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Phytophthora wilt of carnation in the Netherlands

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Carnation (*Dianthus caryophyllus* L.) is a very important glasshouse crop in the Netherlands with a total area of nearly 500 ha in 1977. Wilt diseases in carnations have already been a big problem in the Netherlands for about 40 years. Especially during the last five years, wilt, caused by *Fusarium oxysporum* f.sp. *dianthi* (Prill. et Del.) Snyder & Hansen and *F. redolens* Wollenw., was found in a great number of glasshouses (Bouwman et al., 1976).

Wilt symptoms, different from those caused by *Fusarium* spp., were observed on young carnations on a holding in the Westland glasshouse district in March 1977. The plants showed a rapid discoloration and wilting, whereas plants attacked by *Fusarium* spp. generally show slow wilting, mostly on one side of the plant. The base of the plant showed also a dry rot. In the period from March to June plants with identical symptoms were found on five more nurseries in different parts of the Netherlands. On each nursery the percentage of diseased plants increased from about 10, when symptoms were first noticed, to 30–40 three months later in the summer. It concerned different cultivars each originating from another propagation nursery.

From the rotten stembase and discoulored xylem vessels of the diseased plants *Phytophthora nicotianae* var. *nicotianae* (van Breda de Haan) Waterhouse A^2 compatibility type was isolated. The identification was confirmed by the Centraal Bureau voor Schimmelcultures (CBS) at Baarn.

Inoculations were made with two isolates of *P. nicotianae* var. *nicotianae* from carnation and with *P. nicotianae* var. *nicotianae* from Sinningia. The root systems of six-week-old carnation cuttings were dipped in suspensions of these isolates, which had been grown on PDA or in standing culture of Richard's solution, and then planted in steamed soil. The plants were kept at a temperature of 20 °C. The first symptoms were observed four weeks after inoculation. The initial symptom was a rapid discoloration and wilting of the whole plant. The base of the plant showed a dry rot. The xylem vessels showed a brown discoloration up to only 1–1.5 cm into the stem. From the diseased plants the *Phytophthora* isolates could be re-isolated. Not only the plants, inoculated with the isolates from carnations, but also those, inoculated with *P. nicotianae* from Sinningia died, although the latter isolate attacked more slowly. It was concluded that *P. nicotianae* var. *nicotianae* was the causal agent for the wilting of the carnations.

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Wilt of carnations caused by *Phytophthora* species, identified as either *P. nicotianae* f.sp. *parasitica* (Dastur) Waterhouse or *P. parasitica* Dastur, has been reported from Greece (Sarejanni, 1952), Hawaii (Hine and Agaraki, 1962), France (Tramier and Mercier, 1965) and Italy (Garibaldi and Rapetti, 1975). In those countries, with a warmer climate than the Netherlands, the disease causes much damage to outdoor carnation crops. Although *P. nicotianae* var. *nicotianae* has previously been found in the Netherlands in several glasshouse-grown ornamental crops, including potplants and cutflowers (e.g. roses) it has not previously been found on carnations.

Samenvatting

Phytophthora verwelkingsziekte van anjer in Nederland

In 1977 werd op een zestal anjerbedrijven, verspreid over Nederland, een verwelking van anjers gevonden, waarvan de symptomen afwijkend waren van die veroorzaakt door *Fusarium oxysporum* f.sp. *dianthi* of *F. redolens*. Uit de verrotte stengelbasis en verkleurde vaten werd een *Phythophthora*-soort geïsoleerd, die werd gedetermineerd als *P. nicotianae* var. *nicotianae*.

Door inoculatieproeven kon worden vastgesteld dat het ziektebeeld door deze *Phytophthora*-soort werd veroorzaakt. Hoewel deze schimmel al eerder in Nederland werd gevonden bij potplanten en bij snijbloemen in de volle grond in de kas, is dit de eerste vondst van de schimmel bij anjer. De aantasting is wel langer bekend in Griekenland, Hawaii, Frankrijk en Italië.

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