

SHORT COMMUNICATIONS

FOOTROT OF TOMATOES, CAUSED BY TWO  
*PHYTOPHTHORA* SPECIES<sup>1</sup>

*Voetrot in tomaat, veroorzaakt door twee Phytophthora-soorten*

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In August 1965, a footrot occurred in a young tomato crop, killing more than 50% of the plants within six weeks of planting. The aerial parts of the plants showed hardly any symptoms before wilting, but at that stage the main root appeared to be dead and in some cases the pith parenchyma of the stem base had disappeared. A *Phytophthora* species was isolated from the main root and identified by the Central Bureau for Mycology (C.B.S.) in Baarn as *P. arecae* (Colem.) Pethyb.

During the first three months of 1966, a very similar type of footrot occurred in young hothouse tomatoes in a number of glasshouses in the Westland area. Healthy looking plants wilted suddenly three to six weeks after planting. The younger leaves became dark green a few days before wilting, and adventitious root development was common. The main root and a number of lateral roots appeared to be dead, and the stem base often had a greyish, somewhat shrivelled, appearance. Again, from the main root and stem base a species of *Phytophthora* was isolated which, according to the C.B.S. in Baarn, closely resembled *P. richardiae* Buisman.

There are marked differences between the symptoms described and those of the footrot caused by *Ascochyta hortorum* (Speg.) Sm. emend. Vogl., the imperfect stage of *Didymella lycopersici* Kleb. In plants infected by *A. hortorum* the older leaves turn yellow before the plants wilt and the stem base is seldom hollow when the symptoms first appear; the infected stem base is dark brown in colour (VERHOEFF, 1963).

Inoculation experiments were carried out with both species of *Phytophthora*, using wheat grain inocula placed in the planting holes in steam sterilized soil, before setting out 25 cm high tomato plants. At soil temperatures of 12-15°C adventitious root formation on the stem bases occurred twelve to fifteen days after planting in soil infested with *P. richardiae* and some days later the plants wilted and died. Most of the root system appeared to be brown and dead and the stem base was grey and often shrivelled; *P. richardiae* was reisolated from these parts. At higher soil temperatures infection took place, but the plants remained alive for ten weeks or more, probably due to rapid development of new, healthy roots. Transferring inoculated plants from a higher to a lower temperature, viz. about 13°C, sometimes resulted in wilting of these plants.

With regard to *P. arecae*, it was found that disease development was favoured

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by higher soil temperatures, e.g. 25–28°C. The optimum temperature for mycelial growth of this fungus is about 30°C, whereas for *P. richardiae* it is about 23°C.

The symptoms of this disease are very like those of a type of footrot which occurred in the spring of 1963 and again in 1965, and which was at that time considered to be a physiological disorder (VERHOEFF & DE MOS, 1963). Further experiments will be necessary to investigate whether this type of footrot is also caused by a *Phytophthora*.

It should be mentioned that *P. arecae* was isolated from tomato plants with footrot symptoms by the Plant Protection Service (P.D.) at Wageningen in August 1964.

#### SAMENVATTING

Uit tomatplanten, die typische voetrotsymptomen vertoonden, konden de schimmels *Phytophthora arecae* en *P. richardiae* geïsoleerd worden. Vooral *P. richardiae* werd in de eerste drie maanden van 1966 uit zieke planten, afkomstig van diverse bedrijven, geïsoleerd. Behalve dat de hoofdwortel afstierf, bleek de stengelbasis vaak grijs van kleur en hol te zijn. Waarschijnlijk zijn de in 1963 beschreven „droogpoten” identiek met deze, door *Phytophthora*-soorten veroorzaakte aantasting van de plantvoet.

#### REFERENCES

- VERHOEFF, K., – 1963. Voetrot en „kanker” bij tomaat, veroorzaakt door *Didymella lycopersici*. Neth. J. Pl. Path. 69: 298–313.  
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