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***Fusarium* colonization and mycotoxin content of organic and conventional maize**

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This handout differs slightly from what I presented in Alghero: I added a couple of explanatory slides as a substitute for the talk and removed slides less important for our message.

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Retention Time (min)

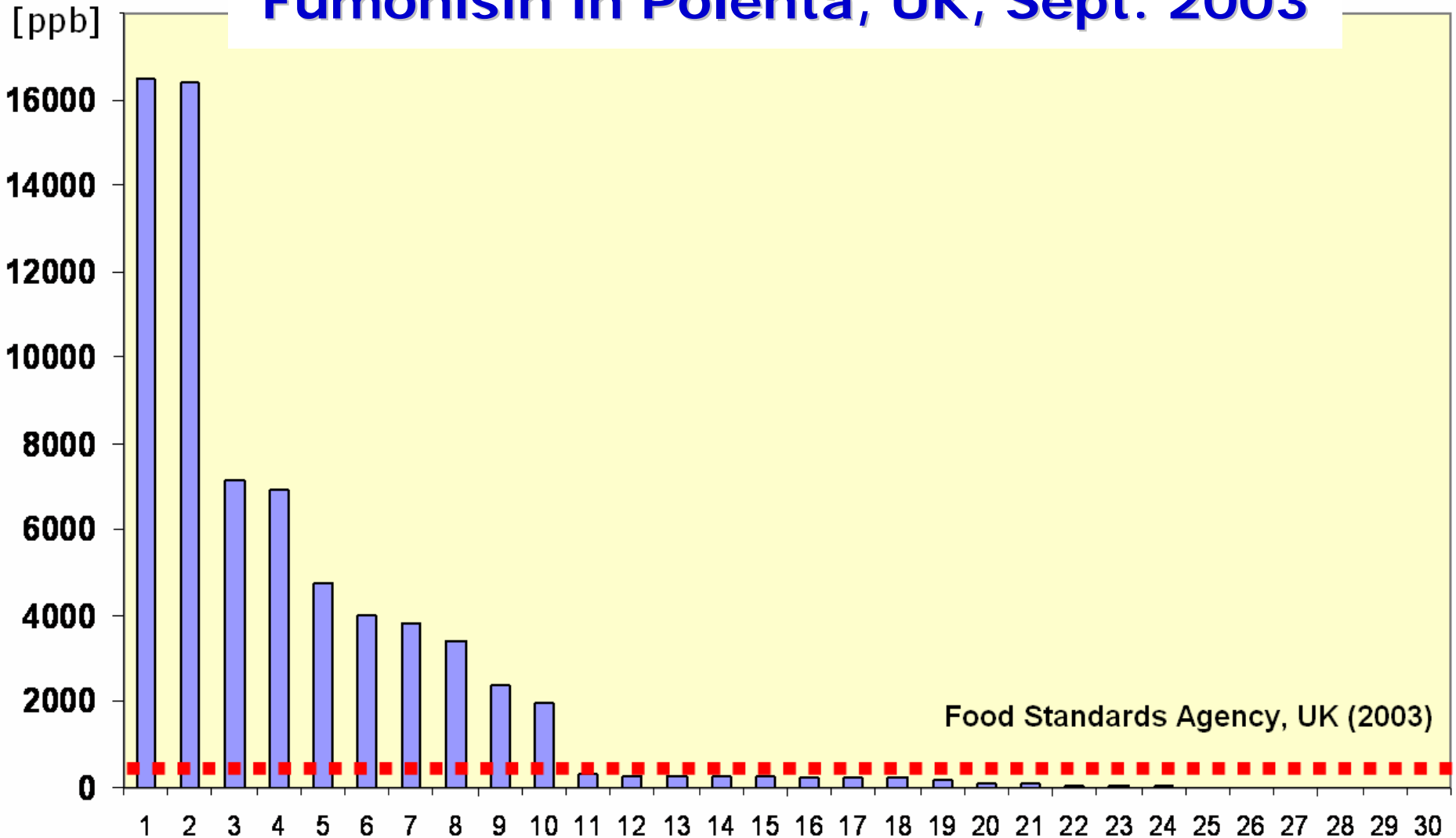


Topics

- Poisonous organic corn in UK
- Organic vs. conventional
- Field trials
- Hypothesis

