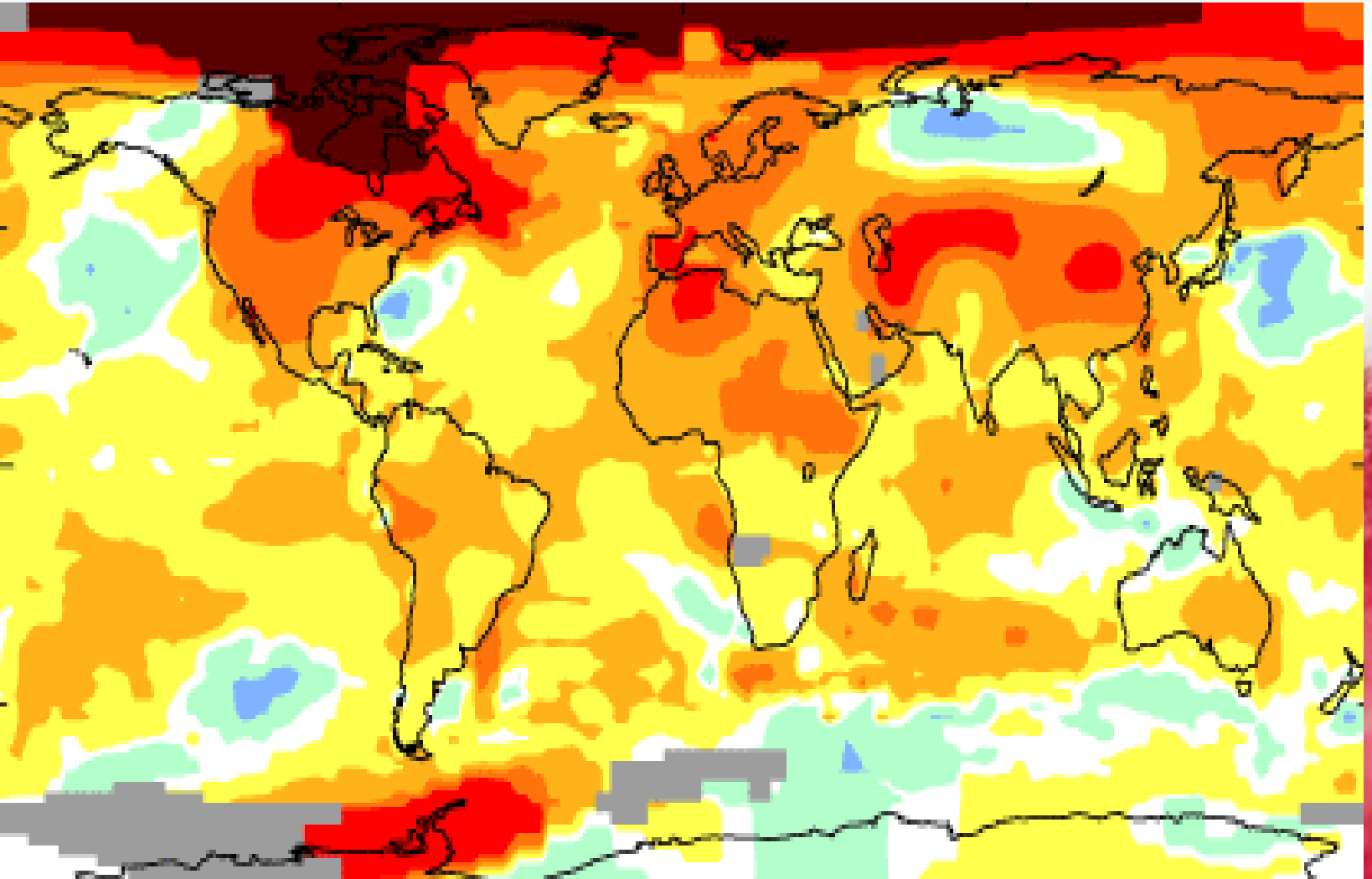
PAOLO FONTANA

CAMBIAMENTI CLIMATICI ED INSETTI ALIENI

Paolo Fontana – World Biodiversity Association

Lusia, 18 maggio 2019

world biodiversity association onlus



Cambiamento climatico

Da Wikipedia, l'enciclopedia libera

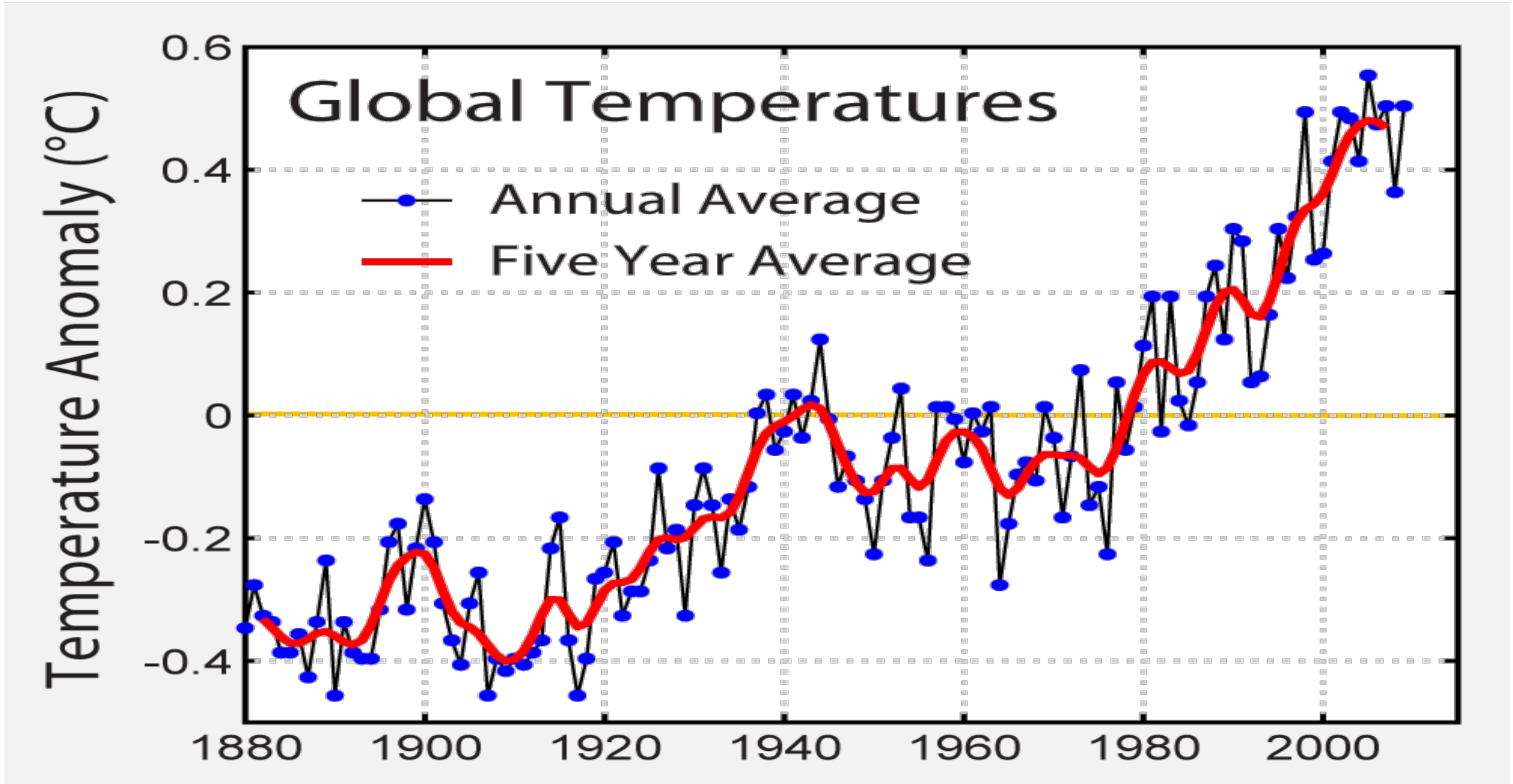
In climatologia con il termine cambiamenti climatici o mutamenti climatici si indicano le **variazioni del clima della Terra**, ovvero variazioni a diverse scale spaziali (regionale, continentale, emisferica e globale) e storico-temporali (decennale, secolare, millenaria e ultramillenaria) di uno o più parametri ambientali e climatici nei loro valori medi: temperature (media, massima e minima), precipitazioni, nuvolosità, temperature degli oceani, distribuzione e sviluppo di piante e animali.

