Influence of Mowing Height on Flowering and Growth of Common Lawn Weeds

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Introduction

Pollinators provide one of the most important ecosystem services through their role in plant pollination. Unfortunately, urbanization and agricultural intensification have led to a loss of biodiversity and reduction in ecosystem function. Initial attempts at increasing pollinator habitat has focused on non-native wildflowers that have proven to be difficult to establish, short-lived, and less competitive with native weeds. Turfgrass weeds are adapted to local environments and often tolerate intense management. However, adjustments to certain cultural practices could further promote floral production and long-term persistence as a pollinator resource. Mowing is one of the most common cultural practices performed on turfgrass, but little is known about the response of common lawn weeds to mowing, specifically mowing height.

Objective

To study the impact of mowing height on perennial weed growth and floral production.

Materials and Methods

- Trials established in Athens, GA during summer 2022.
- Plots (1.1 m^2) were laid out in a split-plot design (main plot = mowing height; subplot = weed species) within a randomized complete block with 4 replications **(Fig 1.)**.
- Four plugs (10.2 cm diameter) of white clover (*Trifolium repens* L.), Virginia buttonweed (*Diodia virginiana* L.), and common lespedeza [*Lespedeza striata* (Thunb.) Hook. & Am.] were collected from native populations and transplanted into bare-ground sub plots **(Fig. 2)**.
- Four mowing heights (non-mowed; 2.5, 5.1, and 7.6 cm) were evaluated. Plots were mowed once weekly with a walk-behind rotary mower with clippings collected.
- No fertility was applied and irrigation in conjunction with natural rainfall was applied at approximately 3.8 cm wk^{-1}.
- Lateral spread (two perpendicular measurements) and floral production were recorded over three months.
- Data were subjected to ANOVA in R using error partitioning appropriate to a split plot analysis. Treatment means were separated using Fisher's protected LSD test at $\alpha = 0.05$.

Figure 1. Split-plot design with mowing height main plots (blue) and weed species sub plots (green) arranged in a randomized complete block (red).

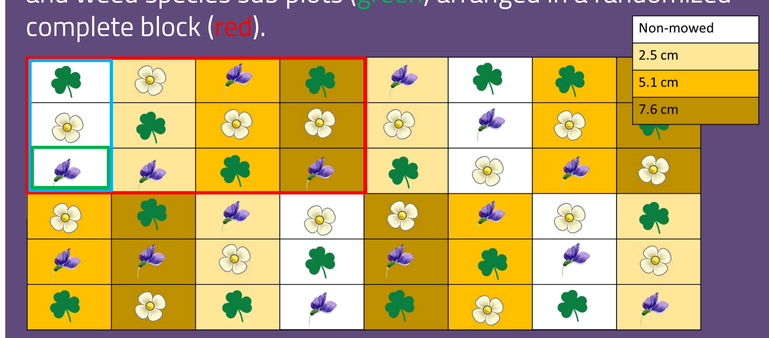
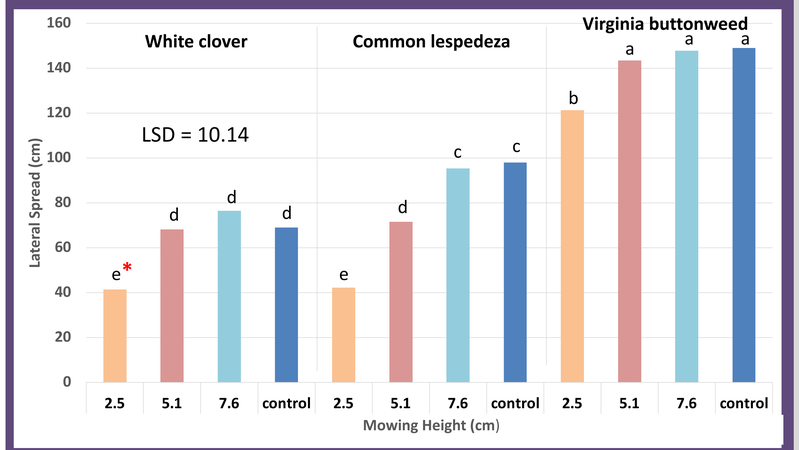


Figure 2. Floral production for: A. common lespedeza, B. white clover, and C. Virginia buttonweed.

