

Weed Management Research Update in Asparagus

Sushila Chaudhari

Assistant Professor (Edible Specialty Crops
Weed Management)

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Outline

- ❖ Impact of fall indaziflam application on rye-cover crop establishment, asparagus tolerance, and pigweed species control
- ❖ Determine the effect of spring application timings [early preemergence (30 days before first harvest) and pre-emergence (15 days before first harvest)] of herbicides on asparagus quality and yield and weed control
- ❖ Research plan for 2022

Indaziflam

- ❖ Indaziflam (cellulose biosynthesis-inhibiting; Group 29), preemergence activity, registered to use in citrus fruit, grapes, olives, pome fruit, stone fruit, and tree nuts
- ❖ Activity on several annual broadleaves including pigweed spp. and grass weeds; provide control for an extended period of time (more than 12 weeks after application)

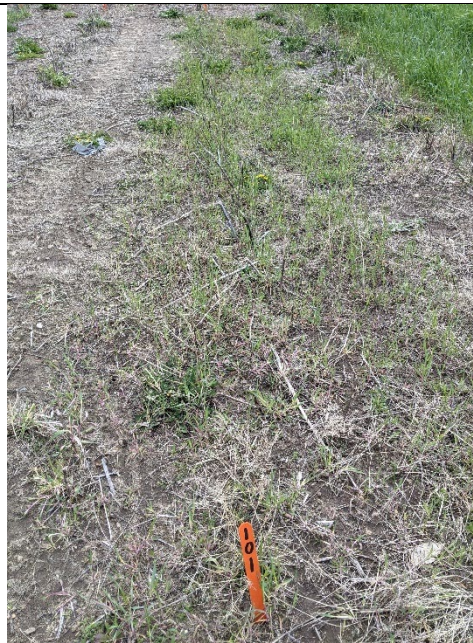
Some concerns are: (1) How to incorporate fall application of indaziflam in asparagus cropping system without having negative impact on ryegrass germination and growth? (2) Is it safe in asparagus crops to apply indaziflam during early spring and achieve optimum level of pigweed control throughout the harvest season?

Impact of fall indaziflam application on rye-cover crop establishment, asparagus tolerance, and pigweed control

- ❖ Asparagus (Guelph Millennium; planted on 2019); Hart, MI
- ❖ Plot Size: 4.5 ft wide x 25 ft long
- ❖ Study Design: RCBD with 4 replications
- ❖ Rye cover crop planted on 09/03/2021 at 168 lb/ac; Fern Mowed on 11/3/2021
- ❖ Indaziflam application: 11/05/2020
- ❖ Before first harvest, on 4/26/2021, all the plots were sprayed with glyphosate (2 lb ai/ac), and non-treated plot sprayed with glyphosate (1 lb ai/ac) + Karmex (3 lb ai/ac) + Prowl H2O (3 lb ai/ac)

Pest Code		% RYE	HOWE	TOTAL	TOTAL	GRASS
Crop Name				WC	BL	
Rating Date	Rate	20Apr2021			27May2021	
Rating Unit	lb ai/ac	0-100	0-100	0-100	0-100	0-100
Non-treated	-	51	15	10	86	100
Karmex 80WP	3	0	33	84	86	99
Tricor 75DF	1					
Alion 1.67SC	0.011	65	33	38	93	100
Alion 1.67SC	0.022	18	45	64	95	100
Alion 1.67SC	0.045	5	65	63	88	100
Alion 1.67SC	0.067	1	79	75	89	99
Alion 1.67SC	0.090	0	83	60	93	100

Pest Code		AMARANTH		TOTAL	Yield	
Crop Name		ASPA		WC	TOTAL	TOTAL
Rating Date	Rate	16Jun2021			GOOD	GOOD
Rating Unit	lb ai/ac	0-100	0-100	0-100	NO./PLOT	KG/PLOT
Non-treated	-	0	0	0	63.5	1.94
Karmex 80WP	3	0	8	19	70.5	2.11
Tricor 75DF	1					
Alion 1.67SC	0.011	3	89	86	77.8	2.31
Alion 1.67SC	0.022	3	94	90	72.8	2.15
Alion 1.67SC	0.045	5	95	90	66.0	2.11
Alion 1.67SC	0.067	1	99	91	85.0	2.54
Alion 1.67SC	0.090	5	99	93	76.5	2.27



