

TACKLING INVASIVE SPECIES IN AFRICA

Frequently Asked Questions

Q. What are invasive species?

A. According to the Convention on Biological Diversity, invasive species include animals, plants, fungi and microbes introduced accidentally or deliberately outside their natural habitats or countries of origin. For a species to become invasive, it must successfully out-compete native organisms, spread through its new environment, increase in population density and harm ecosystems in its introduced range.

Q. How do invasive species spread?

A. Movement of people, as well as trade in animals, plants and their products, are the key ways through and resultant increase in trade and travel, along with weak phytosanitary systems in developing countries, has dramatically elevated the rate of species invasions. In addition, climate change is expected to alter the geographical ranges of some species further contributing to invasions.

Q. What is the global impact of invasive species?

A. Globally, invasive species are considered the second most important threat to nature, after human activity, due to their severe and cross-cutting impacts on the health of people, animals, plants and the environment, and overall economic development. The ability of invasive species to dominate new locations enables them to colonise valuable land making it unsuitable for agriculture and livestock keeping. Invasive species also damage crops, for example by transmitting diseases, limiting production and yield, thereby threatening food and nutritional security. In addition, many invasive species have quarantine status and are rigorously monitored on imported crops, plants or seeds in many countries to prevent their arrival and establishment. In accordance, produce from countries or regions with known presence of invasive species with quarantine status are subject to international trade restrictions, with significant and adverse economic implications. Some invasive species, especially insects and other arthropods, cause diseases in people and animals. Moreover, the chemical pesticides used to control invasive pests are often destructive, thereby affecting the balance of nature by displacing or killing indigenous beneficial species, like pollinators and natural enemies of harmful insects. Economies also suffer as a result of the major financial investments required to implement the spectrum of activities necessary for the prevention, and suppression of invasive species.

Q. How do invasive species affect sub-Saharan Africa?

A. Sub-Saharan Africa (SSA), is one of the most susceptible regions to invasive species. Indeed, it is projected that the threat posed by this menace in the region will directly affect the attainment of three sustainable development goals (SDGs): SDG1 (No Poverty); SDG2 (Zero Hunger); SDG3 (Good Health and Well Being); and at least five goals indirectly: SDG4 (Quality

Education); SDG5 (Gender Equality); SDG8 (Decent Work and Economic Growth); SDG 10 (Reduced inequalities), and SDG 13 (Climate Action).

Q. What are some examples of invasive species affecting crops in Africa?

A. The most recent invasive species in SSA is the fall armyworm, a moth that is native to the Americas, which was first reported in Africa in January 2016. The pest is currently devastating maize and other crops in at least 38 African countries, placing at risk the food security, and indeed the very livelihoods, of around 300 million people. Previous invasive species include the larger grain borer, a serious pest capable of reducing stored grain to pulp, which was introduced into Africa from Central America in the late 1970s. Two years ago, the potato cyst nematode, microscopic, soil dwelling roundworms that are highly destructive to potatoes worldwide, was reported in Eastern Africa. In the horticultural sector, recent invaders include the fruit flies species *Bactrocera zonata*, *B. dorsalis* and *B. latifrons*, which are native to Asia. In particular, *B. dorsalis*, known as the oriental fruit fly, which is currently present in almost all African countries, is extremely devastating. Aside from ruining fruit and vegetable yield, at times up to 100%, the oriental fly, like other fruit fly species, is a quarantine pest, and its presence in Africa restricts the export of produce from the continent to Europe and emerging markets in North America. Moreover, the citrus psyllid, *Diaphorina citri*, the vector of the devastating greening disease which is responsible for the near collapse of the citrus industry in Florida, USA, has recently been reported in Africa. In addition, *Tuta absoluta*, a moth originating from Peru, has swept across Africa, leading to the declaration of a state of emergency in some of the continent's main tomato producing areas.

Q. What are some invasive insect-vectored and other crop diseases in Africa?

A. Examples include the maize chlorotic mottle virus (MCMV) transmitted by corn thrips, which originated from Peru and is a combination with the sugarcane mosaic virus causes the maize lethal necrosis (MLN). Other invasive insect-vectored crop diseases include the tomato spotted wilt virus, transmitted by western flower thrips, the iris yellow spot virus, transmitted by onion thrips and banana bunchy top virus, transmitted by the banana aphid. As indicated above, a recent invader, the citrus psyllid, is transmitting the citrus greening disease, also known as Huanglongbing, posing serious threats for the citrus industry in Africa.

Q. Are invasive species implicated in diseases of people and animals in Africa?

A. Factors such as climate change and movement of people are affecting the geographical distribution of vectors as well as

pathogens of emerging infectious diseases. As a result, while the diseases are already causing significant problems in traditional zones, they are now also spreading to new areas in Africa, while also becoming a growing threat beyond the continent. Examples include two mosquito species, *Aedes aegypti* and *Aedes albopictus*, that transmit, dengue, Zika, chikungunya, and other viruses. Commonly known as the Asian tiger mosquito, *Aedes albopictus* is considered to be the most invasive mosquito in the world. Originally native to Asia, it has invaded Europe, Latin and North and South America, and Africa, where it has extended range in West and Central Africa. In general, in its endemic settings, *Aedes albopictus* does not feed on people much, which makes it only secondary to *Aedes aegypti* in the transmission of these viral diseases. However, in new locations, *Aedes albopictus* could become more important as an emergence vector, thereby contributing to the introduction of disease to new areas.

