

**MANAGEMENT OF THE RED COTTON MITE, *TETRANYCHUS*  
*TELARIUS*(LINNE') ON COTTON, USING TWO RECOMMENDED  
PESTICIDES AND THEIR MIXTURES**

CAESAR GABRIEL KAMBO MWANGI

A thesis submitted in partial fulfilment for the degree of Master of  
Science in (Entomology) in Department of Zoology of the [University of Nairobi.]

1996

UNIVERSITY OF NAIROBI LIBRARY



0104022 9

THIS THESIS HAS BEEN ACCEPTED  
THE DEGREE OF..... MSc 1996  
AND A COPY MAY BE LOANED IN THE  
UNIVERSITY LIBRARY

UNIVERSITY OF NAIROBI  
LIBRARY

## ABSTRACT

A field study on the management of the red cotton mite, *Tetranychus telarius* (Linne') was conducted at the National Fibre Research Centre (NFRC), Mwea Tebere, during the 1990/91 cotton growing season. In the study, two acaricides namely, Brigade (Biphenthrin) 2.5 % E.C. and Kelthane (Dicofol) 18.5 % E.C. each at three different rates and nine of their mixtures at different ratios were applied as foliar sprays against *T. telarius*, a serious pest of cotton in the Central and Eastern regions of Kenya.

In this study, different rates of Brigade and Kelthane as well as their mixtures were used with the aim of reducing the cost of red cotton mite control to prices affordable by the small scale farmers. The rates of application of Brigade, Kelthane and their mixtures in (g a.i./ha) used in the experiment were; Brigade at 15.0; 30.0 and 60.0 g a.i./ha; Kelthane at 115.6, 231.2 and 462.4 g a.i./ha; Brigade:Kelthane mixtures at ratios of 15.0:115.6; 15.0:231.2; 15.0:462.4; 30.0:115.6; 30.0:231.2; 30.0:462.4; 60.0:115.6; 60.0:231.2; and 60.0:462.4 g a.i./ha. A total of 16 treatments including the unsprayed controls were tested for their efficacy against the red cotton mite. The effect of these test acaricides on the distribution of *T. telarius* within the cotton plants and also the cost of its control were determined in the current study.

The experimental design used was 4X4 partially balanced quadruple lattice design with four replicates. During the experiment live adult mites were counted only from the upper 12 main stem node leaves and the data obtained for the distribution of mites was subjected to two-way analysis of variance and means separated by Duncan's Multiple Range Test at a significance level of  $p=0.05$ . The results obtained showed that the distribution of the red cotton mites within the main stem node leaves were not significantly affected by acaricide treatments and that leaves number 3, 4, 5 and 6 had a consistency of harbouring the highest mite densities. In this study, leaf number 4 recorded the highest mite population density of  $3.0 \pm 0.27$  mites per leaf while leaves 3, 5 and

6 recorded  $2.4 \pm 0.27$ ,  $2.3 \pm 0.27$ , and  $2.2 \pm 0.28$  mites/leaf) respectively. In order to increase the accuracy and efficiency in the estimation of red cotton mite populations on cotton plants, the most suitable sampling unit was recommended to be between the third and the sixth node leaf.

The study revealed that of all the sixteen treatments tested, the mixture of Brigade 60.0:Kelthane 115.6 g a.i./ha provided the best mite control, recording a mean mite population density of  $0.90 \pm 0.1$  mites/plant. However its control effect did not differ significantly from that of Brigade applied alone at rates; 30.0 and 60.0 g a.i./ha with  $1.88 \pm 0.3$  and  $0.94 \pm 0.3$  mites/plant respectively. On the other hand the efficacy of this mixture did not significantly exceed that of Brigade:Kelthane (30.0:462.4, 60.0:231.2 and 60.0:462.4 g a.i./ha) with ( $1.97 \pm 0.3$ ,  $1.50 \pm 0.4$  and  $1.01 \pm 0.1$  mites/plant) respectively. The performance of all the 3 rates of Kelthane (115.60, 231.2 and 462.4 g a.i./ha) was poor recording a population density of  $19.0 \pm 8.9$ ,  $13.0 \pm 7.2$  and  $11.0 \pm 5.8$  mite per plant respectively while that of the unsprayed plots recorded  $9.0 \pm 1.2$  mites per plant. In most of the treatments tested, Brigade boosted the activity of Kelthane resulting into mixtures of Brigade and Kelthane being more efficacious than Kelthane applied alone.

The treatment of Brigade 30.0:Kelthane 462.4 g a.i./ha gave the highest returns of K£847.63/ha while the standard (Kelthane 462.4 g a.i./ha) gave K£ 540.96 /ha resulting into a Gross Margin of K£ 455.53 /ha and K£ 371.36/ha respectively. Of all the treatments tested, the most cost effective acaricide mixture in the management of the red cotton mites was found to be Brigade:Kelthane (30.0:462.4 g a.i./ha).

The established mite sampling technique in this case was expected to be quick, efficient, cheap and relatively accurate in the monitoring and estimation of red cotton mite populations in cotton fields. On the other hand, this sampling technique together with the recommended cost effective mite management strategies would increase the production of high quality cotton necessary for both local textile industries and export market.