GROWTH RETARDATION OF POTTED OLEANDER PLANTS FROM VARIOUS ALAR APPLICATIONS

TABLE 1

Treatment	Growth (cm) Days after treatment	
	24	42
0.85% Alar	7.2 bc	19.4 abc
0.85% Alar & 1% Foamex	3.4 c	11.5 def
0.85% Alar and 1% Jet X	2.1 d	7.4 efg
0.85% Alar & 1% Rockwood	4.0 bc	12.3 cde
1% Foamex	11.8 a	26.3 a
1% Jet X	12.3 a	25.7 a
1% Rockwood	11.4 a	23.0 ab
0.85% Alar & 1% UN1-1081	9.0 a	17.8 bcd
1% UN1-1081	8.4 ab	20.3 ab
No Treatment	11.8 a	24.0 ab
F Value	10.4	20.9

TABLE 2

Treatment	Growth (cm) Days after treatment	
	29	44
0.5% Alar	8.9 ab	12.9 a
0.5% Alar & 0.5% Foamex	3.6 c	6.3 bc
1% Alar	6.1 bc	9.3 ab
1% Alar & 0.5% Foamex	4.1 c	6.1 c
No Treatment	10.0 a	11.4 ab
F Value	14.8	7.0

TABLE 3

Treatment	Growth (cm) Days after treatment		Drying Time (minutes)
	38	56	
0.5% Alar	26.2 bc	42.0 abcde	8
0.5% Alar & .75% CD 587 not foamed	20.9 cde	36.4 bcdef	9
0.5% Alar & .75% CD 587 foamed	13.2 f	26.0 fg	197
0.5% Alar & 1% Jet X not foamed	31.1ab	52.0 a	15
0.5% Alar & 1% Jet X foamed	17.2 def	32.4 cdefg	191
0.5% Alar & 1% UN1 1108	26.4 bc	41.1 abcde	13
1% Alar	23.4 bcd	38.6 bcdef	8
1% Alar & .75% CD 587 not foamed	15.5 def	29.4 efg	8
1% Alar & .75% CD 587 foamed	9.5 f	21.2 g	208
1% Alar & 1% Jet X not foamed	22.3 cd	43.2 abcd	10
1% Alar & 1% Jet X foamed	14.1 ef	30.5 def	202
1% Alar & 1% UN1 1108	21.3 cde	31.0 defg	11
.75% CD 587 foamed	35.2 a	52.3 a	185
1% Jet X foamed	38.1 a	52.1 a	180
1% UNI 1108	30.6 ab	45.7 ab	15
No Treatment	36.8 a	—	
F value	21.4	10.5	

TABLE 4

Treatment	Growth (cm) Days after treatment		Drying time (minutes)
	37	58	
0.5% Alar	22.1 abcd	38.4 abc	30
0.5% Alar & 1% Fomark not foamed	17.6 cdef	39.7 abc	56
0.5% Alar & 1% Fomark foamed	10.4 ef	21.0 d	140
0.5% Alar & 0.5% Fomark foamed	11.5 ef	24.3 d	125
1% Alar	16.8 cdef	38.5 abc	30
1% Alar & 1% Fomark not foamed	13.0 def	26.0 cd	50
1% Alar & 1% Fomark foamed	7.7 f	16.0 d	145
1% Alar & 0.5% Fomark foamed	7.7 f	15.4 d	128
1% Alar & 1% Regulaid	15.2 def	28.7 bcd	59
1% Fomark foamed	20.5 bcde	33.1 bcd	150
0.5% Fomark foamed	32.1 ab	46.1 ab	130
1% Regulaid	28.5 ab	52.5 a	60
No Treatment	32.9 a	45.5 ab	—
F Value	9.2	7.7	

FOAM SPRAYS OF INCREASE GROWTH EFFECTS ON OLEAND

HENRY HIELD

THE PLANT GROWTH REGULATOR, succinic acid 2,2-dimethylthydrazide (SADH) is registered for use on certain crop plants under the name Alar and for ornamental plants under the name B-Nine. B-Nine is used to reduce stem elongation of chrysanthemums, hydrangeas and bedding petunias, marigolds and zinnias. This chemical is effective in reducing the growth of oleander, but the cost of the required concentration is generally prohibitive for field plantings.