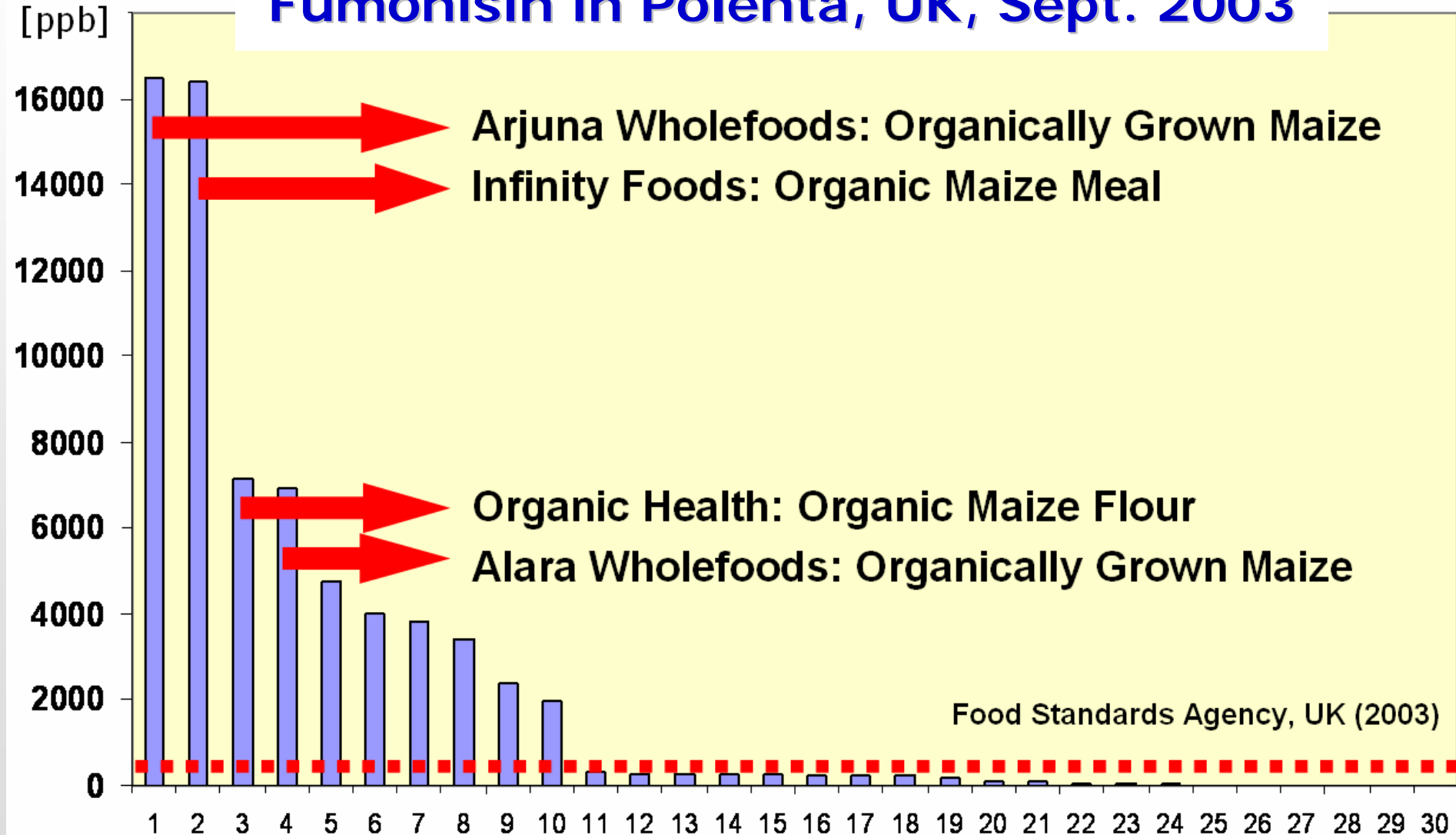


Fumonisin in Polenta, UK, Sept. 2003





Fumonisin in Polenta, UK, Sept. 2003





Added text

All highly contaminated samples were labeled organic. On the average, organic cornmeals contained 9 mg FB1/kg, conventional cornmeals 160 μ g FB1/kg.

