



UNIVERSITY OF
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EXTENSION

Plant Pathology

Identifying Disease in Georgia Alfalfa

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Introduction

Alfalfa (*Medicago sativa*) production is economically and nutritionally important to livestock and equine, but the management of alfalfa is more intensive than other forages. Georgia soils are typically lower in pH, and alfalfa requires a minimum of 6.5 pH in order to establish, grow, and promote nutrient intake from phosphorous and potassium applications. Soils with lower pH are at risk of aluminum toxicity. However, with Georgia's higher humidity level than much of the rest of alfalfa production areas, disease is certainly a major concern. The three most popular varieties planted in Georgia are Bulldog 505, Bulldog 805, and Alfagraze 600RR. Bulldog 505 and Bulldog 805 exhibit resistance to Fusarium wilt and Phytophthora root rot. Alfagraze 600 RR exhibits resistance to nematodes, Phytophthora root rot, Fusarium wilt, Anthracnose, and Verticillium wilt.

Disease resistant varieties do alleviate some management to several major pathogens known to infect alfalfa. A comprehensive study of diseases in relation to alfalfa in Georgia has not been conducted in order to determine the feasibility or economic impact of control through chemical applications. Therefore, proper identification of pathogens infecting alfalfa will contribute to better control recommendations, and future research will determine if control methods provide economic benefit to producers.

Materials & Methods

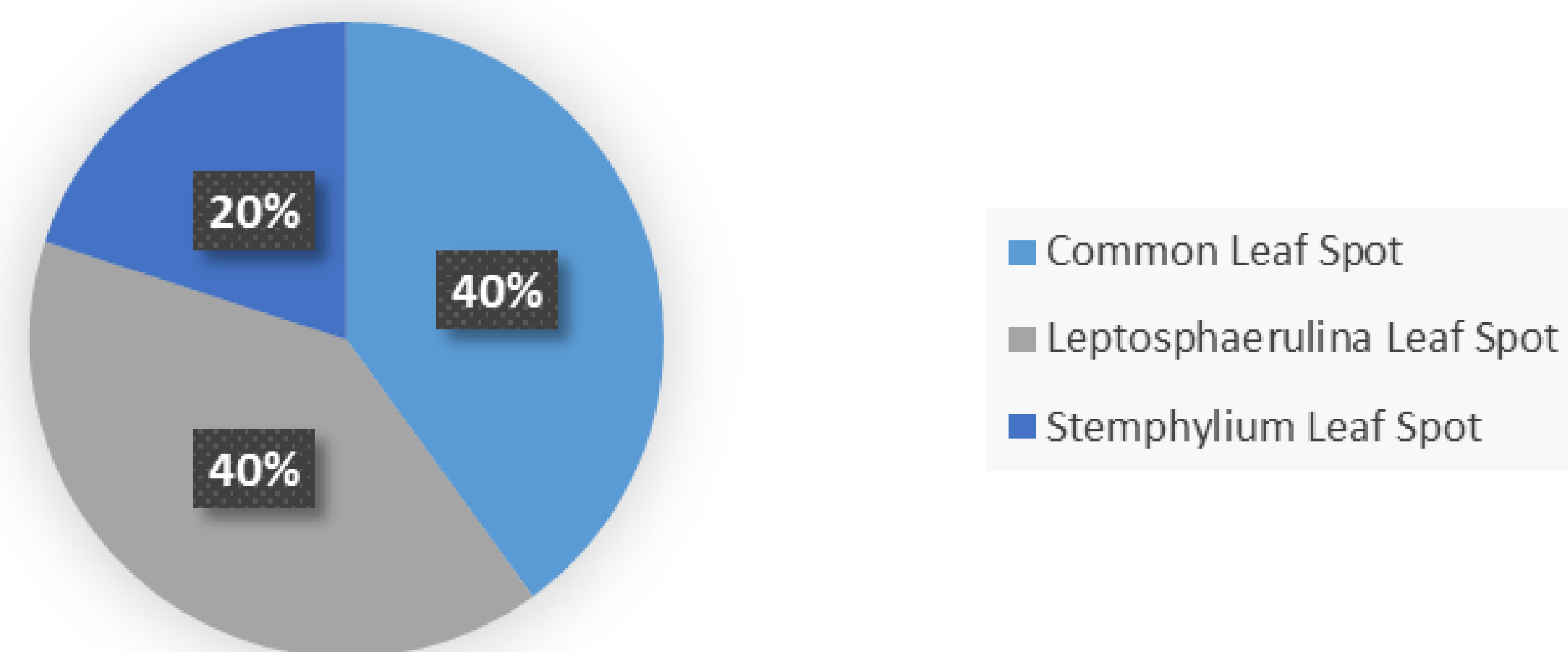
Three sites were selected to scout: 1) 5 acre Alfagraze 600 RR field in Jones County, 2) 67 acre Bulldog 505 field in Putnam County, 3) 22 acre Bulldog 505 field in Putnam County. Each field was scouted and sampled at ten different locations in order to randomize the experiment. Once the first sample was observed fifty paces were stepped off at a random cardinal direction. The subsequent cardinal direction was chosen at random until the ten samples were observed. A 2.33 ft in diameter hoop served as the parameter for each sample where last rainfall, plant height, number of plants in the sample, number of infected plants, and a description of symptoms were recorded. A record was made of environmental issues observed on leaf area that included freeze damage, phosphorous deficiency, and water issues. Each plant's leaves, stems, inflorescence (when present), roots (if applicable), and biomass were observed in the sample.

