Optimizing pregermination techniques for three turfgrass species

2013 Research Update

Jason Henderson[1], John Inguagiato[1], and Victoria Wallace[2]

1 Department of Plant Science and Landscape Architecture, University of Connecticut

2 Department of Extension, University of Connecticut

Purpose of Project:

To provide research based recommendations for pregerminating three turfgrass species by investigating the influence of water temperature, soaking duration, aeration, and drying time on germination and seedling persistence. The objectives of this study are to:

1. Determine the effect of soaking duration, water temperature, and aeration on seed germination and seedling persistence of three turfgrass species.

2. Determine the optimal moisture content of seed from three turfgrass species to maximize spreadability and survival rate.

Experimental Treatments:

Kentucky bluegrass (Wildhorse), perennial ryegrass (Soprano), and creeping bentgrass (A4) have been obtained to initiate three separate studies this spring semester. All studies will include non-pregerminated seed of each species as untreated controls.

The first study will include all three species, four soaking durations (8, 24, 48, and 72hrs) and treatments will be aerated or not aerated. The study will have two primary phases; pretreatment and germination. The pretreatment phase will consist of seeds (900g) soaking in 8000ml of water at 20° C in a 4 gallon bucket for the various durations. For each of the soaking durations, half the treatments will be aerated using a commercial air pump and 6" airstones. Following pretreatment, 100 seeds will be individually placed on moistened blotter paper and placed in 6" X 9"plastic incubators to determine germination rate. The incubators will be placed in a growth chamber that will remain at 25°C for an 8 hr photoperiod and reduce to 15°C for 16hrs of darkness. Germination counts will be conducted daily for the first 10 days and final counts completed at 14 days for perennial ryegrass, 21 days for Kentucky bluegrass and 28 days for creeping bentgrass.

The second study will include the same turfgrass species and be performed very similarly. However, water temperature during the pretreatment soaking phase will include three separate temperatures, 4°C, 20°C, and 25°C. Optimal aeration and soaking duration (determined from study 1) will be kept constant for all treatments.

The third study will include the same turfgrass species and the optimal soaking duration, water temperature, and aeration. Following pretreatment, the water content of the seed (i.e. drying time) will be varied to determine the water content level at which percent germination in reduced. It is important to determine how dry the seed can get to assist will the ease of spreading without negatively affecting percent germination. These studies will be initiated January 23.