

Response of hardy ferns to drought stress

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INTRODUCTION

The aim of this study was to compare the growth and decorative value of seven taxa of hardy ferns cultivated under optimal conditions and under drought stress. We also determined the long term effect of drought on plant quality by assessing their condition after winter.

MATERIALS AND METHODS

The study was carried out in a plastic tunnel and it involved the following taxa (1) *Athyrium niponicum* 'Red Beauty'; (2) *Cyrtomium fortunei* 'Clivicola'; (3) *Dryopteris atrata* (4) *Dryopteris erythrosora*, (5) *Dryopteris filix-mas*, (6) *Dryopteris filix-mas* 'Linearis Polydactylon' and (7) *Polystichum setiferum* 'Proliferum'. For 30 days the plants were cultivated in the substrate of variable soil water content (SWC): 80% SWC (control) and 30% SWC (drought). Long-term impact of drought on plant quality was assessed 181 days after the stress cessation.

RESULTS AND DISCUSSION

The greatest growth reduction caused by water shortage was noted in *Dryopteris filix-mas* (48%), and the smallest in *Dryopteris erythrosora* (25%). The plants exposed to drought had a smaller diameter than those grown under optimal conditions. Drought stress clearly decreased leaf greenness index, and the drop was the greatest (82%) in *Dryopteris filix-mas* 'Linearis Polydactylon', and the smallest (51%) in *Polystichum setiferum* 'Proliferum'.

The visual score assessment after winter revealed that even 181 days after treatment, the ferns still showed visible signs of summer drought. Among ferns experiencing water shortage the lowest bonitation score was reached by *Dryopteris filix-mas*, and the highest by *Polystichum setiferum* 'Proliferum'.

CONCLUSION

Athyrium niponicum 'Red Beauty' and *Dryopteris filix-mas* were found the most sensitive to drought, while *Cyrtomium fortunei* 'Clivicola', *Dryopteris erythrosora*, and *Polystichum setiferum* 'Proliferum' showed moderate resistance to this stress.



The 30th day of
drought

181 days after
the stress
cessation