Riscaldamento globale

Da Wikipedia, l'enciclopedia libera

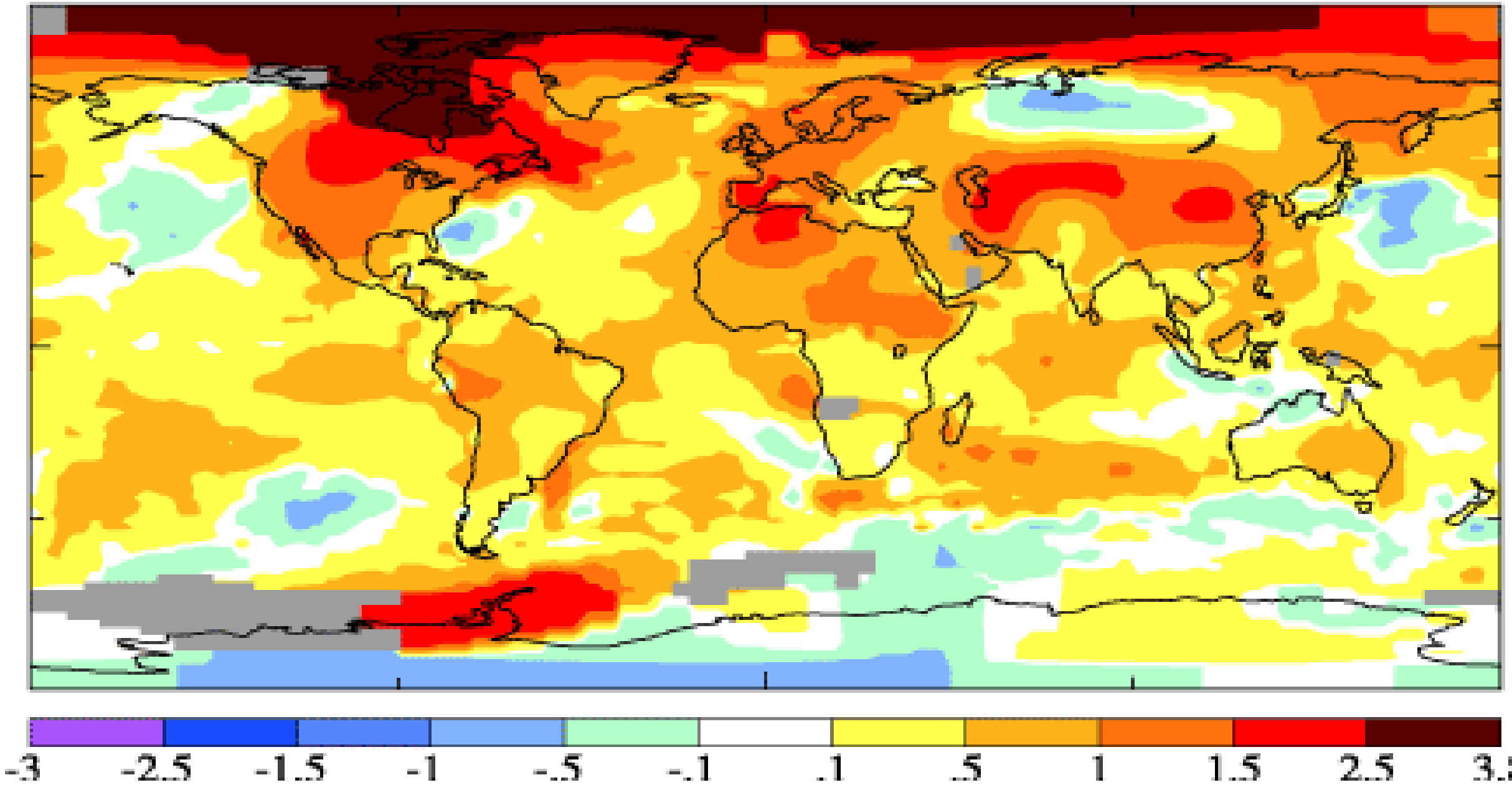
Anomalia media della temperatura atmosferica a terra e della temperatura della superficie dei mari, così come ricostruita dall'IPCC (Intergovernmental Panel on Climate Change), nelle serie storiche degli ultimi 150 anni.

In climatologia l'espressione riscaldamento globale (traduzione dall'inglese **global warming**, tradotto talvolta con riscaldamento climatico o surriscaldamento climatico) indica il mutamento del clima terrestre sviluppatosi nel corso del XX secolo e tuttora in corso. Tale mutamento **è attribuito in larga misura alle emissioni nell'atmosfera terrestre di crescenti quantità di gas serra** (con conseguente incremento dell'effetto serra) e ad altri fattori che la comunità scientifica ha rilevato come imputabili all'**attività umana**.



Intergovernmental Panel on Climate Change

(b) 2006 Surface Temperature Anomaly (°C)



Shrimp, squid: As plankton move from warm surface waters to cooler depths, fish and shellfish become nutrient-starved. The global catch could decline.

Crab: Climate change is causing many species of crab, flounder, lobster and mackerel to shift their habitats, migrating to find cooler water.

