

Ohio Department of Transportation Research Project Fact Sheet



Evaluate and Develop Post-Construction Groundcover that Meets Erosion and Sediment Goals and is Beneficial to Pollinators

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Photo 1: Monarch butterfly on swamp milkweed

The Problem

Pollinator populations are in peril, and species such as the monarch butterfly and rusty patched bumblebee are threatened with extinction. To combat this decline, a federal memorandum called for leaders to improve pollinator populations through creation of habitats with native plants that offer floral resources. Departments of Transportation are critical in the creation of habitats for pollinators due to their land management responsibilities. The Ohio Department of Transportation aims to improve pollinator habitats while reducing management costs by developing native plant seed mixes for post-construction groundcover.

Research Approach

- Phase I: Researched and developed native plant seed mixes to use along ODOT managed roadsides.
- Phase II: Field-tested native seed mixes developed in Phase I for meeting construction requirements and improved pollinator habitat over a 3-year period.
 - Installed seed mixes at 12 site locations in six counties. Each site tested three seed mixes for either Roadside, Slope, Wet Ditch, or Fenceline test types with three replicates (Figure 1).
 - Each seed mix was installed using two seeding methods, as appropriate for the test type: broadcast seeding, drill seeding, and hydro-mulching.
 - Soil nutrient and texture analyses were completed. Fertilizer was applied to all sites as needed. Soil amendments were applied only to sites well below minimum thresholds outlined in ODOT Specification 659.
 - Sites were managed by mowing and herbicide application.
 - Plant surveys were completed to determine species and percent vegetation coverage.
 - Pollinator surveys were completed to identify all bees, butterflies, and moths that visited blooming plants.



Photo 2: Tornado Tack application to broadcast seeding



Photo 3: Vegetation evaluation

Test Site	Replicate Block 1						Replicate Block 2						Replicate Block 3					
	Plot A	Plot B	Plot C	Plot D	Plot E	Plot F	Plot E	Plot F	Plot C	Plot B	Plot A	Plot D	Plot C	Plot D	Plot F	Plot B	Plot A	Plot E

Figure 1: Sample of test site design. Test sites consisted of three replicate blocks with six plots in each. Letters represent different seed mixture and seed installation method combinations.

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This research was sponsored by the Ohio Department of Transportation and the Federal Highway Administration.

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Findings

- Soil testing was critical prior to seeding to determine the soil amendments needed
- Native seed mixes can achieve 70% vegetative cover
 - All tested seed mixes met vegetation requirements during the first growing season at 9 of 12 sites.
 - After amending and reseeding the three sites that did not meet requirements at the end of year 1, all seed mixes at all sites met vegetation requirements by the end of the study (Figure 2).
 - All tested installation methods were effective
 - Wet ditches that were within the clear zone had difficulty getting established due to ODOT maintenance and site conditions.
- Native seed mixes had a higher pollinator richness than the introduced seed mixes (Figure 3).

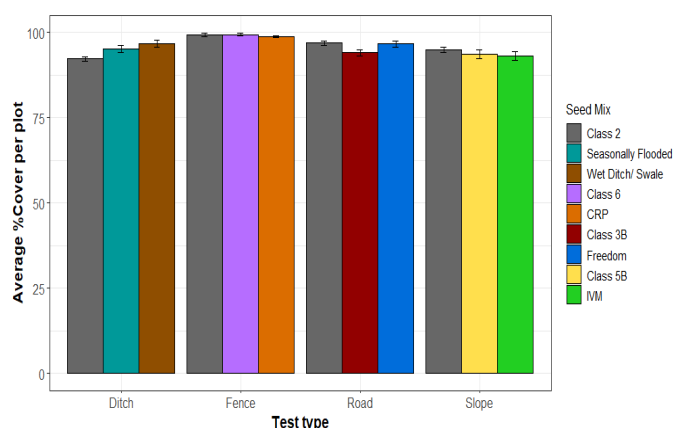


Figure 2: August 2022 average vegetation percent cover per plot for each seed mix and test. Standard error bars are provided around the mean values.

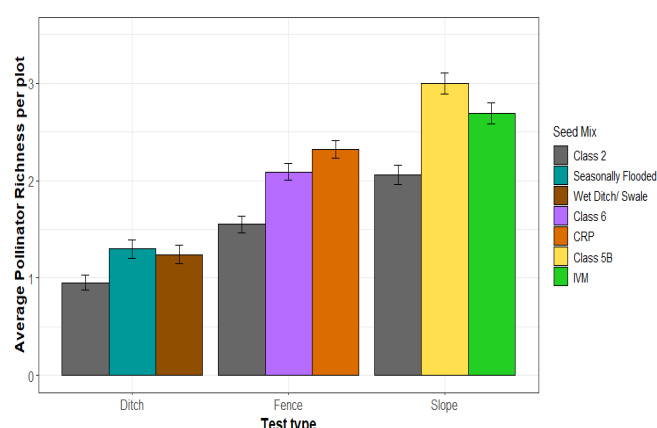


Figure 3: 2020-2022 Average daily per plot active pollinator species richness for plots of each seed mix type. Standard error bars are provided around the mean values.

Recommendations

- The following recommendations are based on site preparation, seeding methodology, seed mixtures, and maintenance requirements of each habitat type:
 - Update Specification 659 per recommendations in the report
 - Adhere to updated Specification 659
 - ODOT representatives should designate in the plans the appropriate seed mix to use in different parts of the right-of-way
 - Perform soil tests on native and imported soil. If needed, apply soil amendments when seeding native or naturalized species. In the absence of soil amendments, use furnished topsoil.
 - Seed native species in late fall through early spring
 - Use the scorecard developed as part of this study to prioritize sites to seed with natives.
 - Specified seed mixes should be seeded using the seed mix applications per Table 1.

Table 1: Recommended seed mixes and seed mix application methods		
Test Type	Seed Mix	Seed Mix Application
Fencelines	All Ohio CRP* ODOT Class 6	Drill Seeded Hydro-mulched
Roadsides	ODOT Class 2	Broadcast, Hydro-mulched
Slopes	IVM** ODOT Class 5B	Hand Broadcast Hydro-mulched
Wet Ditches	Seasonally Flooded*** Wet Ditch/Swale***	Broadcast Hydro-mulched

* Conservation Reserve Program seed mix developed by Pheasants Forever

** Integrated Vegetation Management seed mix developed by Pheasants Forever

*** Developed by Davey Resource Group

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