PRE & POST-EMERGENT HERBICIDE TRIAL ON SLENDER ICEPLANT *(MESEMBRYANTHEMUM NODIFLORUM)*

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AIM

To investigate chemical control options of 'slender iceplant' *(Mesembryanthemum nodiflorum)* with commonly used crop herbicides. The focus was to find suitable pre and post emergent options, in legume crops and pastures.

BACKGROUND

Slender Iceplant (*Mesembryanthemum nodiflorum*) has traditionally been viewed as a plant of saline environments and a good indicator of saline soils. Since 1999 iceplant has spread rapidly from saline valley floors into productive paddocks in many areas of the Northern Agricultural Region. This spread has been facilitated by soil disturbance events such as flooding and our lack of understanding of the biology of iceplant resulting in inappropriate management practices.

Once the iceplant has established, it creates its own favorable environment by accumulating salt from depth in the soil and depositing it in its succulent tissues. This storage of salt in the iceplant stubble is then leached with summer and breaking rains, creating a stressful osmotic environment in the topsoil for winter annuals to germinate. The iceplant waits until flushing rains have leached salts from the topsoil to germinate, which is usually after good opening rains or late winter and spring.

Department trials in 2004 and 2005 showed effective control of iceplant with simazine 500 g/L at 2 L/ha, atrazine 500 g/L at 1 L/ha, chlorsulfuron 750 g/kg at 15 g/ha and metsulfuron-methyl 600 g/kg at 5 g/ha. These options are however not registered, and do not cater for legume pasture situations. Trials performed by South Australian Research & Development Institute (SARDI) in 2005 showed effective control of the closely related 'common iceplant' (*Mesembryanthemum crystallinum*), with a mixture of Diuron & Broadstrike®. This mixture was applied post-emergent with minimal damage to medics.

Dicamba in a mix with 2,4-D amine is the only fully registered option in Western Australia for the control of slender iceplant. As this option is not suitable in legumes, replicated trial work was performed this year to obtain data necessary for permanent registration of herbicides for slender iceplant control.

TRIAL DETAILS

	Site 1	Site 2
Property	Brian McAlpine - Maya	Damian Ryan - Morawa
Soil type	Red-brown loam over brown clay-loam	Red clay-loam over red-brown hardpan at 20cm & ferruginous layer at 1m
Sowing date	1/7/06 – Yagan Barley	Not sown
Pre-emergent Spraying date	3/7/06	4/7/06
Post-emergent Spraying date	10/10/06	9-10/10/06
Paddock rotation	2005 Yagan Barley	2004 & 2005 Beecher barley
Growing Season Rainfall	May – Oct 105mm	May – Oct 99mm

RESULTS

Table 1: Percentage Iceplant control, visually rated on 30/11/06, for a range of herbicide treatments.

Pre-emergent Treatments	Maya % Iceplant kill	Morawa % Iceplant kill

25g Broadstrike	98	99
50g Broadstrike	100	100
500mL Diuron + 25g Broadstrike	81	97
500mL Diuron + 10g Chorsulfuron	100	100
500mL Diuron + 5g Chlorsulfuron	95	99
150mL Diflufenican	95	94
500mL Diuron 50%	3	9
1000mL Diuron 50%	50	50
500mL Diuron + 100mL Diflufenican	86	92
1000mL Diuron + 100mL Diflufenican	97	91

Post-emergent Treatments	**Maya % Iceplant kill**	**Morawa % Iceplant kill**
25g Broadstrike + wetter	0	0
50g Broadstrike + wetter	0	0
500mL Diuron + 25g Broadstrike	0	0
500mL Diuron + 10g Chorsulfuron	100	100
500mL Diuron + 5g Chlorsulfuron	90	99
150mL Diflufenican	0	0
500mL Diuron 50%	0	0
1000mL Diuron 50%	0	0
500mL Diuron + 100mL Diflufenican	0	0
1000mL Diuron + 100mL Diflufenican	0	0
Post-emergent Treatments	**Maya % Iceplant kill**	**Morawa % Iceplant kill**
800mL Gramoxone + oil		99
1L Spray Seed + oil		99
320mL Dicamba + 640ml 2,4-D amine + oil		95
15g Logran + oil		90
1L Reglone + oil		80
25g Raptor + 750mL Bromoxynil		75
1L Glyphosate + oil		10
320mL Dicamba (500g/L) + oil		0
320mL 2,4-D amine (625) + oil		0
640mL 2,4-D amine (625) + oil		0
500mL MCPA LVE + oil		0

COMMENTS

Slender iceplant exhibits a germination quality that increases its chance of survival. Three sets of seeds are released from capsules on three separate occasions following rain. Seeds maturing in the terminal part of the capsule germinate to a high percentage during the winter months. Whereas, seeds maturing in the lower part of the capsule exhibit some level of dormancy and has a low percentage of germination in the winter months. This mechanism spreads the risk of germination failure and increases the chances of species survival. When looking at control options for iceplant, it is therefore necessary to consider cost effective, pre-emergent herbicide options to control iceplant with the emerging pasture in autumn, as well as post emergent control in pastures for late winter or spring.

Pre-emergent

Good ice-plant control results were achieved with Broadstrike®, diflufenican and diuron in various mixes in these trials. Broadstrike® in particular performed well, however in the extreme, dry conditions of 2006 both diflufenican and diuron were perhaps not fairly tested. The use of diuron or diflufenican in mixtures with Broadstrike® is desirable given the reported SU resistance found in a related species (*Mesembryanthemum crystallinum)* in South Australia.

These results would indicate that there may well be scope to reduce the rates of Broadstrike®, if used pre-emergent. This trial will be repeated in 2007, along with reduced rates in an endeavor to find an economic option for pre-emergent ice-plant control.

Post -emergent

Chlorsulfuron and metsulfuron methyl gave good results in controlling iceplant. The registered option of Dicamba + 2,4-D has also performed well this year. This is consistent with results achieved in 2004 and 2005.

Under the drought conditions of 2006 glyphosate did not perform well, in relation to Spray Seed®. This can be expected for a translocated herbicide which performs better in moist conditions. Previous trial work has indicated glyphosate and Spray Seed® to normally be, both equally effective.

The better results achieved with Gramoxone® as opposed to Reglone® indicate that the paraquat fraction of Spray Seed® is more active than the diquat fraction, in controlling ice-plant. If this is confirmed in future trial work, this fact may well be useful in minimising legume and broadleaf damage, whilst controlling grasses and ice-plant in a knockdown application.

The diuron treatments alone, or in mixes did not appear effective this year. This is perhaps not surprising given the nature of diuron activity and the drought conditions of 2006. Further work with diuron will occur in hopefully a more normal season in 2007.

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