

Influence of Variety and Tillage Practices on Leaf Spot Control with Sulfur

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Introduction

- Chlorothalonil is the most popular fungicide used to protect peanut from leaf spot disease in part because of low financial cost and multi-site efficacy for resistance management
- There is concern about the long-term use of chlorothalonil in peanut, especially in export markets
- Resistance to SDHI and DMI fungicides is present in leaf spot in North Carolina
- Fungicide options that do not possess high risk for leaf spot resistance are limited
- Sulfur is a potential fungicide for use in the same application slots as chlorothalonil
- Differences in peanut variety susceptibility to leaf spot exist
- Cereal rye grown as a winter cover crop suppresses weeds, thrips and tomato spotted wilt, and leaf spot disease
- While yield response to tillage systems have been evaluated in North Carolina, information on cover crops is limited
- Yield of Virginia market type cultivars can be lower in reduced tillage systems compared with conventional tillage systems on some soil series

Objective

Efficacy of sulfur compared with chlorothalonil was compared in one experiment with different tillage systems with a single cultivar and in a separate experiment with cultivars expressing variation in resistance to leaf spot disease

Variety Evaluation with Sulfur versus Chlorothalonil

Material and Methods

- Conventional tillage
- Virginia market type varieties: Bailey II, Emery, Sullivan, NC 20, NC 21, Walton, and Tif-NV H/O Jumbo HO
- Runner market type varieties: Tif-NV H/O Runner, Florunner 297, and Florunner 511.
- 5-spray program on two-week schedule with varying levels of chlorothalonil (1.5 pints/acre) and sulfur (Microthiol Disperss, 5 pounds/acre)
- Lucento, Tebuconazole, and Revytek applied at labeled rates
- Leaf spot incidence and defoliation ratings were taken in August and September
- Bailey II, Emery, Sullivan, NC 20, and NC 21 were dug in late September based on pod mesocarp color
- Walton, TifNV HOLJ (Jumbo), Florunner 297, Florunner 511, and TifNV HOL R (Runner) were dug in mid-October

Results

- Bailey II, Sullivan, and NC 20 expressed less disease than other varieties when evaluated at digging (Figures 1 and 2)
- Chlorothalonil provided more effective protection from leaf spot incidence and defoliation than sulfur when either chlorothalonil or sulfur were the only leaf spot component (Table 1)
- When applied as the first and last spray in a 5-spray program, leaf spot incidence and canopy defoliation were similar with chlorothalonil or sulfur
- In most instances, peanut yield was greater when chlorothalonil was used compared with sulfur
- Differences in leaf spot (incidence and defoliation) and yield were noted when comparing fungicide programs with either chlorothalonil or sulfur as the only leaf spot component (chlorothalonil provided greater protection)

Leaf spot control with Tillage and Sulfur versus Chlorothalonil

Material and Methods

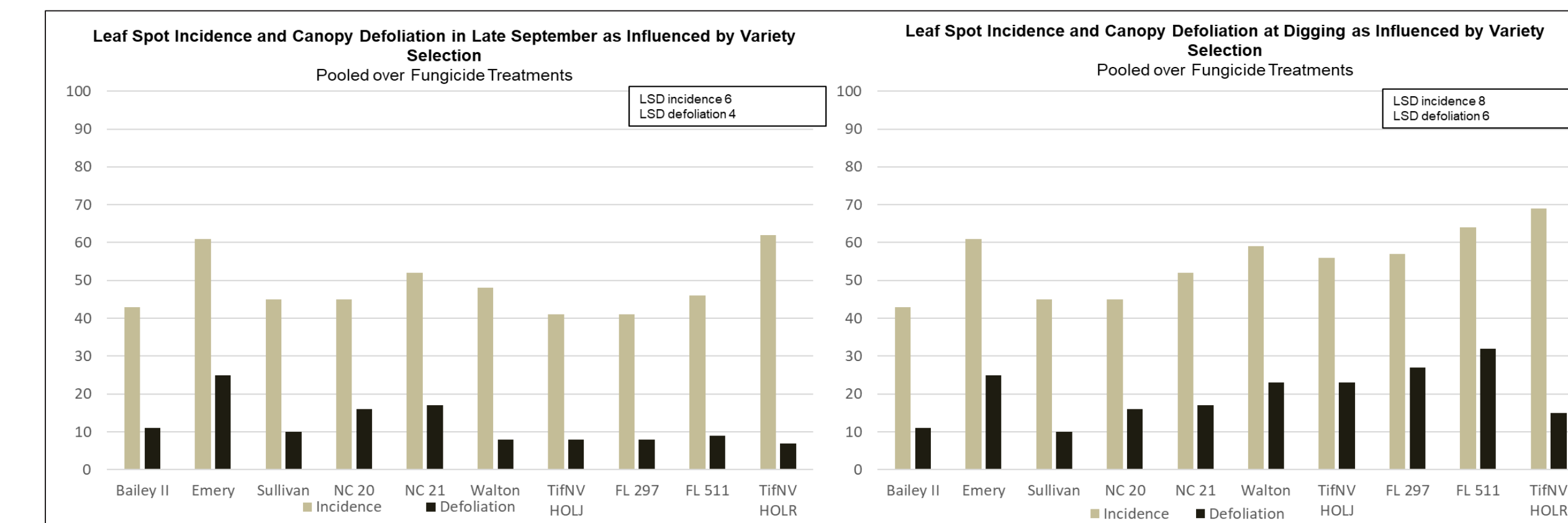
- No-tillage or strip-tillage into native vegetation or a cereal rye cover crop
- A 3-spray fungicide program or a 5-spray fungicide program was used with varying sprays of chlorothalonil or sulfur, in conjunction with broader spectrum fungicides
- Fungicides rates were the same as rates used in the variety trial

