



Virginia Agricultural Council

Is Dilution the Solution? Assessing Tall Fescue Toxicity in Cool Season Pasture

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Introduction

Tall fescue toxicosis decreases health and performance of grazing livestock in Virginia and the Southeast. Toxicosis is caused by ingestion of ergot alkaloids produced by a fungal endophyte (*Neotyphodium coenophialum*) that infects most tall fescue. Increasing percentage of other forages in the pasture sward is thought to decrease pasture toxicity. This project evaluated the impact of species diversity, as enhanced by interseeding forages, on total pasture toxicity.

Materials and Methods

Six plots were assigned frost seeding treatments of a normal rate (1X) and double rate (2X) (Table 1). Seeding was conducted on February 9, 2016. To improve establishment, re-seeding via no-till drill was done on March 16, 2018.

Forage Species	Variety	1X Rate (lbs)/acre	2X Rate (lbs)/acre
Bermudagrass	Laredo®	3	6
Alfalfa	Ameristand 403T®	8	16
Red & White Clover	Cinnamon Plus & Durana®	7.5 lb: Red 5 lb; White 2.5 lb	15 lb: Red 10 lb; White 5 lb

Results

Forage Establishment and Composition

The 1X rate treatment of mixed red and white clovers was the only successful method of establishment in Year 1 and 2 (Figure 1). By July in year 4 (2019), the 2X rate showed greater establishment. 2X plots were rotationally grazed in the early spring, while the 1X plots were summer stockpiled. This may have helped the double rate establishment. However, by August of year 4, there was no clover noticeable in 2X clover plot.



Figure 1. Image of white clover establishment (left) alfalfa (right) year 2.

Forage Sward Percent Composition 7/1/2019

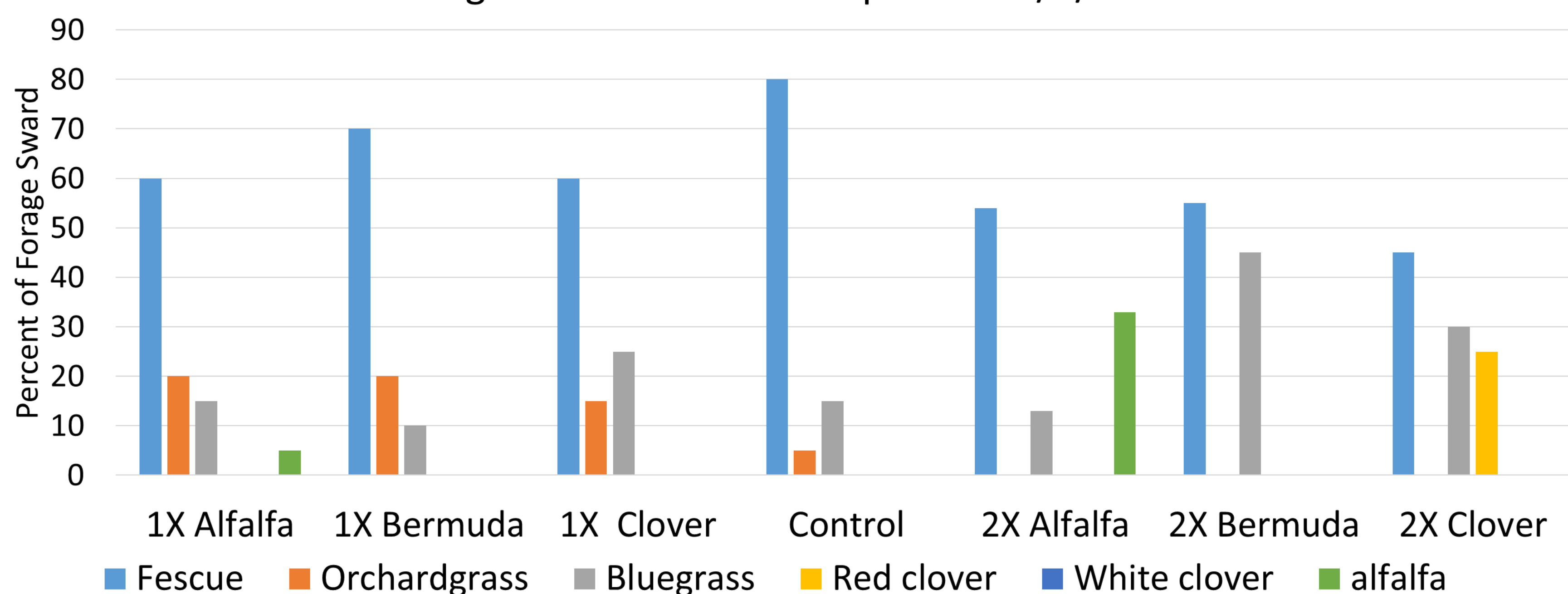


Figure 2. Forage Sward Percent Composition as of 7/1/2019

Yield and Fescue Toxicity

Yield was measured in July in year 3 and July and August in year 4. Standing biomass of forage for year 4 (2019) are shown in Figure 3. Seasonal changes in total ergot concentration are shown in Fig. 4. Data in figure 3 shows the results of total ergot alkaloids for each plot on 8/9/2019.

