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Control of the Leaf Spot Disease of Turmeric Caused by *Colletotrichum capsici* (Syd.) Butl. and Bisby

by

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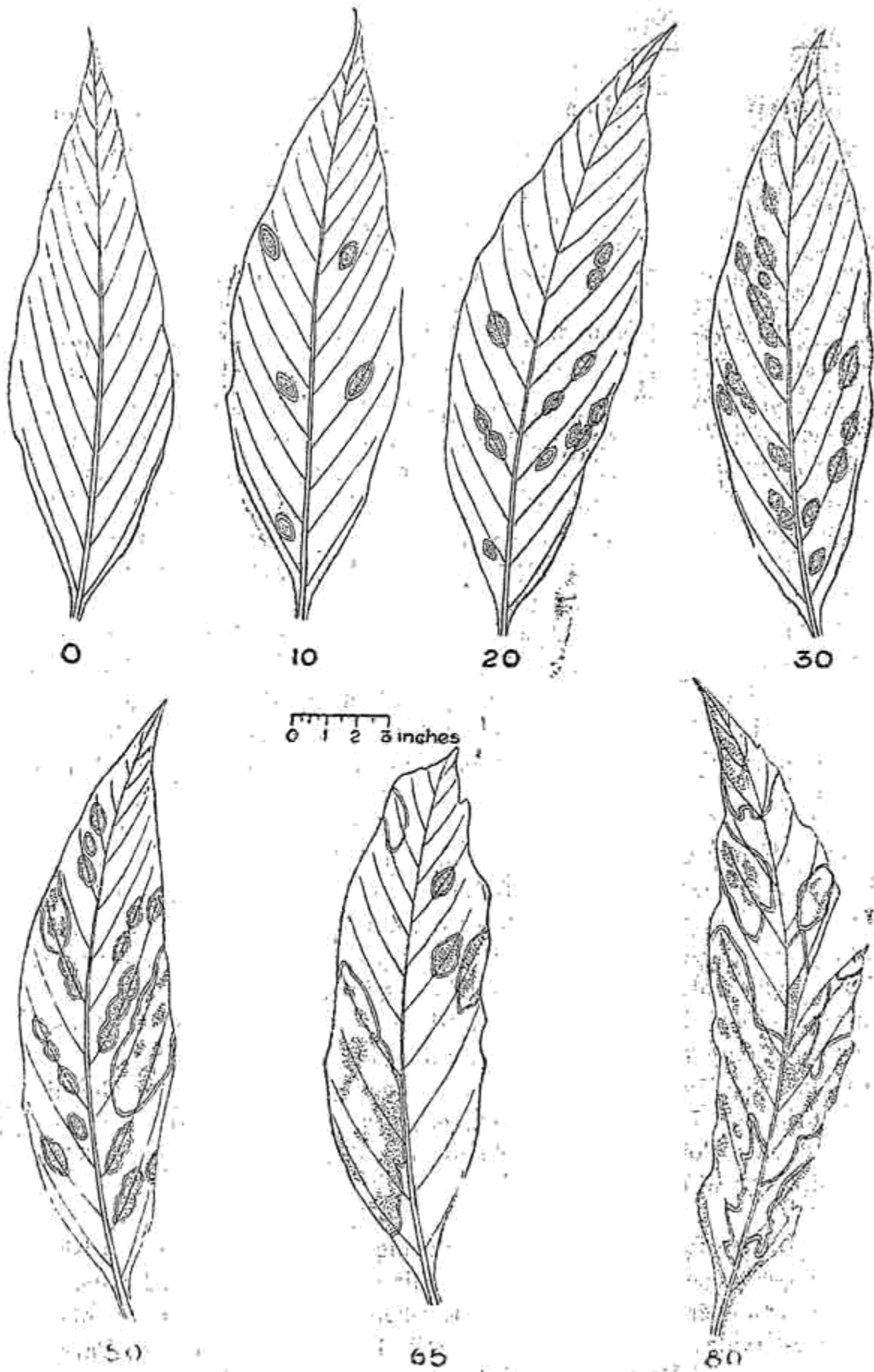
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Introduction: The leaf spot disease of turmeric is widespread in India. The disease is incited by *Colletotrichum capsici* (Syd.) Butl. and Bisby (syn. *Colletotrichum curcumae* (Syd.) Butl. and Bisby) which causes extensive spotting of the leaves. The leaves may eventually dry up and thus adversely affect the formation of rhizomes. The consequent loss has been estimated to be about 50% by Ramakrishnan (1954). He has also observed that high atmospheric humidity favours the development of the leaf spots (Ramakrishnan, 1954) and that the disease is controlled by two sprayings with 1% Bordeaux mixture, the yield being increased by more than 90%. However no statistically laid out trials with fungicides seem to have been conducted. The availability of several fungicides received for test was therefore taken advantage of in laying out a randomised and replicated experiment on the control of this disease.

