THURSDAY AFTERNOON SESSION

December 5, 1968

The afternoon session convened at 1:00 p.m. in the Ballroom with Leslie Hancock serving as moderator.

MODERATOR HANCOCK: As our first paper this afternoon we have an excellent example of the cooperation between science and practice which our Society is famous for. Charles Sheer, Commercial Nursery Agent of the Cooperative Extension Service of Suffolk County, Long Island, New York will present the paper. The work was done in cooperation with Mr. Rasweiler and both will be available to answer questions after the paper is given. The subject is "Systemic Insecticides on Rhododendrons."

TEST OF THREE GRANULAR SYSTEMIC INSECTICIDES ON NEWLY ROOTED RHODODENDRON CUTTINGS[1]

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Repeated foliar insecticide sprays have been necessary to control aphids on newly rooted rhododendrons which are grown on Long Island from January to June in greenhouses. This study was designed to determine if granular systemic insecticides applied after planting would effectively control aphids from the time of planting to removal from the greenhouse.

Materials and Methods

Rooted cuttings of *Rhododendron catawbiense* (Hybrids) var. "Roseum Elegans", "Catawbiense Alba" and "Nova Zembla" with the majority "Roseum Elegans" were used for these experiments. The systemic insecticides used were: Di-Syston (disulfoton), Temik (UC21149) and Thimet (phorate) — all 10% granulars.

The study was conducted in two greenhouses, one was glass (24 by 60 feet) and the other polyethylene (14 by 80 feet). The glass greenhouse contained three raised wooden benches, two side benches, 3 by 60 feet and one in the middle of the house, 7 by 58 feet. In the polyethylene house the side benches were 3 by 75 feet and the middle bench was 4 by 70 feet. In the polyethylene house 18 plots, 3 by 8 feet, were set

[1]Submitted by the senior author as partial requirement for a Masters Degree at the University of Connecticut, Storrs, Conn

up on the side benches and 9 plots, 4 by 6 feet, on the middle bench. The glass greenhouse benches were divided into 30 randomized plots (3 by 8 feet in the side benches and 3.50 by 6.75 feet on each side of the middle bench). Each plot contained 250-275 rooted cuttings. Rooted cuttings from a propagation greenhouse were planted in the test houses October 15th-17th. The rhododendrons were planted in a medium of nearly equal parts German peat and coarse perlite. The plants were fertilized with a 20-20-20 liquid fertilizer as they developed "hunger" signs. No other additives were included in the media.

The polyethylene greenhouse was heated by forced hot air and the glass house by hot water. Both houses had poly-tube ventilation systems.

Treatments were applied on January 4, 1968 using a randomized design. Treatments were Di-Syston at rates of 5, 10 and 20 lbs. of active ingredient per acre, Thimet at 5, 10, and 20 lbs., Temik at 3, 6 and 12 lbs. and an untreated check. All treatments were replicated three times in each house except that in the polyethylene house two replications of each Temik treatment were used. Granulars were applied with a Japanese hand duster to distribute the material evenly on the surface of the soil. The plants were lightly watered after all treatments were completed.

Plants in the polyethylene house were infested with aphids (*Masonaphis azaleae*, Mason) on February 12, 1968 and February 20, 1968 and in the glass house on February 16, 1968; April 10, 1968 and April 17, 1968.

Periodically the rooted cuttings were pruned according to the normal practice. The total number of aphids were tallied on 20 young leaves taken radomly from the new growth from each plot.

Results and Discussion

Attempts at aphid infestation were not successful until the last date aphids were introduced, and were much slower getting started in the glass house. New plant growth was also slower in the glass house and probably caused the delay in aphid infestation.

By April 17th the effect of the insecticides in the polyethylene house were apparent (Table 1). Thimet was not as effective as Temik and Di-Syston. By April 29th the Thimet had further weakened to the point that these plots could easily be picked out visually.

Aphids in the glass house plots were counted and recorded on May 31st. At this time the Thimet treatment at 5 lbs. active ingredient per acre was little better than no treatment (Table 2).

Metcalf, et al. (1957) have demonstrated that Di-Syston and Thimet were initially absorbed and translocated at approximately equal rates. They also noted little difference in basic metabolism within the living plant but Thimet was oxidized to its toxic components some what slower than

Di-Syston. Our results show a considerable difference in the effective life of the two materials. Thimet is noted for its high volatility and strong odor. The higher volatility and slower oxidization may reduce the amount of Thimet that can be absorbed by the plant as compared to Di-Syston applied at equal rates. This may explain the poorer control with Thimet at the same rate as Di-Syston. Johnson (1960) and Strew (1966)

Table 1 Control of aphids, *Masonaphis azaleae* (Mason), on rooted rhododendron cuttings in polyethylene greenhouse Half Hollow Nursery, Huntington, L I, N. Y April 17 and 29, 1968.

