



**10th International Symposium on
Fungal Endophytes of Grasses**

June 18-21, 2018 – Salamanca, Spain

Book of Abstracts

Edited by Beatriz R. Vazquez de Aldana and Iñigo Zabalgogeoazcoa

Identification of main factors determining seed production of three *Festuca* species and its relation to potential endophyte propagation

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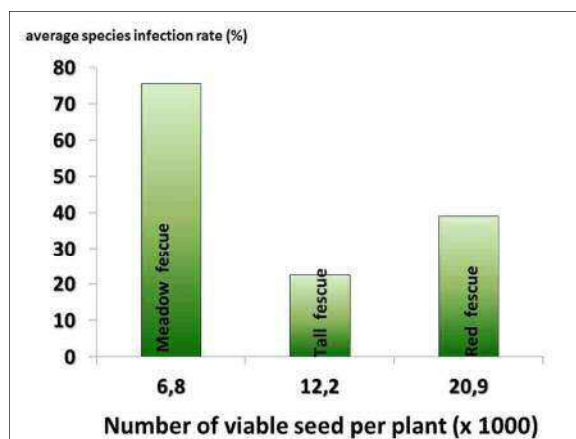
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Fescues are grass species frequently inhabited by endophytes. Country-wide survey in Poland (534 ecotypes examined) resulted in following endophyte frequency data: *Festuca arundinacea* (Tall fescue) – 22.6% (range from 0 – 40%); *Festuca pratensis* (Meadow fescue) – 75.7% (range 56 – 94%), *Festuca rubra* s.l. (Red fescue) – 39.1% (range 17 – 60%). In all E+ grass ecotypes (295 out of 534 collected), meadow fescue constituted 58.3%, red fescue – 37.0% and tall fescue only 4.7%.

Seed production experiment has been performed in four locations in Poland (Radzików, Leszno, Szelejewo and Nieznanice). Fifteen genotypes from three species (tall fescue - *Festuca arundinacea*, meadow fescue - *F. pratensis* and red fescue - *F. rubra*) were measured and observed during three consecutive years. Despite of phenological observations (heading and flowering start dates), biometrical measurements (plant height, leaf dimension, number of generative stems etc.) seed yield of single panicle, seed yield of plant and seed yield per plot (i.e. 50 plants) number of viable seeds were determined. Significant effects of years, locations and genotypes were calculated for mentioned species for almost all tested traits. Multiple linear regression analysis was used to estimate major predictors of seed yield. It resulted in different numbers of predictors for different species. For meadow fescue five, for red fescue – three and for tall fescue – only two statistically significant predictors were selected. For all species leaf width and number of generative stems were statistically significant and had positive weights. For meadow and red fescue – also seed yield from single inflorescence was significant with positive weight. Our results demonstrate that leaf width together with number of stems and single panicle yield are the most important determinants of plant seed yield in three *Festuca* species.



There was no positive correlation between average number of viable seed produced in each species with average endophyte infection rate observed in Poland. Moreover, the highest seed yields per plant and per plot were noted for tall fescue, while the lowest, for meadow fescue, what was opposite to endophyte infection rates. Therefore, it is most likely that seed production is not a major factor determining endophyte spread in wild or semi-wild habitats. Endophytes are easily spread by seeds, but different forces (i.e. climatic, genetic, agronomic etc.) deal with seed production.