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CONTROL TRIALS AGAINST THE BROWN WHEAT MITE

The Petrobia or brown wheat mite (*Petrobia latens* (Muller)), has almost a world-wide distribution and has been known as a minor pest of winter cereals in southern Queensland for many years. Basically, the mite is a problem during periods of dry weather, and conditions ideal for its development occurred during June/September, 1963, over the greater part of the northern and eastern Darling Downs, west to Drillham and north into the Callide Valley. Recorded hosts included wheat, oats, barley, linseed and onions, and with later planting of summer crops it was noted on seedlings of sorghum, maize and cotton. Damage was associated principally with wheat. Overseas hosts listed by Baker and Pritchard (1953) include wheat, rye, sorghum, many kinds of grasses, onions, garlic, lucerne, burr clover and cotton.

Two distinct types of eggs, short-term and long-term, are laid by this mite (Fenton 1951). Observations on the heavy black soils of the northern Darling Downs during 1963 indicated the presence of both long-term and short-term eggs on the dried leaves at the bases of the plants, on trash in the field, in the top 2 in. of soil and to a depth of 12 in. in deep soil cracks caused by the dry weather. Plant damage and excessive populations were common on wheat which had been sown on land carrying the mulched remains of the previous season's wheat crop. Populations were usually lower on wheat following a previous linseed or summer crop and invariably of little to no consequence in crops sown on land which had been fallowed during the previous summer. These observations emphasize the importance of long-term egg survival in seasonal populations and demonstrate that pest numbers can be largely controlled by crop rotations.

As a satisfactory chemical providing good kills of brown wheat mite was not known when the pest upsurge occurred, two trials were carried out in seedling wheat crops during August/September, 1963. In the first, a series of nine chemicals were tested in an 11 x 3 randomized block layout with unit plots measuring 30 ft x 12 ft. This trial showed dimethoate to be a promising control and therefore in the second trial rates of application for this material were investigated, using a 6 x 4 randomized block layout with unit plots of

50 ft x 24 ft. Spray concentrations and dosages for the two trials are given with the results in Tables 1 and 2. The insecticides were applied by a power-driven hand boom applicator and populations were assessed by counting mites per plant on 10 random plants per plot in Trial 1 and five randomly selected 6-in. lengths of row per plot in Trial 2.

TABLE 1

MEAN NUMBERS OF *P. latens* PER PLANT IN TRIAL 1—IRONGATE

Treatment		Pretreatment	Post-treatment		
Material	Dosage (Active constituent lb/ac)	July 29	Aug. 1 2 days	Aug. 8 9 days	Aug. 14 15 days
Untreated (mean of two)		20·917	19·800	19·117	29·400
DDT emulsifiable concentrate	0·25	22·900	22·633	23·500	31·000
Kelthane emulsifiable concentrate	0·5	19·133	13·667	20·433	18·967
Phosphamidon concentrate	0·4	17·867	5·867	10·033	11·867
Dimethoate concentrate	0·125	21·667	6·267	4·667	5·633
Azinphos-ethyl emulsifiable concentrate	0·5	21·067	4·533	3·500	6·667
Azinphos-methyl dispersible powder	0·5	20·300	13·333	14·433	18·667
Carbaryl dispersible powder	0·5	24·800	22·000	19·533	25·467
"Mesurol" dispersible powder	0·375	21·033	7·700	5·367	3·033
Diazinon emulsifiable concentrate	0·125	21·800	6·533	7·033	11·867
Necessary differences for significance	5%	5·670	8·932	9·436	10·149
	1%	7·720	12·161	12·847	13·818
For comparisons of treatments	5%	4·910	7·735	8·172	8·789
	1%	6·685	10·531	11·126	11·967

TABLE 2

MEAN NUMBERS OF *P. latens* PER SAMPLE UNIT IN TRIAL 2—BROOKSTEAD

Treatment		Post-treatment* Mean number per sample		
Material	Dosage (Active constituent oz/ac)	Aug. 26 3 days	Sept. 2 10 days	Sept. 10 18 days
Dimethoate concentrate	1·90	52·10	33·25	47·25
Dimethoate concentrate	1·02	44·30	52·65	60·05
Dimethoate concentrate	0·45	60·95	60·25	89·45
Dimethoate concentrate	0·24	42·95	57·25	68·20
Kelthane emulsifiable concentrate	3·65	103·40	84·45	101·50
Untreated				
Necessary differences for significance	5%	24·25	22·34	57·97
	1%	34·00	31·32	81·27

* Pretreatment populations in all plots, and post-treatment populations in all untreated plots, grossly exceeded 200 per sample and were not included in the analyses.

The only chemicals to show promise in Trial 1 were dimethoate, azinphos-ethyl and Mesurol. An effect was shown on population level for two weeks after treatment and observations indicated that population differences were still present up to five weeks from the time of the applications. Trial 2 results demonstrated that dimethoate at rates as low as ¼ oz active constituent per ac gave good kills. These results were confirmed by subsequent commercial applications throughout the district at applications of about ½ oz per ac.

The killing of brown wheat mite in these trials was not followed by yield differences because of adverse growing conditions. Growth differences, however, were apparent in the preheading period. Provided good conditions occur during late development of the crops, chemical control of brown wheat mite could be economically sound in the seedling and early growth period of wheat and possibly other winter cereals.

REFERENCES

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