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Response of Peanut Genotypes to Various Fungicide Regimes for Control of Foliar and Soilborne Diseases in South Texas

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Summary

Foliar and soilborne disease development was considered moderate to high at both locations in 2002. Results from this study revealed that Headline, Stratego and Abound when averaged across all six varieties, significantly reduced late leaf spot disease incidence compared to the untreated check. Headline provided the best control compared to Abound and Stratego. Tamrun 96 was significantly lower in *Rhizoctonia* limb rot and southern blight disease incidence than all other cultivars evaluated. Headline and Abound significantly reduced southern blight disease incidence at the Yoakum location compared to the untreated check while all three fungicides significantly reduced *Rhizoctonia* disease incidence at the Atascosa test site. Stratego provided unacceptable control of southern blight. All three fungicides when averaged across all cultivars, significantly increased yield over the untreated check at both locations. Yields were higher for Headline compared to Abound and Stratego. All three fungicide significantly increased value (\$/A) over the untreated check.

Introduction

Peanut diseases, both foliar and soilborne, are problems that south Texas peanut producers must give consideration to especially when environmental conditions are conducive to disease development. These diseases, if not effectively controlled, can significantly impact yield and quality. Disease management practices include the selection of fungicides and cultivar selection. Fungicides can vary in their effectiveness in controlling both foliar and soilborne pathogens.

Also, peanut producers have several commercial cultivars from which to choose. These cultivars also have varying levels of resistance to foliar and soilborne diseases and may need fungicide applications. The objective of this study was to evaluate currently released cultivars in combination with current peanut fungicides to determine which regime could provide a greater benefit to south Texas peanut producers.

Material and Methods

This study was conducted in 2002 at the Texas Agricultural Experiment Station (TAES) near Yoakum and in Atascosa County on Jimmy Seay's farm near Leming Texas. The study was set up in a split-plot configuration with sub-plots consisting of 2 rows by 25 ft long with 3 replications. Test plots were planted on May 31 at the TAES location and May 28 at the Atascosa County location. Cultivars included Tamrun 96, Tamrun OL 01, Flavor Runner 458, AT 1-1, Georgia Green and GK-7 (HO). The fungicides included Headline (BAS 500) (12 fl oz/A), Stratego (14 fl oz/A) and Abound (18.5 fl oz/A). Application timings at the TAES location for Headline were 49, 64, 79, 92 days after planting (DAP); Stratego, 64 and 92 DAP; Abound, 64 and 92 DAP. At the Atascosa location, applications timings for Headline were 45, 60, 74 and 88 DAP; Stratego, 60 and 88 DAP; Abound, 60 and 88 DAP. All fungicides were applied with a CO₂ pressurized backpack sprayer with a two row hand-held boom with three nozzles (D3 tips, #13 core and slotted strainers) per row. Spray rate was 20 gallons per acre at 2.8 mph. Assessment of leaf spot was visually made using the Florida rating scale where 1 = no disease and 10 = plants dead, completely defoliated from leaf spot. The soilborne diseases, *Rhizoctonia* limb rot and southern blight, were evaluated by counting target sites (disease hits) per 50 ft of row above ground (AG).

Results and Discussion

Yoakum: Leaf spot was considered high at the TAES test site. All three fungicides reduced leaf spot significantly compared to untreated check (Table 1). However, leaf spot incidence was still considered moderate to high with the Stratego and Abound treatments, respectively. When averaged across all treatments Tamrun 96 had the lowest leaf spot severity than all other cultivars (Table 2).

Southern blight disease severity was assessed aboveground prior to digging. Only Headline and Abound significantly reduced southern blight disease incidence compared to the untreated check (Table 3). Research shows that Stratego provides control of certain foliar diseases but inconsistent control of soilborne diseases which was the case in this test. Tamrun 96 had the lowest southern blight disease incidence when averaged across all treatments and was significantly lower than Flavor Runner 458 and AT 1-1 (Table 4).

Averaged across all six cultivars, all three fungicides significantly improved yield over the untreated check. Headline provided significantly higher yields than Abound and Stratego (Table 5). Tamrun 96 and Tamrun OL 01 were the two highest yielding cultivars (Table 6). Extremely wet conditions late in the season in addition to high southern blight disease incidence caused Flavor Runner 458 and AT 1-1 yields to be reduced significantly.

All three fungicides significantly increased value/A over the untreated check (Table 5). Headline resulted in a significantly higher value/A than Stratego and Abound.

