



# Resistance to *Fusarium* head blight and DON accumulation in spring wheat cultivars

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## Introduction

*Fusarium* fungi cause Fusarium head blight (FHB) in cereals. In wheat, *Fusarium* infection not only affects yield, but also the quality of the kernels due to the accumulation of mycotoxins, e.g. deoxynivalenol (DON). Consumption of DON-contaminated products can cause serious illnesses and immuno-suppression in humans and animals. Breeding for resistance is the only way to reduce accumulation of DON.

In this research project spring wheat cultivars grown in organic agriculture were investigated for their levels of resistance to *Fusarium culmorum*, as well as to the accumulation of DON.

## Materials and methods

Spring wheat cultivars and breeding lines were obtained from experimental cultivar trials. Field experiments were performed in two years at organic farms in the Netherlands. Since wheat is most susceptible at flowering time, artificial inoculations were made at this stage. FHB ratings were determined as the product of the percentage of infected heads and the proportion of infected spikelets per infected head. Mycotoxin analysis of kernels was carried out by TRL Rotterdam, NI.

## Results and discussion

All artificial inoculation treatments resulted in successful infection. In 2003, average infection levels were higher than in 2002 (Table 1). This is similar for DON concentrations. Significant differences were found between cultivars. Thasos, Lavett, Minaret and Pasteur are the cultivars with highest levels of resistance and lowest DON concentrations in two years. Some cultivars did not or hardly respond to increased disease pressure. Tybalt and Sunnan, two highly infected cultivars, had highest DON concentrations.

## Conclusions

Significant differences in levels of resistance between spring wheat cultivars give farmers the opportunity to choose for cultivars with highest levels of resistance to FHB. This study also shows that in years with severe *Fusarium* infections, DON concentrations can become too high in all cultivars tested.

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Table 1. Levels of FHB infection and DON concentrations in artificially infected spring wheat cultivars.

Cultivar	FHB 4 w post inoculation			DON in ppm	
	2002	2003	Mean	2002	2003
Thasos	5	17	11	0.4	11
Lavett	9	16	13	2.9	18
Minaret	11	17	14	0.5	18
Pasteur	15	15	15	5.6	21
Melon	26	21	24	2.7	32
Anemos	24	30	27	3.0	24
Quattro	33	43	38	13.5	73
Baldus	21	57	39	1.2	29
Monsun	28	62	45	5.2	46
Paragon	44	53	49	22.0	56
Tybalt	59	46	53	29.3	93
Vinjett	43	-	-	7.5	-
Cracker	47	-	-	8.4	-
Sunnan	56	-	-	29.3	-
LSD	12	6			

