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THREE CYCLES OF SELECTION FOR TOLERANCE TO PYTHIUM ULTIMUM ROOT DISEASE IN ANNUAL RYEGRASS

I. J. Pemberton, G. R. Smith, and L. R. Nelson

Background. Annual ryegrass and cool-season clovers are commonly used in combination for overseeding warm-season perennial grasses in the southeastern United States. Together, ryegrass and clovers provide high-quality forage during the late winter and early spring months. Disease causing (pathogenic) fungi living in the soil can sometimes attack germinating seed and emerging seedlings under cool, wet growing conditions. *Pythium ultimum* is one of the pathogenic fungi responsible for the poor establishment of arrowleaf clover observed in east Texas. Many clover seedlings are killed before emergence, when they are most vulnerable. Previous research has shown that annual ryegrass is also attacked by *P. ultimum*, however unlike arrowleaf clover, seedling emergence of ryegrass is minimally affected. Disease symptoms include stunting of roots, tan discoloration, and tip "burn" (indicating death of growing point). Three cycles of selection for tolerance to *P. ultimum* have been completed; this study compared the tolerance of TAM 90 with selected populations of Syn1 and Syn3.

Research Findings. A laboratory procedure developed to examine seed germination in the presence of *P. ultimum* was used to evaluate TAM 90, Syn1, and Syn3 for susceptibility to this disease. The most tolerant plants from each cycle were selected and grown to maturity to produce the next cycle. Data are presented in Fig. 1.

Application. Selecting for tolerance to *P. ultimum* root disease in annual ryegrass should lead to improved stand establishment and productivity. Development of annual ryegrass with tolerance to root disease is a component of a broad effort to improve forage crops for beef and dairy cattle in Texas. Testing Syn3 germplasm in the field at multiple locations will be the next step in evaluating this population as a potential new varietal release.

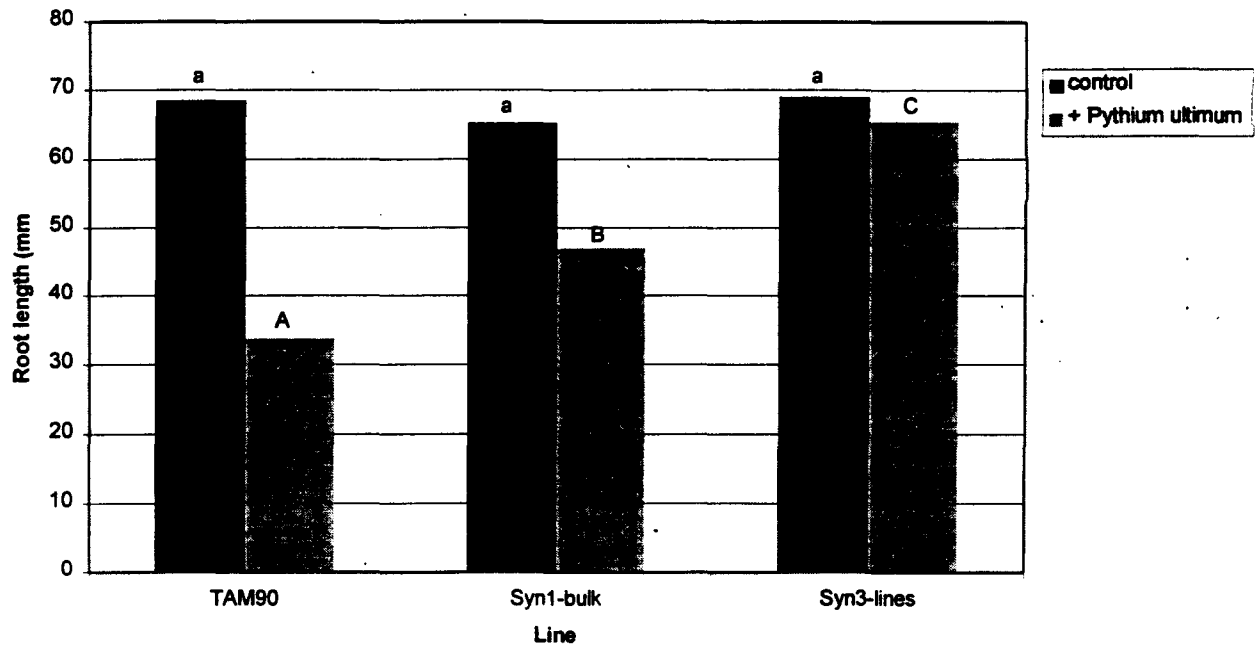


Figure 1. Mean root length of TAM 90 and two populations of annual ryegrass selected for tolerance to *Pythium ultimum* root disease during germination.