

The onion thrips, *Thrips tabaci* Lindeman, is the most destructive insect pest of onion, *Allium cepa* L. worldwide. Despite the heavy losses incurred as a result of damage by the onion thrips, very little efforts have been made to develop an integrated pest management strategy in many African countries.

Studies were undertaken on the distribution of the onion thrips and their seasonality, in relation to the onion growth stages and management strategies for thrips evaluated on the onion crop. To determine the distribution of thrips species associated with the onion and the crop management practices, a survey was conducted between 2000 and 2001, in seven districts within Central, Eastern, Rift Valley and Western provinces of Kenya. The results showed that all the onion farms were infested by at least one thrips species. *T. tabaci* was the predominant species constituting 89.6 % of the adults collected. The other thrips species were the western flower thrips, *Frankliniella occidentalis* (Pergande) (6.3%), the cotton bud thrips, *F. schultzei* (Trybom) (1.4%), the bean flower thrips, *Megalurothrips sjostedti* (Trybom) (1.5%) and the gladiolus thrips, *Thrips simplex morison* (0.3%). A predatory thrips *Aeolothrips* sp. constituted 0.3% of the thrips collections. *F. occidentalis* infested most onion farms within Kirinyaga District\_ where it constituted 43.5% of the thrips. Thrips were ranked as the most important insect pests of onions by farmers and pesticides were the only control method used against the onion pests. The Red Creole was the most commonly grown onion cultivar and the crop was mostly grown under furrow irrigation, in a mono cropping system The onion crop management practices adopted and their likely association with severe thrips damage of the onion crops is discussed

Studies on the relationship of weather and onion crop phenology to thrips infestation showed that thrips infested the onion crops throughout the year and that immigration of thrips from external sources caused the initial thrips infestation on onion. The highest thrips numbers were observed during the bulb formation and enlargement stages from 35 to 84 days after transplanting (DAT), while the lowest thrips numbers occurred during pre-bulbing (0 to 28 DAT) and maturation growth stages (91 to 105DAT). Dry weather with moderately high temperatures tended to increase the thrips numbers, while wet seasons with moderately high relative humidity resulted in low thrips numbers. Relative humidity was the only significant weather factor for predicting thrips numbers in the onion crop.

Studies on the relationship between thrips infestation, and onion plant damage, disease incidence, growth and bulb yield showed a significant positive correlation between foliar disease intensity and damage of onion plants with thrips infestation. Thrips infestation resulted in yield losses ranging from 18 to 60% among the nine different onion plantings grown in the year 2000 and 2001. Thrips infestation also significantly ( $P=0.05$ ) reduced the onion bulb quality. Infestation at 56DAT significantly reduced the onion bulb yield during the onion crop development. A switch in dry matter increase from the leaves to the bulb occurred from the 56DAT and continued until harvest. The dry matter partitioning between the leaves and bulb during the onion crop development was best fitted to a non-linear third-degree polynomial relationship. A correlation matrix for the onion growth variables. bulb yield and thrips infestation showed significant positive correlation between the final bulb yield and the growth variables, while thrips infestation was negatively correlated with the onion growth and bulb yield.

Evaluation of the promising preventive options for onion against thrips infestation was carried out using two field trials at Mwea Tebere during 2001. All the preventive treatments tested significantly reduced thrips population during the early growth stages. Imidacloprid (Confidor 200 SL®) seedling drenching and Carbofuran (Furadan 5G®) soil placement. significantly reduced thrips population and increased onion bulb yield over the unprotected control. None of the pesticides tested was phytotoxic to the onion seedlings.

The bulb formation and enlargement stages were shown to be critical for the protection of onion from thrips infestation and yield reduction. Selective protection of the onion crop during the critical growth stages gave higher marginal returns than the full season calendar based protection.