Controlled-Release Fertilizer in Containerized Native Perennials

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Introduction

The production of bedding plants and herbaceous perennials was in excess of $775 million nationally in 2019 (USDA, NASS Quick Stas). Fertilizers are an essential component in the plant production process. Yet consumers or end-users may misapply or use fertilizers in excess, leading to environmental degradation, in their attempt to establish plants in the home landscape. This study was to determine optimal concentrations and release rates of controlled-release fertilizers to produce marketable plants and enhance landscape establishment with residual fertility of three native species: New England aster (*Symphyotrichum novae-angliae*), false indigo (*Baptisia australis*), and little bluestem (*Schizachyrium scoparium*). This is the last year of an establishment field-trial following a parallel greenhouse production study.

Materials and Methods

For each species, the experiment was a randomized complete block design with factorial arrangement. There were six individual plants per replication and three replications for each concentration x rate treatment. The experiment consisted of a greenhouse and a field phase, where all field plants were grown simultaneously in the greenhouse phase.

Dormant, vernalized, 50-cell seedlings were received from a commercial producer March 25, 2019, and held for a week before being transplanted into containers with the experimental fertilizer treatments (Figure 1). Container media consisted of (by vol.) 80 percent Canadian sphagnum peat moss and 20 percent perlite amended with a wetting agent. Substrate was amended with either 8, 12, or 16 lb/yd^3 from 14-4-14 controlled-release fertilizer (Florikan) with 100-, 180-, or 270-d release period.

Half of the plants were harvested at the conclusion of a six-week greenhouse production phase. At harvest, substrate pH and electrical conductivity were collected. Plant height and bi-directional width were measured, and aboveground biomass was collected, oven dried, and weighed. Dry biomass was saved for tissue nutrient analysis by a commercial laboratory.

The other half was planted at the Iowa State University Horticulture Research Station May 22, 2019. Plants were planted in rows by species, and treatments were randomized within rows.

Plants were irrigated for the 2019 growing season when soil moisture fell below 20 percent using FieldScout TDR probe. Irrigation was discontinued for the 2020 season. Monthly data collection June-October 2019 and May-September 2020 included bi-directional width and height (cm) and leaf greenness with a SPAD 502 Chlorophyll meter (Spectrum Technologies) (Figure 1). The August 10, 2020, derecho resulted in early harvest of the New England aster August 13, 2020. False indigo and little bluestem plants were harvested October 2, 2020. Harvested plants were oven dried and saved for tissue nutrient analysis by a commercial laboratory.

Results and Discussion

Results of this study are being assembled and analyzed and will be forthcoming in 2021.

Acknowledgements

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Figure 1. Potting of perennial plugs with controlled-release fertilizer treatments (left, April 9, 2019) and field measurements of plants at the Horticulture Research Station (right, August 20, 2019).