Tomatoes: Rising carbon dioxide levels may boost the growth of plants. But, hotter temperatures can reduce yield by lowering photosynthesis, increasing respiration and causing reproductive failure, such as broken fruit.

Red bell peppers and garlic: Shifting climates could cause the arrival of new plant diseases and pests. Farming practices could shift, because farmers will need more heat and drought- tolerant plants.

Bread: A global temperature increase of 1 degree Celsius would lead to a worldwide decline in wheat yield by 4.1 percent to 6.4 percent.

Pepper: A rain-fed crop. Faced with recent droughts, farmers are trying new breeding programs and horticultural techniques to boost pepper's resiliency.

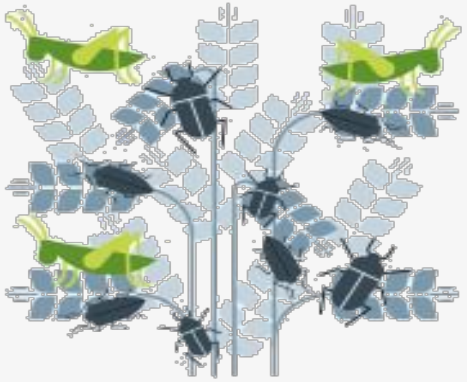
FOOD AND FARMING | 30 August 2018 19:00

Rise in insect pests under climate change to hit crop yields, study says

HOW CLIMATE CHANGE IS CREATING A GLOBAL PEST PROBLEM

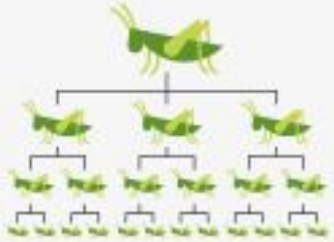
COME IL CAMBIAMENTO CLIMATICO STA
CREANDO UN PROBLEMA GLOBALE PER I PARASSITI

As pest pressures are higher in hotter climates, global warming is already increasing the impact of pests on **public health** and **industry**.



We can expect pests in the future to cause the **spread of diseases** into new areas and have a **major impact on food production**.

COME IL CAMBIAMENTO CLIMATICO INFLUENZA I PARASSITI



Gli insetti possono fare un numero maggiore di generazioni

Aumento della resistenza agli insetticidi

Alcuni insetti possono divenire più grandi a temperature più calde

Maggior sopravvivenza durante i mesi invernali

Dispersione verso i poli, con climi più miti

Maggiore impatto degli attacchi sulle culture e alle persone

Parassiti dei raccolti sempre più voraci: colpa del clima

Impact of Climate Change on Insect Pests and Their Management Strategies

Abhishek Pareek, B.M. Meena, Sitaram Sharma, M.L. Tetarwal, R.K. Kalyan and B.L. Meena

Introduction

Climate change is an important determinant of abundance and distribution of species. It is concerned with everyone since it posess potential threat to environment, and agricultural productivity and production throughout the world. It has implications for livelihood and survival of human beings. According to Intergovernmental Panel on

