

**PURPOSE:** In Maryland, thousands of acres have been planted to native warm-season grasses (NWSGs) and wildflowers to protect water quality and provide wildlife habitat. However, existing plantings lack species diversity due to the use of low diversity planting mixes and improper management. To improve stand diversity an appropriate selection of wildflower species and management treatments are required. Objectives include evaluating vegetative response to disturbance and effectiveness of inter-seeding native wildflower mixes to determine the optimal methods for renovating warm-season grass stands to increase diversity and improve wildlife habitat. Vegetation percent cover and composition were evaluated for three years.

## “Mesic” site

## “Dry” site

### A. Time of mowing/disking (T)

1. Late Summer Mow and Disk (mid-Aug to mid-Sep)
2. Fall (dormant) Mow and Disk (Nov)
3. Fall (dormant) Mow (Nov) and Spring Disk (Mar)
4. Late Winter/Early Spring Mow and Disk (Mar)

### TREATMENTS ON BOTH SITES:

### B. Disking intensity based on % bare ground (D = Disk or C = Chisel plow)

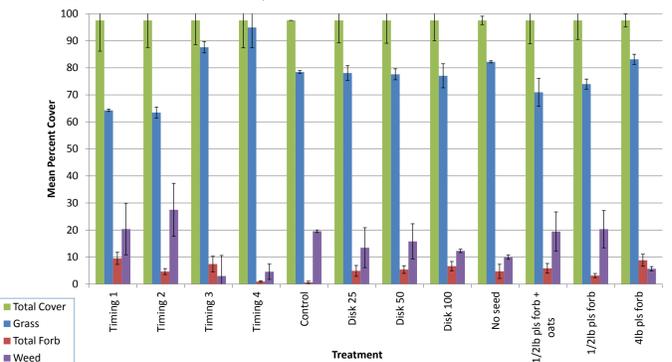
1. 25 percent bare ground
2. 50 percent bare ground
3. 100 percent bare ground
4. No disk (control)

### C. Overseeding

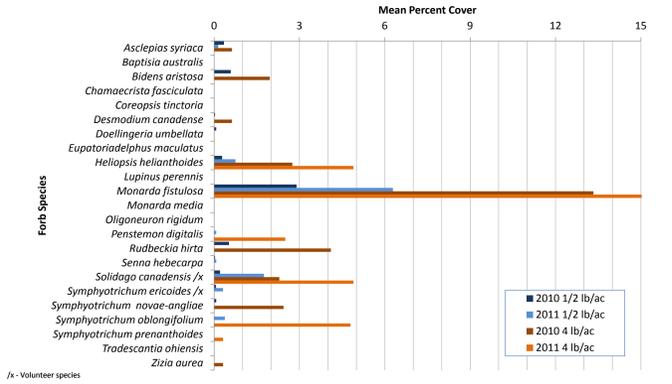
1. None - Control (x)
2. ½ lb/ac PLS rate (w)
3. ½ lb/ac PLS rate w/small grain nurse crop (g)
4. 4 lb/ac PLS rate (c)



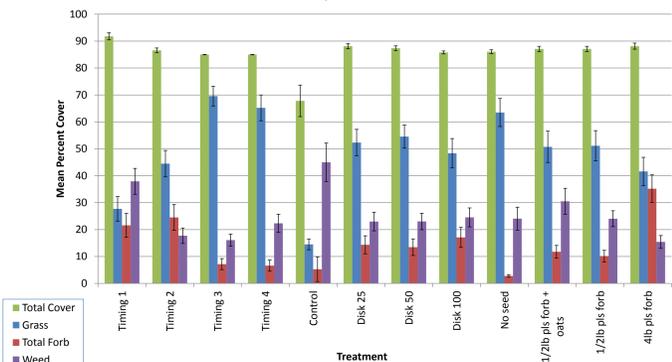
Comparison of mean percent cover at “mesic” site (C2 Plot) 3 seasons after treatments (Fall 2011). Timing treatments are time of disking and seeding (1 = Sep, 2 = Dec, 3 & 4 = Mar). Disk treatments represent the target amount of bare ground after disking (25%, 50%, and 100% bare ground). Last 4 treatments are seeding rates. Error bars represent +/- 1 standard error. Percent cover based on cover class midpoints.



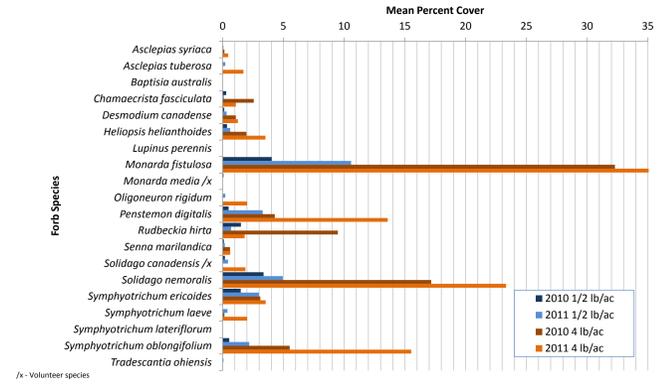
Forb species mean percent cover at “mesic” site (C2 Plot) 2 and 3 growing seasons after treatments, for plots seeded with forbs at 1/2 and 4 lb/ac PLS. Mean percent cover for *Monarda fistulosa* 2011 4 lb/ac is 22.8%.



Comparison of mean percent cover at “dry” site (Locust Plot) 3 seasons after treatments (Fall 2011). Timing treatments are time of disking and seeding (1 = Sep, 2 = Dec, 3 & 4 = Mar). Disk treatments represent the target amount of bare ground after disking (25%, 50%, and 100% bare ground). Last 4 treatments are seeding rates. Error bars represent +/- 1 standard error. Percent cover based on cover class midpoints.



Forb species mean percent cover at “dry” site (Locust Plot) 2 and 3 growing seasons after treatments, for plots seeded with forbs at 1/2 and 4 lb/ac PLS. Mean percent cover for *Monarda fistulosa* 2011 4 lb/ac is 50%.



## Results

- The data indicate fall disking more effectively reduced NWSG density and better facilitated wildflower establishment and growth. Spring disking was ineffective at reducing grass density, which resulted in smaller wildflower plants while having comparable or better germination.
- Greater disking intensity resulted in only a small improvement in persistent reductions of grass cover and improvement of wildflower establishment.
- Disking reduced indiangrass cover, but not switchgrass and big bluestem, suggesting that indiangrass is more susceptible to disking.
- Some species of wildflower established and persisted much better than others, while others were not found during the study period.

## Conclusions

- Overall disking did not achieve the desired level of WSG thinning. Larger scale evaluations should be conducted to determine the most effective and efficient methods for reducing the NWSG cover in established stands. In addition to disking, other methods of disturbance should be evaluated, including plowing and herbicide treatment.
- Susceptibility to disking likely varies among species of WSG's and should be considered when planning a disking treatment.
- The timing of disturbance to NWSGs should be evaluated further. Currently, the most common time for disking and burning NWSGs is in the early spring, because it is more convenient for managers, and it leaves wildlife cover standing through the winter. If fall disturbance is more effective, then current management practices will need to be re-evaluated.
- To maximize effectiveness of renovation practices, wildflower mix composition should be adjusted to ensure that a significant proportion of the mix is comprised of species that have demonstrated establishment at a variety of sites and conditions.