

les dossiers d'**AGROPOLIS** INTERNATIONAL

Expertise of the scientific community



Biodiversity

Science for humans
and nature



A. Monard © CIRAD

Understanding the origins of desert locust plagues

The desert locust is a major pest. Spectacular plagues can span an area of over 29 million km² from Mauritania to India, inducing considerable material, human and environmental damage. Controlling this insect is thus crucial, and a national priority in many developing countries. Preventive desert locust control requires permanent monitoring of environmental conditions in the outbreak source areas, which account for only 0.25% of the total invasion area. Each concerned country should have a fast reaction capacity so as to be able, if necessary, to carry out preventive treatments of the first outbreaks before they spread. Rapid interventions are essential.

In collaboration with national locust control centres and the Food and Agriculture Organization of the United Nations, CIRAD's Locust Ecology and Control research unit is conducting research in Africa to facilitate detection of high risk situations. Molecular biology techniques (microsatellite markers, AFLPs) are used to gain insight into and more

accurately monitor migrations and solitary population variations during pre-invasion phases so as to assess the extent of risk. In addition, the unit is working on enhancing the use of spatial remote sensing and geographic information systems so as to be able to detect conditions suitable for locust breeding even earlier. These habitats are located in remote and relatively uninhabited desert areas. Satellite data can provide continuous estimations of rainfall and green grassy vegetation development, i.e. key factors for predicting desert locust development and outbreaks. Satellites such as METEOSAT, SPOT-VGT, MODIS and SMOS are used and fine calibrations are under way. All of these studies should further enhance the desert locust plague prevention strategy which has already proven its efficacy over the last 50 years.

Contact: Michel Lecoq, michel.lecoq@cirad.fr

▲ A gregarious desert locust, *Schistocerca gregaria* Forskål.

de Costa Rica, Empresa Brasileira de Pesquisa Agropecuária, etc.) and development agents. There are also interdisciplinary collaborations with other research units (BGPI, CBGP, DAP, etc.).

The unit generates knowledge in the fields of pest biology and ecology, plant epidemiology and sustainable resistance. These results contribute to enhancing pest management, thus reducing damage

and improving produce quality. The study findings are promoted through the dissemination of new methods for forecasting and managing biotic risks, and by the identification of plant material with sustainable resistance.

The unique feature of this unit is the multidisciplinary aspect of the research, combining mycology, entomology, epidemiology, population dynamics, genetics,

landscape ecology, integrated control and biostatistics in different agroecological settings and on scales ranging from the tree to the landscape, including village plots and commercial plantations. ...