TOMATO MITE CONTROL.

The cosmopolitan tomato mite (*Vasates lycopersici* (Massee) : Eriophyidae) (see Lamb 1953) has been known as a pest in Queensland for many years. First recorded by Tryon (1917), it was later discussed briefly by Veitch and Simmonds (1929), and in more detail by Veitch (1938), Sloan (1941, 1945), Officers of the Department of Agriculture and Stock (1951) and Smith (1955).

This mite has a State-wide distribution on tomato (*Lycopersicon esculentum* Mill.), and is a major pest in the crop, particularly in districts from Rockhampton north. Other hosts are potato (*Solanum tuberosum* L.), Cape gooseberry (*Physalis peruviana* L.), wild gooseberry (*Physalis minima* L.) and blackberry nightshade (*Solanum nigrum* L.). More recently (7–11–55) a major pest of tobacco in the Texas-Yelarbon-Inglewood region has been identified by the Commonwealth Institute of Entomology as *Vasates* sp. nr. *lycopersici* (Massee).

On September 18, 1951 an exploratory field trial (6 x 4 randomised block, with plot size of 4 adjacent plants of Bowen Globe) was set out in the Bowen district to evalute chemicals and control schedules against *V. lycopersici*. Mite counts were made on November 13, using the following method :—Two leaflets, each about 1·25 sq. in., were taken from the base of the fourth leaf from a terminal on each plant. The 8-leaf plot sample was placed in formalin for 24 hours, the formalin and water washings then being filtered by suction through black filter paper marked in eight equal sectors. The mites on one sector were counted. Details of treatments and results as pest survival on November 13 are given in Table 1.

Table 1.

RESULTS OF EXPLORATORY FIELD TRIAL.

Treatment.*	Treatment Rate (Active).†	Frequency of Treatment.	Transformed Mean. ($\sqrt{x + \frac{1}{2}}$)
Parathion (E605) spray (0·02% active)	1·6–4·8 oz./ac.	Fortnightly	0·6
Parathion spray (0·02% active)	1·6–4·8 oz./ac.	Weekly	0·4
Parathion spray (0·01% active)	0·8–2·4 oz./ac.	Fortnightly	0·4
Sulphur spray	3·75–12·25 lb./ac.	Fortnightly	9·4
Sulphur spray	3·75–12·25 lb./ac.	Fortnightly	1·0
Sulphur dust	5–15 lb./ac.	In intervening weeks	
Check			27·1
Differences necessary for significance 5%			1·33
Differences necessary for significance 1%			1·84

* All treatments sprayed fortnightly with DDT (0·1%) and copper oxychloride (0·25%).

† Varied with plant size.

To improve mite counts within plots, the following method was used during 1954. Mites were counted until at least 160 were scored, or until those in all sectors had been used, which ever occurred first. Final results were adjusted and expressed as the numbers of mites per 8-segment equivalents (*s.e.* ± 10%).

During July a screening trial was set out using parathion as the standard against para tertiary butylphenoxyisopropyl chloroethyl sulphite ("Aramite"), para chlorophenyl para chlorobenzene sulphonate ("Ovamite" = "Ovotran" = ("Mitran"), para chlorobenzyl para chlorophenyl sulphide ["Chlorparacide"] ("Mitox"), para chlorophenyl benzene sulphanate ("Elimite"), and "Systox".

Results indicated that none of the newer materials warranted further trials against the tomato mite.

Table 2.

RESULTS OF A TYPICAL FIELD TRIAL.

Treatment.	Frequency of Treatment.	Mites at Final Sampling.		Yield of Marketable Fruit. (Mean Weight, lb./Plot).
		Equivalent Mean.	Transformed Mean. $(\sqrt{x + \frac{1}{2}})$	
(*a*) Sulphur wettable powder (0·15%)	Fortnightly	0·99	1·22	94
(*b*) Sulphur dust (90% S) ..	Fortnightly, alternating with (*a*)			
Lime sulphur (0·22% polysulphide)	Fortnightly	3·26	1·94	94
Parathion (0·015% active) ..	Weekly	8·03	2·92	78
Parathion (0·015% active) ..	Fortnightly	13·94	3·80	100
Parathion (0·015% active) ..	Fortnightly	39·95	6·36	89
Check	..	858*	..	114
Differences necessary for significance { 5%	..	..	3·49	F not
1%	..	..	4·89	significant

*Obviously inferior and not included in the analysis.

The results from a typical field trial set out as a 6 x 4 randomised block with 8 plants of the variety Valiant per plot are given in Table 2. Treatments in this trial were applied over a 3-month period from July 14, a week after planting out, until a week before final harvesting. The sulphur and first two parathion treatments were used in combination with DDT wettable powder (0·1 per cent.) and copper oxychloride (0·25 per cent.). These materials were used in the intervening weeks on the lime sulphur plots, and copper oxychloride only was used with the third parathion treatment. Samples for mite counts were taken on August 5

and 18, September 2, 15 and 29, and December 11. The first occurrence of the pest in appreciable numbers was in the mid-September samples—i.e., 2–4 weeks later than usual. This delay probably accounts for the satisfactory comparative yields from check plots.

This experimental work in the Bowen district and observations on commercial control demonstrate that *Vasates lycopersici* (Massee) in tomato crops can be controlled by parathion or sulphur schedules. Taking into account local field conditions and crop, the sulphurs were recommended for use on tomatoes (Smith 1955 a) and parathion for the control of the Eriophyid and Tetranychid mites on tobacco in south-western Queensland (Smith 1955 b).

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