Which organic cultivation-specific factor accounts for the difference?



Factors affecting mycotoxin content*

Organic

- Ploughing
- Non-host precrop
- No Bt allowed
- (No fungicides allowed)
- (Low plant density)

Conventional

- Low/no tillage
- Maize/wheat precrop
- Use of Bt cultivars
- (Fungicides used)
- (High plant density)

Fusarium/mycotoxins: ■ less, ■ more.

*Only major factors which differ between organic and conventional cultivation listed



Added text

Crucial factors controlling mycotoxin content, such as wheater, soil treatment and cultivar resistance, are not known for samples collected from the retail.

We need field trials in which the same maize varieties are grown side by side under organic and conventional conditions.



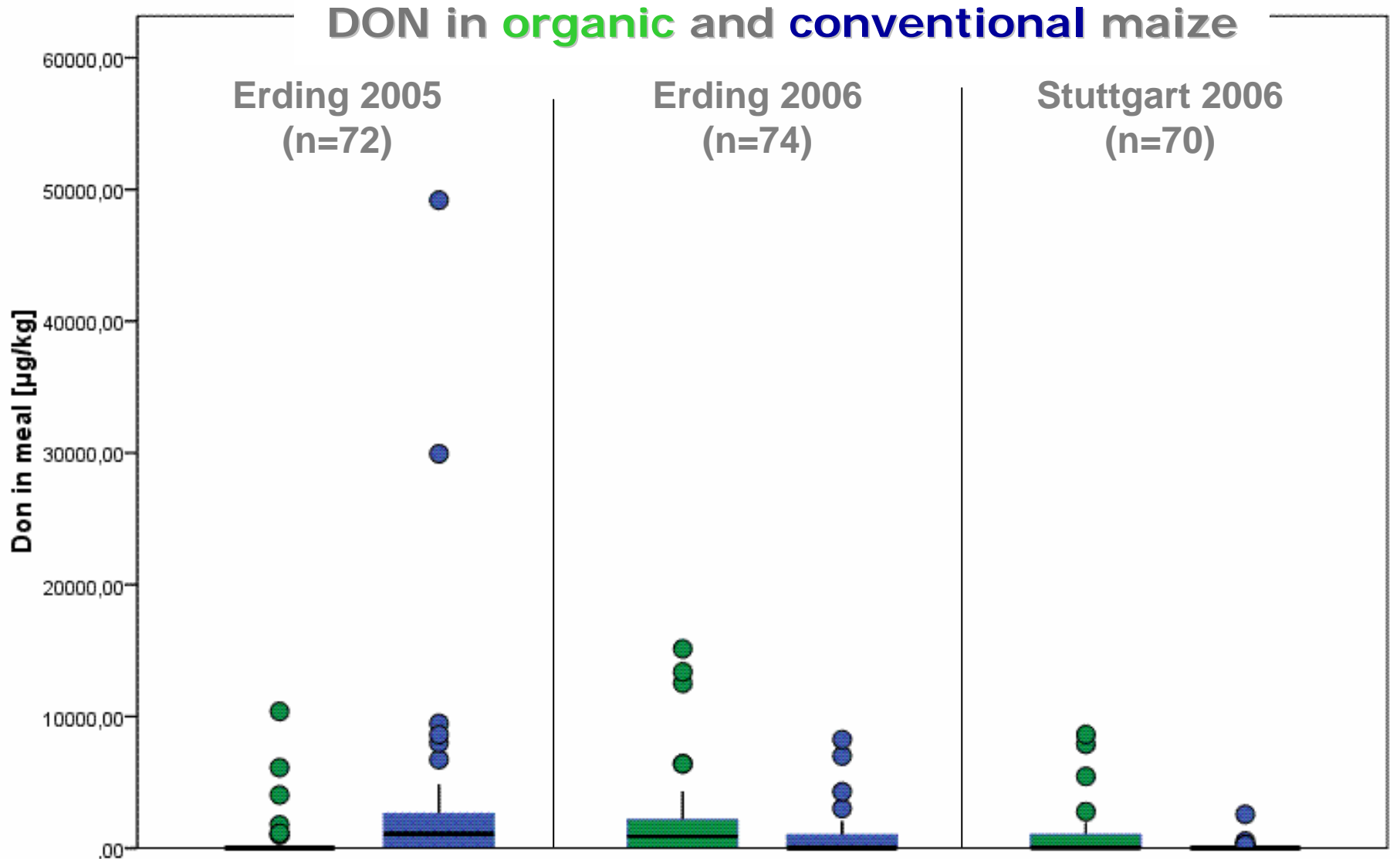
Topics

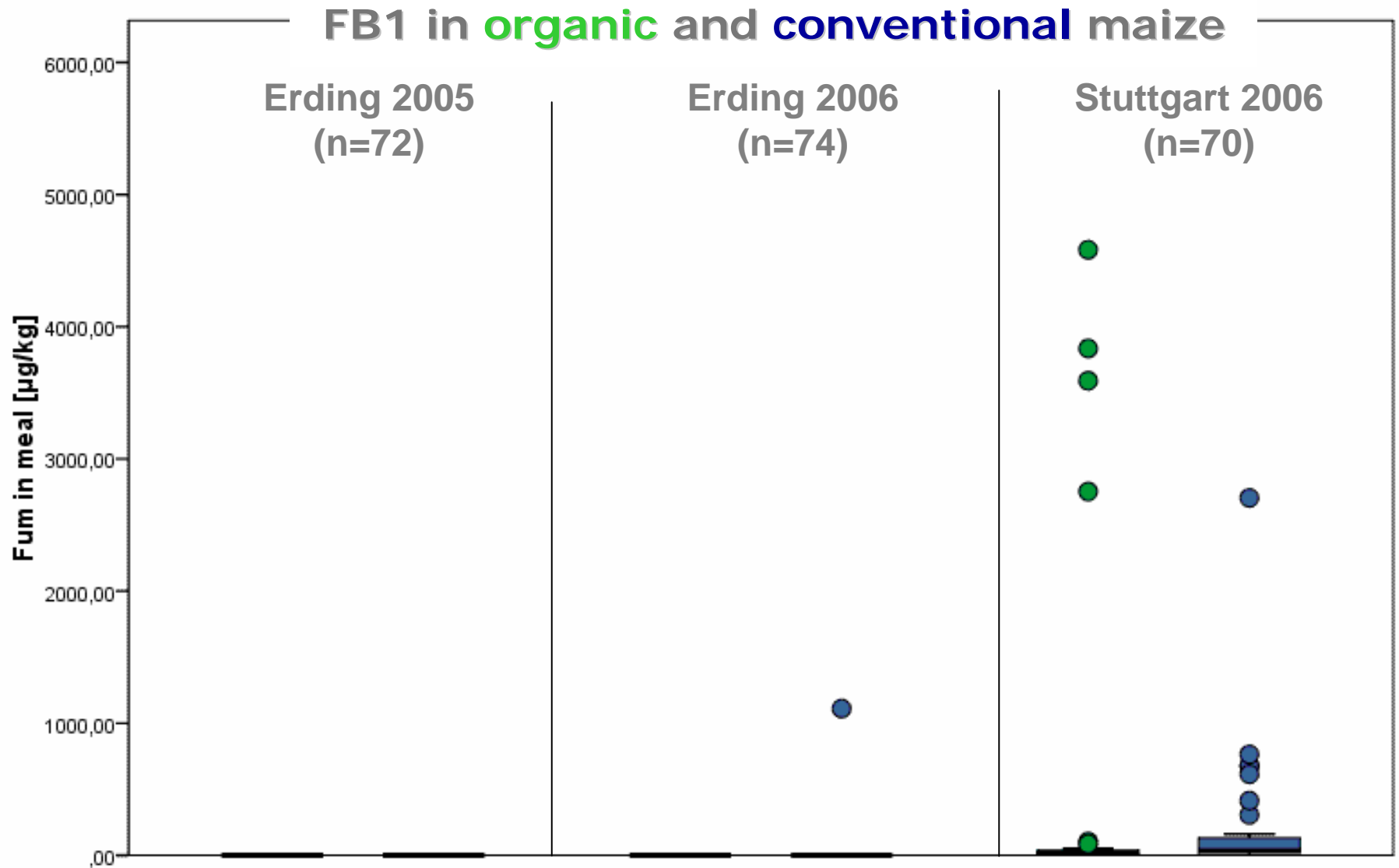
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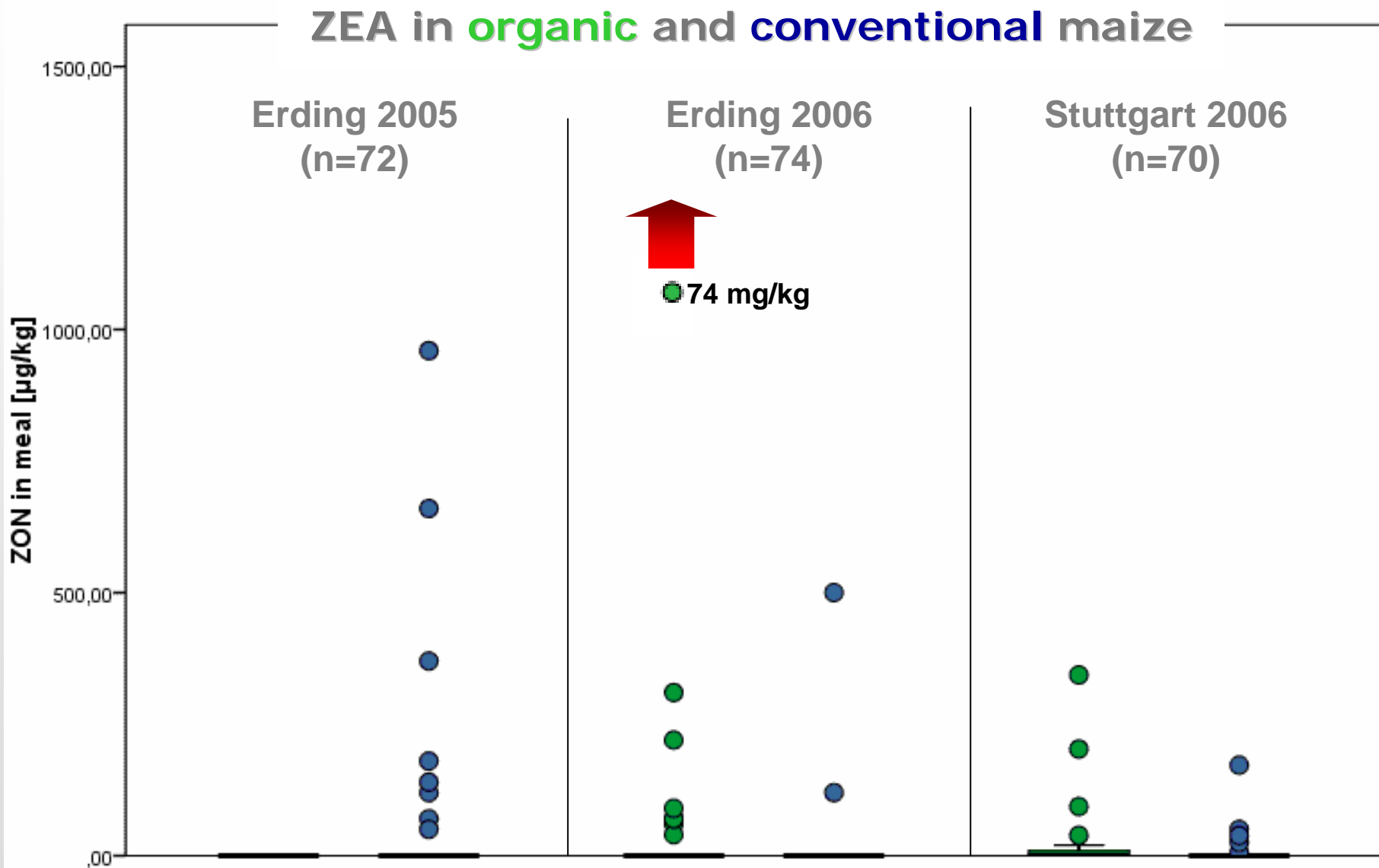


Field trial

- 18 maize genotypes in 2 replicas
- 3 locations, 3 years
- Rating of infection
- qPCR for *F. graminearum* Schw. and *F. verticillioides* (Sacc.) Niren.
- DON, ZEA, FB1 (HPLC-MS-MS)

