

Introduction:

- Slender false brome (*Brachypodium sylvaticum*) is an invasive grass that spreads rapidly by seed.
- Information is lacking on seed formation and plant growth requirements (Holmes *et al.* 2010).

Objectives:

- Understand the timing of seed formation, which has implications for future management practice
- Determine which natural factors influence plant growth

Hypothesis:

- We think that *B. sylvaticum* will produce seed heads first in areas of moist, dense canopy cover.

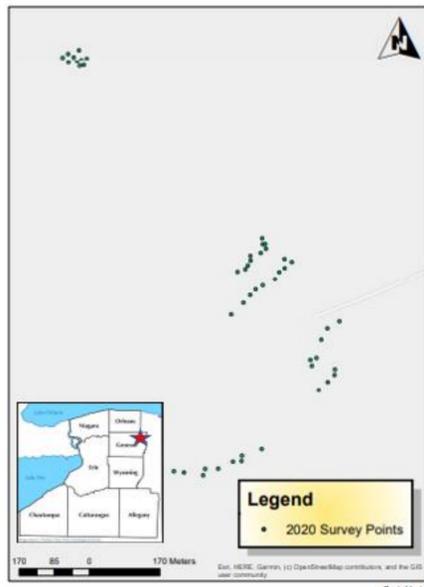


Figure 1. Map of 2020 survey points in Genesee County, NY

Methods:

- In 2020, we randomly selected 50 individual *B. sylvaticum* plants in Genesee County, NY.
- Plants were spaced a minimum of 10 m apart to ensure there was no influence with other plants in study.
- We developed a scale to categorize inflorescence based on visual observations (Table 1).
- Each week, we categorized seed formation based on the scale
- Each week, we measured plant height from the base of the plant to the tip of the longest leaf.
- We collected canopy cover, soil moisture, and soil pH at each plant to determine if these factors influence growth.
 - We used a densiometer to determine canopy cover above each plant.
 - We used a soil meter to gather pH and soil moisture at the base of each plant.
- We ran a multiple linear regression on canopy cover, soil moisture, and soil pH.
- Soil pH was converted to [H+].

Table 1. Scale of inflorescence used to categorize *B. sylvaticum* seed heads.

Scale	Description
S1	No visible inflorescence
S2	Inflorescence present, hidden by leaf sheath
S3	Inflorescence present, extended beyond leaf sheath, not open, single tapering point
S4	Beginning to open
S5	Completely open and drooping

Results:

- Canopy cover showed a significant relationship with *B. sylvaticum* height ($P=0.00038$, $R^2=0.28$) (Figure 2).
- There was no significant relationship in soil moisture ($P=0.43$, $R^2=0.06$) or soil pH ($P=0.94$, $R^2=0.008$).
 - Soil moisture ranged from 0% - 70% across the study sites (\bar{x} = 35%)
 - Soil [H+] ranged 0.000001-0.000032 across the study sites.
- Seed head awns did not develop until Week 5 (July 20- 24).
 - During that week, most plants were scaled 3-4 on our inflorescence scale.

