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CHEMICAL CONTROL OF SCLEROTINIA BLIGHT OF PEANUT

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Sclerotinia Blight has become a serious peanut disease since it was first discovered in Oklahoma in 1972. Chemical control is an important part of a Sclerotinia Blight disease management program. It is necessary to determine effective fungicides, proper fungicide application techniques and proper application timing. The Plant Pathology Department is thankful to the personnel at the Caddo Research Station, industry cooperators, and the Oklahoma Peanut Commission for providing us with resources to conduct these trials.

Fungicide trials were established in an area with naturally occurring inoculum of Sclerotinia Blight on the Caddo Research Station near Ft. Cobb, Oklahoma . The tests began in 1983, and with the exception of 1986, the plots were planted to 'Florunner' variety peanut. In 1986 the Spanish type peanut variety 'Spanco' was planted and for uniformity the 1986 data is not presented in this report. All treatments were replicated 4 times in a randomized complete block design.

The fungicides were applied as a basal spray with a wheelbarrow plot sprayer equipped with 3 fan tip nozzles per row and calibrated to deliver approximately 40 gal of water per acre (1983-1989). In 1990, most treatments were applied with a flat fan nozzle attached to a canopy opener to increase coverage of basal stems and surrounding soil surface. Those fungicides that were tank-mixed with Bravo were applied as a full-canopy spray with a wheelbarrow plot sprayer equipped with 3 cone nozzles per row and calibrated to deliver 26 gallons of water per acre. Disease ratings were made at intervals during the season and at harvest. Peanuts were dug with a conventional digger-invertor, harvested with a plot thresher, sacked, dried, and cleaned before weighing to determine treatment yields. Data were subjected to statistical analysis to determine whether treatment differences were real. A statistical difference indicates that the difference is due to treatment and not to variation within the field.

RESULTS AND DISCUSSION

Results from 1983 thru 1990 showed that the Rovral plus Botran combination treatment had the highest yield and lowest percent Sclerotinia Blight incidence (Table I). The average over years showed that the Rovral treatment had a slightly higher yield and lower Sclerotinia Blight incidence than Botran (Table I). The higher yields and lower incidence of Sclerotinia Blight that occurred in the Rovral plus Botran combination could be due to the extra dosage and/or extra applications involved in using this combination treatment.

TABLE I

Sclerotinia Blight Incidence (%) and Peanut Yields from 1983-1990 Chemical Trials, Caddo Research Station, Ft. Cobb, Oklahoma.

Year	No Treatment		Botran		Rovral		Rovral + Botran	
	Sclerotinia Blight %	Yield lb/A	Sclerotinia Blight %	Yield lb/A	Sclerotinia Blight %	Yield lb/A	Sclerotinia Blight %	Yield lb/A
1983	48	681	40	1422	41	1134	28	1467
1984	30	1622	15	2133	14	2405	9	2405
1985	44	1928	25	2100	19	2394	12	2541
1987	59	2065	22	2711	26	2916	21	3120
1988	72	1407	50	2212	42	2053	42	2121
1989	52	1800	39	2072	36	2692	--	----
1990	44	2549	46	2738	38	3380	24	3812
Average	50	1721	34	2198	31	2425	23	2578

Percent Sclerotinia Blight was determined by number of hits divided by number of potential hits multiplied by 100.

The best treatment yield from each year was used, therefore treatment rates and application times vary from year to year. The highest rate for Rovral was 3 pound ai per acre and the highest rate for Botran was 9 pound ai per acre.

Data from 1986 was excluded due to variety difference (See text).

TABLE II

Effect of New Fungicides on the Control of Sclerotinia Blight of Peanut, Caddo Research Station, Ft. Cobb, Oklahoma, 1990.

Fungicide & Rate Formulation/Acre	Date of Application	Disease Severity Sclerotinia Blight	Grade	Value per Acre	Yield lb/A
ASC66825 50W 1.5 lb	7/27, 8/29	435 gh	72	$1425	4417 a
CGA445 50W 2.0 lb	7/27, 8/29, 9/25	512 fgh	72	1385	4258 ab
ASC66825 50W 2.0 lb	7/27, 8/29	493 fgh	69	1312	4235 ab
ASC66825 50W 1.0 lb	7/27, 8/29	715 efg	75	1371	4083 a-c
CGA445 50W 1.0 lb	7/27, 8/29, 9/25	843 efg	75	1300	3857 b-e
Rovral 4F 1 qt + Triton 1956 1 pt and Botran 75W 4 lb + NuFilm 8 fl oz	7/27, 9/25 8/7, 8/29	505 fgh	69	1176	3812 b-e
Rovral 4F 1 qt + Triton 1956 8 fl oz	7/27, 8/7, 9/25	999 def	69	1045	3380 d-f
ASC66825 50W 1.5 lb	8/7, 8/29	1566 bc	72	1010	3131 fg
No Treatment		1928 ab	70	792	2549 h

Disease Severity is the Area Under Disease Progress Curve (AUDPC); the higher the value the greater the disease severity.

Means followed by the same letter within a column are not significantly different at P = 0.05 according to Duncans Multiple Range Test.

TABLE III

Effect of Rovral Individually and in Combination with Other Compounds on Control of Sclerotinia Blight of Peanut, Caddo Research Station, Ft. Cobb, Oklahoma, 1990.

