

***Phytophthora ramorum* Experience and Approach in the Netherlands¹**

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Abstract

Phytophthora ramorum was found for the first time in the Netherlands in 1993. In 2001 a risk analysis was done. The results initiated a program to investigate the spread in the Netherlands and to develop measures to prevent further spread. The measures outside the nurseries gave rise to intensive discussions with the managers and owners of these areas. In 2002 the European Union (E.U.) Commission Decision aimed at preventing introduction and spread of the pathogen and gaining insight in the distribution came into force. During the first season of inspections 4 percent of the nurseries growing host plants had *P. ramorum* infections on rhododendron or viburnum. In the second season of inspections the number of infections at the nurseries dropped to 1.5 percent and in the current season, 2004-2005, the incidence of *P. ramorum* has dropped even lower. The measures appear to be effective. Outside the nurseries 2 percent of the inspected rhododendron sites had infections. During the follow-up survey at the infested sites two infestations in *Quercus rubra* were found. The owners had to remove the infestation or prevent people from entering the area. Eradication from the Netherlands territory is not considered feasible. In addition to these government measures there is also a national campaign to encourage owners/managers of green spaces to remove infested plants and as a result lower the inoculum pressure.

Key words: infestation, Netherlands, nurseries, plant quarantine policy, public and private green spaces

Nurseries

At the nurseries Naktuinbouw, Netherlands Inspection Service for Horticulture, inspects the host plants under responsibility of the Plant Protection Service. In case of a suspicion the follow-up activities are handed over to the Plant Protection Service. The Plant Protection Service conducts the diagnoses and imposes the treatment measures. For the diagnosis the Taqman ITS-PCR is used combined with isolation of the pathogen. To determine the type of *P. ramorum* the isolates are tested with PCR-RFLP based on Cytochrome oxidase subunit 1 gene. Since the beginning of the inspections for *P. ramorum* the number of infestations has

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declined sharply from 4 percent in 2002-2003 to 1.5 percent in 2003-2004 to 0.5 percent in the first part of the season in 2004-2005. In addition to the effectiveness of the measures, awareness by the growers and a shift in the assortment contributed to the decline. Infestations were found in rhododendron, viburnum and in one case in *Taxus x media*. During the first season the majority of the infected lots were *Viburnum x bodnantense* Dawn.

Public and private green spaces

During the preliminary survey outside the nurseries in 2001 infestations were found only in rhododendron. Based on this experience the extensive survey of 2002-2003 was directed towards rhododendron. Sites with rhododendron and at least one other “potential” host plant were selected for inspection. Infestations were found at 30 of the 1400 inspected sites with rhododendron. Because of the known susceptibility of *Vaccinium myrtillus* an additional 100 sites were inspected. No additional infestations were found. The infestations in rhododendron were mostly found in old plants growing in the shade. During the follow-up inspections two infections were found in *Quercus rubra*, and none in the other “potential” host plants. In this survey more than 900 samples were tested of 18 different “potential” host plants.

Treatment measures included complete removal of the plants or cutting back the plants to below 50 cm. At 50 percent of the sites where infested rhododendron had been cut back, re-growth was partly found infected. Relying on the symptoms, newly developing shoots get directly infected from the stumps. Another observation was that the delimitation for the measures at the larger infestations was in general too narrow. The measures have been adjusted for these deficiencies. The period that the infestation remains under observation is extended to at least one year. The widespread occurrence of the disease combined with the difficulties in eradication led to the conclusion that eradication of *P. ramorum* from the territory of the Netherlands is not feasible.

Policy

The aim of the program is to protect the indigenous plants by trading healthy plant material, eradication at the nurseries and containment outside. At the nursery level the program is successful. For the public and private green spaces the conclusion is that especially the larger infected sites with a high inoculum pressure pose a risk for our indigenous plants.

The containment measures are based on the strong recommendation to remove the infestation and if the infestation is not removed the owner has to make sure that the area is not accessible. Until now all owners, with one exception, have chosen to remove the infestation. Taking into account the spread outside the nurseries it is not possible for the government to locate all infestations. Therefore a national campaign has been initiated to lower the inoculum pressure. The aim is that the owners/managers of the public or private green spaces take responsibility

in removing infestations. Part of this campaign is intensive communication and the development of management programs. The management programs are directed at removing the infestation as well as improving the growing practices. Practices include the use of non-host species, planting of host plants under conditions where the pathogen doesn't thrive, maintenance of plantations with rhododendron, and removing shade trees. It is also recognized that there can be variation to the recommended management practices. The primary expenses are the costs of removal and destruction of infested plant material. The costs can be reduced by more than 60 percent by allowing the plant material to be chipped and left outside. More feasible, but adequate measures, make it easier for the owner to follow the recommendations.

The sustainability of this approach still needs to be proven, but with more and more fungi being identified as a threat to the public and private green spaces, the efforts by managers and owners of the public and private green spaces will be required in addition to the efforts by the government.