Material and Methods: Four months old planted turmeric crop in Chavadipalayam (Erode, Coimbatore District) a representative tract, was selected in 1955-'56 season and a land two miles from Bhavani was selected during 1956-'57 to conduct the experiment. Fortyeight plots of 8' x 30' were laid out for the experiment in randomised block design replicated four times. There was no leaf spot incidence prior to the start of the experiment. Eight fungicides were used in 1955-'56 season comprising of the spray chemicals Orthocide 50, Dithane Z 78, Bordeaux mixture, cupravit ob 21, Parry copper, copper oxychloride (Mysore chemicals), copper oxychloride (Kirti chemicals) and cupramar.

Eleven fungicides were used during 1956-'57 season comprising of the spray chemicals orthocide 50, Flit 406, Dithane Z. 78, Bordeaux mixture, Copper oxychloride (Kirti Chemicals) Mycop 50, Fytolan, Cuprous oxide and dusts Micop DO 4, Micop DO 6 and Parry, 4%.

Garding chart for Turmeric leaf spot disease.



The sprayings were given with a Sapperlot type Addison rocker sprayer and the dusts were applied by an Addison's rotary duster. An untreated control was kept for comparison. In the experiment conducted during 1955-'56 first spraying was done in the first week of December and a second spraying was done in the first week of January. Infection counts were recorded before each spraying and a final count was recorded one month after the final spraying. The yield data could not be recorded since the harvest was done by the landowner without previous intimation.

In the experiment conducted in 1956-'57 the first sprays and dusts were given during the last week of September on 24-8-'56 when the crop was four months old. The second and third sprayings were given one month and 2 months after the first spraying on 27-9-'56 and on 5-11-'56 respectively and adjusted to coincide a day after receipt of rainfall during the respective months. The rainfall received during the period of the experiment in 1956-'57 presented below.

<i>Month</i>	<i>Total rainfall in inches</i>	<i>No. of rainy days</i>
August, 56	0.79	5
September, 56	3.50	11
October, 56	13.73	17
November, 56	7.94	15
December, 56	0.48	4
January, 57	0.11	1
February, 57	0.45	2

Infection counts on the incidence of the disease were recorded every time before the fungicidal treatment and a final count was recorded 45 days after the last spraying. The intensity of infection was classified into seven grades by collecting leaf samples of different disease intensity and each grade was assigned a category value by eye judgement i. e. 0, 10, 20, 30, 50, 65 and 80 each representing the percent of leaf area infected. The grading chart used is appended. One hundred leaves were graded for each treatment and the mean grade of infection for each calculated. The rhizomes were unearthed on 15-3-'57 and the yield of fresh rhizomes was recorded at that time.

Experimental Data and Results: The intensity of infection in the different plots and the yield data are presented in the table. The results were statistically analysed and found to be significant. Relation between the incidence of leaf spot disease and the yield was also studied.