Fungicide & Rate Formulation/Acre	Date of Application	Disease Severity Sclerotinia Blight	Grade	Value per Acre	Yield lb/A
Rovral 4F 1 qt + Triton 1956 1 pt and Botran 75W 4 lb + NuFilm 8 fl oz	7/27, 9/25 8/7, 8/29	505 fgh	69	$1176	3812 b-e
Rovral 4F 1 qt + Botran 75W 2 lb + NuFilm 8 fl oz and Botran 75W 4 lb	8/7, 9/25 9/11	1508 bc	73	1218	3705 c-e
TennCop 5E 4 qt and Rovral 4F 1 qt +TennCop 5E 4 qt	5/23, 6/20, 7/6 7/27, 8/7, 9/25	795 efg	70	1101	3517 d-f
Rovral 4F 1 qt + Triton 1956 8 fl oz	7/27, 8/7, 9/25	999 def	69	1045	3380 d-f
Bravo 720 1.5 pt + Rovral 4F 1 pt and Rovral 4F 1 qt	8/7, 8/29, 9/11 9/25	1091 cde	73	1112	3373 ef
Rovral 4F 1 qt	7/27, 8/7, 9/25	1078 cde	68	960	3176 fg
No Treatment		1928 ab	70	792	2549 h
TennCop 5E 4 qt	5/23, 6/20, 7/6 8/7, 8/14, 9/11	2107 a	68	763	2541 h

Disease Severity is the Area Under Disease Progress Curve (AUDPC); the higher the value the greater the disease severity.

Means followed by the same letter within a column are not significantly different at P = 0.05 according to Duncans Multiple Range Test.

TABLE IV

Sclerotinia Blight and Yield Comparison Between Untreated Peanut Line 'TX798736' and Florunner Treated with Fungicides, Caddo Research Station, Ft. Cobb, Oklahoma, 1990.

Treatment	Date of Application	Disease Severity Sclerotinia Blight	Grade	Value per Acre	Yield lb/A
Florunner + ASC66825 50W 1.5 lb/A	7/27, 8/29	435 gh	72	$1425	4417 a
Florunner + CGA445 50W 2.0 lb/A	7/27, 8/29, 9/25	512 fgh	72	1385	4258 ab
TX798736 Untreated		169 h	71	1247	3902 b-d
Florunner + Rovral 4F 1 qt/A + Triton 1956 1 pt/A and Botran 75W 4 lb/A + NuFilm 8 fl oz/A	7/27, 9/25 8/7, 8/29	505 fgh	69	1176	3812 b-e
Florunner + Rovral 4F 1 qt/A + Triton 1956 8 fl oz/A	7/27, 8/7, 9/25	999 def	69	1045	3380 d-f
Florunner Untreated		1928 ab	70	792	2549 h

Disease Severity is the Area Under Disease Progress Curve (AUDPC); the higher the value the greater the disease severity.

Means followed by the same letter within a column are not significantly different at P = 0.05 according to Duncans Multiple Range Test.

Also, applying two fungicides that differ in their action could possibly help explain the increased control and higher yields that were obtained with the Rovral plus Botran treatment.

In 1990, two experimental compounds (CGA 445 and ASC 66825) were tested for their effectiveness against Sclerotinia Blight. ASC 66825 and CGA 445 treatments had a significantly lower Sclerotinia Blight disease severity and significantly higher yields than either the Rovral treatment or the untreated control (Table II). These fungicides were applied just prior to Sclerotinia Blight infection. However, one treatment with ASC 66825 was applied after disease establishment and resulted in a 1286 lb per acre yield decrease when compared to the same treatment and rate applied prior to infection (Table II). This demonstrated the importance of preventive fungicide applications. The 4000 pound plus yields obtained from plots treated with ASC 66825 or CGA 445 indicated that these fungicides gave excellent control of Sclerotinia Blight which allowed treated plants to produce near their yield potential.

All Rovral treatments and different combinations of fungicide with Rovral significantly increased yields over no treatment. Also, these Rovral treatments and combinations reduced Sclerotinia Blight, except a Rovral-Botran tank mix that was applied after the disease had become established (Table III). This result again demonstrated the value of preventive fungicide applications. The highest yield and lowest disease severity among Rovral treatments was Rovral applied prior to infection, followed with two Botran treatments as needed, and then followed with a Rovral treatment 3-4 weeks prior to harvest (Table III). These results concur with results from previous years in that a Rovral-Botran combination results in higher yields and lower Sclerotinia Blight disease severity than when either chemical is applied individually. The Tenncop treatment was not effective when applied alone. However, higher yields and lower Sclerotinia Blight disease severity was obtained when Rovral was added to a TennCop treatment than a Rovral treatment alone (Table III).

The peanut line, TX 798736, is the breeding line from which the Sclerotinia Blight resistant Spanish peanut variety 'Tamspan 90' was selected. The lowest Sclerotinia Blight disease severity was obtained from plots planted to TX 798736 line which was not treated with a fungicide to control Sclerotinia Blight. Yields obtained from the TX 798736 plots ranked fifth out of eighteen entries (Table IV). The untreated TX 798736 plots had 1353 pounds per acre more peanut than did the untreated Florunner plots (Table IV). These results indicate that Tamspan 90 variety will produce a high yield in a field infested with Sclerotinia without fungicides to control Sclerotinia Blight.

In summary, these results indicate that: 1) Rovral-Botran combinations tend to give higher yields and lower disease severity than either of these chemicals applied alone or other Rovral combination treatments; 2) planting a resistant variety gives acceptable yields without the cost of a fungicide; 3) fungicide applications just prior to infection provides best disease suppression and yield increases; and 4) ASC 66825 and CGA 445 will effectively control Sclerotinia Blight.

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