

Summary of results:

The research undertaken had two main goals, firstly to improve practical aspects of managing mites such as sampling, thresholds and timing of control and secondly to develop a better understanding of the factors influencing mite abundance. In particular, earlier research had shown that the survival of mites through the early season (November/December) strongly influenced the likelihood of later outbreaks. The possibility that early season plant quality influences mite survival was investigated. A summary of key findings is given below.

1. The earlier that mite infestations were initiated and the faster their rate of increase the greater their effect on yield and fibre quality of cotton. The development of a model to estimate yield loss, based on time of mite infestation and rate of population increase, is proposed.

2. Most durable control of mites was achieved if populations were controlled at lower levels (30% of plants infested) than at higher levels. Thresholds for mites in the Siratac program were lowered accordingly.

3. The distribution of mites in fields was highly aggregated and biased toward younger leaves. Options for improving mite sampling were given in the Siratac Manual and the sampling position for mites was changed from the 8th mainstem node below the terminal to the 3rd.

4. Analysis of seasonal abundance data indicates that higher initial infestation levels are correlated with earlier, and potentially more damaging, mite outbreaks. Further, the survival of mites through November and December seems to be pivotal in determining the extent to which this potential is realised.

5. Mites survive winter as actively reproducing colonies on whatever vegetation is available. In reducing the carry over of mites between seasons the aim should be to provide as little suitable vegetation for mites as possible. This should help reduce initial mite infestation levels in cotton.

6. Phenological changes in the suitability of cotton for mite reproduction and development were do not explain the early season decline in mite abundance. Cotton cotyledons were less suitable for mite reproduction than young true leaves. This may slow the early development of mite populations, but only until true leaves appear.

7. The resistance to mites of okra leaf genotypes was investigated. Okra leaves have less surface area suitable for mites which results in density dependent competition between mites occurring earlier than on normal shaped leaves and leads to slower rates of population growth.