Native Grass Cover Influences Forb Density in CP-42 Pollinator Plantings

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Native grass cover influences forb density in CP-42 pollinator plantings
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Background
In recent years, pollinator populations have greatly declined due to a large decrease in habitat. In order to combat this decline, government programs have provided farmers with incentives to convert cropland to pollinator habitat. Farmers are required to plant at least 9 insect-pollinated species, with 3 species each blooming in early, middle and late summer. Any grasses must be native and comprise no more than 25% of the seed mix. Because of the high cost of forb seed and relatively low cost of grasses, we aimed to evaluate the effectiveness of this seed mix strategy. We predicted that higher native grass cover would not significantly impact pollinator resources, and that successful establishment of sown grasses and forbs would reduce weed invasion.

Methods
• We surveyed 27 randomly chosen CP-42 sites in eastern Iowa, all within 60 minutes from the University of Northern Iowa, and used data from 19 sites for the present study.
• ArcGIS was used to select 5 random points within each plot to use as starting points for 100m transects.
• 75 total quadrats were surveyed at each site. Each quadrat was 0.5m x 2.0m running along the 100m transect at 7m intervals.
• Forbs greater than 20cm tall were identified and recorded
• Grasses were surveyed using percent cover of a 0.5m x 1.0 m quadrat. This was done every 7m on the left side of each 100m transect.
• Grass cover was classified into cool season-seeded, cool season-unseeded, warm season-seeded, and annual.
%Cover of grasses and bare ground were organized into six categories: 0-5%, 6-25%, 26-50%, 51-75%, 76-95%, and 96-100%; the median of each cover class was used for analysis.

Results
• Sown and unsown grass cover were not significantly correlated with seeded forb stem density (pollinator resources) (Figure 2 a-c).
• There was a slight but nonsignificant (p=0.102) negative correlation between sown grass %cover and unsown (weed) forb stem density (Figure 2d).
• As total grass cover increased, bare ground decreased (p=0.027) (Figure 2i).
• Combined ranks of unsown vegetation showed a significant negative impact on sown plants.

Preliminary Conclusions
Higher cover of sown grasses and forbs in 3-year CRP fields was associated with lower weed density/cover and bare ground (Figure 3). Site-to-site variation was high. This study provides some evidence that the CP-42 seed mix strategy could be improved by adding more native grasses, without diminishing pollinator resources.

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References

Figure 1. CP-42 randomly chosen 3-year old plantings surveyed in 2018; farms are anonymized.

Figure 2a-i. Correlations between sown and weedy (unsown) grass %cover with forb density and bare ground.

Figure 3. CP-42 sites highly ranked in % cover bare ground and weeds, were lower ranked for native wildflowers and grasses (p<.0001).

Figure 4. CP-42 plantings with low (a) and high (b) grass cover