

Herbicide Efficacy for Pricklypear Management Using Individual Plant Treatments

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Purpose:

This project was established to investigate the efficacy of three new herbicides for pricklypear management using individual plant treatments. The standard herbicide recommended for this kind of treatment has been Tordon 22K, a restricted-use herbicide containing the active ingredient picloram. Picloram has residual activity in the soil and has the potential to enter underground water sources.

The 3 new herbicides were compared to the standard Tordon 22K treatment. Surmount is a combination of picloram and fluroxypyr. This herbicide is restricted-use because of the picloram but it has the potential to 1) reduce the amount of picloram in the environment, 2) provide quicker results than Tordon 22K, and 3) provide less expensive control when use for individual plant treatment. PastureGard is a combination of triclopyr and fluroxypyr. This herbicide is non-restricted which may offer a chemical control option for landowners without a pesticide applicator's license. The third new herbicide included in this project was Vista with the active ingredient fluroxypyr. Vista is also a non-restricted herbicide which offers potential for landowners without a pesticide applicator's licenses.

Methods:

Test sites were established in 9 counties across Extension Districts 10 and 12. Pricklypear colonies were treated individually using an ATV equipped with spray guns. Ten gallons of spray volume were used for each treatment at each of the 9 locations. Vista, Tordon 22K, and Surmount were all applied at a 1% concentration. PastureGard was applied at a 2% concentration. PastureGard was included at all sites except Bandera County because this was the first site established and this treatment was added later. All treatments included the treatment herbicide, a non-ionic commercial surfactant with 90% active ingredients and a dye both at a 0.25% concentration in water. Sites were established between August and December of 2004.

One-year and two-year (except Dimmit County) post-treatment evaluations were conducted in each county in 2005 and 2006. Herbicide efficacy was evaluated as the percentage of pricklypear colonies with 75% or greater pad-mortality within colonies. Results were evaluated with an analysis of variance statistical model using herbicide treatment, year post-treatment, season of treatment, and treatment by season as sources of variation.

Results:

Analysis of variance indicated that there was no difference ($p=0.9732$) among treatments (Table 1). There was also no difference between years post-treatment ($p=0.2116$) and no treatment by season interaction ($p=0.5025$). However, average percentage of pricklypear colonies with 75% or greater pad-mortality was significantly greater ($p=0.0074$) for summer treatments than for winter treatments (Table 2).

Table 1. Two-year evaluation of pricklypear control by herbicide treatment. Control is expressed as the percentage of colonies with 75% or greater pad-mortality.

County	Month Treated	Pricklypear Colonies with 75% or Greater Mortality, %			
		Tordon 22K	Vista	Surmount	PastureGard
Bandera	August	76	79	61	-
Blanco	August	80	91	88	88
Bexar/Atascosa	December	76	69	95	90
Dimmit (1 st year)	December	80	82	90	87
Edwards	November	86	86	84	65
Kendall	August	93	92	96	99
Kimble	November	80	60	68	77
Real	November	71	65	70	59
Sutton	November	61	59	54	40
Average*		78	76	78	76

*Average includes one-year evaluation in Dimmit County.

Table 2. Comparison of season of treatment. Control is expressed as the percentage of colonies with 75% or greater pad-mortality including one-year evaluation in Dimmit County.

Season	Pricklypear Colonies with 75% or Greater Mortality, %	P-value
Summer	86	0.0074
Winter	71	

Discussion and Conclusions:

Since this project was initiated, Surmount has become the standard for pricklypear individual plant treatment. Both Vista and PastureGard provided control levels equivalent to Surmount and Tordon 22K.

Because Tordon 22K and Surmount both contain picloram which has a residual effect, we expected that these treatments might show a greater increase in control levels in the second year than Vista or PastureGard. Although changes in control levels from year-one to year-two were not statistically significant, Vista and PastureGard showed numerical increases of about 3% compared to about 10% for Tordon 22K and Surmount.

All treatments had higher control levels in summer. Because Vista and PastureGard have no residual activity, these products are probably best applied with warm temperatures and good soil moisture to take advantage of higher plant activity corresponding to these conditions.