

Hotshot* Herbicide – a new weapon for *Lantana camara* control

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Summary From 2001 to 2004, Dow AgroSciences have been testing a new combination product for the control of lantana (*Lantana camara* L.) in south-east Queensland. Twelve trial sites were set up from Ban Ban Springs in the north to Murphy's Creek in the south. Lantana varieties found in the trials included Helidon white and common pink.

Hotshot* herbicide (10 g a.i. L⁻¹ aminopyralid + 140 g a.i. L⁻¹ fluroxypyr MHE) at rates of 500 to 700 mL 100 L⁻¹ of water, applied as a high volume spot spray application (2500 L ha⁻¹ equivalent), gave effective control of actively growing lantana up to 1.5 m tall, 12–15 months after application. Control was more reliable with Hotshot across the different trial sites compared to glyphosate and Grazon* DS herbicide (100 g a.i. L⁻¹ picloram + 300 g a.i. L⁻¹ triclopyr).

The addition of aminopyralid to fluroxypyr improved the initial speed of brown out on lantana compared to fluroxypyr alone. Hotshot is safe to use for lantana control under Eucalypt trees and is selective to grass species.

Keywords Lantana, efficacy, aminopyralid, fluroxypyr, grass selective.

INTRODUCTION

Lantana (*Lantana camara* L.) is one of Australia's most debilitating invasive weeds. It is recognised as a Weed of National Significance because of its impacts on primary industries, conservation and biodiversity, and the extent of its distribution. Since its introduction to Australia as an ornamental plant in the 1840s, it now infests more than four million hectares in eastern Australia in an area that extends from Victoria to northern Queensland and has also spread into the Northern Territory and Western Australia (van Oosterhout 2004).

Chemical control is one method used in the integrated approach to manage lantana infestations. Different herbicides have been used for many years, with many active ingredients registered in Australia for control of lantana by different application methods (Day *et al.* 2003).

The use of fluroxypyr for lantana control in Australia was first reported by Love (1989). Aminopyralid is a new pyridine carboxylic acid herbicide designed and developed for selective broadleaf weed control

in rangeland, pastures, rights-of-way and other non-crop land areas (Chemello *et al.* 2005). A formulated combination of aminopyralid + fluroxypyr (registered as Hotshot* herbicide) is currently the best product for the control of lantana in natural ecosystems. This combination provides reliable control of lantana, has no soil residual affect on Eucalypts and is selective to grass species.

MATERIALS AND METHODS

Twelve trials were carried out over three seasons in south-east Queensland commencing in early 2002 with final assessments for the final years trials completed in early 2005. Details of the trial locations, conditions, etc. are shown in Table 1. Each site was set-up as a non-randomised design with a single plot with site location and variable application time used as replicates. Treatments for all trials were applied using a motorised high volume spray unit with a Spraying Systems handgun with a D6 spray tip applying a water volume of 2500 L ha⁻¹ at an operating pressure between 600 and 800 kPa.

Efficacy on lantana was assessed for percent visual brown-out, 20 to 70 days after application and percent control, 12 to 18 months after application. Percent control assessments were made by counting the number of dead and live plants in each plot as well as an overall percent visual rating of control for each plot.

Grass injury was measured throughout the trial by visually assessing the injury (biomass reduction) to grass in areas that had been sprayed. At the final assessment, the number of lantana seedlings in each plot was counted in an attempt to measure the residual control provided by the treatments.

RESULTS AND DISCUSSION

Initial brown out Results from early trials (Figure 1) showed that the addition of aminopyralid at 5 g a.i. 100 L⁻¹ water to fluroxypyr significantly increased the level and speed of brown out of lantana compared to fluroxypyr alone. This information allowed for an early decision on the potential use rates for effective control of lantana. Brown out speed is a key attribute when land managers want to quickly determine if any bushes have been missed during a spray program.

Table 1. Details of *Lantana camara* sites in south-eastern Queensland where trials were conducted from 2002 to 2005.

Trial number	Location	Application date	Conditions at application	Lantana height (m)	Lantana growth stage	Flower colour
024013RA	Tarong	21-Mar-02	Dry	0.8–1.2	50% flowering	White
024014RA	Happy Valley	27-Mar-02	Dry	0.8	end flowering	Pink
024001CL	Ban Ban Springs	20-Feb-02	Dry	1.0–2.0	50% flowering	Pink
034003RA	Tarong	17-Jan-03	Dry	0.6–1.5	Flowering	White
034002RA	Happy Valley	15-Jan-03	Dry	0.5–0.8	Flowering	Pink
034010RA	Murphy's Creek	11-Mar-03	Moist	1.5–2.5	Flowering	Pink
034009RA	Tarong	12-Mar-03	Moist	1.2–1.7	Flowering	White
034012RA	Tarong	02-Apr-03	Moist	1.2–1.9	Flowering	White
044001RA	Tarong	28-Feb-04	Moist	0.3–1.2	Flowering	White
044002RA	Murphy's Creek	29-Feb-04	Moist	0.5–1.7	Flowering	White
034014PM	Rope Hill	12-Mar-04	Moist	1.0–1.2	Fruit set	Pink-edged Red
034017PM	Marburg	05-Apr-04	Moist	1.0–1.5	Fruit set	Pink

