

Relative humidity, seed moisture content, storage temperature and seed longevity in Zoysiagrass (*Zoysia japonica* Steud.)

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Abstract

Zoysiagrass, *Zoysia japonica* Steud., is a native warm-season grass in China. It is characterized as a deep coat-imposed dormancy and with limited seed longevity. The objective of this study was to explore zoysiagrass seed longevity related to storage conditions. The equilibrium moisture contents of zoysiagrass seed by 20% NaOH dormancy breaking treatment at 60%, 70% and 80% relative humidity stored at 25 °C were 10.39%, 12.34% and 15.03% with dry weight basis. Based on the equilibrium moisture content, zoysiagrass seeds (original germination percentage of 84% and viability of 89%) with one of four moisture contents (7.9%, 12.11%, 15.8%, 19.36%) were stored hermetically at one of four constant temperatures (3, 14, 25, 35 °C) for up to 217 d, and changes in final germination percentage (FGP), mean germination time, viability and vigor index were determined at 5d interval during first 30 day period, and tested at 15 to 30 d interval afterward. At the highest seed moisture content of 19.36% and storage temperature of 25 and 35 °C, after 30 d and 50 d respectively, FGP decreased to 50% of original germination percentage. At the seed moisture content of 15.8% and 35 °C, after 42 d FGP decreased to 50% of original germination percentage, but at 25 °C, after 31 weeks FGP decreased to 52% of original germination percentage. At the seed moisture content of 12.34% and 35°C, after 31 weeks, FGP decreased less than 10%. At the lowest seed moisture content of 7.9%, no significant FGP changes at all of four temperature conditions, however, the vigor index results indicated a consistent deterioration occurred during storage. Our results suggest at ambient temperature condition the optimum storage conditions for zoysiagrass seed as following, atmospheric relative humidity is not higher than 60%, seed moisture content is less than 8.0%.