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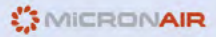
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Locust and grasshopper management and control

IMPORTANCE OF SOLITARIOUS DESERT LOCUST POPULATION DYNAMICS: LESSONS FROM HISTORICAL SURVEY DATA IN ALGERIA

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The desert locust, *Schistocerca gregaria* (Forskål) (Orthoptera: Acrididae), is a major pest and well known in its gregarious phase. However, it is not well understood during recession periods, when the solitary phase populations are discrete. Nonetheless, these populations are at the origin of the invasions when ecological conditions become favourable. This lack of knowledge of the solitary phase individuals impedes effective preventive management of this pest.

Archive data collected in Algeria from 1980 to 2011 were used to analyse solitary population dynamics across the Algerian Sahara where some outbreak areas are located that play a major role in the invasion process. The results confirm previous empirical observations on solitary population dynamics. First, a clear difference could be documented between the northern and southern Saharan regions of Algeria concerning the locust dynamics and the impact of environmental conditions. The importance of runoff was clear to create suitable habitats over a long period and to very distant places from rainy areas. Second, a link, on an annual basis, between green vegetation and presence of solitary locusts was found.

Third, statistical relationships between various locations demonstrated a clear regional dynamics. Our study confirmed the importance of migrations of solitary populations among Algerian regions and more generally within the recession area of this species. The operational implications of these findings are multiple.

First, they confirm the need of a flexible and scalable preventive system during the year, from 1 year to another and with a clear distinction between the northern and southern Saharan areas of Algeria. Second, they also confirm the necessity for the inclusion of wadis and soil moisture estimations from remote sensing in geographic information systems for preventive management. And third, they clearly illustrate the importance to target solitary locusts for more efficient preventive survey operations.

Key Words: *Schistocerca gregaria*, phase polyphenism, migration, meteorological data, Orthoptera, Acrididae.