PAINT-ON APPLICATION OF ACEPHATE FOR APHID CONTROL ON CRAPE MYRTLE

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Abstract. Orthene 75 S™ (acephate) in a 3:1 and 4:1 (v:v ratio) water slurry was painted on the trunks of row-planted, seedling crape myrtle, *Lagerstroemia indica*, for control of the crape myrtle aphid, *Tinocallis kahawaluokalani*. The amount of slurry banded on the trunk was based on the trunk diameter of test plants. Evaluation of the treatments was made by periodic counts of aphid populations. Treatments showed four weeks control of aphid populations after apparent absorption through the bark. No phytotoxicity was observed as a result of any treatments.

Aphids on crape myrtle cause physical damage to the plant and can cause an unsightly gray to black film to cover the tree and objects below the tree, thus, detracting from its ornamental qualities. Paint-on applications of acephate appear to be absorbed directly into the trunk, consequently, reducing aphid populations for 3 to 4 weeks without phytotoxicity. Paint-on application is a quick and effective method of aphid control. Arborists can apply this paint-on technique to standard or multi-trunked crape myrtles simply by encircling the trunk in a fast and simple manner using paint brushes or possibly paint rollers once acephate is approved by EPA for this treatment.

The crape myrtle aphid, *Tinocallis kahawaluokalani,* often occurs in high populations in summer along the Gulf Coast from Texas to Florida and northward along the east coast to Washington, D.C. (6). Baker (1), Dozier (2), and Johnson (3) state that this aphid is the most common serious pest of crape myrtles in the southern United States. Zimmerman (7) noted that they have been introduced into Hawaii. Their piercing-sucking mouth parts remove cellular sap from the leaves and new shoots. As the population increases, "honey-dew" secretions become exceedingly heavy and can cover the leaves, shoots and major branches (4). These sugary secretions eventually harbor "sooty-mold" fungi, *Capnodium* spp. The resulting gray to black film covering the tree and anything below the canopy greatly detracts from the natural beauty of the plant and surrounding area.

Overwintered aphid eggs, in the bud scales, hatch in late April. Aphid populations remain through October (1). Both winged and wingless forms are present throughout the summer and early fall. The young are born live during the summer with egg production continuing until late in the fall.

Landscape maintenance personnel primarily rely on chemical sprays to control aphids, but often wait until high populations are established before corrective sprays are employed. In crowded urban areas, however, the use of insecticidal sprays can be hazardous and clients are becoming even more aware of environmental concerns regarding the use of pesticidal sprays.

Little testing has been done with paint-on applications. Smith et al. (5) used insecticides as a bark treatment to control wax scales. A.D. Oliver, Jr. (personal communication) used Cygon 2E™ as a bark treatment on camellias to control tea scale. Cygon 2E is labeled for use as an undiluted, paint-on, band treatment on birch to control leafminers.

The objective of this study was to take advantage of the systemic nature of Orthene 75 S™ (acephate) by applying two, paint-on concentrations at three rates directly to the trunk to determine if naturally occurring aphid populations could be controlled.

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Materials and Methods

One hundred and six seedling crape myrtle trees, *Lagerstroemia indica*, ranging in diameter from 3 mm (1/8 in) to 6 mm (1/4 in) at 15 cm (6 in) above the soil line, were planted in two rows on 1 meter (3 ft) centers on February 27, 1986 at the LSU Hammond Research Station, Hammond, Louisiana.

On August 26, 1986, after heavy aphid populations of both nymph and adults were present, 70 trees were selected for a randomized complete block (RCB) design with 5 blocks and 14 trees per block within two rows. Treatments consisted of banding a slurry of acephate (Orthene 75 S™) in water with either a 3 parts acephate:1 part water or 4 parts acephate:1 part water, (v:v ratio) completely around the trunk at 5 cm (2 in) from the soil line. The band width was determined by the mean stem diameter of the seedlings used which was 5 mm (1/5 in). A camel hair brush 6 mm wide was cut to deliver a width of 5 mm to encircle each trunk. The 3:1 or 4:1 rate was increased by doubling or tripling the width of the band (2x or 3x). Control trees within the two rows were banded once with a clean brush and water. Time required for banding was less than one minute per tree.

Aphid population counts were uniformly taken. Two leaves from each quadrant and two from the top, totaling 10 leaves, were examined from each plant. Both nymph and adult aphids were counted using a Donegan Optivision™ Glass Binocular magnifier.

On August 24, 1987, after heavy aphid populations of both nymph and adults were present, 70 of the same trees were again selected for a RCB design with 5 blocks and 14 trees per block. Trunk diameters ranged from 16 mm (5/8 in) to 32 mm (1 1/4 in). The band width was determined by the mean diameter of the seedlings which was 24 mm. Consequently, a 25 mm (1 in) brush was cut to deliver a 24 mm wide band to encircle the trunk from 1 to 3 times as described above.

Treatment means for the experimental data were compared statistically at the P = 0.05 level using Dunnett's One-tailed T test after being transformed on a log scale for normalized standard error and distribution.

