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INTRODUCTION

Florida paspalum, *Paspalum floridanum*, is a warm season native perennial grass occurring throughout the southeastern United States. This species is utilized by wildlife, especially gamebirds, for food and cover (Grelen and Hughes, 1984). Harrison germplasm Florida paspalum was evaluated and released by the USDA-Natural Resources Conservation Service (NRCS) East Texas Plant Materials Center in 2004 for soil conservation and wildlife. Freshly harvested seeds of Harrison germplasm have varying degrees of dormancy that can hinder stand establishment. Seed age has shown to be effective in overcoming seed dormancy of warm season grasses species (Shaidee et al., 1969). Prechill, which involves moistening the seed and cold storage for various lengths of time, has been used to overcome seed dormancy in switchgrass (*Panicum virgatum*) (Zarnstorff et al., 1994; Douglas and Grabowski, 1995). There is no information on the effect of seed age and prechill on germination of Florida paspalum. Objective of this study was to examine seed age and prechill on germination of two Florida paspalum seed lots.

MATERIALS AND METHODS

Generation 0 and 1 seed of Harrison germplasm was collected from seed production fields at the USDA-NRCS East Texas Plant Materials Center near Nacogdoches, TX (31.61 N -94.65 W; Elev. 338 ft). Generation 0 seed lot was harvested in 2000-2004 and represents ages two to six years. Generation 1 seed lot was harvested in 2003-2005 and represents ages one, two and three. Seed were stored in a temperature (~50°F) and relative humidity (~50%) controlled environment. Seed lots were separated into heavy and light fractions with a South Dakota seed blower. Only the heaviest fraction was used for germination tests. One hundred seed of each seed age and treatment combination was placed on a paper substrate in germination boxes. Prechilled seed was stored in a refrigerated environment for 14 days at 38°F (AOSCA, 1993) prior to initiation of the germination test. Seed was kept moistened with a 2% KNO₃ solution to insure adequate moisture for seed germination. Seed was placed in a germinator for 28 days with alternating day/night time temperature of 86/68°F and light for 8 hour day/10 hour night. Experiment was arranged as a randomized complete block with four replications. Germinated seeds were counted and discarded at 7, 14, 21, and 28 days. Experiment was repeated and an average germination percentage determined. Only the 28 day count (total) will be reported in this paper. Germination data was subjected to an analysis of variance, linear and quadratic regression analysis procedures in Statistix® 8 (Analytical Software, 2003).



Florida paspalum inflorescence in flowering.



Direct combining Florida paspalum seed in late July in eastern Texas.

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RESULTS AND DISCUSSION

Generation 0 Seed Lot

An analysis of variance revealed a significant ($P \leq 0.05$) increase in germination of two year old seed when exposed to a prechill treatment (data not shown). Prechill treatment did not increase germination of three to six year old seed. To explain this anomaly, regression analysis was performed on germination data as a function of seed age as influenced by prechill and no prechill, respectively (Fig. 1). Results showed that germination was more influenced by seed age ($r^2 = 0.95$) than by exposure to a prechill treatment ($r^2 = 0.77$). Prechilling the seed two weeks prior to conducting the germination test was sufficient to overcome seed dormancy in the two year old seed. It appears that storing the seed dry for four to six years in a controlled storage environment was adequate in overcoming seed dormancy. It is interesting to note that germination percentage increased curvilinearly as seed aged. This observation suggests that seed quality may be vulnerable to degradation after three years of storage in a controlled environment. Additional testing will be conducted to verify this observation.

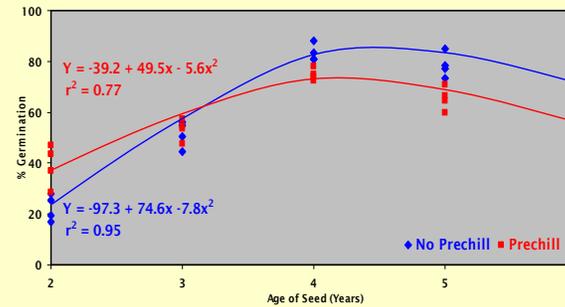


Fig. 1. Total germination of generation 0 seed of Harrison germplasm Florida paspalum as a function of age of seed and seed treatment, USDA-NRCS East Texas Plant Materials Center, Nacogdoches, TX.



Preparing seed for germination testing.



Germinated seed of Florida paspalum.

Generation 1 Seed Lot

There was a linear response to age of seed and prechill on germination (Fig. 2). Seed dormancy was extremely high in one year old seed as reflected by poor germination response to prechill treatment or short term storage (< 12 months) in a controlled environment. Douglas and Grabowski (1995) reported a 25% increase in germination of one year old seed of switchgrass that had been prechilled for two weeks prior to germination testing. A combination of factors such as temperature, light exposure and slow after-ripening of freshly harvested seed may have contributed to poor germination (Wheeler and Hill, 1957). Seed dormancy was present in the three

Generation 1 Seed Lot (continued)

year old seed as indicated by the response to prechill but the difference in prechill and no prechill treatment was 13% compared to 24% between the two treatments at age two, which would suggest seed dormancy is reduced with age.

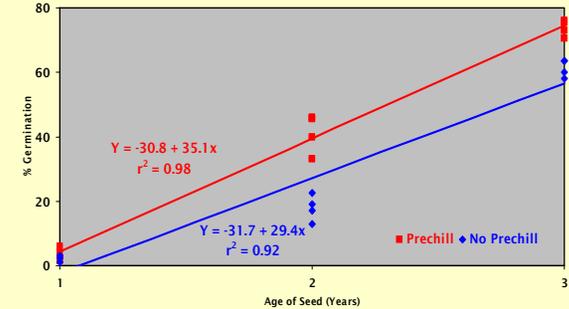


Fig. 2. Total germination of generation 1 seed of Harrison germplasm Florida paspalum as a function of age of seed and seed treatment, USDA-NRCS East Texas Plant Materials Center, Nacogdoches, TX.

CONCLUSIONS

Seed age had the greatest influence on germination of Generation 0 seed lot of Harrison germplasm Florida paspalum. As seed aged germination percentage increased curvilinearly and peaked at four years. A gradual decline in germination percentage after four years suggests seed quality of Generation 0 may be affected by storage duration in a temperature (50°F) and relative humidity (50%) controlled environment. Seed dormancy was evident in two year old seed of Generation 0 seed lot, and in one, two and three year old seed of Generation 1 seed lot, but was overcome with a two week prechill at 38°F. However, a two week prechill had limited effect in reducing seed dormancy in one year old seed of Generation 1 seed lot. Preliminary results suggest seed dormancy of these two seed lots of Harrison germplasm Florida paspalum can be reduced with a minimum of three years of storage in a controlled environment (50°F and 50% relative humidity) resulting in improved stands. This study will continue to gain more understanding of the germination requirements of Florida paspalum.

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