

The pest status of *Tuta absoluta* on potato in South Africa

Diedrich Visser (ARC-Vegetable and Ornamental Plants) - article and photos.



Fig. 1. *Tuta absoluta* final instar larva (8 mm).

Background

The tomato leafminer was first reported in South Africa in August 2016. In South Africa it is more commonly known by its scientific name, i.e. *Tuta absoluta*. The caterpillars (Fig 1) are small leafminers and the adults are micro-moths in the family Gelechiidae (Fig 2). The caterpillars make blotch leaf mines (Fig 3), similar to that of the potato tuber moth. *Tuta absoluta* originated from South America, but today it is found across Europe, Africa, the Middle East, and spreading

towards East Asia. It is one of the most destructive pests on tomato, but it will also infest and damage other crops in the Solanaceae family. Although potato is a known host of *T. absoluta*, much confusion existed as to whether its devastating damage capabilities on tomato might be equally applicable to potato, especially its potential to attack and infest tubers. A project was therefore initiated to investigate the pest status of *T. absoluta* under field conditions, as well as on tubers under controlled environments.



Fig. 2. *Tuta absoluta* adult moth (6 mm).



Fig. 3. A typical leaf mine of *Tuta absoluta*.

Occurrence in potato fields

Six potato fields were monitored every ten days over a period of three years at the ARC-VOP (Roodeplaat, Pretoria), for the presence of *T. absoluta*. During each visit, 100 leaf mines were collected randomly across the field and later dissected in the laboratory to facilitate the identification and counting of larvae inside the leaf mines. In addition, a commercial potato farm in Mpumalanga was visited on three occasions to install pheromone traps and to collect tubers at harvest. The potato tuber moth was included in all monitoring actions during the field visits, as a control and for comparisons.

Tuta absoluta was consistently present in all potato fields, both in leaf mines (larvae) and pheromone traps (moths). However, at the ARC-VOP, Roodeplaat, the potato tuber moth was the seasonal dominant species in leaf mines over three years, despite intermittent higher peaks of *T. absoluta* during some

inspection dates. A general (rounded) ratio of 70:30 was found in favour of the potato tuber moth, for the ARC-VOP research farm (Fig. 4). However, no evidence could be found that the larvae of *T. absoluta* infested tubers under field conditions, even though larvae were always present in leaf mines, and very high numbers of moths were caught in pheromone traps placed in the potato fields.

Potential to infest potato tubers

Tuta absoluta was also evaluated for its potential to infest potato tubers under controlled conditions in the laboratory. First instar larvae were unable to penetrate potato tubers that did not have any visible sprouts. However, even small sprouts could sustain an infestation; the length of sprouts played a role in its reproduction potential - tubers with longer sprouts sustained more larvae. In all tests, the potato tuber moth reproduced at a higher rate than *T. absoluta* when feeding and competing on the same sprouted tubers, as well as when feeding on sprouted tubers without competition. No cultivar differences could be found; *T. absoluta* survived and reproduced on sprouted tubers of seven tested cultivars.

Conclusions

The final conclusion of this study is that, although *T. absoluta* occurs in all potato fields as larvae in leaf mines, it is not a threat to potato production. Our current information indicates that tubers will not be attacked under normal field conditions, and that mining in leaves is more limited, compared to the potato tuber moth. Sprouted seed tubers may be vulnerable when left outside and not in cool storage, but the risk is much lower than for the potato tuber moth. It is recommended that *T. absoluta* should be classified as a minor pest that may consume a limited amount of foliage under most conditions. If it becomes a concern, e.g. on the rare occasions when it may move to potato from adjacent infested tomato fields, many insecticides are available for its control. However, even then, *T. absoluta* will fall into the same category as the other caterpillars sometimes found feeding on potato foliage, i.e. it will be part of the minor caterpillar complex on potato.

A detailed final report on the findings of this study will be made available on the website of Potatoes South Africa, www.potatoes.co.za. For any further enquiries, contact Dr Diedrich Visser, email: dvisser@arc.agric.za. Potatoes South Africa are acknowledged for funding of the project, and EDE Farming is acknowledged for access to their potato production facilities. ©