Pectinaria gossypiella

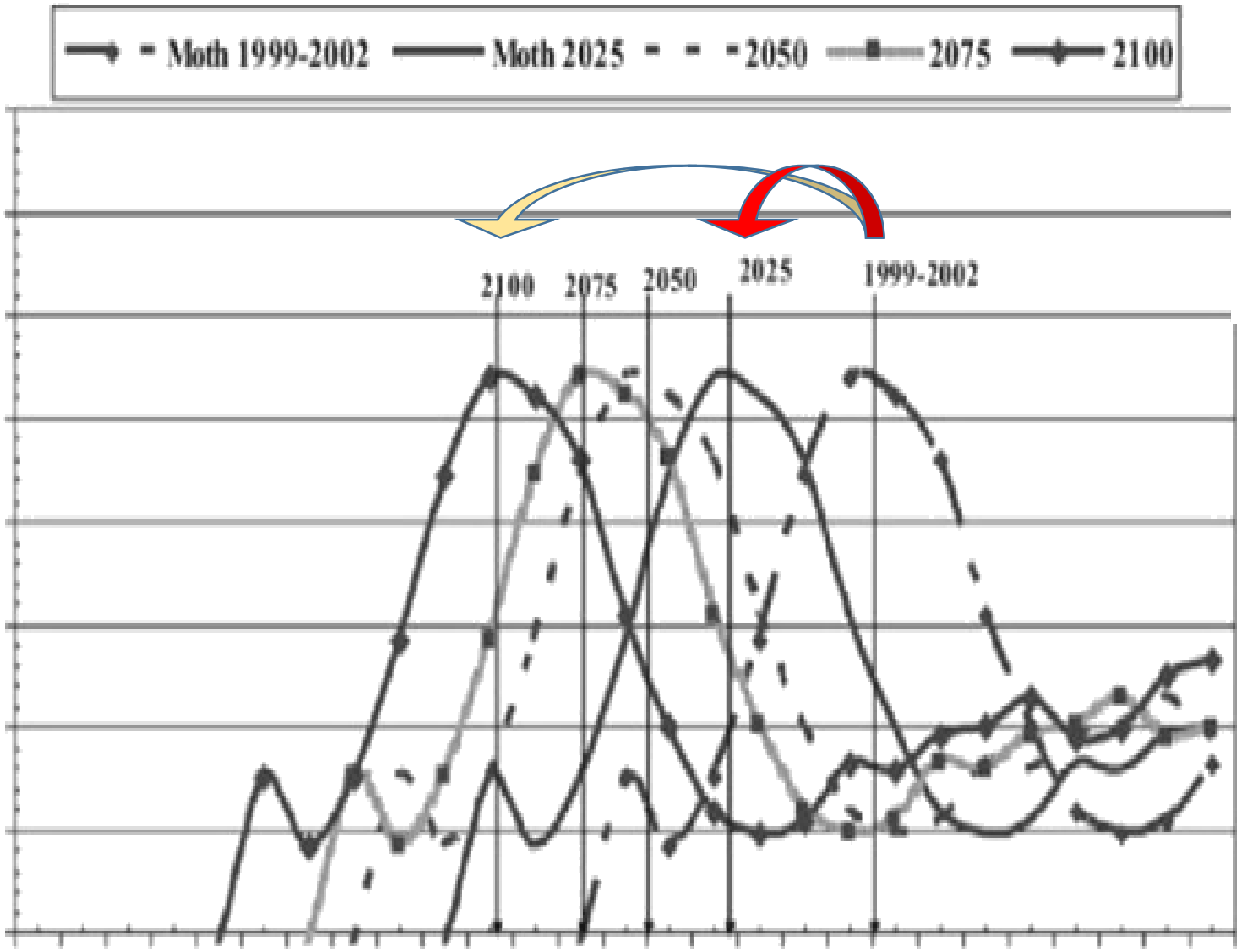


Fig. 3 The peak of the pink bollworm moth's emergence, from the diapause larvae, occurred through the study seasons 1999-2002 in the last third of May and in the predicted seasons 2025, 2050, 2075, and 2100