Non-treated



Karmex 80WP + Tricor 75DF



Alion 0.011 lb ai/ac



Alion 0.022 lb ai/ac

April 20, 2021



Alion 0.045 lb ai/ac



Alion 0.067 lb ai/ac



Alion 0.090 lb ai/ac

April 20, 2021



Karmex 80WP + Tricor 75DF

Non-treated

Aug 20, 2021

No negative impact from fall application of indaziflam on asparagus;
however, higher rates causing reduction in rye grass stand



Alion 0.090 lb ai/ac

Alion 0.067 lb ai/ac

Alion 0.045 lb ai/ac

Alion 0.022 lb ai/ac

Alion 0.011 lb ai/ac

Aug 20, 2021

Determine the effect of spring application timings [EPRE (30 days before first harvest) and PRE (15 days before first harvest)] of herbicides on asparagus and weed control

- ❖ Asparagus (Guelph Millennium; planted on 2009); Holt, MI
- ❖ Plot Size: 5.3 ft wide x 50 ft long
- ❖ Study Design: RCBD with 3 replications
- ❖ Herbicide application: EPRE = 4/06/2021
PRE = 4/20/2021



Trt No.	Treatment Name	Rate lb ai/ac	Growth Stage	Asparagus injury (%)		
				10-May	21-May	7-Jun
1	Untreated Weedy		PRE	10	3	3
2	Alion 200	0.065	EPRE	17	8	3
3	Alion 200	0.13	EPRE	13	3	3
4	Alion 200	0.065	PRE	20	13	10
5	Alion 200	0.13	PRE	20	20	7
6	Zidua	0.106	EPRE	13	5	3
7	Zidua	0.267	EPRE	3	10	0
8	Zidua	0.106	PRE	7	10	3
9	Zidua	0.267	PRE	17	13	13
10	Chateau	0.128	EPRE	27	15	10
11	Chateau	0.192	EPRE	23	20	10
12	Chateau	0.128	PRE	20	10	10
13	Chateau	0.192	PRE	30	25	3
14	Karmex	3	EPRE	17	10	7
	Prowl H2O	3.9	EPRE			
15	Command	1	EPRE	13	10	7
	Spartan	0.375	EPRE			
16	Sinbar	1	PRE	10	7	3
	Callisto	0.241	PRE			



Trt	Treatment	Rate	Growth	TOTAL GOOD	TOTAL GOOD	TOTAL CULL	TOTAL CULL
No.	Name	lb ai/ac	Stage	NO./PLOT	KG/PLOT	NO./PLOT	KG/PLOT
1	Untreated Weedy		PRE	479	11	38	1
2	Alion 200	0.065	EPRE	477	11	43	1
3	Alion 200	0.13	EPRE	493	12	30	1
4	Alion 200	0.065	PRE	498	11	34	1
5	Alion 200	0.13	PRE	463	11	36	1
6	Zidua	0.106	EPRE	504	11	38	1
7	Zidua	0.267	EPRE	507	12	31	1
8	Zidua	0.106	PRE	563	13	42	1
9	Zidua	0.267	PRE	518	12	34	1
10	Chateau SW	0.128	EPRE	451	10	29	1
11	Chateau SW	0.192	EPRE	493	11	30	1
12	Chateau SW	0.128	PRE	462	11	53	1
13	Chateau SW	0.192	PRE	380	9	41	1
14	Karmex	3	EPRE	439	10	22	0
	Prowl H20	3.9	EPRE				
15	Command	1	EPRE	533	12	36	1
	Spartan	0.375	EPRE				
16	Sinbar	1	PRE	516	12	38	1
	Callisto	0.241	PRE				

No negative impact on asparagus yield from spring EPRE or PRE application of indaziflam

Research plan for 2022.....

- ❖ Determine the impact of fall application of indaziflam on rye-cover crop establishment, asparagus tolerance, and pigweed species control (*Hart, MI*)
- ❖ Determine the effect of spring application timings [early preemergence (30 days before first harvest) and pre-emergence (15 days before first harvest)] of indaziflam and potential new herbicide (pyroxasulfone) on asparagus quality and yield and weed control (*Holt, MI*)
- ❖ Determine the impact of spring application timings of pyroxasulfone on asparagus tolerance and weed control (*Hart, MI*)
- ❖ To investigate the growth characteristics of Powell amaranth biotypes (normal-growth and small-growth habit biotypes) (*greenhouse*)
- ❖ Planting asparagus at Holt, MI to use in future research work

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 - Nicole Soldan
 - Monique Hemker
 - Christopher Galbraith
 - Undergraduate Students



Sushila Chaudhari
sushilac@msu.edu
517-914-0128

<https://www.canr.msu.edu/people/dr-sushila-chaudhari>