

Spotlight on Agriculture

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CHEMICAL CONTROL OF *Acacia nebrownii* AT TWO LOCALITIES IN SOUTHERN NAMIBIA WITH THE ARBORICIDE MOLOPO GG 200P PELLETS

INTRODUCTION

Acacia nebrownii (water thorn: *slapdoring*) is a many stemmed deciduous shrub often found in depressions, along seasonal rivers and in low lying sandy flats with underlying calcareous soils (Le Roux and Muller, 2010). The dense, often impenetrable stands of *Acacia nebrownii* found in many locations in southern Namibia, gave reason for investigating the effect of chemical control on this species. Similar work carried out by Van Eck and Van Lill during 2004 (Agricola, 2008) with the arboricide Molopo GG 200 P at a locality on the "Kalk" southeast of Mariental, obtained very high mortality rates on *Acacia nebrownii* (Agricola 2008). However, only one plot per herbicide application rate (2 kg/ha, 2,5 kg/ha and 3 kg/ha) was treated.

For the follow-up trial, two localities were selected based on the sufficient occurrence of *Acacia nebrownii*. One was on the Farm Nomtsas, ± 50 km north-north west of Maltahöhe, while the second locality was on the Farm Longueval, ± 110 km south east of Mariental. Both localities fall within the broad vegetation description "Dwarf Shrub Savanna", although the botanical composition of each of the localities is quite different from each other. Average rainfall for both areas in which these localities are situated is between 150 to 200 mm per annum. Bush densities varied from a lowest of 400 bush/ha to 4 200 bush/ha at Nomtsas, with an average of 2 045 bush/ha, and a lowest of 500 bush/ha to a highest of 4 900 bush/ha, with an average of 2 500 bush/ha at Longueval.

METHOD

Nine plots were selected at each locality during October of 2006. Each plot measured 50 m x 50 m and was marked with a steel peg at its lower left corner and its GPS position noted. Plots were treated with the equivalent of 3 kg/ha, 4 kg/ha and 5 kg/ha of Molopo GG 200P, in a manner simulating aerial application as described by Van Eck and Van Lill (2008). Each rate of application was repeated three times at each locality. A bush count was carried out along

the middle of each plot, using a 50 m rope and counting all dead and alive *Acacia nebrownii* within 1 meter on either side of the rope. The count so obtained represented the density in a quadrat of 50 x 2 m = 100 m². Counting was again repeated during August of 2009 on the same quadrat, noting again all dead and alive *Acacia nebrownii*. The period October 2006 to August 2009 included three growing periods, and was considered a sufficient period of time for the arboricide to take effect.

RESULTS

Table 1. A comparison of *Acacia nebrownii* mortality after application of the arboricide Molopo GG 200P at three different application rates at two different localities

	Nomtsas				Longueval				
	% Mor Rep 1*	% Mor Rep 2	% Mor Rep 3	Ave***	% Mor Rep 1	% Mor Rep 2	% Mor Rep 3	Ave	
App rate** 3 kg	58	28	60	49	App rate 3 kg	45	100	42	62
App rate 4 kg	67	73	89	76	App rate 4 kg	94	88	33	72
App rate 5 kg	85	76	82	81	App rate 5 kg	100	93	58	84

* % Mor Rep 1 = Percentage Mortality Repetition 1

** App rate = Application rate

*** Ave = Average

DISCUSSION

At both localities there was an increase in mortality of *Acacia nebrownii* as the application rate increased. This implies that even higher rates of application may achieve higher mortality rates than the highest average mortality of 84 % shown. However, the highest application rate (5 kg/ha) resulted in an average mortality rate of 81 % at Nomtsas and 84 % mortality at Longueval, compared to the 91 % mortality with an application rate of 3 kg/ha achieved by van Eck and Van Lill in 2008. This discrepancy can be explained through soil type. The work by Van Eck *et al.* was carried out on shallow calcareous soils, where the uptake of the arboricide is known to be better, resulting in a higher

degree of effectiveness. Van Eck and van Lill (2008) points out that the effect of arboricides diminishes dramatically on soils where the clay content exceeds 25 %. The sites at Nomtsas contained 16 % clay and the plots at Longueval 12,4 % clay on average.



Figure 1. Nomtsas before treatment.



Figure 2. Nomtsas after treatment with 4 kg/ha.



Figure 3. Longueval before treatment.



Figure 4. Longueval after treatment with 4 kg/ha.

With reference to Table 1, the following: In the case of Nomtsas, the 3 kg application rate had one outlying value in its repetition, namely 28 %. In the case of Longueval, three outlying values occurred, namely 100 % mortality in the 3 kg application rate, 33 % mortality in the 4 kg application rate and 58 % mortality in the 5 kg application rate. These outlying values cannot be explained with the available data.

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