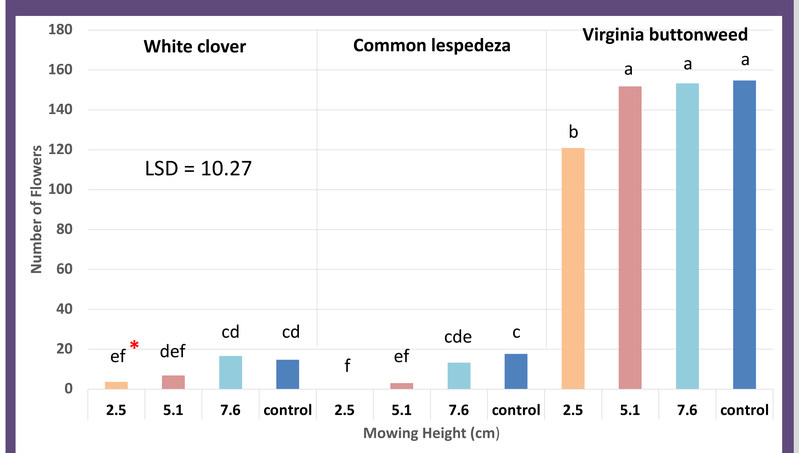
Results

Figure 3. Lateral spread of common lawn weeds in response to mowing height in Athens, GA during the summer of 2022.



*Means within the same column followed by the same lowercase letter are not significantly different according to Fisher's LSD test at $\alpha = 0.05$.

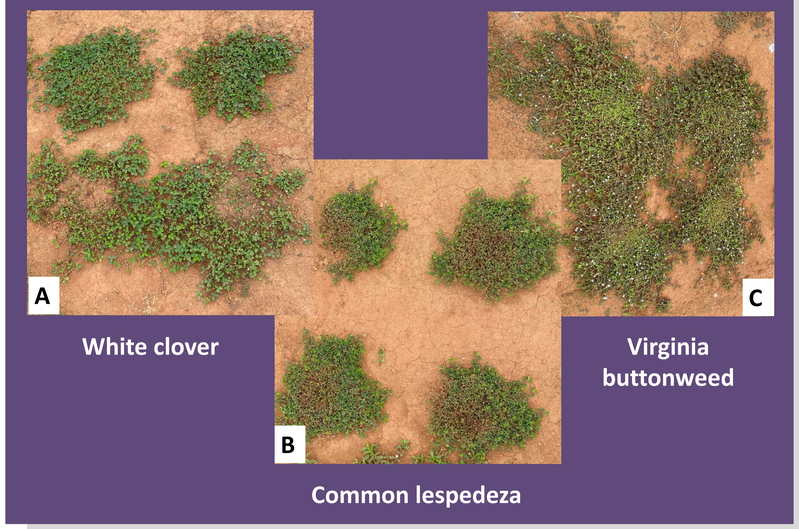
Figure 4. Floral production of common lawn weeds in response to mowing height in Athens, GA during the summer of 2022.



*Floral production is expressed as the average number of flowers per day over the length of the trial. Means within the same column followed by the same lowercase letter are not significantly different according to Fisher's LSD test at $\alpha = 0.05$.

Results

Figure 5. Response of common lawn weeds to weekly mowing with a rotary lawnmower at 2.5 cm: A. white clover, B. common lespedeza, and C. Virginia buttonweed.



Results and Discussion

- Virginia buttonweed lateral spread was greatest among species, regardless of mowing height **(Fig. 3, Fig. 5C)**.
- Common lespedeza and white clover exhibited similar responses to mowing height; however, lateral spread in response to no mowing and 7.6 cm was greater for common lespedeza **(Fig. 3, Fig. 5 A and 5B)**.
- Virginia buttonweed floral production was greatest among species, regardless of mowing height **(Fig. 4)**.
- Common lespedeza and white clover floral production were similar, but substantially less than Virginia buttonweed. As mowing height decreased, floral production decreased in both species **(Fig. 4, Fig. 5A and 5B)**.
- Although each weed species shows potential as a floral resource for pollinators, evaluation of excavated vegetative propagules at the termination of this research will further determine plant persistence.

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