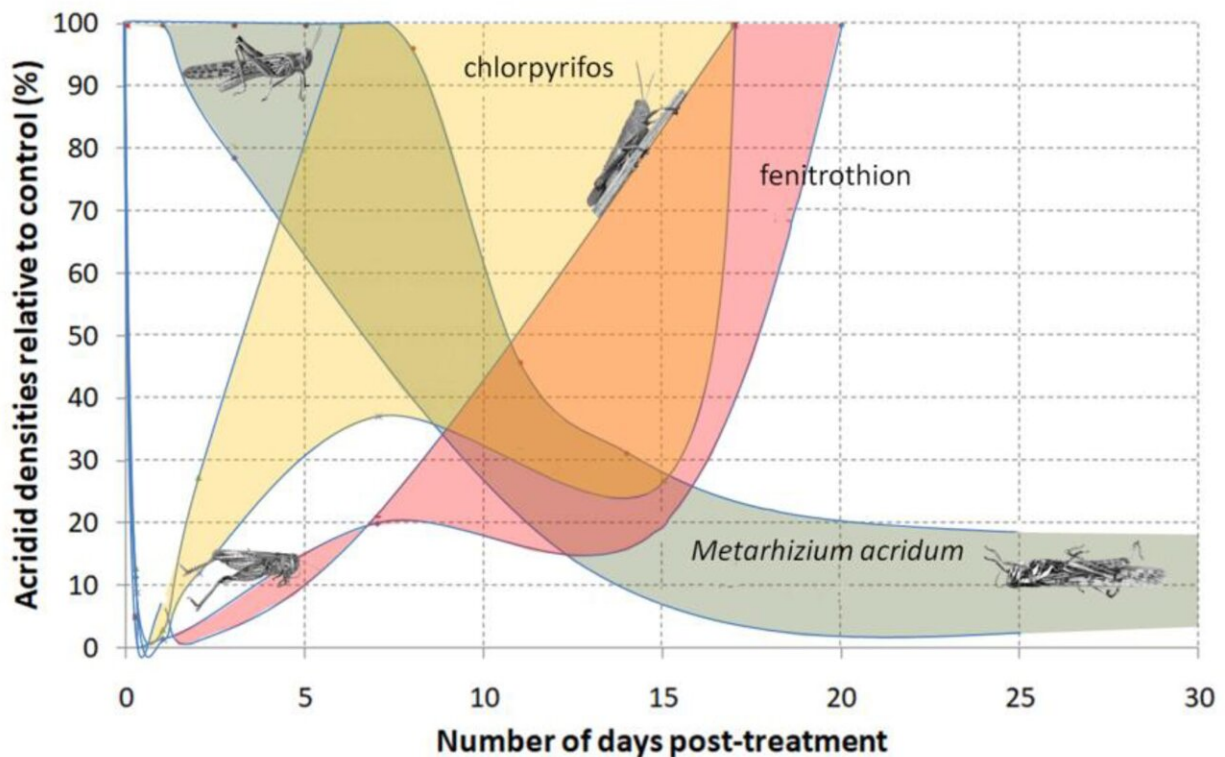


Insecticide use against desert locust in the Horn of Africa 2019–2021 reveals a pressing need for change

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Densities of acridids in the first month following sprays with either chlorpyrifos, fenitrothion or *M. acridum*. Credit: *Agronomy* (2023). DOI: 10.3390/agronomy13030819

In work published in *Agronomy*, the TMG Research gGmbH study team

traced a highly destructive desert locust invasion in the Eastern Africa and Horn region between 2019-2021. Ethiopia and Kenya sprayed well over a million hectares of territory with damaging nerve agents malathion and chlorpyrifos, both from the organophosphate family of pesticides.

The scale of the invasion—and subsequent choice of control measures—was magnified by unprecedented breeding due to changing [climate conditions](#). Due to the inaccessible location of the breeding grounds, the scale of the threat was discovered too late and countries were left with little choice but to use highly toxic chemical pesticides. However, this had severe impacts on honey bees and other pollinators, indicating that valuable biodiversity was destroyed by the campaign.

Animal pollinators, mostly insects, play a critical role in food production and biodiversity health. Scientists at the TMG Research found that in the case of Ethiopia, control measures led to an officially reported 78% decline in honey production, equating to a loss of US\$500 million in revenue.

In addition, [ecosystem services](#) provided by bees are estimated to be worth more than 15 times the value of honey and other hive products combined. Tallying the cost of recolonizing empty beehives as well as mortality of wild pollinators, the "true costs" of the organophosphate campaign is likely to be in the realm of billions of dollars.

The consequences for Ethiopia's valuable honey sector have been catastrophic: an estimated 76 billion honeybees either perished or abandoned their hives all together, plummeting honey production from a peak of nearly 70,000 tons in 2017-18 to just over 10,000 tons in 2021 (FAOSTAT). Similar impacts were revealed by a comprehensive study in Senegal, commissioned by the Food and Agriculture Organization of the UN (FAO) in the aftermath of the 2003-2005 Western African

plague.

The solution: Innovative early warning systems and new ways to fight desert locust

In recent years, much of the Horn of Africa and parts of Western Asia have experienced unprecedented outbreaks of desert [locust](#), forcing them to resort to the use of organophosphates to decisively eliminate the threat. In 2020, Kenya was confronted by an unfathomable locust swarm spanning 2,400 km²—equal to the area of Luxembourg—with a potential density of 80 million individuals per km² (or nearly 200 billion locusts in total).

Since a locust can eat as much as its own body weight of 2 grams per day, this particular swarm had the theoretical potential to devour upwards of 384,000 tons of vegetation daily, including pastures and [food crops](#), with [disastrous consequences](#) for the maize harvest—an important staple crop.

Had countries an access to better early warning systems, such drastic action might have been avoided. In light of expected climate-induced increases in intensity and frequency of locust outbreaks in future, it is imperative that more sustainable approaches to manage pest invasions at national and international level are explored as a matter of urgency.

The study calls on affected countries, and international support agencies, to urgently embark on a set of interrelated measures to prevent the use of highly toxic chemical pesticides in future.

1. Invest in intelligent early warning and action systems to identify locust breeding sites pre-empting the use of widespread pesticide campaigns

2. Launch an urgent independent scientific enquiry into the high mortality of honeybees in both Ethiopia and Kenya, which should also address the mortality of wild bees and other non-target organisms—on land, air and in water bodies.
3. Pursue a ban on the use of organophosphates.
4. In tandem with early action, explore safer biopesticide alternatives, such as a recent successful campaign in [Somalia](#).
5. Support countries and international organizations to develop a new governance to manage climate-related pests and diseases.

More information: Wim C. Mullié et al, Insecticide Use against Desert Locust in the Horn of Africa 2019–2021 Reveals a Pressing Need for Change, *Agronomy* (2023). [DOI: 10.3390/agronomy13030819](https://doi.org/10.3390/agronomy13030819)

Provided by TMG Research gGmbH

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