Atascosa: Leaf spot severity at the Atascosa test site was moderate. All three fungicides evaluated significantly reduced leaf spot disease incidence compared to the untreated check (Table 1). Headline provided significantly better leaf spot control than Stratego and Abound. All three fungicides also significantly reduced *Rhizoctonia* limb rot when compared to the untreated check (Table 3). When averaged across all treatments, leaf spot and *Rhizoctonia* limb

rot severity was consistent among most cultivars (Tables 2 and 4). Tamrun 96 did have significantly lower *Rhizoctonia* limb rot disease severity than Flavor Runner 458.

All three fungicides significantly enhanced yields when compared to untreated check (Table 5). Headline improved yield significantly over Stratego and Abound. Tamrun 96 was the highest yielding cultivar when averaged across all treatments followed closely by Tamrun OL 01. As at Yoakum, due to excessive rainfall, optimal harvesting of the early maturing cultivars AT 1-1 and Flavor Runner 458 was delayed resulting in significantly lower yields (Table 6).

Value/A results at the Atascosa test site were similar to the Yoakum test site (Tables 5 and 6).

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Table 1. Leafspot severity averaged across six runner cultivars

Treatment	Leafspot (Fld scale 1-10) Final Rating		
	# of Appl.	Yoakum 10-1-02	Atascosa 10-3-02
Untreated Check	--	7.06	6.69
Headline (12 fl oz/A)	4	3.58	2.89
Stratego (14 fl oz/A)	2	4.36	4.39
Abound (18.5 fl oz/A)	2	5.58	4.83
LSD (0.05)		0.37	0.34

Table 2. Leafspot severity averaged across all treatments.

Cultivar	Leafspot (Fld Scale 1-10) Final Rating	
	Yoakum 10-1-02	Atascosa 10-3-02
AT 1-1	5.29	4.67
Flavor Runner 458	5.18	4.54
Georgia Green	4.96	4.63
Gk-7 (HO)	5.46	4.92
Tamrun 96	4.75	4.67
Tamrun OL 01	5.04	4.79
LSD (0.05)	0.37	0.23

Table 3. Southern blight and Rhizoctonia limb rot disease incidence averaged across 6 runner cultivars.

Treatment	Soilborne Disease Hits/ 50 ft Plot		
	# of Appl.	Yoakum Southern blight 10-1-02	Atascosa Rhizoctonia 10-15-02
Untreated Check	--	10.8	10.7
Headline (12 fl oz/A)	4	5.7	3.9
Stratego (14 fl oz/A)	2	11.2	5.3
Abound (18.5 fl oz/A)	2	5.7	4.8
LSD (0.05)		2.4	1.5

Table 4. Southern blight disease incidence averaged across all treatments

Cultivar	Soilborne Disease Hits/ 50 ft Plot	
	Yoakum Southern blight 10-1-02	Atascosa Rhizoctonia 10-15-02

AT 1-1	10.0	6.8
Flavor Runner 458	12.1	7.3
Georgia Green	8.0	5.7
Gk-7 (HO)	7.2	7.2
Tamrun 96	5.4	4.8
Tamrun OL 01	7.3	5.4
LSD (0.05)	3.0	2.4

Table 5. Yield and Value/Acre averaged across six runner cultivars.

Treatment	# of Appl.	Yield (lbs/A)		Value (\$/A)*	
		Yoakum	Atascosa	Yoakum	Atascosa
Untreated Check	--	1685	2705	285.38	483.69
Headline (12 fl oz/A)	4	3678	4542	631.66	819.66
Stratego (14 fl oz/A)	2	2348	3962	395.46	706.65
Abound (18.5 fl oz/A)	2	3201	4065	569.99	736.61
LSD (0.05)		335	422	59.78	77.75

*Based on 2002 Peanut Loan Schedule

Table 6. Yield and Value/Acre averaged across all treatments.

Cultivar	Yield (lbs/A)		Value (\$/A)*	
	Yoakum	Atascosa	Yoakum	Atascosa
AT 1-1	1773	2575	297.24	453.70
Flavor Runner 458	2217	2840	377.25	518.97
Georgia Green	2882	4245	502.92	769.69
Gk-7 (HO)	2725	4238	465.13	764.84
Tamrun 96	3557	4580	619.72	817.91

Tamrun OL 01	3215	4431	561.45	794.83
LSD (0.05)	590	675	110.56	121.93

*Based on 2002 Peanut Loan Schedule