Discussion: From the results Bordeaux mixture was found to be superior in controlling the disease though Orthocide 50 and Dithane Z. 78 were statistically on a par with Bordeaux mixture.

However when the yields were considered Dithane Z. 78 gave the highest yield being comparatively better than Bordeaux mixture or Orthocide 50 and being statistically superior over untreated control.

There is a highly significant negative correlation between the percentage of infection and the yield as indicated by the correlation coefficient. $r = 0.5582$. (Table value r -5% level 0.2875 1% level—0.3721.) So there is a definite indication that the leaf spot disease of turmeric has a depressing effect on the yield of the crop.

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LITERATURE CITED.

- Ramakrishnan T. S. (1954) Leaf spot disease of Turmeric (*Curcuma longa*) caused by *Colletotrichum capsici* (Syd.) Butl. and Bisby. *Indian. Phytopath.* 7: 111—117.

TABLE I
Effect of spraying on disease incidence and yield.

Treatment	Active ingredient	Concentration used	Disease incidence 1955-'56	Disease incidence 1956-'57	Yield per plot	Calculated acre yield
<i>Spray Chemicals:</i>						
Orchocido 50	N (Trichloromethylthio) 4-Cyclohexeno-1-2-Dicarboximide.	1 lb in 50 gallons of water	7.9	15.68	84.25 lb	15291 lb
Flit. 406	do	do	..	20.09	75.25 "	13,668 "
<i>Dithiocarbamate:</i>						
Dithano Z. 78	65% Zinc ethylbis dithio. carbamate.	1 lb in 50 gallons of water	8.2	15.80	100.25 "	18,195 "
<i>Copper group:</i>						
Bordeaux Mixture	1% strength	1% strength	7.2	12.94	95.0 "	17,243 "
<i>Copper oxychlorides:</i>						
Cupravit ob 21	50% Copper oxychloride	1 lb in 40 gallons of water	8.8	..	..	..
Parry Copper fungicide	do	do	10.1	..	..	..
Copper oxychloride (Kirti Chemicals)	do	do	12.7	18.65	82.0 "	14,883 "
Copper oxychloride (Mysore Chemicals)	do	do	14.6	..	..	..
Mycop 50%	do	do	..	18.86	75.75 "	13,744 "
Fytolan	do	do	..	19.38	72.0 "	13,068 "
<i>Copper oxide group:</i>						
Cupramar	50% Cuprous oxide	do	11.5	..	..	..
Cuprous oxide (Kirti Chemicals)	78-80% do	do	..	18.88	8.45 "	14,792 "
<i>Dust Chemicals:</i>						
Mycop DO ₁	4% Copper dust	..	..	20.94	70.5 "	12,792 "
Mycop Do. 6	" "	..	..	22.2	73.25 "	12,792 "
Parry Cop. 4%	" "	..	..	20.0	76.25 "	13,295 "
Untreated control	..	..	..	23.70	76.0 "	13,839 "
	Critical difference.	3.24	..	3.40	20.40 "	13,794 "

Infection 1955 — 1956 C. D. 3.24

Bordeaux mixture	Orthocide 50	Dithane	Cupravit	Parry Copper fungicide,	Cupramar	Copper oxy-chloride (Kirti)	Copper oxy-chloride (Mysore)	Control
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Infection 1956 — 1957 C. D. 3.4

Bordeaux Mixture	Orthocide 50	Dithane	Copper oxy-chloride (Kirti)	Mycop 50	Cuprous oxide (Kirti)	Fytolan	Parry Cop 4%	Flit 406	Mycop Do 4	Mycop Do 6	Control
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Yield 1956 — 1957 C. D. 20.4

Dithane	Bordeaux mixture	Orthocide 50	Copper oxy-chloride (Kirti)	Cuprous oxide (Kirti)	Parry Cop 4%	Control	Mycop 50	Flit 406	Mycop Do 6	Fytolan	Mycop Do 4
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