The greatest entry of growth regulators is frequently during the initial wetting from the spray treatment. These trials were conducted to determine if Alar growth retardation could be increased through the use of foam carriers to increase the wetting time. Alar concentrations are given as active ingredient of the 85% WP. Statistical evaluations were at the 1% confidence level.

Foams

The foaming agents tested were commercial products or ones where future marketing was anticipated. Preliminary screening for phytotoxicity indicated that

Oleander plant to right just after application of a foam treatment.

ALAR RETARDING ER

Oleander cuttings 48 days after treatment. Left to right: 1% Alar alone; 0.5% Alar & 0.5% CD 587 not foamed; 0.5% Alar & 0.5% CD 587 foamed; and 0.5% CD 587 alone foamed.

a 1% level was usually tolerated. With 1% CD 587 and with Fomark there was some burn of mature leaves and a very slight marginal leaf burn sometimes resulted from 0.5% Fomark in areas of greatest foam persistence.

For greenhouse testing the foams were expanded to an estimated volume of 10 to 1 or greater with a kitchen mixer. Plants were dipped into the various foam or liquid preparations. Pots were then placed on their side until the plants had dried to prevent the material from draining into the soil.

Comparison

Alar alone was compared with Alar applied in foams or with the surfactant UNI-1108 for growth reduction (table 1). Oleander treated with Alar in Jet X foam showed less growth than plants treated with Alar alone, or Alar plus surfactant, at both dates of measurement. The Alar-Foamex foam treatment resulted in less growth than Alar alone, but showed no difference as compared with Alar plus surfactant at the 42-day post treatment measurement. Foam and surfactant applications alone had growth results similar to the plants with no treatment.

Applications of Alar at 0.5% and 1% levels with 0.5% Foamex foam gave a significant growth reduction from 0.5% Alar alone (table 2). The 0.5% Alar in foam was equal in effectiveness to 1% Alar alone or in foam.

Growth reduction from Alar with the unexpanded foaming agent—used like a surfactant—was compared with the same mixture applied as an expanded foam (table 3). The CD 587 foams with Alar resulted in the least growth. At 38 days, the 0.5% Alar in each of the expanded foam applications was superior to the unexpanded foams with comparable Alar, and was also better than both levels of Alar alone. The 1% Alar in Jet X foam differed from the high Alar not-foamed treatment. Both 1% Alar foam treatments differed significantly from Alar alone.

The 56-day measurements for the same experiment showed significant growth reductions for 0.5% Alar with Jet X foam as compared with the not-foamed treatment with 0.5% Alar. Both concentrations of Alar foamed with CD 587 were better than those levels of Alar alone.

Further comparisons with two levels of Alar and two levels of the foaming agent Fomark are shown in table 4. At 37 days the 0.5% Alar alone cause no growth reduction. Unexpanded foam with 0.5% Alar was better than no treatment but was similar to that level of Alar alone and Alar in foam. The largest growth reduction for 0.5% Alar occurred in foam and was significantly different from 0.5%Alar alone.

At 58 days both Alar concentrations in foams caused significantly greater growth reductions than equivalent levels of Alar alone. The low Alar in foam was also different from low Alar in unexpanded foam.

Persistence of foams

In these greenhouse studies (tables 3 and 4), where temperatures ranged from 70° to 85°F, the time for drying of the treatment application was determined. Compared with Alar solutions containing no surfactant, the wetting time was increased 4 to 20 fold by the use of expanded foams. The influence of unexpanded foam and surfactant gave wetting times of less than twice that of Alar solutions containing no surfactant.

The relative volume of the various solutions and foams retained by the plants was not determined. Thus it is possible that some of the difference in drying time was due to volume differences. Also, some of the variation in effectiveness of Alar may have been due to differences in rate of change of Alar concentrations that occurred during drying.

Foams break down and drain as liquid over the plant parts. The foliage is thus wet for the life of the foam. Time of wetting had much to do with the effectiveness of Alar in producing growth retardation. The comparisons of expanded and unexpanded foaming agents showed the greatest growth retardation in the foam phase. The effective Alar concentration was reduced approximately one half by the use of foam as 0.5% Alar in foam was more active than 1% Alar alone.

Alar foam sprays have also been found more effective for growth retardation with Alar on begonia and *Ficus nitida*.

Field testing of foam applications is in progress and results indicate a need for foaming agents of low phytotoxicity and long life under warm conditions as well as study of efficient methods of expansion and dispersal of the foam spray.

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