

Speak No Weevil: What Rhododendron Growers Said About Their Root Weevil Management

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Introduction

Root weevils have long been identified as a key pest in nursery production throughout North America and Europe. Although documentation of existing management practices allows evaluation and description of successful tactics for monitoring and control of root weevil populations, little information about these practices has been assessed

systematically. There is a stigma attached to occurrences of root weevil infestations. Many nursery owners hesitate to speak openly about this particular pest problem. In order to better understand the practices and the needs of growers managing root weevil problems in rhododendron production, nurseries across a diverse range of production scale and location were surveyed in 1998.

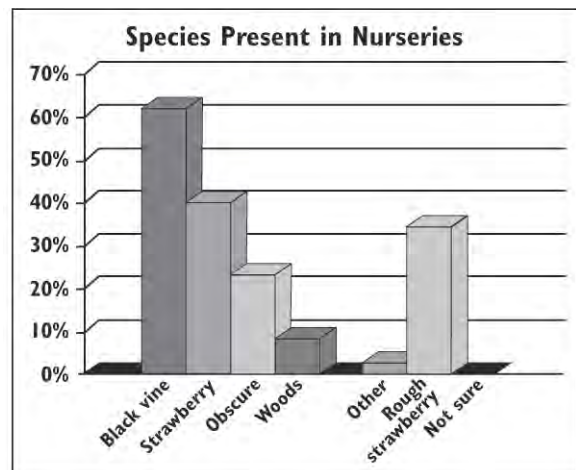
Methods and Materials

Two hundred and seventeen nurseries across a diverse range of production scale and location were surveyed in 1998. Written questionnaires were distributed to nursery personnel who make pest management decisions regarding root weevil control. Survey participants remained anonymous by using a coding system. To facilitate comparison of pest management practices, questions were limited to control of weevils on one plant species, rhodo-

dendron. Rhododendron was chosen as it is grown by a large number and diversity of nurseries and is a favored host for root weevils. Information gathered included: monitoring methods; decision criteria; control methods and timing; effectiveness of tactics; direct and indirect costs; and plant losses. Data were analyzed using SAS Chi-Squared analysis. In-person interviews with a subsample of nurseries of varying sizes occurred to see practices in the field and to gain better perspective.

Results and Discussion

There were 71 responses to the survey (33 percent return). The majority of growers (50 percent) had both container and field production with the remaining producing in containers only (32 percent), field only (17 percent), or in greenhouses (1 percent). Root weevils were considered a problem by 59 percent of the respondents. Many growers (62 percent) had multiple root weevil species present at their site; 38 percent had only one species present. Black vine weevil was the most common root weevil species, present in 62 percent of the nursery sites, followed by strawberry root weevil (40 percent), obscure root weevil (23 percent), Woodswevil (8 percent), and other (2 percent). Over a third of the respondents (34 percent) weren't sure which species of root weevils were present at their sites. Nursery size (dollar value of sales) did have an effect on whether the species of root weevils



present were identified. Larger sized nurseries more frequently identified root weevil species present at their site. Growers have noticed patterns of root weevil infestation in their nurseries. Root weevils were associated with wooded areas by 56 percent of the respondents; nursery boundaries by 35 percent; shaded areas by 21 percent; low sites by 11 percent; and compost piles by 9 percent. Sixty-six percent of those answering said their production areas bordered other susceptible crops. Larger pot sizes were more likely to be infested: 3 gal (64 percent); 1 gal (52 percent); 5 gal (37 percent); and smaller than 1 gal (23 percent).