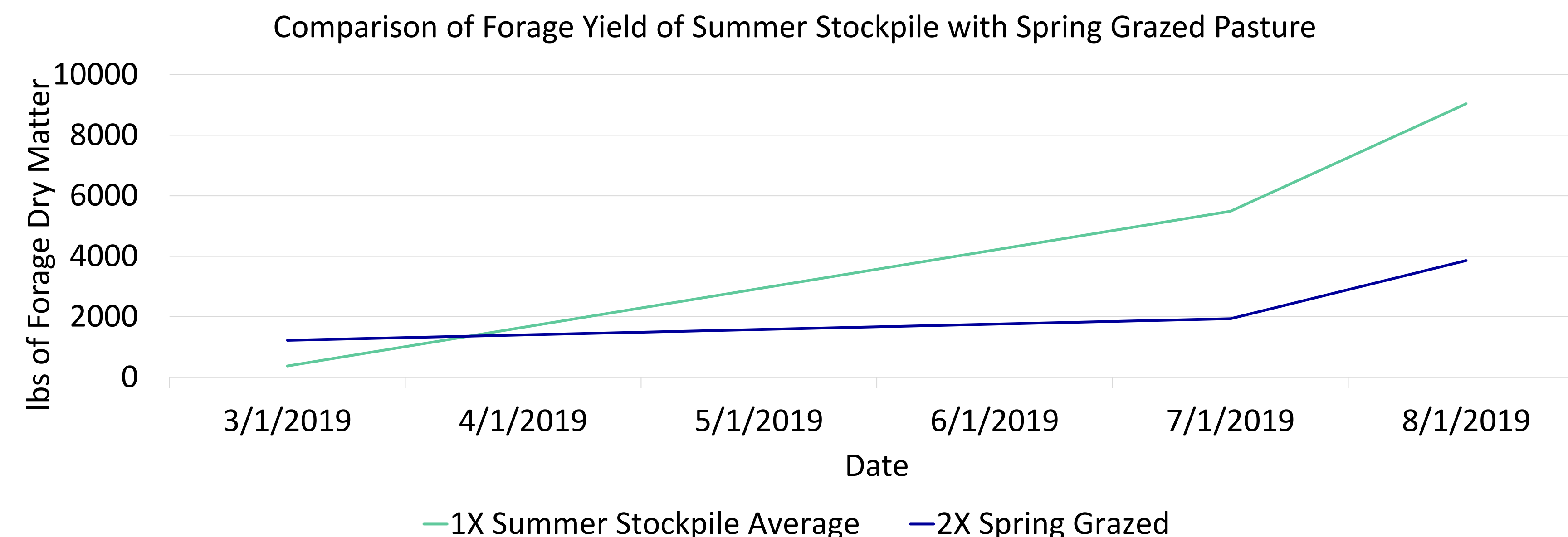


Figure 3. Standing Biomass of Summer Stockpile (1X) and Spring Grazed Pasture (2X).

