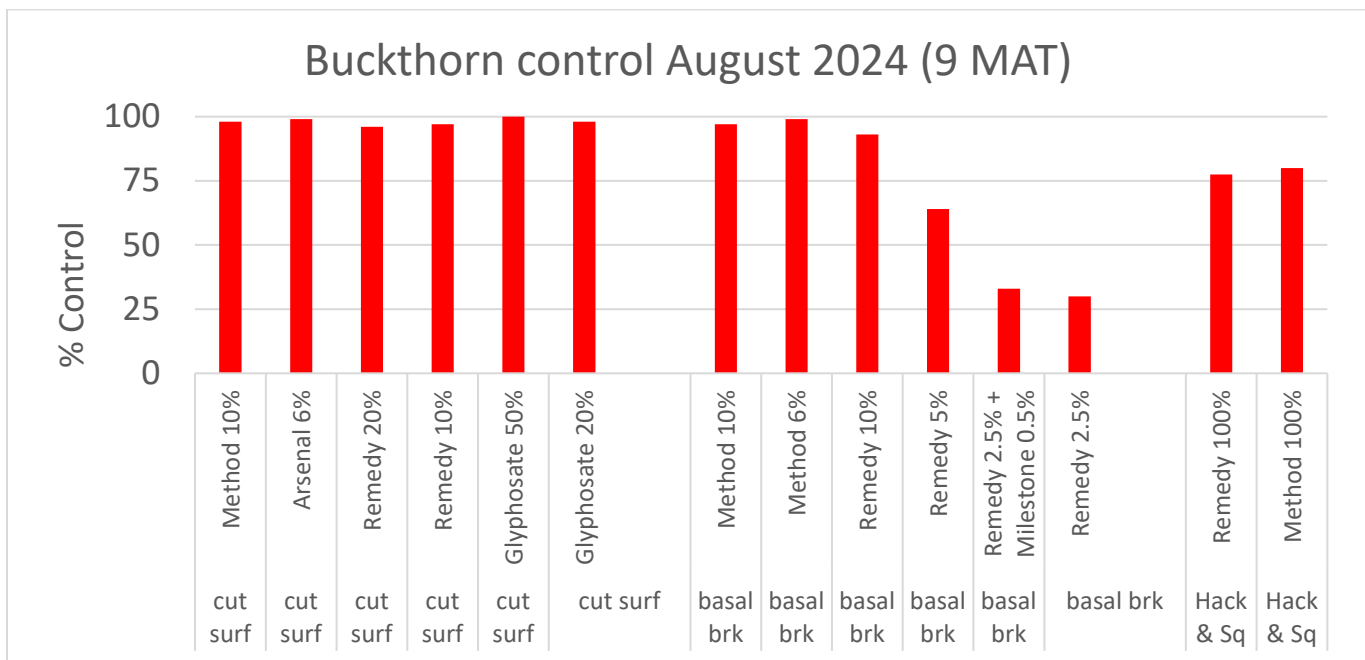


Objective: Demonstrate effective invasive woody shrub management techniques using herbicides on invasive common buckthorn.

Site Description: Management demonstrations were applied along the edge of a paved trail at River Bend Nature Center in Racine, Wi. This area was dominated by hardwood trees but the understory was invaded by common buckthorn. Buckthorn plants were treated by cut surface and basal bark methods. Buckthorn plants were between three and six feet in height.

Application: Applications were made on November 15, 2023. Basal bark and cut surface treatment herbicides were applied to the target area (base of tree or cut surface) with the designated herbicide (see figure and tables) to result in minimal off-target herbicide movement. As leaves were senescing/falling off the trees, foliar treatments were not applied.

Summary of results 9 months after treatment:



TREATMENT DETAILS AND RESULTS

Cut Surface Herbicide Treatment: Twenty-five buckthorn trees were cut and treated with herbicide on 11/15/2023 at a cost of \$0.27-0.32 per tree. At that time, leaves were beginning to fall off trees. At nine months after treatment (183 days), all treatments resulted in >95% mortality. Off-target injury was not observed.

Effectiveness of cut surface treatments on common buckthorn						
Treatment	Rate	% Control 9 MAT (August 2024)	% Mortality 9 MAT	Labor cost per shrub	Product cost per shrub	Total cost per shrub
Method + Bark oil	10% v/v 90% v/v	98	100	\$0.25	\$0.02	\$0.27
Arsenal + water	9% v/v	99	100	\$0.32	\$0.05	\$0.37
Remedy Ultra + Bark oil	20% v/v 80% v/v	96	80	\$0.27	\$0.02	\$0.29
Remedy Ultra + Bark oil	10% v/v 90% v/v	97	90	\$0.31	\$0.01	\$0.32
Glyphosate + water	50% v/v 50% v/v	100	100	\$0.27	\$0.01	\$0.28
Glyphosate + water	20% v/v 80% v/v	98	90	\$0.27	<\$0.01	\$0.27

Basal Bark Herbicide Treatment: Twenty-five buckthorn trees were treated with herbicide on 11/16/2023 at a cost of \$0.07-0.15 per tree. At that time, leaves were falling off trees. This timing is considered appropriate as basal treatments can be applied year-round as long as the bark is dry and herbicide solution doesn't freeze in the container. At nine months after treatment (182 days), Method and the high rate of Remedy (10%) gave 90% control of plants. While control was high, some treated trees did survive in all treatments. These plants likely will need retreatment in the future. Off-target injury was minimal.

Effectiveness of basal bark herbicide treatment on common buckthorn						
Treatment	Rate	% control 9 MAT (August 2024)	% Mortality 9 MAT	Labor cost per shrub	Product cost per shrub	Total cost per shrub
Method	10% v/v	97	90	\$0.10	\$0.05	\$0.15
Method	6% v/v	99	80	\$0.09	\$0.03	\$0.12
Remedy Ultra	10% v/v	93	70	\$0.14	\$0.01	\$0.15
Remedy Ultra	5% v/v	64	40	\$0.8	<\$0.01	\$0.08
Remedy Ultra + Milestone	2.5% v/v+ 1.43 oz/A	33	0	\$0.07	<\$0.01	\$0.07
Remedy Ultra	2.5% v/v	30	10	\$0.08	<\$0.01	\$0.08

Hack and Squirt Herbicide Treatment: One “hack” was applied to each of four buckthorn trees and appropriate herbicide was applied to the wound on 11/15/2023. At nine months after treatment (183 days), Method and Remedy provided modest control (78-80%) with low plant mortality (<25%). Poor control was likely due to too few “hacks” applied to each plant. This is supported by viewing higher levels of injury on the side of the tree where the “hack” was applied. We would expect high levels of control with this approach and attribute the lower effectiveness to the limited translocation of the herbicide to the opposite side of the “hack”. Off-target injury was not observed.