

MTF Research Summary

John N. Rogers, III, Jackie Guevara, Ryan Bearss, Jake Kilby and Evan Rogers
Michigan State University
February 2024

Project Name: Sod on Plastic Establishment Practices for Cool-Season Grasses

How the MTF funding will be used to support project(s): Support funds will allow researchers to gather sod on plastic (SOP) establishment data at various Michigan locations for the benefit of Michigan sod producers.

Background of the study:

Sod grown on plastic is a method of sod production where turfgrass is established on a thin layer of growing medium spread over plastic sheeting.

Benefits of growing SOP

- Complete control of the growing medium, preventing soil layering issues.
- Ability to harvest the whole rootzone without damaging the roots, avoiding transplant shock during sod harvest and installation.
- Faster establishment rate, reducing production time from 18 months to 4 months.
- Facilitates sod production on non-arable lands (e.g., concrete, parking lots).

Project update:

Study # 1: Evaluating Kentucky Bluegrass and Perennial Ryegrass Seeding Ratios for Sod Grown on Plastic Production

This study was conducted from May to September in 2022 and June to August in 2023 at the Hancock Turfgrass Research Center, East Lansing, MI. The location and methods to level the site were different between years. In 2022, the area was rolled and leveled manually by hand. In 2023, a clay mix called DuraEdge was used as a base and was laser graded to achieve 1% slope. Treatments consisted of six Kentucky bluegrass: perennial ryegrass seeding ratios (100:0, 98:2, 96:4, 92:8, 84:16 and 0:100) sowed at 20 seeds inch⁻². To quantify sod harvestability and stability of seeding ratios, tensile strength and shear strength were measured 18 weeks after seeding, respectively.

Key Points Learned to Date:

- Incorporating perennial ryegrass into Kentucky bluegrass during seeding stabilized the surface and improved the harvestability of the sod
- A seeding ratio of 84% KBG and 16% PRG is recommended to minimize washouts and expedite sod production.

- PRG sod (0:100) had the highest tensile and shear strength, demonstrating that PRG sod on plastic production is feasible.
- To further validate these claims, this experiment will be repeated on the DuraEdge area in 2024.

Study # 2: Optimizing Seeding Rates for Perennial Ryegrass Sod Grown on Plastic Establishment

This study was conducted from June to August 2023 at the Hancock Turfgrass Research Center, East Lansing, MI. Four pure live seeding rates (10, 20, 40 and 60 seeds in⁻²) were established and evaluated at 4, 6, 8, 10 and 12 weeks after seeding. Turfgrass cover, shear strength, tensile strength and root cover were measured.

Key Points Learned to Date:

- 20 seeds in⁻² (5 lbs per 1000 ft²) provided the highest sod tensile strength with the lowest amount of seed, making it the optimum seeding rate for perennial ryegrass sod grown on plastic production.
- To further validate this claim, this experiment will be repeated in 2024.

Grad Student(s) Involved:

PhD Candidate Jackie Guevara, MSc student Jake Kilby and Research Technician/PhD Student Ryan Bearss

Benefit Group:

In the short term, these experiments will benefit prospective Michigan Sod Producers interested in entering the sod on plastic market. In the long term, these data will benefit international sports associations (FIFA, MLS, NFL, etc.). Spartan Stadium will also benefit from these endeavors by gaining access to reliable sources of sod on plastic for annual stadium re-sodding.

Project Images:



Figure 1. Sod grown on plastic establishment at Hancock Turfgrass Research Center, East Lansing, MI in June 2023. (a) DuraEgde was used as a base for sod grown on plastic establishment. The area was laser-graded to have a 1% slope. (b) A white plastic was laid down on the area. (c) Sand (1-inch depth) was topdressed on top of the plastic sheet.



Figure 2. Measurement of sod harvestability (tensile strength) at Hancock Turfgrass Research Center, East Lansing, MI – 2023: (1) a Calrochan Sod Puller was used to pull apart a 1 ft × 1.5 ft sod piece, and (2) a digital force gauge was used to measure the force required (lbs · force) to pull sod apart.

Estimated project duration: Studies started in Spring 2022 and will continue through Summer 2025.