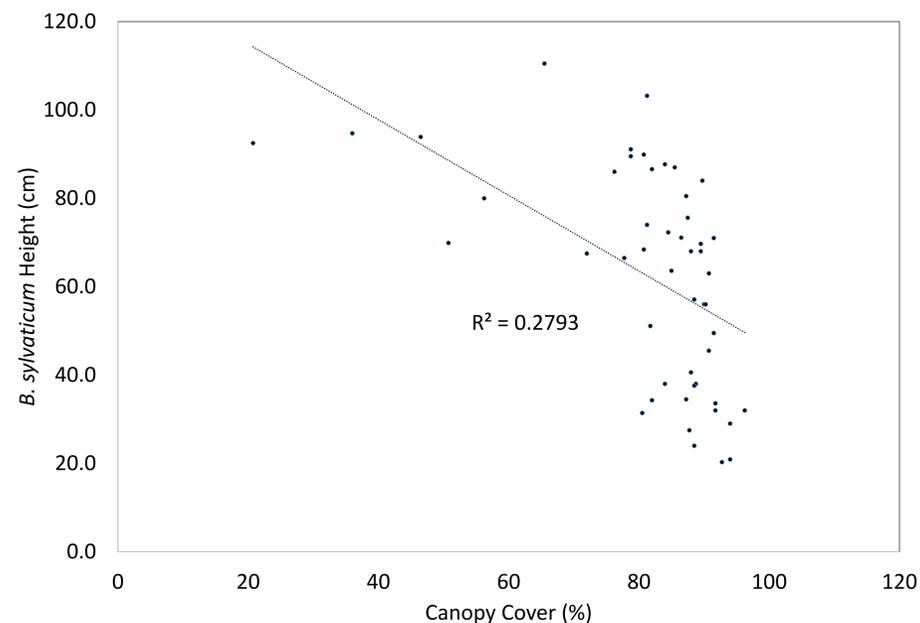


Figure 2. There is a moderate significant relationship ($P=0.00038$, $R^2=0.28$) between canopy cover and *B. sylvaticum* height.

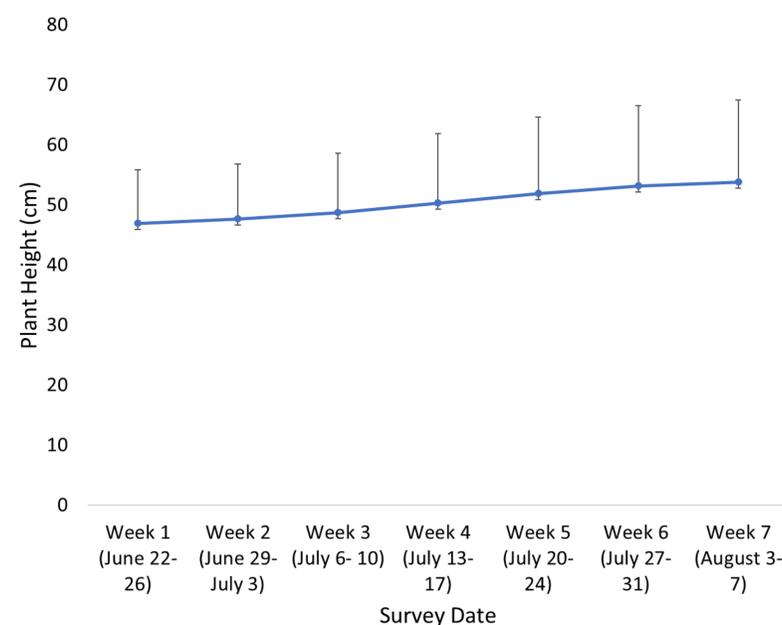


Figure 3. The average plant height of the 50 *B. sylvaticum* plants surveyed from June 22 until August 7. During Weeks 1 and 2, seeds were not present on the plants (S1). During Weeks 3 and 4, the plants exhibited various stages of seed head development (S1- S4). By Week 5*, seed heads had developed, and awns were clearly visible (S3- S4) on all plants. By Week 7, all plants had fully mature seeds (S4- S5).



Figure 4. 4A) 1- No visible inflorescence, 4B) 2- inflorescence hidden by leaf sheath, 4C) 3-Inflorescence closed; single tapering point, 4D) 4- Beginning to open, barbed awns visible 4E) 5- inflorescence completely open and drooping.

Discussion:

- A study by Holmes *et al.* (2010) found that only 9% of *B. sylvaticum* grew in open canopy area.
- Similarly, our study found that *B. sylvaticum* was more abundant in low-light areas; however, it grew taller in high-light areas
- B. sylvaticum* is found to grow in limestone and basic soils (Davies and Long 1991).
- Conversely, the plants in our study were growing in weakly acidic to neutral soils, which suggests that this plant can grow in a variety of soil types.
- Holmes *et al.* (2010) found *B. sylvaticum* growing in a wide variety of soil moisture conditions but found that it prefers moist soils and avoids excessively dry soils
 - Plants in our study were also growing in a variety of soil conditions.
- Little is known about the timing of seed formation, which is important for management.
 - Management practices should occur before the plant forms seeds to prevent the spread.
 - Our study shows that management should occur prior to July 20 in Western NY to prevent seed formation and plant spread.

Literature Cited:

- Davies M.S., G.L. Long. 1991. Performance of two contrasting morphs of *Brachypodium sylvaticum* transplanted into shaded and unshaded sights. *Journal of Ecology* 79: 505-517.
- Holmes S.E., B.A. Roy, J.P. Reed, B.R. Johnson. 2010. Context dependent pattern and process: the distribution and competitive dynamics of an invasive grass *Brachypodium sylvaticum*. *Research Gate*. 1-16.

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