HMX 4388S	Sh2	11.4	12.1	0	30	12.9	9.5	0	25	3.9	5.4	0	30
Harris Moran	HMX 4394	Su	7.1	10.7	0	30	9.3	12.1	0	35	4.0	6.1	0	30
Harris Moran	HMX 4396S	Sh2	7.9	10.7	0	30	5.7	6.1	0	15	3.6	7.5	0	30
Harris Moran	Ice Queen	Sh2	3.6	4.8	0	10	10.0	12.2	0	30	4.6	7.2	0	10
Harris Moran	Legacy	Su	2.1	3.9	0	10	4.3	4.5	0	10	1.4	3.8	0	10
Harris Moran	Max	Sh2	14.3	15.9	0	40	10.0	8.2	0	25	4.6	5.9	0	40
Harris Moran	Polaris	Sh2	6.4	7.5	0	20	14.3	12.1	0	35	3.9	5.4	0	20
Harris Moran	Renaissance	Se	2.4	4.6	0	12	10.0	13.8	0	40	2.9	5.7	0	12
Harris Moran	Revelation	Se	5.3	7.1	0	20	12.1	17.3	0	50	1.7	3.0	0	20
Harris Moran	Sentinel	Sh2	7.1	9.9	0	25	5.7	5.3	0	15	6.0	9.1	0	25
Harris Moran	Suregold	Sh2	8.1	12.6	0	35	7.1	6.4	0	15	7.6	14.5	0	35
Harris Moran	Turbo	Su	9.3	14.0	0	40	7.1	4.9	0	15	6.7	10.4	0	40
Mesa Maize	Accord	Se	9.6	13.3	0	35	16.4	11.8	0	35	8.9	10.4	0	35
Mesa Maize	Bon Appetit TSW	Se	2.9	3.9	0	10	6.4	4.8	0	15	1.4	3.8	0	10
Mesa Maize	Bon Jour TSW	Se	7.1	12.9	0	35	7.1	7.6	0	20	2.9	5.7	0	35
Mesa Maize	Breeders Choice	Se	4.3	6.1	0	15	11.4	9.0	5	30	1.0	2.6	0	15

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Mesa Maize	Brocade TSW	Se	5.7	10.2	0	25	8.6	6.3	0	20	2.4	5.6	0	25
Mesa Maize	Chief Ouray	Se	12.9	12.2	0	30	13.6	9.0	5	30	8.9	16.4	0	30
Mesa Maize	Double Gem	Se	14.3	14.0	0	35	18.6	14.1	0	40	4.0	7.3	0	35
Mesa Maize	Lancelot	Se	2.1	5.7	0	15	13.6	9.9	0	25	2.9	5.7	0	15
Mesa Maize	Luscious TSW	Se	6.4	7.5	0	20	7.1	6.4	0	20	5.7	9.8	0	20
Mesa Maize	Merlin	Se	6.4	8.5	0	25	7.1	6.4	0	20	5.1	9.0	0	25
Mesa Maize	Misquamicut	Synergistic	3.6	4.8	0	10	6.4	10.7	0	30	1.4	3.8	0	10
Mesa Maize	Montauk	Synergistic	5.7	7.3	0	20	6.4	2.4	5	10	4.3	9.3	0	20
Mesa Maize	Nantasket	Synergistic	2.1	2.7	0	5	4.3	9.3	0	25	2.9	7.6	0	5
Mesa Maize	Native Gem	Se	5.3	7.9	0	20	7.1	9.5	0	25	1.7	4.5	0	20
Mesa Maize	Precious Gem	Se	7.1	10.4	0	30	10.7	8.9	0	25	6.9	10.8	0	30
Mesa Maize	Spring Treat	Se	2.1	5.7	0	15	6.4	11.1	0	30	2.9	5.7	0	15
Mesa Maize	SugarPearl TSW	Se	1.4	3.8	0	10	5.0	5.8	0	15	2.4	5.6	0	10
Mesa Maize	Tuxedo	Se	2.1	5.7	0	15	7.1	8.6	0	25	2.1	5.7	0	15
Mesa Maize	Welcome TSW	Se	11.4	18.0	0	50	9.3	10.6	0	25	2.0	3.7	0	50
Mesa Maize	Whiteout	Se	3.6	5.6	0	15	7.1	8.6	0	25	3.3	6.1	0	15
Rogers	Bold	Su	8.6	14.4	0	40	10.7	13.7	0	40	6.0	10.8	0	40
Rogers	BSS3495	Sh2	3.6	9.4	0	25	8.6	18.4	0	50	2.9	5.7	0	25
Rogers	Colonial	Se	6.4	6.9	0	20	8.6	12.5	0	35	2.0	4.5	0	20
Rogers	Double Up	Sh2	6.4	8.0	0	20	12.1	15.2	0	40	2.1	3.9	0	20
Rogers	GH 2042	Su	10.7	14.0	0	40	16.4	12.5	5	40	11.9	21.5	0	40
Rogers	GH 2669	Su	11.4	13.8	0	40	10.0	13.5	0	40	8.9	14.0	0	40
Rogers	GH 6631	Su	2.1	5.7	0	15	11.4	15.2	0	45	2.1	2.7	0	15