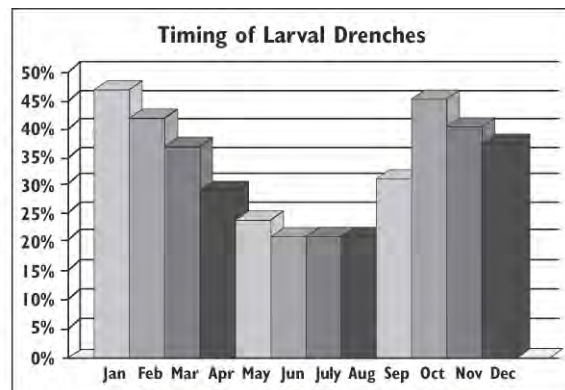
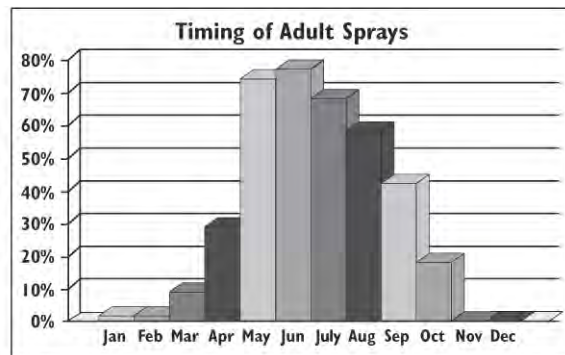
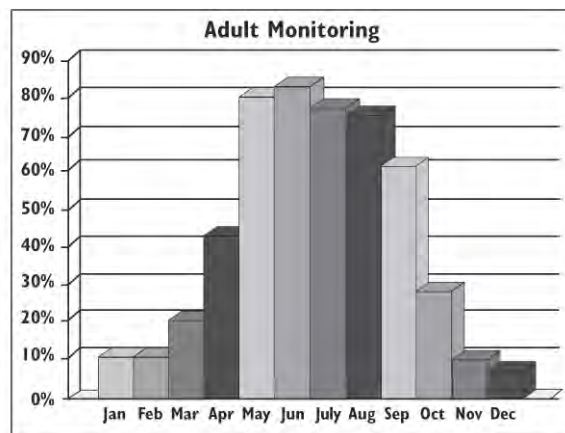
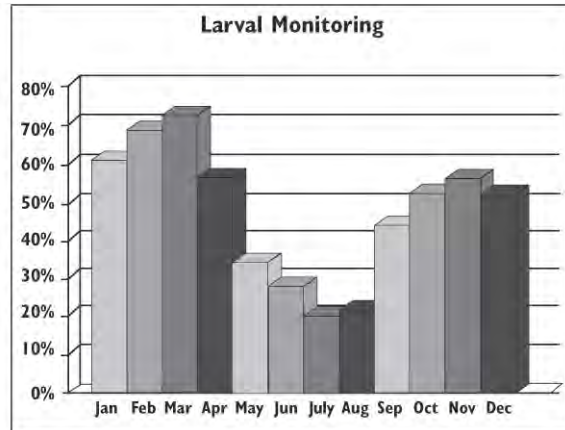
Monitoring

Rhododendron growers are monitoring (80 percent). Most (74 percent) are monitoring for both larval and adult life stages of the weevils. Some (17 percent) monitor for adults only, 7 percent for larvae only, and 2 percent for notching only. The monitoring at these sites is being conducted by growers or employees (97 percent), agricultural consultants (21 percent), and/or supplier field reps (12 percent). Adults are most commonly monitored in the months of June (83 percent), May (80 percent), July (77 percent), August (75 percent), and September (62 percent). Larvae are most commonly monitored in the months of March (72 percent), February (68 percent), January (60 percent), April and November (56 percent). The most commonly cited reason for not monitoring was lack of trained employees (40 percent), lack of monitoring guidelines (30 percent), and cost (20 percent).

Management—Adult Control

Ninety-three percent of respondents use pesticides for adult control. Growers are using a variety of criteria to time applications: adults present (69 percent), spray at regular intervals (57 percent), visible leaf notching (48 percent), larvae present (32 percent), and root injury noted (26 percent). Adult root weevil control sprays are most commonly applied during: June (77 percent), May (74 percent), July (68 percent), and August (58 percent). The most frequently cited number of applications for adults was three (23 percent) and four (23 percent) followed by five per season (19 percent).

The most commonly applied insecticides used for adult control by these growers were the organo-phosphate insecticides: Orthene and Dursban; followed by the pyrethroid insecticides: Talstar and Tempo; and the carbamate, Turcam. Adult control sprays are applied during the day by 48 percent of those answering this question and during the night by 47 percent, the remaining 5 percent applied during both times. As almost equal numbers of respondents apply adult control sprays during the day as during the night, there is a need for insecticides that can be efficacious when applied during the day when there is limited contact with this nocturnal insect.