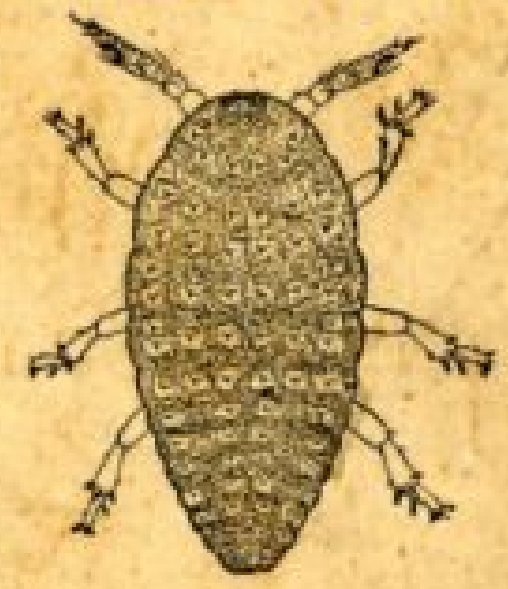
INSETTI ALIENI

1914

MANUALI HOEPLI

Dott. R. GRANDORI

RISULTATI
DEI NUOVI STUDI ITALIANI
SULLA
FILLOSSERA
DELLA VITE



MILANO - ULRICO HOEPLI - EDITORE

1852-1854

Daktulosphaira vitifoliae

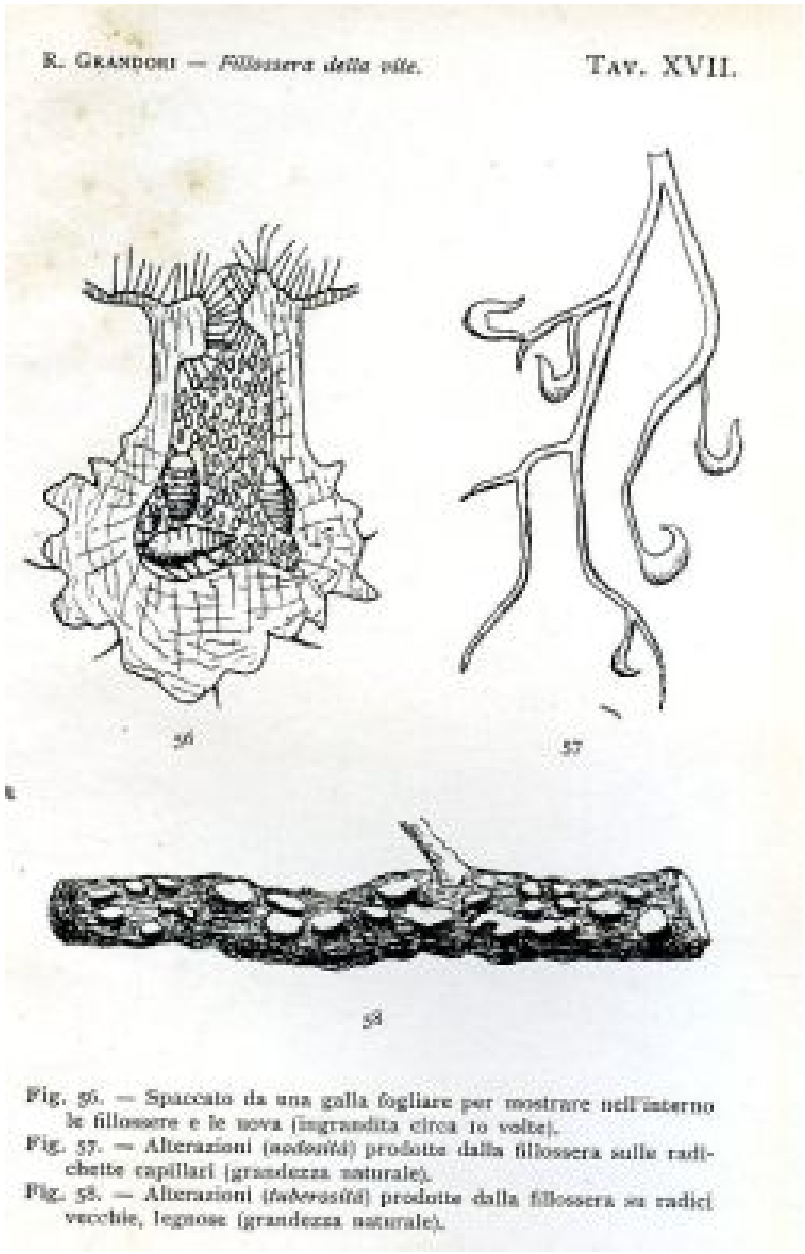
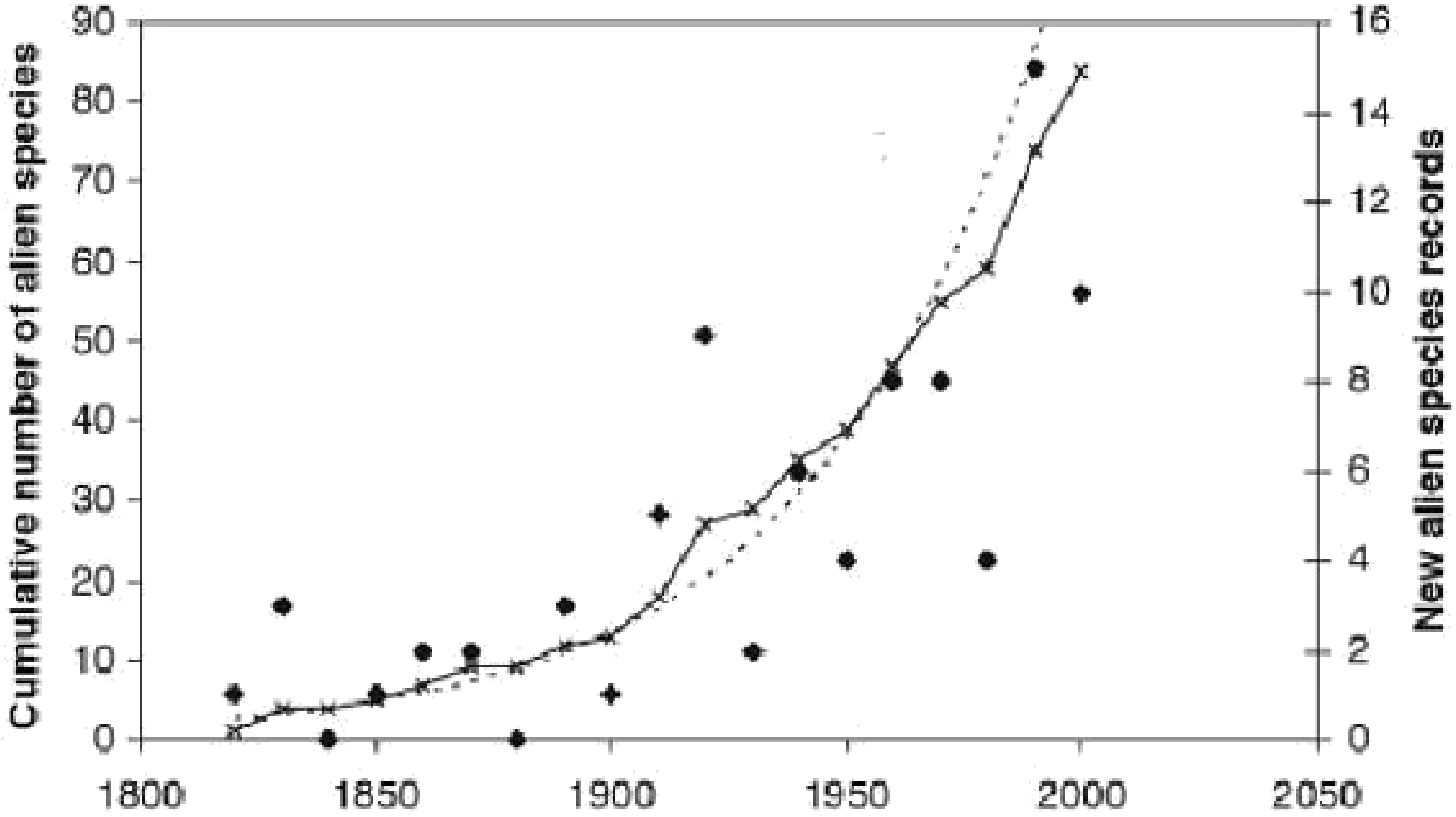