Rogers	GH 6333	Su	15.3	10.9	5	35	15.7	15.7	5	50	7.0	13.9	5	35
Rogers	GSS 2914	Sh2	10.0	14.1	0	40	14.3	14.0	0	40	9.6	18.1	0	40
Rogers	GSS 3287	Sh2	7.9	10.4	0	30	13.6	9.9	0	30	3.7	5.4	0	30
Rogers	GSS 4165	Sh2	1.4	3.8	0	10	8.6	12.1	0	35	2.1	5.7	0	10
Rogers	GSS1303	Sh2	2.1	3.9	0	10	10.0	12.6	0	35	5.7	5.8	0	10
Rogers	Jubilee	Su	8.6	10.7	0	30	20.7	11.3	5	35	6.7	12.7	0	30
Rogers	Providence	Synergistic	2.9	7.6	0	20	11.4	14.9	5	45	3.6	9.4	0	20
Rogers	SS Jubilee Plus	Sh2	16.4	12.1	0	35	11.4	11.1	0	30	8.3	14.2	0	35

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Company	**Entry Name**	**Genotype**	**Ave**	**Std**	**Min**	**Max**	**Ave**	**Std Dev**	**Min**	**Max**	**Ave**	**Std**	**Min**	**Max**
Rogers	Winstar	Sh2	14.3	22.8	0	60	7.1	10.7	0	30	4.6	9.2	0	60
Seminis	Basin R	Sh2	10.0	13.5	0	40	10.0	7.1	0	20	10.3	14.5	0	40
Seminis	Challenger	Sh2	4.3	7.3	0	20	8.6	11.1	0	30	0.7	1.9	0	20
Seminis	Chase	Su	6.4	11.1	0	30	10.0	10.0	0	30	5.3	9.4	0	30
Seminis	Devotion	Sh2	6.4	6.9	0	20	6.4	11.1	0	30	6.1	10.8	0	20
Seminis	EX 08705353	Su	6.4	11.1	0	30	10.0	9.6	0	30	2.6	5.5	0	30
Seminis	EX 08705640	Su	12.1	11.5	0	35	13.6	6.9	5	25	3.9	9.4	0	35
Seminis	EX 08705770	Sh2	47.9	24.3	15	75	42.1	26.3	5	80	26.4	29.8	15	75
Seminis	EX 08705788	Sh2	5.7	13.0	0	35	13.6	12.8	0	40	4.3	9.2	0	35
Seminis	EX 08716636	Sh2	5.0	7.6	0	20	8.6	16.5	0	45	5.0	8.7	0	20
Seminis	EX 9381178	Sh2	1.4	3.8	0	10	9.3	11.7	0	35	0.0	0.0	0	10
Seminis	Harvest Gold	Su	3.6	5.6	0	15	7.1	8.6	0	25	3.9	7.4	0	15
Seminis	Hollywood	Sh2	12.9	14.1	0	35	14.3	15.4	0	40	13.6	22.9	0	35
Seminis	Merit	Su	58.6	25.8	15	85	61.4	35.2	0	100	32.1	32.3	15	85
Seminis	Obsession	Sh2	3.6	5.6	0	15	7.1	8.6	0	25	2.1	5.7	0	15
Seminis	Passion	Sh2	2.9	3.9	0	10	9.3	12.7	0	35	4.1	5.9	0	10
Seminis	Sheba R	Sh2	2.9	3.9	0	10	10.0	10.0	0	30	1.7	4.5	0	10
Seminis	Temptation	Se	1.4	3.8	0	10	10.0	7.6	0	25	2.4	4.2	0	10
Snowy River	Bliss	Su	3.9	4.4	0	12	6.4	8.0	0	20	2.1	3.9	0	12
Snowy River	Colombus	Sh2	12.1	14.1	0	40	10.0	7.6	0	20	6.9	16.9	0	40
Snowy River	Empire	Su	9.3	13.7	0	40	11.4	8.5	0	25	7.0	16.8	0	40
Snowy River	Enterprise	Su	5.0	7.1	0	20	5.0	7.6	0	20	2.9	5.7	0	20
Snowy River	Everest	Sh2	7.1	14.7	0	40	9.3	9.8	0	30	4.3	9.2	0	40
Snowy River	Lancaster	Sh2	6.4	9.0	0	25	10.0	15.8	0	45	2.6	4.5	0	25
Snowy River	Prelude	Su	8.6	11.8	0	30	9.3	11.7	0	35	3.6	6.3	0	30
Snowy River	Punch	Su	13.6	8.0	0	20	10.7	7.3	0	20	7.4	16.8	0	20
Snowy River	Rising Sun	Sh2	2.9	5.7	0	15	9.3	14.0	0	40	2.1	5.7	0	15
Snowy River	UY0607OJ	Su	5.0	6.3	0	15	9.3	10.2	0	30	2.9	5.7	0	15
Snowy River	UY0712OJ	Su	5.0	4.1	0	10	7.9	10.4	0	30	2.9	5.7	0	10
Snowy River	UY1953OK	Su	2.1	3.9	0	10	7.1	10.7	0	30	2.4	4.6	0	10