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Johnson Grass and Pigweed Ecotypes in Tennessee Counties for DNA Profiling

Johnsongrass and Pigweed are warm-season perennial grasses that are native to the Mediterranean region. There were introduced to the eastern North America, and then stretched from northwest Mexico to California and later throughout the American Southwest including Tennessee (TN). As per continued economic damage to TN agriculture from these weeds, it is important to analyze both grass accessions from all around state's counties. This study aims to evaluate how many TN counties reported herbicide usage and then analyze the DNAs of both weeds, from respective regions, towards genetics understanding. Six leaf samples per each ecotype were gathered from 12 counties of western region, 10 in eastern regions, and 16 in central regions of TN. In order to understand how these plants have diversified in these 38 counties, reports of herbicide resistance were also sought from respective Agriculture & Natural Resources Extension Agents. Genomic DNAs from leaf tips were extracted using QIAGEN (Hidden, Germany) kit, and quantified through NanoDrop^{TM} One (Fisher Scientific, Hampton, NH), UV-Vis Spectrophotometer. Three of the counties in the western region, four counties in the central region, and five of the counties in the eastern region reported herbicide usage that was coupled with less than 20 ng/µl DNA retrievable from leaf samples received. Conversely, four of the counties in the western region, seven counties in the central region, and two counties in the eastern region did not report herbicide usage, while the weeds samples received from there gave greater than 20ng/µl DNA concentrations. This study has provided initial results that correlated benefits of weed management for Johnsongrass and Pigweed with DNA profiles while paving the way towards understanding population structure through ecotype studies.