Plants were monitored for any disease presence, but in particular, the plants were monitored for common leaf spot, Verticillium wilt, Sclerotinia crown and stem rot, and stemphylium leaf spot. These diseases are listed as some of the most common diseases that affect alfalfa (Vencelli and Smith, 2014). During observation, plant tissue was collected in order to be viewed microscopically to verify pathogens identified. Collected plant tissue were placed in a wet chamber for 24-48 hours to encourage spore growth. After pathogens were verified in the plant tissue, pathogens were recorded.

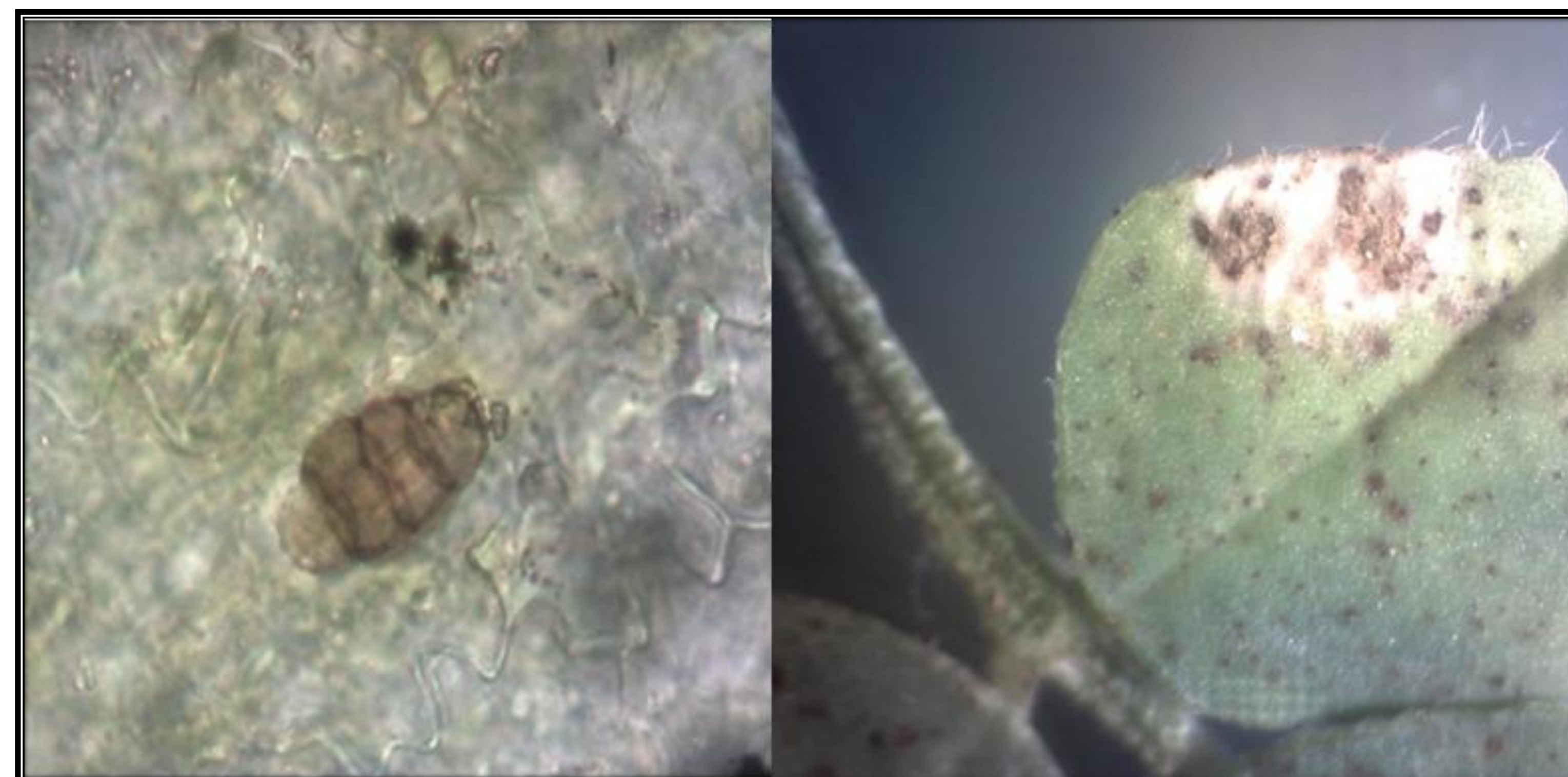


Leptosphaerulina leaf spot (*Leptosphaerulina briosiana*)

Most Common Diseases Observed in the field



Common leaf spot (*Pseudopeziza medicaginis*)



Stemphylium leaf spot (*Stemphylium spp.*)

Results/Future Research

Observations were made between September 28, 2022 and March 1, 2023 with a total of seven observations made at each site. The diseases observed and verified through microscopic identification were common leaf spot (*Pseudopeziza medicaginis*), Stemphylium leaf spot (*Stemphylium spp.*), *Rhizoctonia solani*, and Leptosphaerulina leaf spot (*Leptosphaerulina briosiana*).

A total of 1,339 plants were evaluated for any sign or symptom of pathogens. Of those plants, 1,135 or 84% exhibited signs or symptoms of disease. The most common symptoms recorded during observations were leaf spotting, yellowing of leaf tissue, leaf spotting with yellow halo, stem lesions, and freeze damage. The yellowing of leaf tissue and freeze damage were environmental issues related to either nutrient deficiencies or weather. The most common diseases observed in the field observation was Common Leaf Spot and Leptosphaerulina Leaf Spot followed by Stemphylium Leaf Spot.

Future research needs are determining whether or not fungicide applications would be economically beneficial for Georgia producers, and in turn, would fungicide applications result in greater nutritive value in the treated areas potentially resulting in greater yields and higher quality alfalfa.