Results

- Minor and inconsistent differences in leaf spot incidence and canopy defoliation were noted when comparing tillage and cover crop treatments (data not shown)
- Peanut yield was lower in no-till compared with strip-till on a finer-textured soil while yield was similar on a coarser-textured soil
- On both soils, peanut yield was lower when planting in cereal rye compared with planting in absence of cereal rye (data not shown)
- When chlorothalonil was compared with sulfur as a component of each spray in a 5-spray program, leaf spot incidence and canopy defoliation were lower when chlorothalonil was used (Tables 2 and 3)
- When sulfur or chlorothalonil were applied as the first spray and the last spray of a 5-spray program, leaf spot control and yield were similar
- While main effects were often significant, interactions among tillage, cereal rye, and fungicide treatments were generally not significant
- Tillage did not affect leaf spot incidence or canopy defoliation regardless of fungicide program or cover crop (Figure 3)
- Cereal rye had lower leaf spot incidence and canopy defoliation than the no-cereal rye treatment (Figure 4)
- Yield was lower at Rocky Mount in no till compared to strip till, while yield was similar for both tillage systems at Lewiston (data not shown)

Variety Trial

Figure 1 and 2
Table 1



Influence of Fungicide Program on Leaf Spot Incidence, Canopy Defoliation in Late September and Peanut Yield. Pooled over Variety.^a

Timing	Late September		Digging		Yield
	Incidence	Defoliation	Incidence	Defoliation	
Fungicides	%		%		lbs/ac
None	98 a	37 a	99 a	50 a	4501 b
S-ST-Pv-Rv-S	41 b	6 b	49 b	15 b	4655 ab
C-ST-Pv-Rv-C	37 bc	6 b	45 b	13 bc	4899 a
S-ST-ST-ST-S	34 c	5 b	45 b	14 b	4560 b
C-CT-CT-CT-CT	32 cd	5 b	37 c	8 c	4932 a

^aAbbreviations: C, chlorothalonil; Pv, Provost Silver; Rv, Revytek; S, Sulfur; T, Tebuconazole.

Tillage and Cover Crop Trial

Tables 2 and 3
Figure 3 and 4

Influence of Fungicide Program on Leaf Spot Incidence, Canopy Defoliation and Peanut Yield. Pooled over tillage and cover crop treatments. Lewiston.^a

Fungicides	%		pounds/acre
	Incidence	Defoliation	
None	99 a	62 a	3700 a
S-ST-S	83 b	38 b	4170 a
C-CT-C	82 b	35 b	3930 a
S-ST-ST-ST-S	63 c	18 c	3980 a
C-CT-CT-CT-CT	48 d	14 c	4180 a
S-Pv-Rv-Lu-S	42 d	16 c	4190 a
C-Pv-Rv-Lu-C	51 cd	12 c	4120 a

^aAbbreviations: C, chlorothalonil; Pv, Provost Silver; Rv, Revytek; Lu, Lucento; S, Sulfur; T, Tebuconazole.

