Climate changes and the newly emerged insect pests in the NENA region

The NENA region faces urgent and interconnected challenges of climate change and political instability. These factors not only weaken the agricultural quarantine and phytosanitary system but also create an environment that encourages the spread of agricultural pests across borders. In this brief editorial, I will shed light on some key insect pests that have significantly worsened over the past decade, emphasizing the need for immediate action.

Food and Agriculture Organization FAO and other organizations focus on transboundary insects that threaten crops due to their ability to spread across multiple territories and impact many crops. The most common transboundary pests of crops include desert locusts *Schistocerca gregaria*, fruit flies, red palm weevils *Rhynchophorus ferrugineus*, and fall armyworms *Spodoptera frugiperda* , which invaded maize in 2016 in West Africa. As the migration of these pests is often aided by strong winds, trades, and climatic factors, other insect pests succeeded in traveling across countries and continents, such as citrus leaf miner *Phyllocnistis citrella* in 1994 and tomato leaf miner *Tuta absoluta* (=*Phthorimea absoluta*) in 2006.

Climate change and global warming have caused many insect pests to return in larger numbers. Some pests that were previously under control are now causing harm. This resurgence can also include new pests appearing and becoming problematic for the same reasons. For instance, the *Metcalfa pruinosa* (Say, 1830) citrus flatid leafhopper was recently found in Iraq (2023-2024). *Hauptidia maroccana* greenhouse leafhopper appeared in Jordan in the last three years and was officially recorded in (**2024).** Both insects are entirely new to the NENA region ecosystem.

Four different species of mealybugs were recorded vis. *Dysmicoccus brevipes* pineapple mealybugs on date palm roots in Iraq **(2022-2024),** *Phenacoccus madeirensis* Madeira mealybug on a wide range of agricultural and ornamental plants in Jordan (**2019),** *P.solenopsis* cotton mealybugs severe infestation on a wide range of crops in particular hibiscus species; *Pseudaspidoproctus hyphaeniacus* (Hall 1925), date palm giant mealybugs (**2021).**

Scale insects, such as *Dactylopius opuntiae* (cochineal scale insect), *Ceroplastes rusci* (fig scale insect), *Palmapsis phoenicis* (green pit scale insect), and *Parlatoria blanchardi* (date palm white scale insect), have emerged as potential pests in various environments. For example, *Dactylopius opuntiae* has damaged cactus plants in Morocco, Jordan, Lebanon, Syria, and recently Tunisia. *Ceroplastes rusci* has affected figs in Iraq from 2022 to 2024 and ficus species plants. *Palmapsis phoenicis*, initially registered in 1976 in Sudan, was transported to Libya through infested offshoots, causing significant damage to date palm trees

in Oasis. *Parlatoria blanchardi*, which traditionally infested weak date palm offshoots, has shifted its habitat to infest large trees, leading to substantial damage.

The presence of the Mediterranean fruit fly has exacerbated the issue of fruit flies as insect pests on different crops. Other significant pests have also arisen, such as the recent outbreak of the peach fruit fly, *Bactrocera zonata*, in Iraq. Over the last three years, the peach fruit fly has displaced *Ceratitis capitata*. Additionally, the African fig fruit fly, *Zaprionus Indianus*, has been discovered on date palm fruits and other fruit crops.

Many stakeholders have inquired about the impact of climate change on insect population abundance.

Climate change represents one of the most significant challenges for global agriculture. As temperatures rise and weather patterns shift, the dynamics of agricultural pest populations change, leading to profound implications for crop production and food security. One of the most immediate effects of climate change on agricultural pests is the alteration of their populations and distribution patterns. Rising temperatures can increase pest populations as warmer conditions enhance their reproductive rates. For instance, fall armyworm, a significant pest affecting maize and other crops, has been observed to have longer breeding seasons in warmer climates, resulting in more yearly generations. This phenomenon is evident in regions where previously minor pest outbreaks have evolved into severe infestations, putting additional pressure on farmers to implement pest control measures.

High temperatures will negatively affect the cues and pheromones released by insects and natural enemies working in a complex ecosystem network. Many agricultural pests, such as dubas bugs, *Ommatissus lybicus,* and white scale insects on date palms, have varied thermal tolerances. They can tolerate temperatures above 45 degrees Celsius, as in Jordan Valley in 2022-2024. These tolerances dictate the climates in which they can thrive. Warmer temperatures may allow pests to expand their range into previously inhospitable areas.

Conclusion

The effects of climate change on agricultural pests represent a significant challenge for global agriculture. Farmers should adapt their management practices accordingly as pest populations increase, shift geographically, and alter their life cycles. Understanding these changes is crucial for ensuring food security and sustainable agricultural practices in a rapidly changing climate. Ongoing research and collaboration among scientists, farmers, and policymakers will be essential to develop effective strategies for managing pests in the new environment and supporting agricultural resilience and productivity.

Ibrahim Jaddoa Al-Jboory,Ph

Senior Scientist, Arab Society for Plant Protection

Editor in Chief of ANEPPB