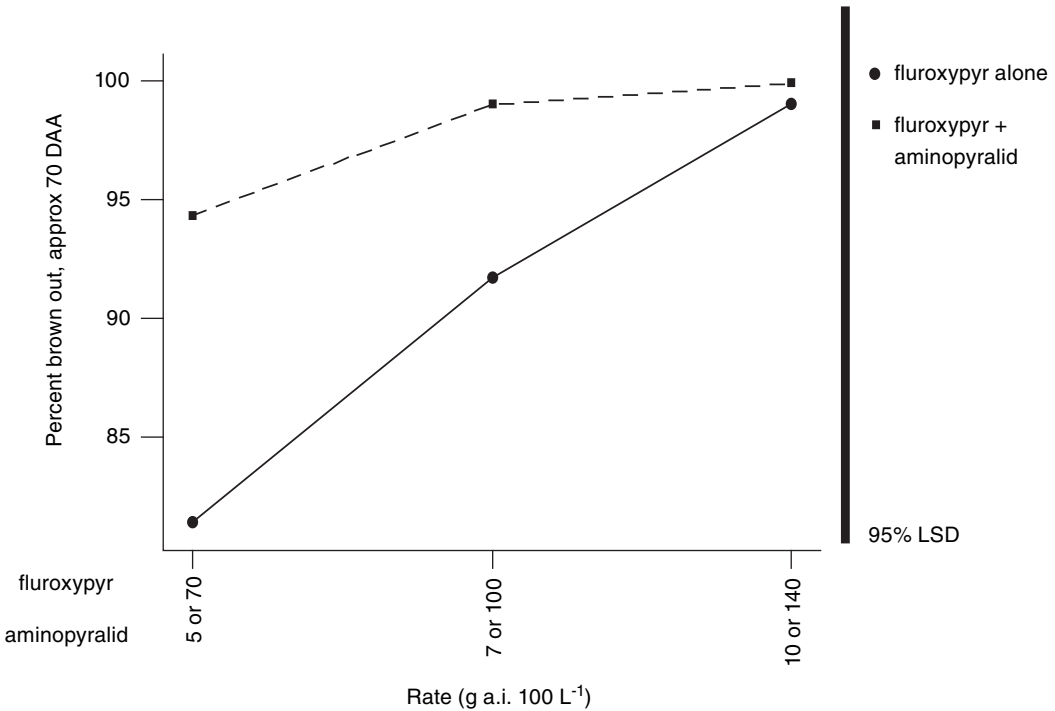


Figure 1. Effect of the addition of aminopyralid to fluroxypyr for the initial brown out of lantana.

Control Results from assessments for percent control of lantana (Figure 2) showed that aminopyralid + fluroxypyr gave reliable control of lantana across the three seasons compared to fluroxypyr alone and

other standards. Aminopyralid + fluroxypyr at 7 + 100 g a.i. 100 L⁻¹ water gave reliable control of larger lantana bushes (1.2 to 1.5 m high) than aminopyralid + fluroxypyr at 5 + 70 g a.i. 100 L⁻¹ water. Both these

