

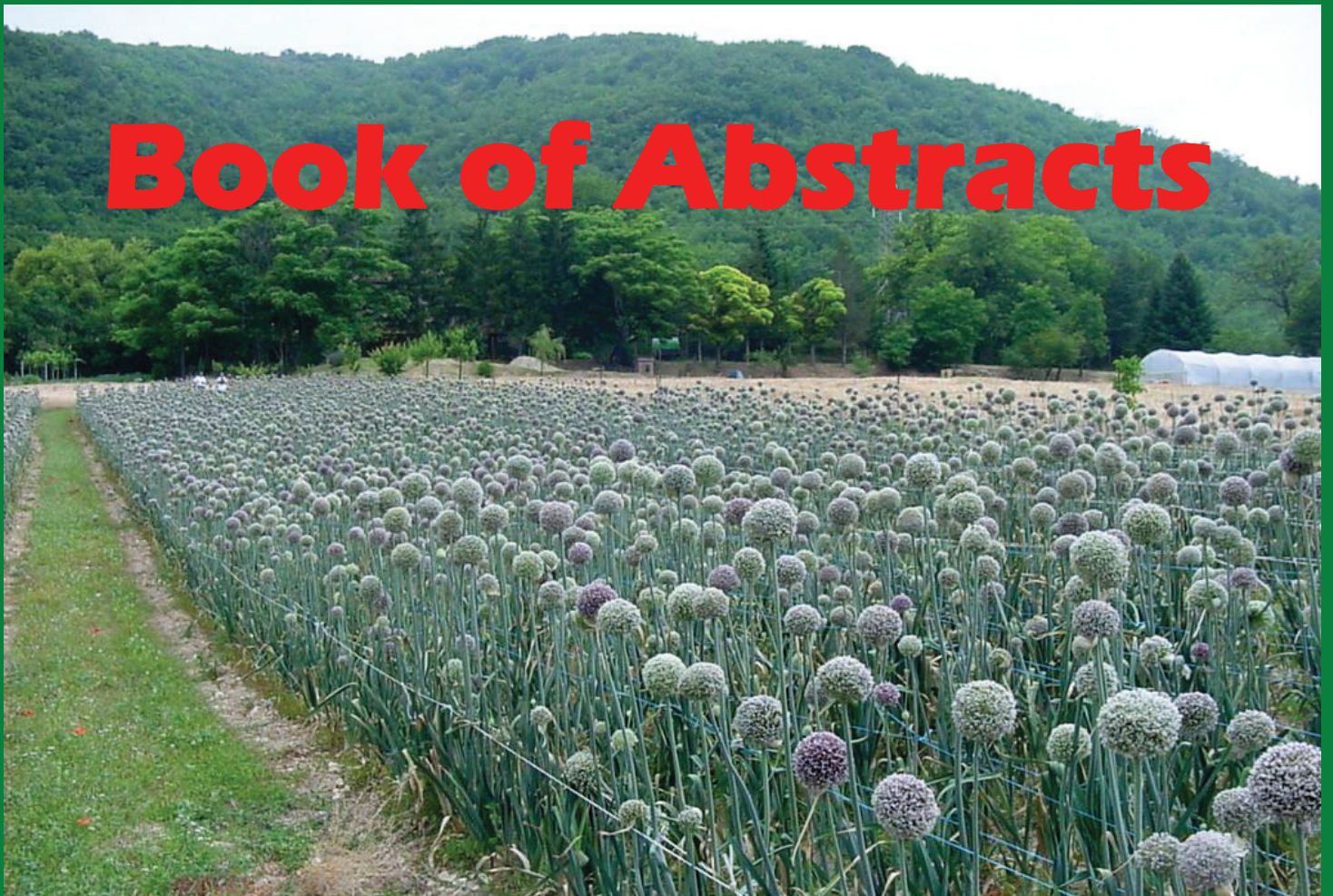
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dealing with genotype-environment interactions

Book of Abstracts



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Relation between growth characteristics and yield of barley in different environments

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The increasing interest in organic farming has increased the interest in examining the importance of the different growing characteristics, such as attack of diseases, grain weight, lodging and heading date. One of the important questions raised was whether the relationship between the growing characteristics and yield would be the same for conventionally and organically grown crop or would some growing characteristics be more important for organically than for conventionally grown crops. This work will focus on that question.

The analyses are performed using two datasets with comparable trials in both conventional and organic grown systems for barley (*Hordeum vulgare*). The two datasets were from Sweden and Denmark. From Sweden 22 conventional and 22 organic grown trials were available. The trials were laid out at 4 locations in Northern Sweden during the years from 1994-2003. The number of varieties per trial varied between 7 and 15 and 50 varieties were represented. Most of the trials were laid out as split-plot designs with 2 nitrogen levels in the conventional grown trial and 2 seed rates in the organic grown trials. From Denmark 4 conventional and 4 organic grown trials were available. The trials were laid out as α -designs at 2 locations in 2 years (2003 and 2004). The number of varieties per trial varied between 108 and 113 and 146 varieties were represented. The data from each country were analysed in a linear mixed model. The effects of location, year, variety, their interaction and interaction with system were included as random effect. The effect of growing system and growing characteristics were included as fixed effects to see how much of the variation caused by varieties and interaction with varieties that could be explained by the growing characteristic and to see if the effect of the growing characteristics depended on the growing system.

The analyses showed that the growing characteristics could explain a considerable part of the variance components for variety or interaction with variety. The effect of some growing characteristics depended significantly on the growing system, but the results varied to some extent between the two countries. In Sweden the effect of volume weight were more important in the conventional grown trials than in the organic grown trials whereas in Denmark grain weight was more important in the organic grown trials than in the conventional grown trials. In Denmark powdery mildew decreased the yield significantly more in conventional grown trials than in organic grown trials. In most cases the other diseases decreased the yield more in the organic grown trials than in the conventional grown trials. In some models the yield in organic grown trials increased as the level of scald attack increased. The results indicated that the effect of a given disease level decreased the yield more in the conventional grown trials than in the organic grown trials – or in some cases increased the yield in the organic grown trial while the yield in conventionally grown trials were increased less or decreased.