Fig. 56. — Spaccato da una galla fogliare per mostrare nell'interno le fillossere e le uova (ingrandita circa 10 volte).
Fig. 57. — Alterazioni (*radicicole*) prodotte dalla fillossera sulle radichette capillari (grandezza naturale).
Fig. 58. — Alterazioni (*tuberosità*) prodotte dalla fillossera su radici vecchie, legnose (grandezza naturale).

Leptinotarsa decemlineata

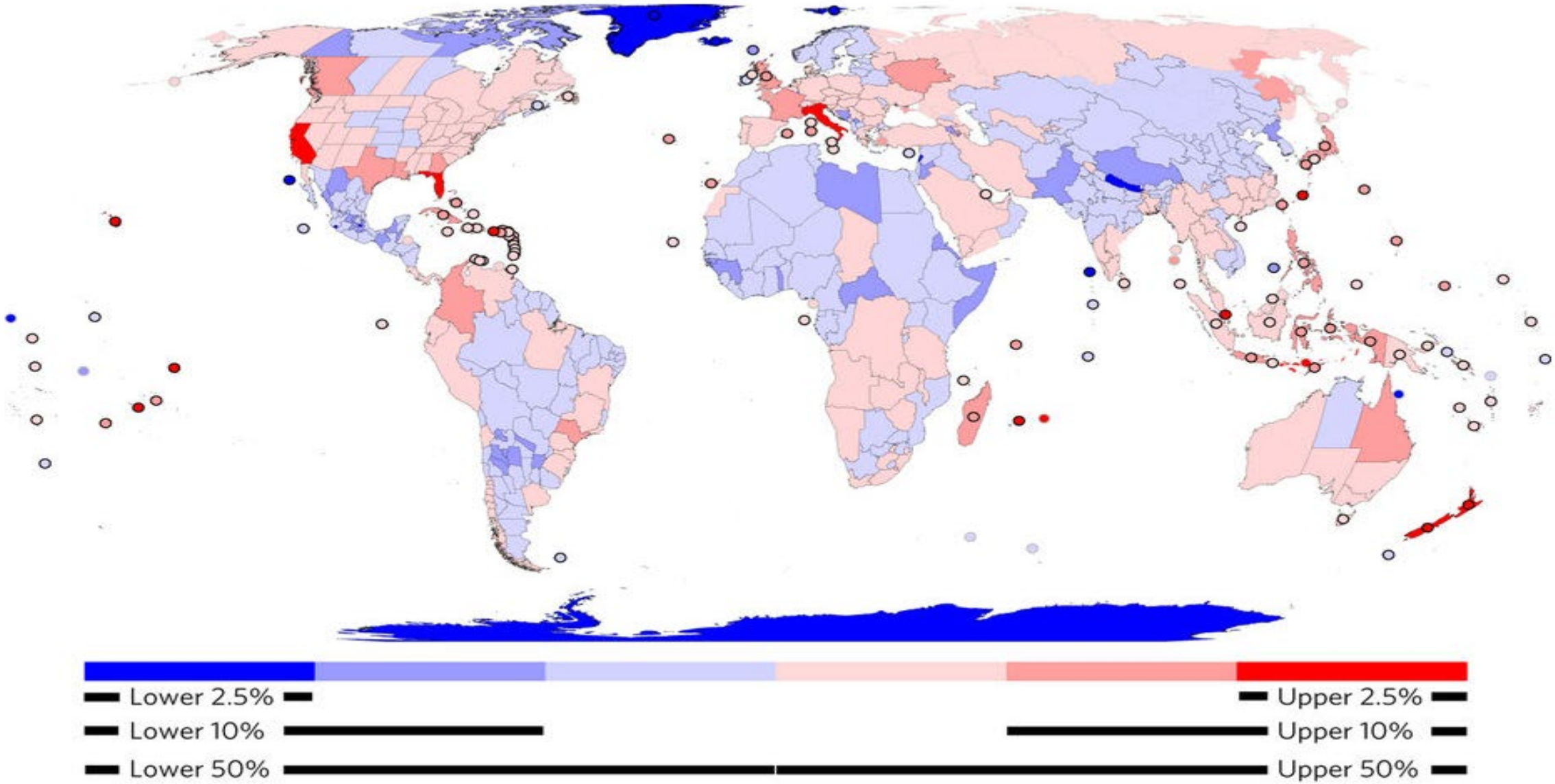
Incremento della diffusione di specie fungine aliene in Europa (Desprez-Loustou, 2009)



