

*INVITATION*

**DOCTOR DEFENCE**

**Friday, 12<sup>th</sup> June 2020 from 14:00**  
at Hall Carl Kylberg, Medicinaregatan 7B,  
41390 Gothenburg, Sweden

**Preharvest Conditions Affecting Apple Quality,  
Antioxidant Responses and Susceptibility to the  
Infection by Grey mould (*Botrytis cinerea*)**

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# **Preharvest Conditions Affecting Apple Quality, Antioxidant Responses and Susceptibility to the Infection by Grey mould (*Botrytis cinerea*)**

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Apple fruits are rich in vitamin C and other antioxidants, which are beneficial for human health. During postharvest storage, there are losses as a result of diseases such as grey mould, caused by the fungus *Botrytis cinerea*. The present work has investigated how to obtain a high quality of apples, allowing long-term storage. One focus of this study was to investigate whether preharvest weather conditions affect apple quality, antioxidant responses and the susceptibility to infection by grey mould. We have tested the hypothesis that high levels of sunlight increase the quality of the fruit and its tolerance to grey mould. To this end, we examined the patterns of several antioxidants, including enzymes, in apple fruit in fending off attack from grey mould. The results show that preharvest exposure to high levels of sunlight can reduce the susceptibility of apples to postharvest disease. The susceptibility of apples also depends on the apple cultivar tested. 'Braeburn' was found to be more susceptible than 'Golden Delicious'. Further studies focusing on 'Braeburn' confirmed a strong effect of sunlight on both quality and susceptibility. In addition, high levels of protein and phenolic compounds were positively associated with the tolerance of apple fruits to grey mould infection. A field study in Sweden following eight orchards growing the cultivar 'Ingrid Marie' over three years shows that the quality of apples and the development of disease varied strongly among years of harvest and with the orchard's location. Preharvest weather conditions strongly affected the growth and development of apples as well as their quality, among which high humidity and high rainfall during flowering and fruit set and low temperature during maturity were the most influential on apple quality and the susceptibility of fruit to infection by grey mould. Knowledge of such crucial factors may guide apple growers to interventions aiming at improving apple quality and postharvest storage.

**Keywords:** *Malus x domestica*, grey mould, preharvest weather, apples' quality, antioxidants, harvest year

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