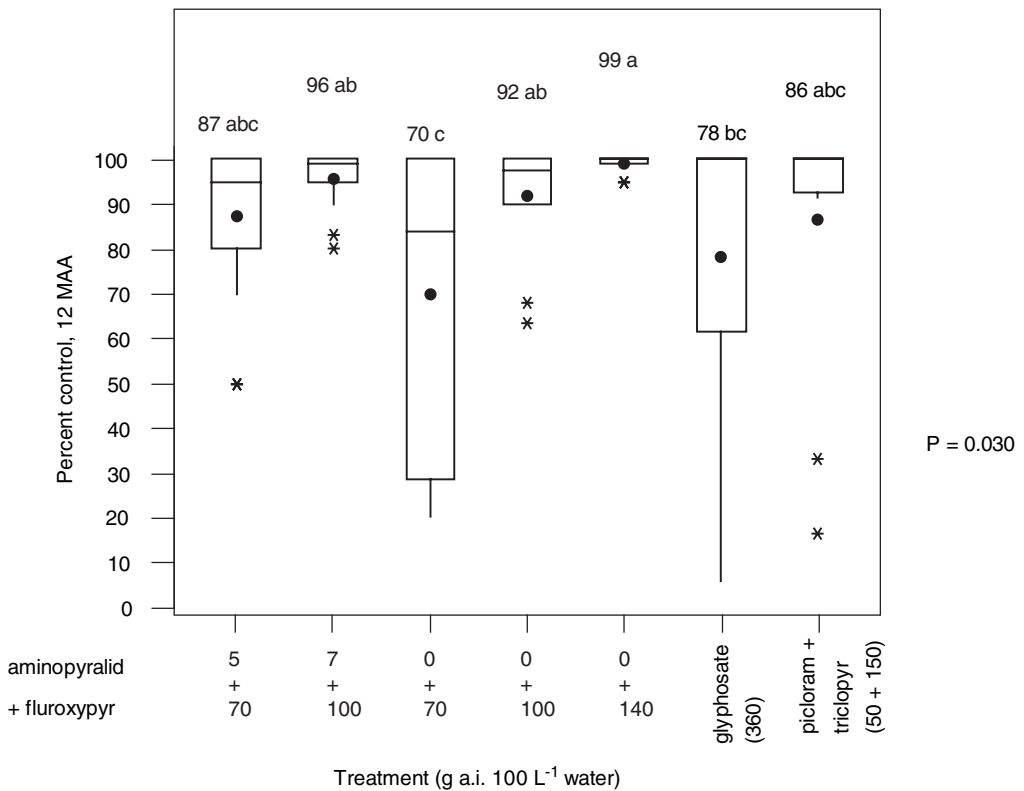


Figure 2. Box and whisker plot showing the reliability of fluroxypyr applied with or without aminopyralid versus standards for the control of lantana, 12 months after application.

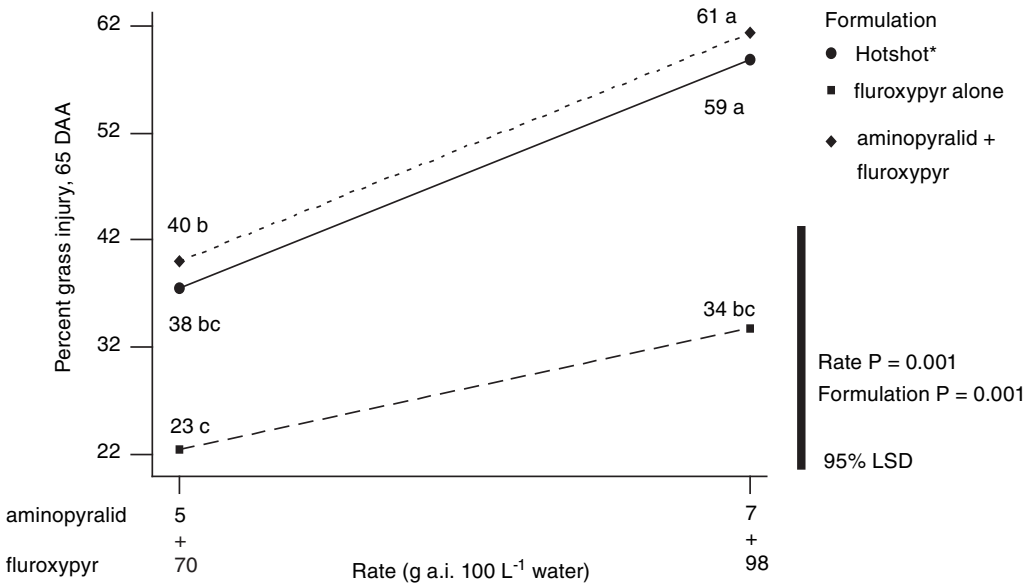


Figure 3. Interaction plot showing the initial injury of fluroxypyr applied with or without aminopyralid to grass, 65 days after application.

rates gave effective control of small bushes (up to 1.2 m high) under good growing conditions.

The key to acceptable control of lantana by high volume application is good coverage of the plant, spraying from both sides of the plant and treating when the lantana is actively growing and flowering.

Grass injury Observations from the trials showed that aminopyralid + fluroxypyr caused more initial yellowing to some grass species around the lantana bushes (Figure 3) compared to fluroxypyr alone. This yellowing was short-term and all grass species recovered, whereas glyphosate caused 80% injury to grass, 65 days after application, and areas around the lantana bushes remained bare up to twelve months after application. In these bare areas, pioneer broadleaf weed species endemic to each area invaded due to no grass competition. However, in the aminopyralid + fluroxypyr treated plots, these broadleaf weeds did not appear due to grass competition remaining and some residual control from the aminopyralid.

CONCLUSION

Aminopyralid + fluroxypyr at 7 + 100 g a.i. 100 L⁻¹ water, applied as a high volume spot application, gave effective control of lantana (actively growing and flowering at application) compared to current standards, glyphosate and picloram + triclopyr.

Initial grass injury around the lantana bushes was more pronounced with the addition of aminopyralid to fluroxypyr compared to fluroxypyr alone, but was not as severe as glyphosate.

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