Q. How about invasive weed species?

A. Invasive weeds in SSA include the *Prosopis* genus (infamously known in Kenya as “Mathenge”), enlisted for rehabilitation of African dry lands in the 1970s, but which has since turned out to be a noxious, extremely aggressive invader that replaces native vegetation and colonises important regions like rangelands. Another species is *Parthenium hysterophorus*, a native of North and South America that is considered one of the world’s most serious invasive plants. Dubbed famine weed in parts of East Africa, the plant is now extensively spread over cultivated and pastoral lands in the region biodiversity loss while also making land hugely unproductive. The *Parthenium* species can cause respiratory problems and dermatitis in people, and dermatitis and diarrhea in livestock, affecting meat and milk quality. Additionally, the weed has the ability to sustain the malaria-transmitting mosquito, *Anopheles gambiae*, by extending its life as a preferred sugar source, even in the absence of a blood meal. In addition, the water hyacinth, *Eichhornia crassipes*, a free-floating aquatic plant native to South America, is a major problem in Africa. For example, in Lake Victoria, floating mats of the weed block boat

access, hampering fishing and transportation, while also forming a habitat for mosquitoes, contributing to malaria prevalence. *campestris*

Q. What is the situation in regard to tackling invasive species in Africa?

A. The increasing frequency of pest invasion and establishment in Africa suggests that many countries lack adequate capacity to detect and implement management measures. To effectively address the invasive species menace in SSA, a shift in approach from a reactive to a more proactive mode based on the internationally recognised three-stage approach of prevention, early detection, and control and restoration is needed to be adopted. A proactive, effective approach to invasive species in SSA will require stronger phytosanitary capacity and systems; continent and nationwide surveillance, and integration of invasive species threats into national disaster response units; interdisciplinary, cross border research to develop novel solutions; collaborative resource mobilisation, as well as crowd-sourcing and citizen science. This stipulates urgent need for systematic, coordinated, consolidated, proactive and sufficiently financed national, regional and international strategies to mitigate invasive pests. In turn, a strategy for invasive species in SSA is vital, to ensure coordination and prioritisation of all relevant issues, as well as effective and continuous partnerships and dialogue among all stakeholders.

Q. Why are *icipe*, IITA and CABI spearheading the development of a regional strategy for invasive species in Africa?

A. The [International Centre of Insect Physiology and Ecology \(icipe\)](#); the [International Institute of Tropical Agriculture](#) and [CABI](#) are spearheading the development of a regional strategy for invasive species, based on their extensive experience, proven leadership in research for development, including on invasive species, capacity building, knowledge dissemination and technology transfer, in Africa.

icipe's mission is ensure better food security and livelihoods in Africa. The Centre achieves this goal by producing world-class knowledge, and then developing solutions that are environmentally friendly, accessible, affordable and easy-to-use by communities. These objectives are delivered through four thematic areas – human health, animal health, plant health and environmental health, resulting in a unique framework to tackle the interlinked problems of poverty, poor health, low agricultural productivity and environmental degradation in a comprehensive manner. The four themes approach also provides a platform to build the capacity and leadership of African scientists in a cross-cutting manner; it allows collaboration with hundreds of researchers and partners across Africa and the world; and it enables the effective transfer of technologies and strategies to end-users. *icipe* gratefully acknowledges the financial support of the following core donors: Swiss Agency for Development and Cooperation (SDC), Switzerland; Swedish International Development Cooperation Agency (Sida); UK Aid, Government of the United Kingdom and Ministry of Higher Education, Science and Technology, Kenya. In addition, *icipe* receives restricted project funding from a range of institutions from across the world, among them, governments, private foundations and United Nations agencies. *icipe* also benefits from extensive partnerships with research collaborators (including universities and research institutes in Africa and beyond), private sector partners, and communities across Africa. A comprehensive list of *icipe* Donors and Partners is available at: <http://www.icipe.org/donors-and-partners>

IITA is a not-for-profit institution that generates agricultural innovations to meet Africa's most pressing challenges of hunger, malnutrition, poverty, and natural resource degradation. Working with various partners across sub-Saharan Africa, IITA improves livelihoods, enhance food and nutrition security, increase employment, and preserve natural resource integrity. IITA is a member of CGIAR, a global agriculture research partnership for a food secure future.

CABI is an international not-for-profit organization that improves people's lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. Through knowledge sharing and science, CABI helps address issues of global concern such as improving global food security and safeguarding the environment. This is achieved by helping farmers grow more and lose less of what they produce, combating threats to agriculture and the environment from pests and diseases, protecting biodiversity from invasive species, and improving access to agricultural and environmental scientific knowledge. CABI's 48 member countries guide and influence the core areas of work, which include development and research projects, scientific publishing and microbial services. We gratefully acknowledge the core financial support from our member countries (and lead agencies) including the United Kingdom (Department for International Development), China (Chinese Ministry of Agriculture), Australia (Australian Centre for International Agricultural Research), Canada (Agriculture and Agri-Food Canada), Netherlands (Directorate-General for International Cooperation), and Switzerland (Swiss Agency for Development and Cooperation). Other sources of funding include the fees paid by our member countries and profits from our publishing activities which enable CABI to support rural development and scientific research around the world.