Living Mulch for Sustainable Maize Stover Biomass Harvest

The Renewable Fuels Standard provides economic opportunities for maize (Zea mays L.) stover use as a feedstock for cellulosic biofuels production. There exist, however, natural resources-related constraints for the removal of maize stover in maize production systems that living mulch (LM) systems may reconcile.

In the November–December issue of Crop Science, researchers report on studies that assessed the impact of two established and suppressed LM species on three unique maize hybrids for maize crop maturity, stand density, leaf area index, grain yield, grain quality, stover quality, and stover C and N, as well as persistence of the LM. Maize grain yield for the no-LM treatment was 23–73% greater, ethanol yield (L ha$^{-1}$) was 12–119% greater, protein concentration was ≤9% greater, and starch concentration was ≤1% lower in no-LM treatment maize than LM treatment maize. Maize hybrid × cover interaction was significant, with inconsistent maize hybrid responses to the LM system.

Living mulch offers a potential solution for alleviating problems associated with maize stover removal from conventional cropping systems. However, results emphasize the importance of further research regarding LM species and maize hybrid compatibility as well as effective LM suppression techniques for minimized competition with the row crop during the growing season.


Know Your Germplasm: Genetic Analyses of Seashore Paspalum

Cultivation of salt-tolerant crops is becoming increasingly important in the face of climate change. Paspalum vaginatum (seashore paspalum) is a highly salt-tolerant warm-season grass that is being used as a turf for sports surfaces in coastal areas and areas with water use restrictions. It can be irrigated with saline, recycled, or reclaimed water and has been branded “the environmental turfgrass.” However, little information is available on the genetics of this species.

An article in the November–December issue of Crop Science reports on a combined ploidy level and genetic diversity analysis in a set of some 100 seashore paspalum accessions. The team found that the medium-textured “turf” types, which are of the highest interest for use on golf courses and other sports surfaces, are diploid and genetically classify into two subpopulations. The broader-leaved genotypes grouped with diploid and polyploid accessions of the taxonomically closely related species P. distichum. No geographic pattern was discerned in the subpopulation groups, but this might be due to the fact that many of the accessions were collected in areas where seashore paspalum was introduced rather than native.

The results of this study will assist breeders with the identification of cultivars and selection of the best parental genotypes for crosses. In addition to providing markers for rapid profiling of seashore paspalum, the team made some strategic recommendations on expanding the germplasm collection.


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Images documenting the presence of pubescence of glumes, which are typically used to distinguish P. distichum from P. vaginatum, in accessions Tropic Shore, Spence, and PI 647922 and glabrous glumes in accessions PI 299042 and HI 36.