

Red Clover Tolerance to Different Herbicide Application Timings

Purpose:

To evaluate the tolerance of red clover to herbicides applied at various growth stages. Herbicide labels indicate that under seeded red clover should be at the 1st to 3rd trifoliolate stage before an application is made. Many wheat producers find themselves in a situation whereby the under seeded crop is not at the labeled stage, yet the weeds are at the ideal stage for application. Therefore, the consequence of spraying when the red clover crop is not at the ideal stage is unknown.

Methods:

The trial was set up as a randomized complete block design. In 2004 only a pure stand of red clover was treated with 3 registered herbicides. This was to establish a “worse case” scenario for red clover herbicide injury since interception of spray droplets is greatest under a pure stand management scenario. In 2005, the same 3 registered herbicides were applied to red clover under seeded into winter wheat to establish a “best case” scenario for red clover herbicide injury, since the wheat crop should intercept the majority of spray droplets before reaching the under seeded red clover.

The following 3 herbicides were applied:

1. Buctril M - applied at 0.4 L/ac at:
2. MCPA/MCPB - applied at 1.7 L/ac
3. MCPA Sodium - applied at 0.6 L/ac

Each herbicide to red clover at the following growth stages:

1. Pre-emergent
2. Cotyledon - Unifoliolate
3. 1st Trifoliolate
4. 2nd Trifoliolate

Visual evaluations of crop injury due to herbicide application were taken periodically over an 8-week period. If at the end of 8 weeks there were noticeable visual difference between treatments, red clover yield would be taken.

Results and Conclusions

- Herbicide injury to red clover was greater in pure stand versus under seeded management systems.
- There was no visual difference in red clover stands when evaluated eight weeks after application, regardless of herbicide, application timing, amount of visual crop injury and cropping system (i.e. pure stand versus under seeded into winter wheat).
- Overall, MCPA Sodium tended to cause the least amount of visual injury to red clover.
- If red clover had not yet emerged, both Buctril M and MCPA Sodium caused little visual injury to red clover once emerged.
- If red clover was at the cotyledon to unifoliolate stage of growth, MCPA Sodium caused the least amount of crop injury.

Crop Advances: Field Crop Reports

- When red clover was under seeded to winter wheat, herbicide applications made at the first to second trifoliolate stage provide a reasonable level of crop safety.

Table 1. Visual injury (%) of a pure red clover stand at 1-2 weeks and 4-8 weeks after applications (WAA) of three different herbicides being applied at 4 different physiological stages of red clover growth at Elora, ON in 2004.

Treatment Details			% VISUAL INJURY	
Treatment	Rate (L/ac)	Application Stage	1-2 WAA	4-8 WAA
Buctril M	0.4 L/ac	PRE	9	0
		cotyledon to unifoliolate	7	0
		1 st trifoliolate	52	0
		2 nd trifoliolate	26	2
MCPA/MCPB	1.7 L/ac	PRE	35	0
		cotyledon to unifoliolate	27	0
		1 st trifoliolate	7	0
		2 nd trifoliolate	4	0
MCPA Sodium	0.6 L/ac	PRE	10	0
		cotyledon to unifoliolate	7	0
		1 st trifoliolate	11	0
		2 nd trifoliolate	4	0

Table 2. Visual injury (%) of red clover under seeded in winter wheat at 1-2 weeks and 4-8 weeks after application (WAA) of three different herbicides applied at 4 different stages of red clover growth at Elora, ON in 2005.

Treatment Details			% VISUAL INJURY	
Treatment	Rate (L/ac)	Application Stage	1-2 WAA	4-8 WAA
Buctril M	0.4 L/ac	PRE	0	0
		cotyledon to unifoliolate	24	2
		1 st trifoliolate	4	1
		2 nd trifoliolate	9	0
MCPA/MCPB	1.7 L/ac	PRE	20	0
		cotyledon to unifoliolate	23	0
		1 st trifoliolate	0	0
		2 nd trifoliolate	0	0
MCPA Sodium	0.6 L/ac	PRE	5	0
		cotyledon to unifoliolate	9	1
		1 st trifoliolate	21	8
		2 nd trifoliolate	4	1

Acknowledgements:

This project is funded in part through contributions by Canada and the Province of Ontario under the Canada-Ontario Research and Development (CORD) Program, an initiative of the federal-provincial-territorial Agricultural Policy Framework designed to position Canada's agri-food sector as a world leader. The Agricultural Adaptation Council administers the CORD Program on behalf of the province.

Project Contacts:

Dr. François Tardif & Peter Smith, University of Guelph, 519-824-4120 ext. 53395/58372
Mike Cowbrough, OMAFRA, mike.cowbrough@ontario.ca , 519-824-4120 ext. 52580

Location of Project Final Report:

Mike Cowbrough, OMAFRA