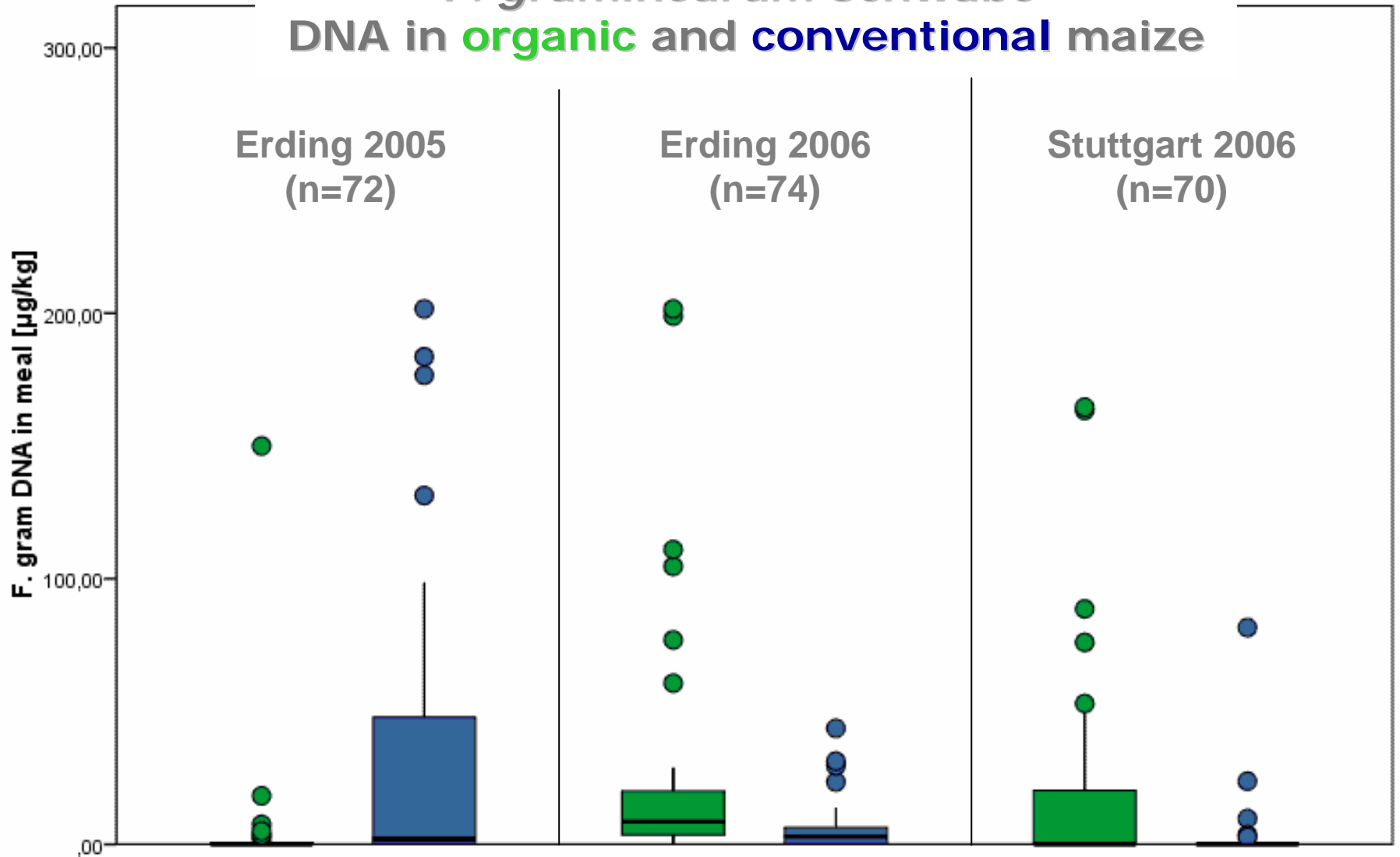




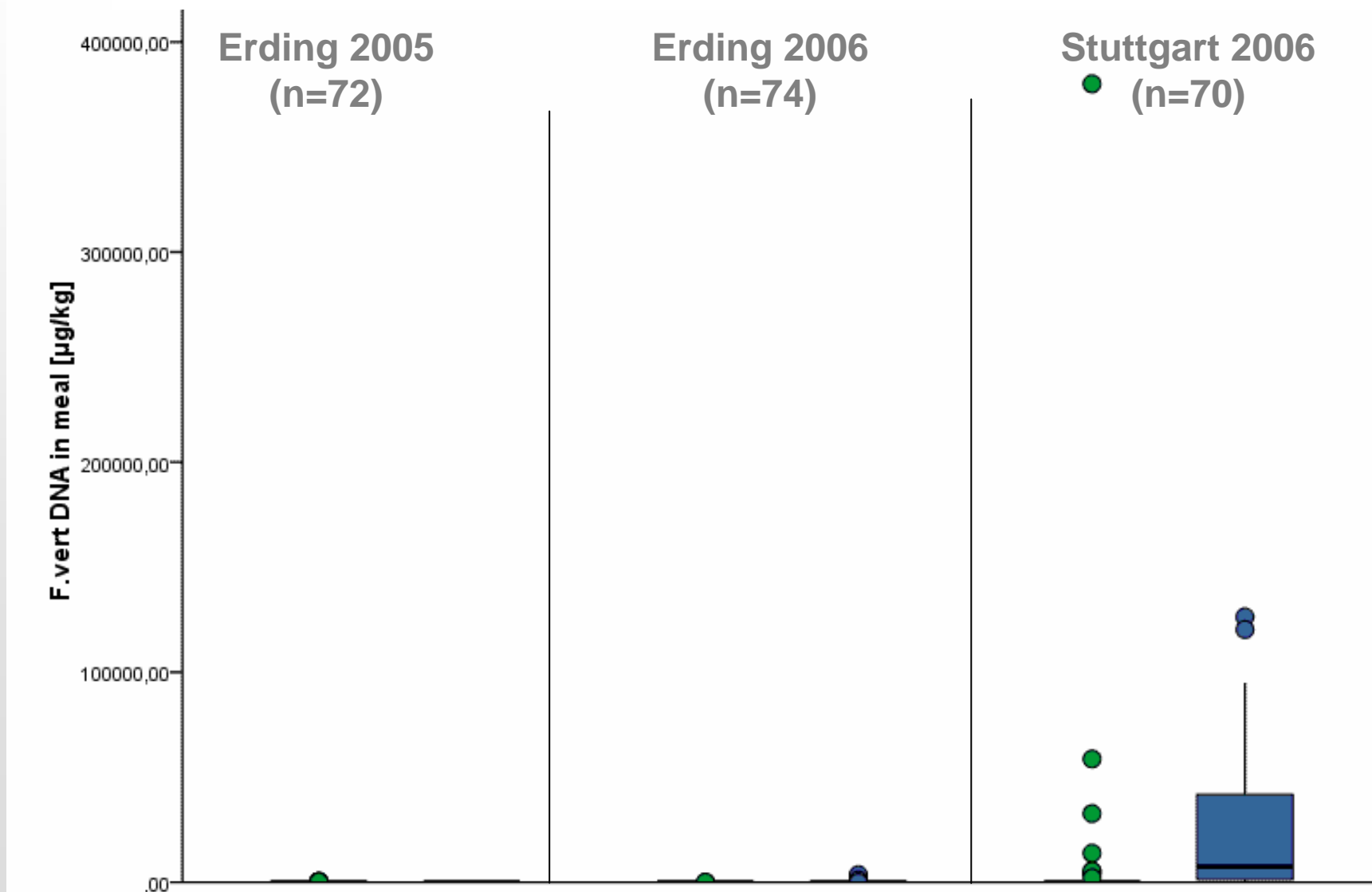




F. graminearum Schwabe DNA in **organic** and **conventional** maize

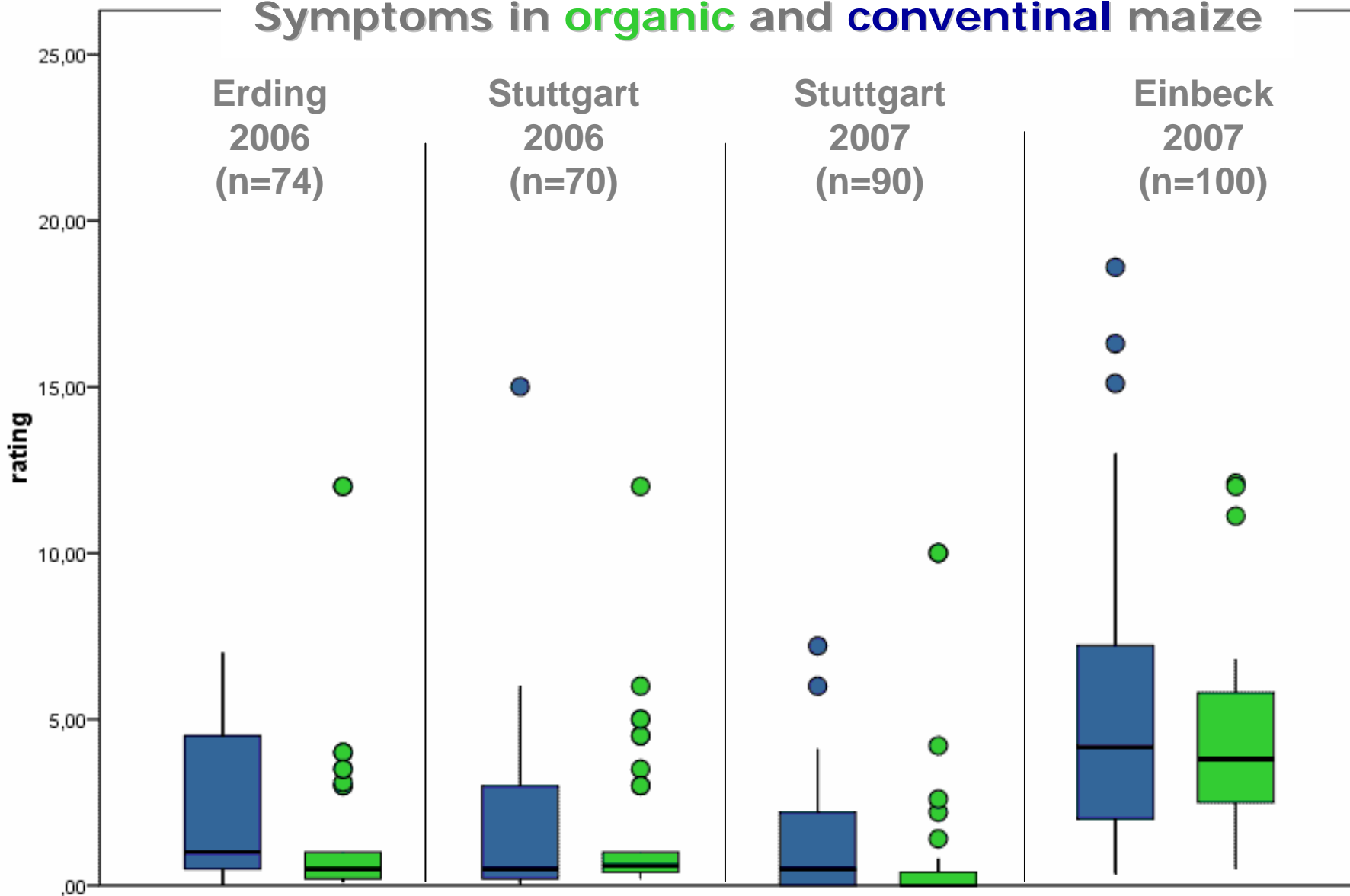


F. verticillioides in **organic** and **conventional** maize





Symptoms in **organic** and **conventional** maize





Extreme values

> 10 times larger than the next highest value

- 1x zearalenone - ORGANIC
- 4x fumonisin B1 - ORGANIC



Fumonisin in maize in BW 2000

- 11 samples > 1000 µg FB1/kg - ORGANIC
- Max. value 12.560 µg/kg - ORGANIC

(41 certified organic and 133 conventional maize samples from food monitoring by ILBW Sigmaringen)



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Organic maize



Hypothesis

Susceptible weeds may serve as source of inoculum for organically grown maize.



Acknowledgment

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