Factors affecting Thrips resistance in cabbage

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Introduction

Thrips (*Thrips tabaci*) are an important pest on cabbage, in organic as well as conventional cultivation. In the Netherlands symptoms appear mostly in September-October and continue to develop during cold storage. Although large differences in susceptibility to thrips damage occur among cultivated varieties it is not clear if this is due to variation in resistance (affecting the thrips population) or tolerance (affecting symptom development upon thrips feeding). Also, little is known about plant traits affecting resistance or tolerance. We aim to elucidate these questions in this project.

Figure 1. Damage caused by thrips feeding on a leaf from a cabbage head.

Field experiments

We grew ten cabbage varieties for mid- to late-season harvesting at two locations in the Netherlands. All varieties were planted end May 2005, and four also mid-June. At four dates between August 10 and October 22, plants were harvested and evaluated for thrips number and damage, and characterized for a number of traits, including among others compactness of the head, leaf surface wax and Brix.

Effect of planting date

Four varieties were planted end May and mid-June. Of these, Slawdena and Bartolo are susceptible and Galaxy resistant to thrips damage. Planting late resulted in less symptoms on the susceptible varieties and especially on the intermediate variety Rivera, but had no effect on Galaxy (Fig.2).

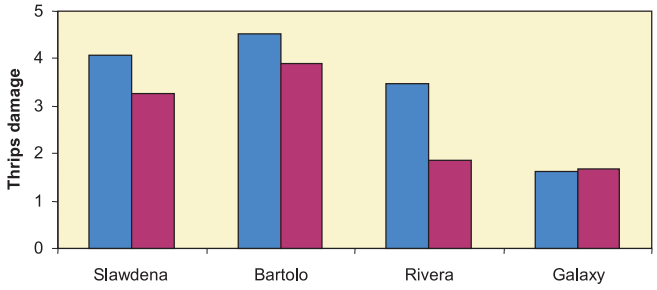

Figure 2. Mean Thrips damage (scale: 0=no damage, 9=severe damage) observed on 22 October, on four varieties planted end May (blue) or mid-June (purple).

Plant traits

Among the plant traits studied we found highly significant correlations of Thrips damage at harvest with compactness of the head early in the season, leaf surface wax and leaf sugar content as estimated by a Brix measurement. However these factors do not completely account for the differences in Thrips damage (Fig. 3).

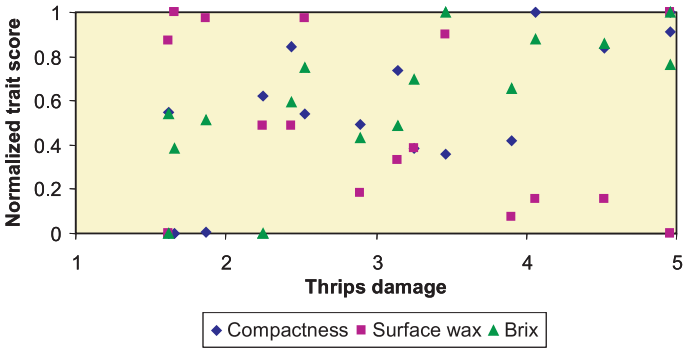

Figure 3. Relation of normalized plant trait scores and Thrips damage on 22 October.

Resistance versus tolerance

The size of the Thrips population and the amount of damage were highly correlated (R=0.91 and 0.86 in the third and fourth harvest, respectively). We found no varieties with a remarkably low damage in relation to the number of Thrips. This suggests that the differences in Thrips damage among the varieties are caused by differences in resistance rather than differences in tolerance.

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