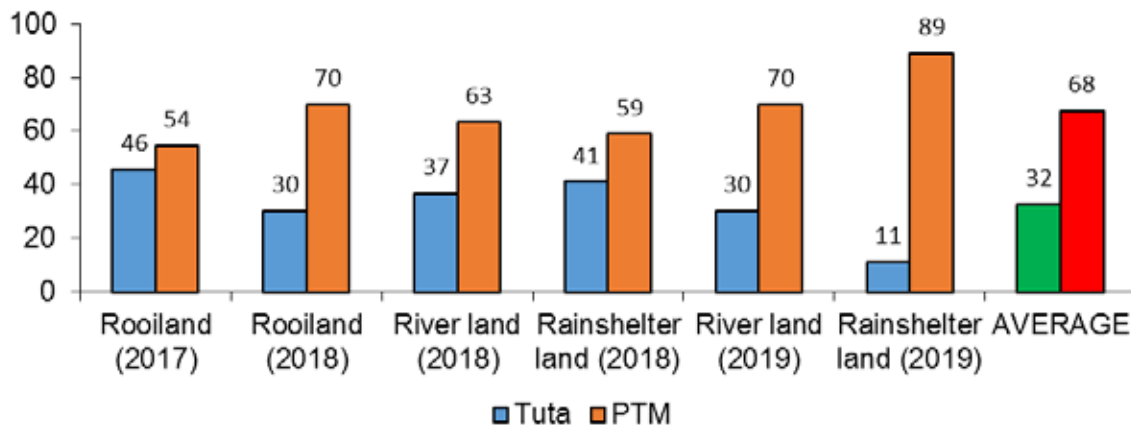
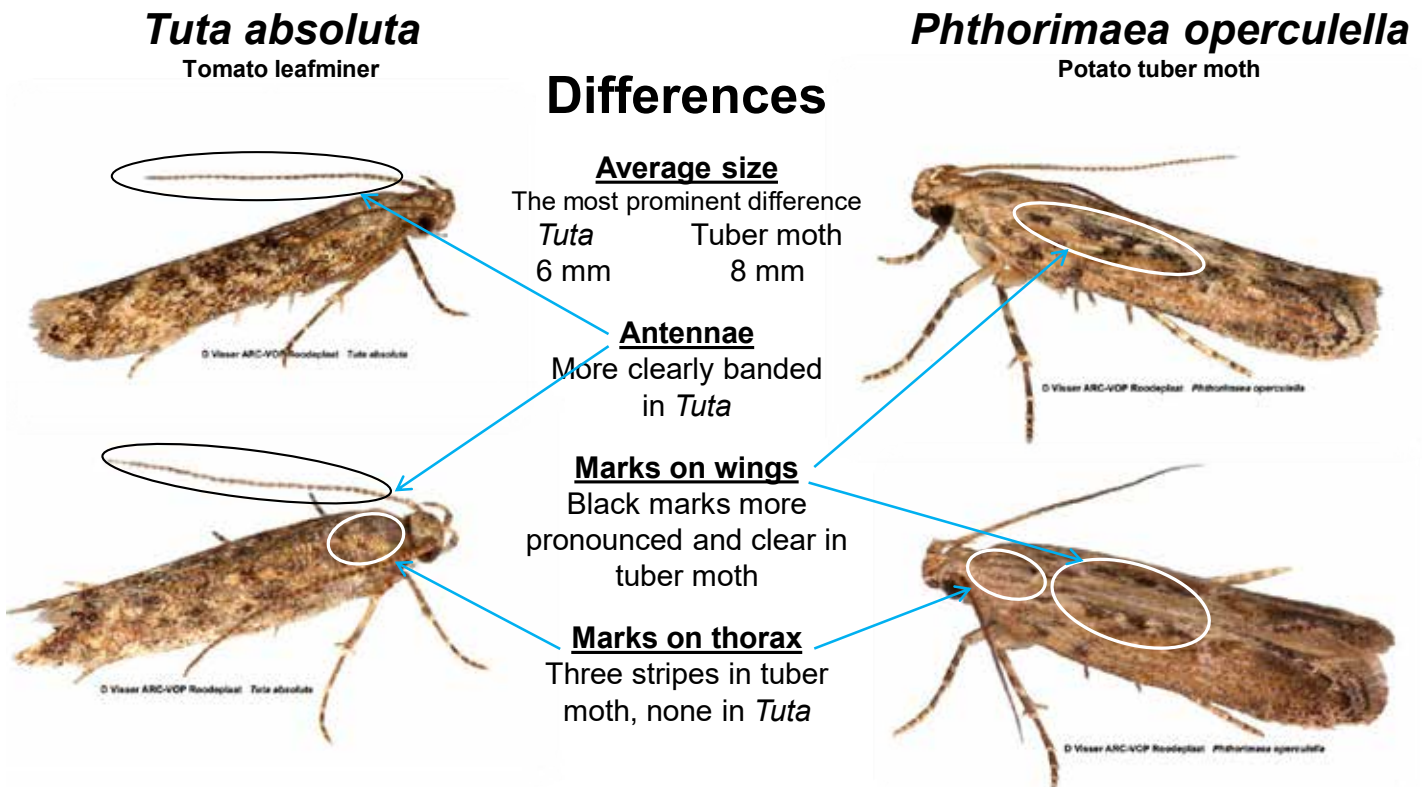


Fig. 4. The percentage ratio of *Tuta absoluta* (Tuta), and potato tuber moth (PTM) larvae, in leaf mines collected in six potato fields over three years at ARC-VOP Roodeplaat.

A detailed final report on the findings of this study will be made available on the website of Potatoes South Africa, www.potatoes.co.za. For any further enquiries, contact Dr Diedrich Visser, email: dvisser@arc.agric.za. Potatoes South Africa are acknowledged for funding of the project, and EDE Farming is acknowledged for access to their potato production facilities.



For final and conclusive identifications, analyses of the genital structures of the male moths are necessary.