Results and Discussion

The August through October 1986 data are inconclusive (Table 1). The control plants had the highest aphid populations. Fifteen days after treatments, the populations on the control plants dropped to 39 ± 15 aphids on the control plants and to less than one on all other treatments. The drop in aphid populations in the control plants may have been due, although not measured, to root absorption of acephate washed into the soil by rainfall and not from seasonal change in aphid populations. Both juveniles and mature crape myrtle trees on the station away from the treated area maintained high population pressure. On Sept. 10, however, there was a significant difference in aphid populations between control plants and treated ones. On Sept. 30, 20 days after treatments, counts were again made and there was no significant difference between control and treated plants.

The data from 1987 indicated a strong relationship between banding with acephate and aphid control (Table 2). On Aug. 24, just prior to treatments, the aphid populations were high. After treatments, the aphid populations significantly dropped on the second date. The aphid population on control plants also dropped. One of the 2x, 4:1 treatments in block 1 was inadvertently omitted, which may have resulted in an unusually high population value on Sept. 9. All treatments except the one noted remained low through Sept. 16 which was over 23

Table 1. Mean number of aphids on crape myrtle from treatment date of August 26 until October 27, 1986.

Treatment	Mean number of aphids per 10 leaves Aug 26[NSy]	Sep 10**	Sep 30[NS]	Oct 13[NS]	Oct 27[NS]
1x, 3:1	1145±51	<1	<1	<1	<1
1x, 4:1	1016±67	<1	2±2	<1	<1
2x, 3:1	1214±76	<1	<1	2±1	2±1
2x, 4:1	1128±70	<1	<1	<1	<1
3x, 3:1	1134±57	<1	<1	<1	<1
3x, 4:1	1237±114	<1	2±1	<1	<1
Control	1271±127	39±16	3±2	<1	<1

y NS and ** indicate no significance and significance at the 0.01 level, respectively, when comparing control with each of the treatments as performed by the Dunnett's One-tailed T test.

z ± standard error

Table 2. Mean number of aphids on crape myrtle from treatment date of August 24 until September 30, 1987

Treatment	Aug 24 NS[y]	Sept 2**	Sept 9**	Sept 16**	Sept 21**	Sept 30*
1x, 3:1	1510±343[z]	10±7	3±3	18±8	52±14	199±48
1x, 4:1	1271±293	7±7	3±1	33±12	47±13	187±31
2x, 3:1	1427±380	1±1	4±3	20±8	30±6	213±38
2x, 4:1	1580±387	31±23	264±261	44±21	49±15	218±39
3x, 3:1	1399±192	1±1	<1±<1	10±5	26±5	176±40
3x, 4:1	1883±321	<1±<1	<1±<1	20±5	31±7	163±30
Control	1867±509	380±175	267±85	155±35	142±28	442±83

y NS, *, and ** indicate no significance and significance at the 0.05 and 0.01 level, respectively, when comparing control with each of the treatments as performed by the Dunnett's One-tailed T test.
z ± standard error

days. By Sept. 21, one 2x and both 3x treatments still suppressed aphid populations, whereas populations in the two 1x and one 2x treatments increased slightly. On the last date counts were made, which was 37 days after treatment, aphid populations on all treatments were on the rise. Higher concentrations of acephate displayed some suppression of aphid populations, but the effect was not significant statistically. No phytotoxicity was observed as a result of any treatment.

Conclusions

Aphid control can be expected for up to a month using an acephate paint-on banding application on small trees. The authors believe it will be economically feasible to use this method instead of spraying. It's faster to prepare and apply and there is no tank or spray equipment to clean afterwards. Also by placing acephate directly onto the trunk, one reduces spray drift of the product, especially in crowded urban environments.

After applying the product as a paint-on band around the trunk, a whitish residue remains obvious until rainfall washes the residue from sight. The authors therefore recommend that the band be placed six inches from the soil line to lessen the likelihood of human or pet exposure. The authors recommend that after registration of Orthene 75 S™, which is expected in the Spring of 1992, applicators should use neoprene rubber gloves, and goggles or a face shield when applying the band. Avoid direct skin contact and, if clothing is contaminated with the product, wash separately from other clothing.

(Note: This paper reports the result of research only, and does not imply registration of a chemical under amended FIFRA. Before using the test product mentioned in this research report, be certain of its registration by appropriate state and/or federal authorities.)

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Résumé. Un mélange liquide composé d'Orthene 75 S[MD] (acéphate) et d'eau, dans des proportions (volume/volume) de 3:1 et de 4:1, était appliqué sur les troncs d'une plantation en alignement de lilas d'été, *Lagerstroemia indica*, pour le contrôle du puceron du lilas d'été, *Tinocallis kahawaluokalani*. Le nombres de bandes du mélange liquide était basé sur le diamètre du tronc des plants à évaluer. L'évaluation des traitement était effectuée par des dénombrements périodiques des populations de pucerons. Les traitements affichaient une efficacité de contrôle de quatre semaines des populations de pucerons après absorption apparente au travers de l'´corce. Aucune phytotoxicité était observée résultante à un traitement quelconque.