



## Invasive Plant Control Series

### Beefsteak Plant (*Perilla frutescens*)

#### Summary

Beefsteak Plant (*Perilla frutescens*) is an up and coming invasive annual herbaceous plant in Knox County. Beefsteak Plant (Fig. 1) is often found invading woodlands, forest edges, right-of-ways, agricultural field edges after disturbances. Several methods of chemical control were evaluated in 2019 to determine the best method for controlling this species. All treatments were effective in controlling Beefsteak Plant; however, new Beefsteak Plant seedlings appeared in control plots around a month after treatments. Of the treatments, the 0.5% glyphosate solution appears to be the best right now, but more research needs to be done to determine best time to apply spray to avoid multiple applications in a single growing season as well as if mowing or a combination of mowing and herbicide use can be more effective.

#### Methods

Three different herbicide treatments were tested to control Beefsteak Plant. The different treatments were: 1) 0.7 oz./gal. 2,4-D amine salt plus nonionic surfactant, 2) 0.5% glyphosate solution plus nonionic surfactant, 3) 1% glyphosate solution plus nonionic surfactant, and 4) a control (or no treatment). Herbicide were applied with a foliar application to young individuals (2-3 sets of true leaves, less than 6" tall) on June 4th, 2019. The experimental site was a tree planting area on a forested edge in a hydric soils area. Treatment areas were roughly 1 squared meter plots. Efficacy of treatments was measured by estimating the percent controlled from 2 to 51 days after treatment (or DAT).



Figure 1: Beefsteak Plant in flower.

#### Results

The percent control of the different treatments is listed in Table 1 and visualized in Fig. 2. Treatment 1 was the first to show signs of controlling the plants at 2 DAT, but from 6 DAT on to 51 DAT all three treatments (1-3) followed the same trajectory and did not differ statistically from one another. Treatment 2 ended up with the least amount of Beefsteak Plant at the end of the study (51 DAT) was not statistically different from the other two treatments.

*The Knox County Cooperative Invasive Species Management Area (CISMA) is a local, non-profit organization, whose mission is to minimize the impact of invasive plant species in Knox County by educating the public, monitoring and removing invasive plants, and promoting and protecting native plants.*



# Knox County Cooperative Invasive Species Management Area

Table 1: The different treatments, rates, and percent control of Beefsteak Plant.

Treatment #	Treatment Name	Rate	Rate Unit	Visual Percent Control					
				2 DAT <sup>†</sup>	6 DAT	15 DAT	24 DAT	35 DAT	51 DAT
1	2,4-D amine salt + NIS*	0.7	oz/gal	60	85	100	100	85	80
2	Glyphosate + NIS	0.64	oz/gal	0	80	95	95	90	85
3	Glyphosate + NIS	1.28	oz/gal	0	90	100	100	80	75
4	Control	N/A	N/A	0	0	0	0	0	0

\*NIS = Nonionic Surfactant

<sup>†</sup>DAT = Days After Treatment

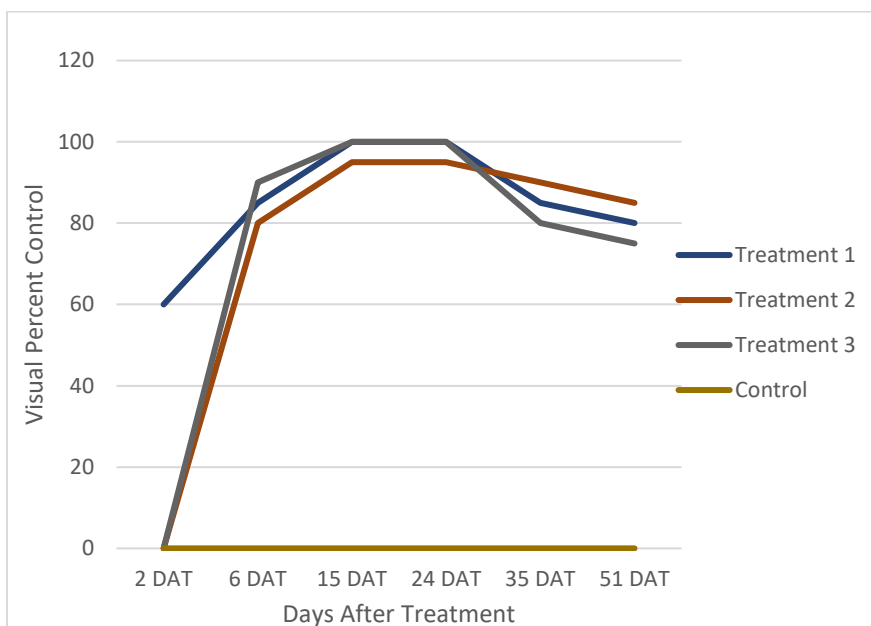


Figure 2: Percent control of Beefsteak Plant days after different treatments.

## Discussion

All control techniques were effective in reaching 95 to 100 % control of Beefsteak Plant by 15 DAT. However, Beefsteak Plant seems to have continuous germination throughout summer, and new seedlings appeared after the others died, roughly 35 days after application. More Beefsteak Plant seedlings appeared with the treatments that did the most disturbance (i.e. Treatment 1 and 3), but those treatments were not statistically different from Treatment 2. More research needs to be done to determine best time to apply spray to avoid multiple applications in a single growing season. In addition, mowing or a combination of mowing and herbicide use could be investigated to see if those treatments would yield better results.

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