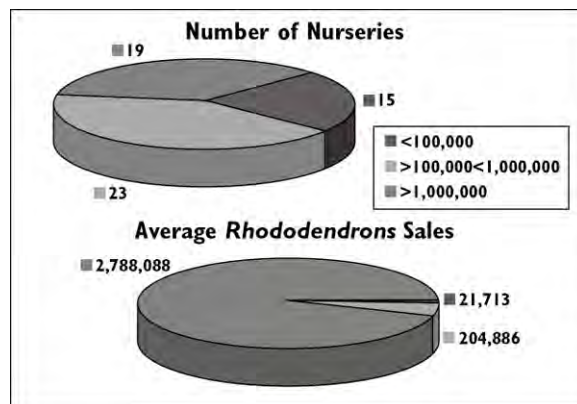
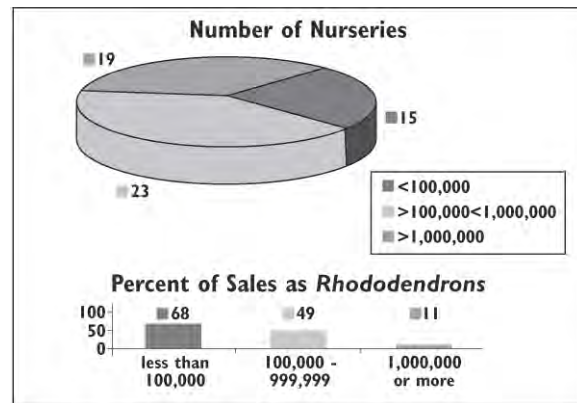
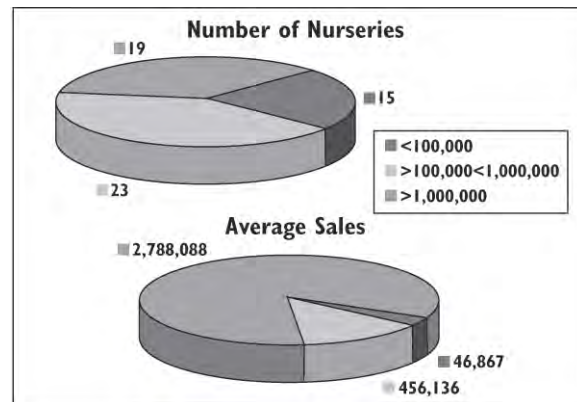
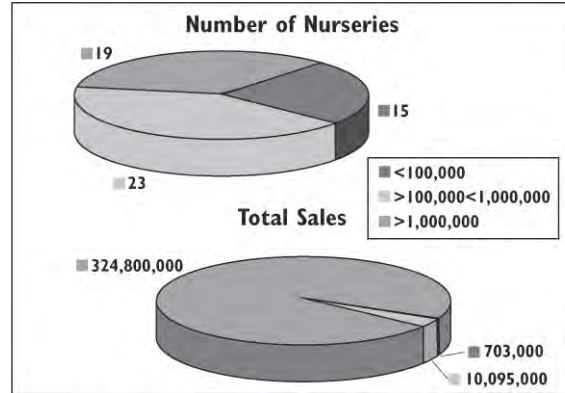
Management—Larval Control

Fifty-four percent of respondents use pesticides for larval control. Again, growers are using a variety of criteria to time applications: Larvae present (63 percent), spray at regular intervals (33 percent), adults present (12 percent), and visible leaf notching (9 percent), and girdling (4 percent). Larval control applications are most commonly applied during January (47 percent) and October (45 percent), followed by February (42 percent), November (40 percent), March (47 percent) and December (47 percent). The most frequently cited number of applications for larvae was three (29 percent), two (21 percent), and four (17 percent).

The most commonly applied insecticides for larval control are organophosphates including Dursban, Furadan, and Orthene. Sixty-five percent of the respondents use alternative forms of control to manage root weevils, most commonly entomopathogenic or “beneficial” nematodes. This was rather a surprising finding given the cost and stringent requirements required for successful use of these biocontrol organisms. Sixty-three percent of respondents rotate pesticides. Fifty-three percent of those applying pesticides were satisfied with the control achieved with their applications. Only 7 percent have had a shipment rejected or returned due to root weevils. Fourteen percent had stopped growing a rhododendron cultivar due to root weevils. Nine percent considered discontinuing rhododendron production due to root weevils.

Economic Impact

Fifty-seven of the nurseries responded to economic queries. Economic analysis began by dividing nurseries into categories based on the annual sales of the nurseries. Three divisions by size were annual sales of less than \$100,000; between \$100,000 and \$1,000,000; or greater than \$1,000,000. Total annual sales of the responding nurseries were greater than \$300,000,000. Annual sales in each nursery size division averaged \$46,867 for small nurseries; \$456,136 for mid-size nurseries; and \$2,788,088 for large nurseries. Rhododendron sales as a percentage of total nurseries sales varied greatly. Rhododendron sales as a percentage of total nurseries sales varied greatly. Although rhododendron sales were a smaller proportion of their overall sales, large nurseries accounted for the largest average rhododendron sales. Nursery sales size (dollar value) does not have an effect on the dollar value losses to weevils. In other words, smaller nurseries have greater losses as a percentage of sales. Conversely large nurseries have lower losses to weevils as a percentage of sales. Over 65 percent of all growers reported 0–2 percent losses in saleable materials to root weevils. Ninety percent of the medium/large-sized growers (\$500,000–\$1,000,000 sales) reported only 0–2 percent losses to root weevils. Overall, only



13 percent of nurseries described their losses to weevils as 5 percent or more. If crop loss was less than 5 percent, then the average crop loss in dollar value was \$823/nursery/year. If the crop loss was greater than 5 percent, the average crop loss in dollar value was \$7,310/year/nursery. Overall, the average loss per year per nursery was \$2,264.

Economic Threshold

It appears that there is a correlation between the percentage losses to root weevil damage and the level of satisfaction with the root weevil management program. The level of satisfaction dips sharply once the rhododendron crop losses reach 2 percent or greater. Of growers that are “satisfied” with their weevil management programs, the average losses per year to weevils were \$1,232/year/nursery. Of those growers “not satisfied” with their weevil control, losses averaged \$4,789/year/nursery. Perhaps more telling, dissatisfied growers with more than 5 percent crop

losses to weevils lost an average of \$9,464 per year per nursery. In this case, the weevil is winning and they know it.