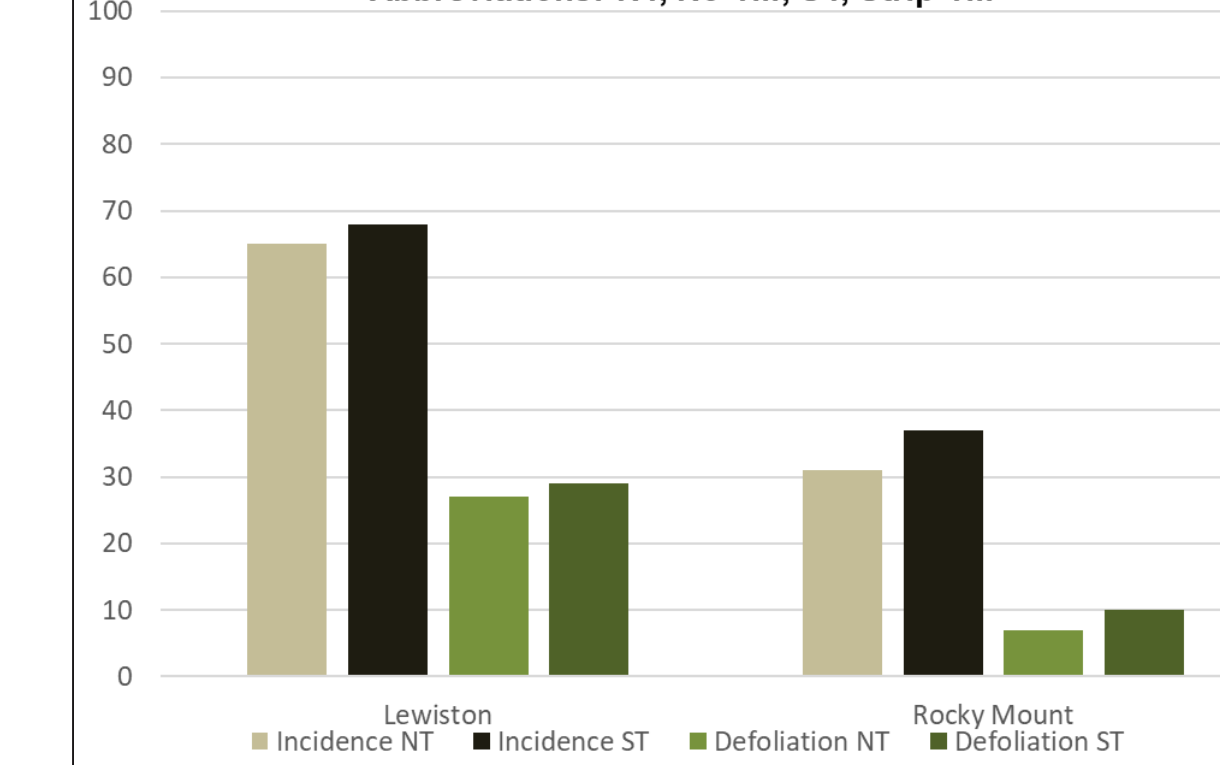
Influence of Fungicide Program on Leaf Spot Incidence, Canopy Defoliation and Peanut Yield. Pooled over tillage and cover crop treatments. Rocky Mount.^a

Fungicides	%		pounds/acre
	Incidence	Defoliation	
None	92 a	41 a	4421 c
S-ST-S	81 a	9 b	5030 ab
C-CT-C	59 b	6 bc	4910 ab
S-ST-ST-ST-S	1 c	1 c	4570 bc
C-CT-CT-CT-CT	0 c	0 c	4780 abc
S-Pv-Rv-Lu-S	5 c	2 c	5130 a
C-Pv-Rv-Lu-C	0 c	1 c	4870 abc

^aAbbreviations: C, chlorothalonil; Pv, Provost Silver; Rv, Revytek; Lu, Lucento; S, Sulfur; T, Tebuconazole.



Leaf Spot Incidence and Canopy Defoliation as Influenced by Tillage Pooled over Cereal Rye and Fungicide Treatments Abbreviations: NT, No Till; ST, Strip Till



Leaf Spot Incidence and Canopy Defoliation as Influenced by Cereal Rye Pooled over Tillage and Fungicide Treatments

