

Sweet Corn Herbicide Impact Residual Study

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Pest Control. Dual II Magnum, 1.33 pint/acre applied preemergence for annual grass control.

Introduction

Impact (topramezone) is one of three important HPPD (4-hydroxyphenyl-pyruvate-dioxygenase) herbicides labeled for use in sweet corn. The other two are Callisto (mesotrione) and Laudis (tembotrione). Impact provides postemergence control of numerous broadleaf weeds and control or suppression of several annual grass weeds. Research evaluations and commercial usage have shown good safety when used on corn but label restrictions severely limit rotational crop plantings for vegetable growers. This study looks at Impact herbicide use on sweet corn and its potential for injuring subsequent crops of snap bean, cucumber, and tomato.

Materials and Methods

Planting. Cultivar BC 0805 (Syngenta) was planted with a John Deere 7000 corn planter on May 28, 2008, in field S-3 having loamy-sand soil with 2.0% organic matter and soil pH of 6.50.

Plot Design. A randomized complete block design with three replications was used. Plots consisted of six rows 30 ft long and spaced 30 in. apart and thinned to a uniform population of 28,000/acre after emergence.

Fertility and Irrigation. Water was applied as needed by center pivot irrigation system to supplement rainfall. Fertilizer was applied preplant incorporated at rate of 60 lb/acre nitrogen (N) and 100 lb/acre potassium (K₂O). An additional 60 lb/acre nitrogen was sidedressed on June 18.

Treatments. Postemergence herbicide treatments applied on June 25 with CO₂ backpack sprayer with pressure of 35 PSI in volume of water to equal a rate of 15 gallon/acre. Weather conditions were sunny, plant and soil surfaces dry, air temperature of 85°F, and SW wind at 5–7 mph. Corn plants were about 12 in. tall at the V5-V6 growth stage.

Results and Discussion

Dual II Magnum was applied preplant, on May 5, to trial area providing good weed control through planting and crop emergence. However, plots were weedy when the postemergence herbicide treatments were applied. Most common weeds were carpetweed, purslane, velvetleaf, and morning glory ranging in size from 1 to 4 leaves. Herbicide treatments were applied on June 25 and sweet corn cultivar BC 0805 did not show any signs of phytotoxicity afterwards, even at the 2X rates. Trial results support the recommended usage rates for Impact of 0.5 to 0.75 oz/acre and tank-mixing with atrazine for improved weed efficacy. Weed control ratings in Table 3 show tank-mixing Impact with Aatrex 4L (atrazine) improved weed control over treatments using Impact alone. And, when Impact was used alone, the ½ X rate (0.38 oz/acre) lessened weed control compared with the 1X and 2X rates. Sweet corn yield and weed control of Impact tank-mixed with Aatrex 4L (Treatments 5 and 6) were not statistically different from those of Callisto or Laudis tank-mixed with Aatrex 4L (Treatments 7–10).

This study will continue in 2009 when plots of cucumbers, snap beans, and tomatoes will be planted in the 2008 herbicide plots and carryover herbicide injury will be evaluated.

Table 1. Postemergence herbicide treatment descriptions.

Herbicide treatment ¹	Rate/acre
1. Control – no post herbicide	---
2. ½ X rate Impact (topramezone)	0.38 oz
3. 1X rate Impact (topramezone)	0.75 oz
4. 2X rate Impact (topramezone)	1.50 oz
5. 1X rate Impact (topramezone) + Aatrex 4L (atrazine)	0.75 oz + 1.0 pint
6. 2X rate Impact (topramezone) + Aatrex 4L (atrazine)	1.5 oz + 2.0 pint
7. 1X rate Callisto (mesotrione) + Aatrex 4L (atrazine)	3.0 fl oz + 1.0 pint
8. 2X rate Callisto (mesotrione) + Aatrex 4L (atrazine)	6.0 fl oz + 2.0 pint
9. 1X rate Laudis (tembotrione) + Aatrex 4L (atrazine)	3.0 fl oz + 1.0 pint
10. 2X rate Laudis (tembotrione) + Aatrex 4L (atrazine)	6.0 fl oz + 2.0 pint

¹All postemergence treatments applied with crop oil concentrate at 1.0% v/v.

Table 2. Average yield and ear size of sweet corn, cv. BC0805, from postemergence herbicide treatments.

Treatment	Yield dozen ears/acre	Yield cwt/acre	Husked ear weight (lb)	Husked ear length (in.)	Husked ear diameter (in.)
1. Control	1,984	164.91	0.50	8.50	1.73
2. ½ X rate Impact	2,032	183.67	0.54	8.62	1.76
3. 1X rate Impact	2,000	172.45	0.52	8.53	1.72
4. 2X rate Impact	2,096	184.05	0.53	8.62	1.75
5. 1X Impact + Aatrex 4L	2,000	180.38	0.53	8.72	1.75
6. 2X Impact + Aatrex 4L	2,112	184.44	0.54	8.57	1.77
7. 1X Callisto + Aatrex 4L	1,920	171.49	0.53	8.62	1.77
8. 2X Callisto + Aatrex 4L	1,952	179.03	0.56	8.53	1.78
9. 1X Laudis + Aatrex 4L	1,968	172.07	0.54	8.66	1.75
10. 2X Laudis + Aatrex 4L	1,920	180.19	0.53	8.71	1.74
LSD 5%	n.s.	n.s.	n.s.	n.s.	n.s.

Table 3. Postemergence herbicide treatment weed control ratings.¹

Treatment	Carpet weed	Morning glory	Velvet leaf	Purslane	Overall control
1. Control – no post herbicide	P	P	P	P	P
2. ½ X rate Impact	G	P-F	F	F	F
3. 1X rate Impact	E	F	G	F	F-G
4. 2X rate Impact	E	G	G	G	G
5. 1X Impact + Aatrex 4L	E	G	E	G-E	G-E
6. 2X Impact + Aatrex 4L	E	G-E	E	E	E
7. 1X Callisto + Aatrex 4L	E	G-E	E	G-E	G-E
8. 2X Callisto + Aatrex 4L	E	E	E	E	E
9. 1X Laudis + Aatrex 4L	E	E	E	G-E	E
10. 2X Laudis + Aatrex 4L	E	E	E	E	E

¹Weed control ratings: P = poor, F = fair, G = good, E = excellent.