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## HERBICIDES FOR WEED CONTROL IN FIELD GROWN ROSE PLANTS DURING THE FIRST YEAR OF PRODUCTION

H. Brent Pemberton and William E. Roberson

### INTRODUCTION

There are several times during the field production of rose plants that herbicide application for weed control is critical for producing high quality plants. Post-plant applications are needed for winter and early summer weed control during the critical time of rootstock cutting, rooting and establishment in the first year of production. The objective of this study was to determine the effects of various herbicides on the growth of *Rosa multiflora* during the first season after planting.

### MATERIALS AND METHODS

Canes of *Rosa multiflora* were cut from one year old plants and soaked for 10 minutes in 1% sodium hypochlorite. The canes were then cut into 8 inch lengths and stored at 30° F for 30 days. After storage, all buds except the top two were removed. These cuttings were planted in raised beds 6 inches apart in 40 inch rows on 22 January 1988.

On 25 March, the herbicide treatments (Table 1) were applied broadcast with a CO<sub>2</sub> pressurized sprayer using the equivalent of 39 gallons per acre. The herbicide formulations used were Surflan 4AS with 4 lbs a.i./A, Dual 8E with 8 lbs a.i./A, Princep Caliber 90 with 90% a.i., and Endurance 65WDG with 65% a.i.

A randomized complete block design with four replications was used. Weeded control plots were hand weeded every 1 to 3 weeks as needed until 1 July. On 1 August, % weed coverage was assessed and 10 rootstock plants per plot were harvested for dry weight determinations of new shoot growth. Analysis of variance procedures were used to discern treatment differences.

### RESULTS AND DISCUSSION

The use of either rate of Surflan or Dual alone resulted in higher new shoot dry weight than the non-weeded control (Table 1). There was no difference in dry weight when Princep or Endurance was used. However, the combination of Princep with Surflan or Dual resulted in greatly reduced weed coverage and increased plant growth when compared to the non-weeded control.

As expected, the benefit of the use of herbicides which resulted in increased plant growth was largely due to weed control and the subsequent decrease in

competition for water and nutrients. New shoot dry weight increased as % weed coverage decreased thus exhibiting a negative correlation ( $r=-0.78$ ) between the two variables. The only result that could be interpreted to be a direct negative effect of a chemical on plant growth was seen when the highest rates of Princep and Dual were used in combination. This combination reduced plant growth below that obtained from the lower rates of the same combination while weed control was unaffected. The high rate of Princep and Dual did not reduce growth below that of the weeded control, however.

In summary, Surflan and Princep at 2 and 0.8 lbs a.i./A, respectively, Dual and Princep at 3 and 0.8 lbs a.i./A, respectively, or Dual at 6 lbs a.i./A were the best treatments for weed control and plant growth in the present study. Other treatments performed quite well also. Decisions for a herbicide program for rose production would also have to consider the costs of the various chemicals. In addition, effects of multiple applications during the two year production cycle need to be studied. Also, many of these herbicides are being used experimentally and have not been cleared for use on roses so that labels should be checked before use as always.

Table 1. Mean total new shoot dry weight per plot (10 plants) and percent weed coverage at harvest during the first summer of growth.

Herbicide	Rate (lbs active ingredient/acre)	Rose New Shoot Dry Weight (g)	% Weed Coverage <sup>z</sup>
Surflan	2.0	15.1 defg <sup>y</sup>	35 bcde
Surflan	4.0	21.8 abcd	23 cde
Dual	3.0	17.2 cdef	39 bcde
Dual	6.0	20.5 bcd	10 de
Princep	0.8	12.7 fgh	89 ab
Princep	1.6	12.1 fgh	87 abc
Endurance	1.5	12.7 fgh	37 bcde
Endurance	3.0	9.1 gh	57 abcd
Surflan + Princep	2.0 0.8	23.1 abc	32 bcde
Surflan + Princep	4.0 1.6	23.7 abc	3 de
Dual + Princep	3.0 0.8	28.4 a	5 de
Dual + Princep	6.0 1.6	18.1 bcdef	2 e
Endurance + Princep	1.5 0.8	13.5 efgh	43 bcde
Endurance + Princep	3.0 1.6	19.9 bcde	38 bcde
Weeded Control		25.0 ab	26 bcde
Non-Weeded Control		7.4 h	97 a

<sup>z</sup>Analyzed as the arcsin  $\sqrt{x}$  transformation. Means were converted to the original scale.

<sup>y</sup>Means separation in columns by Ryan-Einot-Gabriel-Welsch multiple range test, 5% level. Means followed by the same letter are not significantly different.