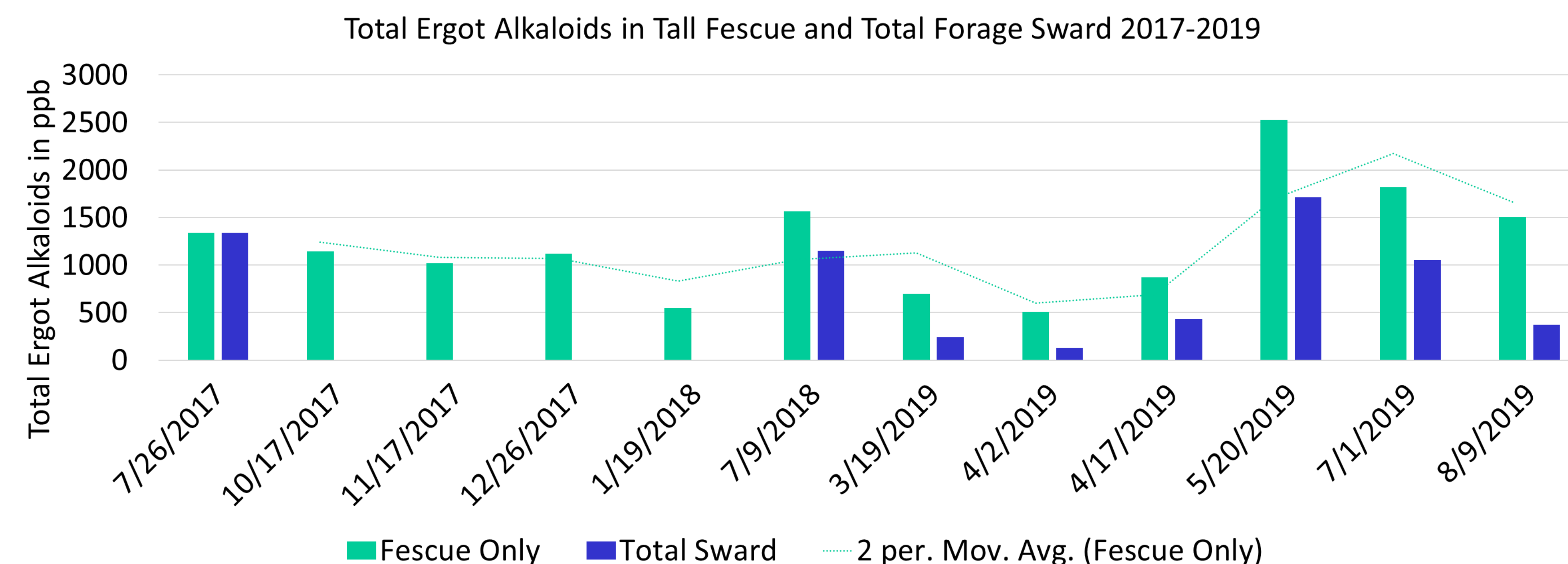


Figure 4. Average Total Ergot Alkaloids in Tall Fescue by Sampling Date.

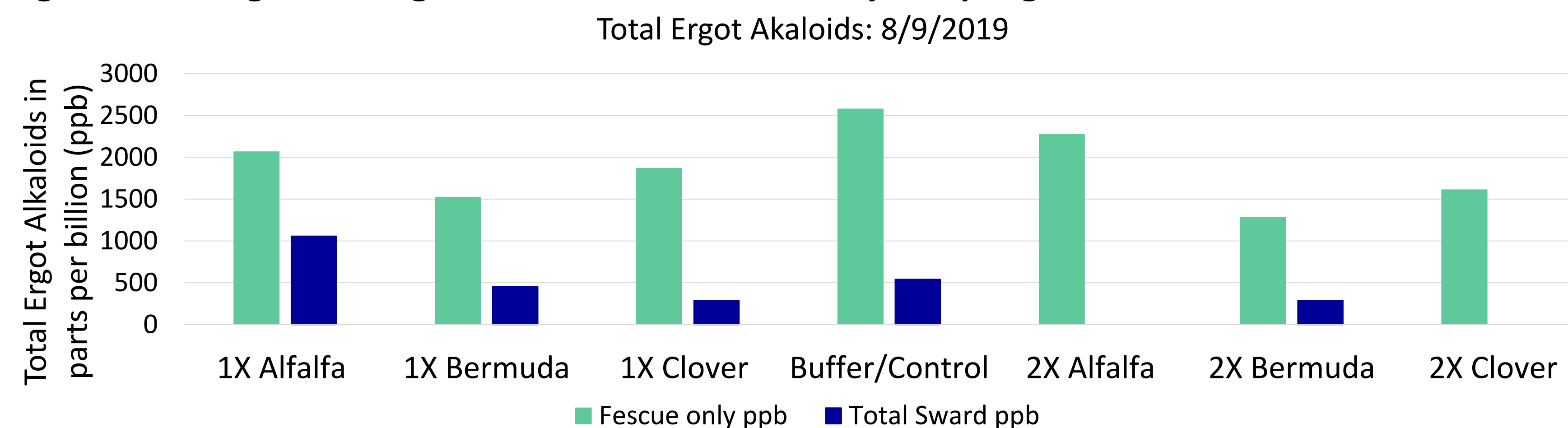


Figure 5. Average Total Ergot Alkaloids on 8/9/2019.

Conclusions

Frost seeding clovers remains the most efficient method of establishing alternative forage to increase pasture diversity. Although we did not have full successful establishment of the intended forages, existing species within the sward provided some dilution effect. Total sward alkaloids were lower ($P < 0.05$) than in fescue, provided fescue was about 60% of the pasture. Grazing pastures early in the spring reduced late summer forage yield when compared to summer stockpiled forage in August ($P < 0.05$). Pastures should be managed for diversity to lessen effects of tall fescue toxicosis.