Material (All 10% Granular)	Rate Lbs Active Ingred Per Acre	Number of Aphids[1] April 17, 1968 Total	% Reduction From Check	April 29, 1968 Total[2]	% Reducton From Check
Temik	12	4	99.6	1*	99.9
	6	6	99.4	6*	99.2
	3	38	96.7	29*	96.6
DiSyston	20	2	99.8	3*	99.6
	10	9	99.2	3*	99.6
	5	51	95.5	46*	94.6
Thimet	20	72	93.7	180*	78.9
	10	116	90.7	127*	85.1
	5	226	80.1	330	61.2
Check		1133		850	

[1]On 60 leaves, 20 leaves per plot
[2]All treatments significant over check at 01 level
*Significant over check at 001 level

Table 2 Control of aphids, *Masonaphis azaleae* (Mason), on rooted rhododendron cuttings in glass greenhouse. Half Hollow Nursery, Huntington, L I., N. Y. May 31, 1968.

Material (All 10% Granular)	Rate Lbs Active Ingred Per Acre	Number of Aphids[1] Total	% Reduction From Check
Temik	12	1*	99.8
	6	0*	100.0
	3	0*	100.0
DiSyston	20	1*	99.8
	10	2*	99.6
	5	33*	94.3
Thimet	20	56*	90.3
	10	78*	86.5
	5	558	3.3
Check		577	

[1]On 60 leaves, 20 leaves per plot
*Significant over check at 001 level.

had similar results with the two materials. The method of pruning the plants by removing the tips may have also affected the amount of systemic remaining in the new growth.

At the time of treatment large numbers of fungus gnats were present in the glass greenhouse. After treatment there was a strong odor of Thimet and within a day, no gnats were observed. These observations support the role of Thimet vapor in insect control as previously observed by Johnson (1960). Three to four days after treatment the odor of Thimet could no longer be detected.

Summary

These experiments indicate that 10-20 lbs. active ingredient Di-Syston or 3-12 lbs. active ingredient Temik applied as 10% granulars are effective in controlling aphids on rooted rhododendron cuttings in 50-50 peat, perlite media from January to June under greenhouse conditions including normal cultural pruning. Apparently Thimet 10G is not as effective in controlling aphids on rhododendron cuttings under the same conditions.

REFERENCES CITED

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MODERATOR HANCOCK: Thank you Mr. Scheer, now we are ready for some questions.

VOICE: How dangerous are these materials to use?

CHARLIE SCHEER: The materials must be handled properly. The vapors pose a danger. With Thimet we took precautions to keep the men out of the house and when they did have to go in, to turn on the ventilation system and thoroughly exhaust the house before entering. In general, I think that if you will wear the protective clothing recommended, you will have adequate protection. The filters in the respirator should be checked and refilled every 40 hours or so. Respect these materials and you should have no problem.

ARRIE RADDER: Wouldn't it be advisable to wear goggles also when using these chemicals? I've been told they readily go through your eyes into your body.

CHARLIE SCHEER: It goes through any part of the body, the eyes and mouth particularly. We never had any problem. We were concerned about the dust and especially the fumes.

Thimet can drive you out of the greenhouse because of its odor and the fumes are toxic.

ANDY KNAUER: You protect yourself during application but what happens concerning the men who work around these plants and soil on successive days.

CHARLIE SCHEER: The rule we followed is to keep the men out of the greenhouse for 4-6 weeks, this was based on the recommendations of the various manufacturers. We saw no need to handle the soil, perhaps Lloyd might have a further comment.

LLOYD RASWEILER: There was no need to handle the soil and I put up signs in the greenhouses to warn anyone against handling the plants and soil.

The plants were planted before treatment and there was no need to disturb them until it was time to put them out in the field. I like to run the Rhododendrons on the dry side but occasionally we did have to go into the houses to water. I also like to reach down into the bench and pull up some of the medium to check for water and when we did this we used rubber gloves.

TOM CANNON: I thought these organic phosphates built up in the body even though you only get small amounts at a time.

CHARLIE SCHEER: From the literature I've reviewed the organic phosphates go out of the body. Di-Syston will be absorbed by the body and if you get enough to be in the killing dose range you will get nerve damage. Temik, however, does not give nerve damage, but all these products should be handled with care.

MODERATOR HANCOCK: The consensus of opinion seems to be that its still more important to protect our own skin than our Rhododendrons. The next speaker is Hubert Rhodes who is to speak to us on the subject of juvenility in plants.

JUVENILITY IN RELATION TO ADVENTITIOUS BUD AND ROOT INITIATION IN WOODY PLANTS

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There are some well known facts about juvenility that have a particular bearing on the propagation of woody plants from cuttings and by other asexual methods: (1) that juvenile shoots generally root very readily as cuttings, even in those species and cultivars in which the adult phase can be rooted only with great difficulty; (2) that adventitious shoots formed on roots normally resemble the juvenile shoots of young seedlings; (3) that a juvenile capacity persists in the basal region of the stem of a plant grown from seed or from cuttings of roots or juvenile shoots, making possible the establishment