

Effects of two

# Systemic Pesticides

## on cotton studied in field tests

Plant growth, fruiting time, and yield of cotton were studied during four years of research with systemic pesticides on cotton in Kern and Fresno counties.

Systemic pesticides enter a plant through the seed coat or through the root and are toxic to several insects and mites which feed on the foliage of the plant. Two such pesticides—Thimet and Di-Syston—were used in a four-year study.

Both pesticides were applied by pre-planting seed treatment and by soil ap-

plication. As a seed treatment both chemicals were applied at a rate of four pounds of active ingredient per 100 pounds of seed. The seed was planted at the per acre rate typical for the test area. In the soil application the pesticides were applied as granules in the seed drill furrow, at two and four pounds per acre and as a side-dress, several inches away from the seed, at from 1.3 to 7.0 pounds per acre.

Reduced stands were often observed

where the pesticides were used, especially when planting was followed by cold, wet weather. Even under ideal growing conditions during one experiment, both chemicals reduced plant emergence. On the sixth day after planting, emergence was reduced from 12,000 plants per acre in the check plot to 6,000 plants per acre in the treated plots. The reduction in emergence probably contributed to final stands being reduced from 51,000 to 47,000 plants per acre. Final stand differences of this proportion do not ordinarily affect yield.

Application of Thimet granules in the seed furrow also caused a slight delay in emergence and reductions in final stand.

Control of thrips, spider mites, and aphids on seedling cotton is usually obtained with Thimet and Di-Syston, regardless of the method of application. However, Thimet has been more effective against thrips and spider mites. During the four years of investigation, the pest control obtained was similar to the results shown in the table.

Seed treatment usually does not give control for more than 6-8 weeks after planting. After that period reinfestation may occur at any time. However, in the case of spider mites several additional weeks of control may be obtained.

Furrow and side-dress applications of systemic pesticides give results similar to seed treatment, although some delay in effectiveness usually occurs. The period of effectiveness may extend beyond that of seed treatment. Quantities of material required for equivalent results by side-dress applications are much greater than with seed treatment.

Control of thrips on cotton through use of Thimet or Di-Syston results in better seedling growth. However, plant damage is often evident as marginal leaf burning on cotyledons and on the first true leaves. Furthermore, plants in untreated areas usually commence to bloom at an earlier date with a corresponding earlier boll maturity date.

Yield results during the four years of experimentation were variable. There was little or no difference in yield between the untreated check plots and seed, furrow, or side-dress treatments. Soil variability was largely responsible for yield variation, but none of the differences was significant.

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Effect of Two Systemic Pesticides on Seedling Emergence, Earliness of Flowering, Boll Opening, and Yield of Cotton. Planted April 30, 1958

Treatment	Lbs./acre	Plant emergence 1000's/A			Flowering rate* No./960 row ft.			Open bolls 480 row ft. August 20	Yield bales/A†	
		6 days	9 days	Final	7/1	7/10	7/17	Number	Stand	6" space
As seed treatment										
Check		12	40	52	21	190	430	408	2.8	2.6
Thimet	0.6	6	35	47	1	132	433	267	2.7	2.5
Di-Syston	0.6	6	37	47	10	162	418	305	2.7	2.6
As granules in drill row										
Check		10	45	51	....	.....	.....	.....	2.9	....
Thimet	2.0	4	41	48	....	.....	.....	.....	2.9	....
Thimet	4.0	3	38	48	....	.....	.....	.....	2.8	....
Thimet on seed (Extra comparative check)	0.6	6	33	41	....	.....	.....	.....	2.9	....

\* Plots thinned to 6" between plants to eliminate population effects on flowering rate.

† Stand, plots left with final plant population given in column 4; 6" space, plots thinned to eliminate population effects on yield.

Effect of Two Systemic Pesticides on Infestations of Thrips and Spider Mites and on Yield of Cotton

Treatment	Lbs./A.	Thrips/Plant			Spider mites			Yield bales/acre
		Avg. of 20 plants			Per 20 plants	Infestation score*		
Westhaven, Planted March 26, 1959								
Date		5/5	5/26	6/3	5/26	7/21	8/13	
Thimet on seed	2.6	0.7	16.7	8.9	0.0	0.9	3.9	3.5
" side-dress	6.9	1.5	13.7	8.6	0.2	1.1	2.8	3.5
Di-Syston side-dress	6.3	2.6	24.7	6.4	2.8	2.1	4.9	3.5
Check		5.6	24.9	16.8	12.2	2.6	4.9	3.4
Shafter, Planted April 15, 1959								
Date		5/8	5/20			8/24	9/25	
Thimet on seed	0.5	1.0	12.4			1.4	4.7	2.9
" side-dress	3.7	4.7	14.8			0.0	2.0	2.6
" side-dress	1.3	2.3	9.0			0.1	2.2	2.5
Di-Syston side-dress	3.6	15.7	15.2			0.0	1.7	2.8
Check		26.2	28.3			2.8	4.7	2.6

\* Infestations during July-September scored for severity of infestation: 0 = none present; 1 = light; 2 = light-medium; 3 = medium; 4 = medium-heavy; 5 = heavy with plants severely damaged.