ATO

Nature and cause of fugal infection on grapes

(code Griekse druiven/F.G.Harmsen van der Vliet)

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Confidential

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WAGENINGEN UR

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Author Ir J.A.Verschoor
Microbiology P.L.A. de Leeuw

Institute for AgroTechnological Research
P.O. Box 17
6700 AA Wageningen
the Netherlands

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Introduction

Augst 14th 2001 we received samples of infected grapes (code Griekse druiven/F.G.Harmsen van der Vliet) from the company Harmsen & De Groot in order to establish the nature of the damage (fungal infection) and the possible cause. The grapes were sent From Harmsen en de Groot to ATO by a courier earlier that day.
The grapes were transported from the country of origin, Greece, to the Netherlands in approx. 3 -4 days at temperatures of 4 – 6 °C. Upon arrival, a fungal disorder was discovered, leading to the request of Harmsen en de Groot for determination of the fungus species and the cause of the infection.

Symptoms of the infection

The (fungal) infected tissue was pale brown and water soaked (photo 1). The skin of the berries was loose and slippery on the spots with visible infection. The degree of infection varied from small round brown lesions in the skin, to progressively collapsed tissue (photo 2). On some berries black spore-heads were rising from the infected tissue (photo 3). Infected spots were found in a few scattered berries on each cluster. In some clusters nests occurred with heavily infected berries.
In general the quality of the grapes was rather poor. The stems often showed strong brown discoloration, indicating severe ageing.

Identification

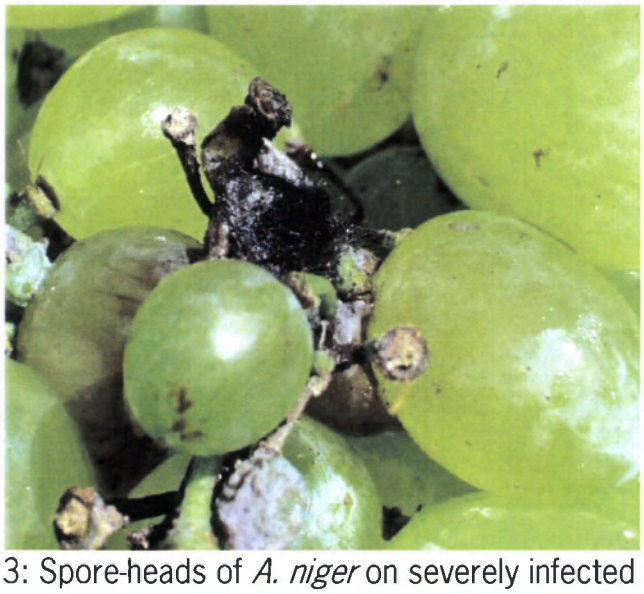
The mould was identified directly from the infected tissue by macroscopic and microscopic examination. We also have transferred infected tissue of berries (from several stages of infection) to a microbiological medium to isolate the mould. The mould was identified as *Aspergillus niger*.

Biology

The fungus exists on plant debris in the soil, and is favoured by temperatures between 25° and 35°C. Spores are disseminated throughout the vineyard in air currents, and characteristically cause infection via injuries such as insect punctures, splits or stem-end fractures. In some grape cultivars a substance in the natural wax coating stimulates growth of *A. niger*, but infection occurs only in mature berries, young berries being resistant to invasion even when wounded. Infection may also occur during and after harvest, through injuries (not necessarily visible) caused by careless handling. The fungus does not grow whatsoever at temperatures below 5°C. Under warm conditions the fungus spreads throughout the cluster.

1: Cluster with infection of *Aspergillus niger*

2: Progressive stages of infection with *Aspergillus niger*



3: Spore-heads of *A. niger* on severely infected tissue

Conclusions

The fungal infection of these grapes was caused by *Aspergillus niger*.

Taking into account that:
- the infection had scattered through the clusters
- the degree of severity of the infection (some visible sporulation on totally collapsed tissue)
- the very slow to absent growth of *A. niger* at the temperatures applied during transport (4-6°C)
- the normal biology of *A. niger* on grapes
- and the poor general quality as indicated by the brown discoloration of many stems

it is clear that the infection occurred somewhere in the period from preceding harvest until refrigeration to 4-6°C was archieved.