

On the incubation period of *Puccinia horiana*

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In his experiments Yamada (1955) found an incubation period of about 10 days for *Puccinia horiana* P. Henn. At a temperature of 15°–20°C Stahl (1964) found a period of 12 days, while Stark and Stach (1965) concluded that this time can vary from at least 10 days to 8 weeks¹. Little being known about the time of incubation in various conditions, the authors decided to do the pilot experiments reported below.

Chrysanthemum plants of cv. 'Indianapolis White G 4' were inoculated on July 13, 1966, by spraying with a mixer-made suspension of sporulating lesions (Zandvoort et al., 1968). Immediately following inoculation the plants were placed in a glasshouse with a minimum temperature of 12°–18°C and a maximum temperature of 25°–31°C. During the first 24 h after inoculation the plants were placed under a black polythene plastic foil. The sixth day after the inoculation the first symptoms of *P. horiana* became visible.

In another experiment, plants of cv. 'Indianapolis White G 4' were inoculated on 27 June by spraying with a mixer-made suspension of spores. The treated plants were placed in glasshouses at four temperatures ranging from 10°C to 30°C. For each temperature treatment 20 plants were used.

Fig. 1 indicates that the time of incubation was shorter than 12 days at 17°C and 21°C, 13 days at 10°C, while at 30°C no symptoms became visible during 29 days.

The development of the fungus at 10°C is definitely slower than 17°C or 21°C. The number of infected leaves after 29 days suggests an optimal infection at 17°C.

At the field inspection done by the Plant Protection Service we commonly found new infections about 2–4 weeks after the destruction of infected plants, which is an indication for an incubation period of at least the mentioned time. An interesting indication of a very prolonged incubation period was found on one well isolated plot. Cuttings, rooted at an infected nursery where the temperature was over 30°C for several hours during some days of the rooting period, had been planted there about 17 June, 1966. After planting in the field there were several days with a high relative humidity and a temperature of 10°–20°C. On 5 August many necrotic spots and only one withered teleutosorus were found. One week later, fresh teleutosori were observed on ca. 2% of the plants.

¹ Mays and Favreu (1967) determined the incubation period in a glasshouse at Versailles and found a time of 7 to 11 days.

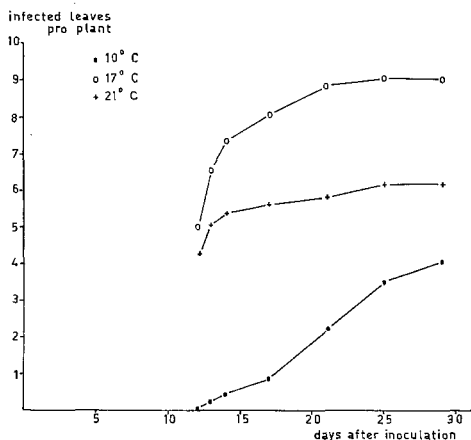


Fig. 1. Mean number of infected leaves per plant at several temperatures on different days after inoculation

Fig. 1. Gemiddeld aantal aangetaste bladeren per plant bij verschillende temperaturen op verschillende dagen na de inoculatie

In wintertime it was not possible to make observations about the duration of the incubation period, since it was too hard to find the teleutosori. The first symptoms of infection by *P. horiana* in stock plants were found some weeks after the beginning of the new growth. This indicates that the fungus can hibernate on stock plants.

In the autumn of 1965 infected plants of cv. 'Juweeltje' were planted for stock plants in a cold frame and outside after removing the leaves. In May 1966 no rust had yet been found in these plants, though the conditions were good for the development of the rust. Melder (1965) also found no rust in a similar experiment. In our opinion all the infected parts had been taken away in making stock plants.

The following conclusions were drawn:

- (1) The minimum incubation period is 6 days. At 10°C this period is at least 13 days.
- (2) The optimum temperature for incubation is about 17°–21°C.
- (3) Field evidence suggests that the incubation period is prolonged by short intervals of supra-optimal temperatures up to at least 56 days.
- (4) The rust can hibernate in or on stock plants.
- (5) Experimental evidence suggests that the hibernating inoculum can be eradicated by complete removal of the green parts of the plant.

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Samenvatting

De incubatietijd van Puccinia horiana

De minimum-incubatietijd van *Puccinia horiana* is 6 dagen. Bij 10°C is deze tijd tenminste 13 dagen. De incubatieperiode was het kortst bij 17°C en 21°C (Fig. 1). Uit een waarneming in de praktijk werd de aanwijzing verkregen, dat door een hoge temperatuur gedurende enige tijd de incubatieperiode kan worden verlengd tot tenminste 56 dagen.

De roest kan op of in moederplanten overwinteren. In proeven werden aanwijzingen verkregen, dat door volledig wegsnijden van de bovengrondse plantedelen het inoculum kan worden verwijderd.

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