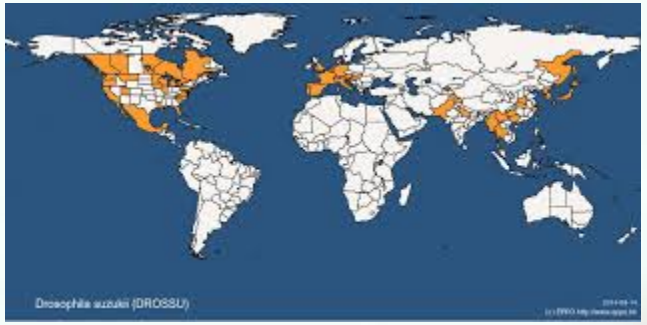
L'Italia punto caldo dell'invasione delle specie aliene

Studio internazionale: il nostro paese è l'hotspot più "rosso" delle specie invasive in Europa

[13 Giugno 2017]



Drosophila suzukii




Halyomorpha halys

Halyomorpha halys

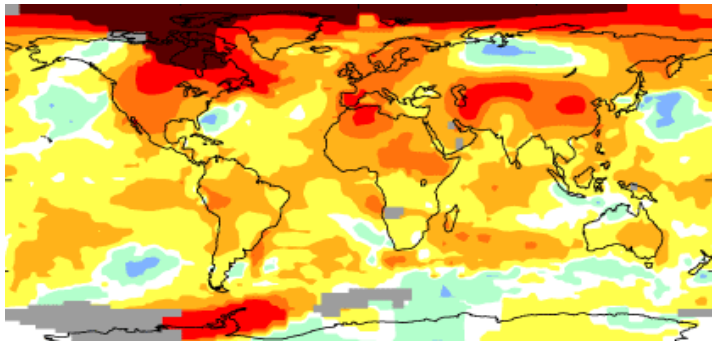
Varroa destructor

IUCN ISSUES BRIEF

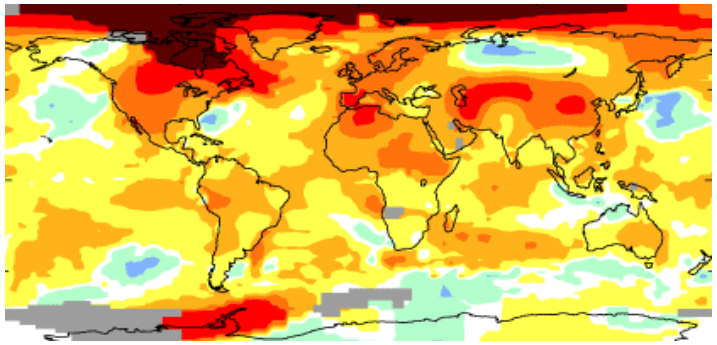
Invasive alien species and climate change

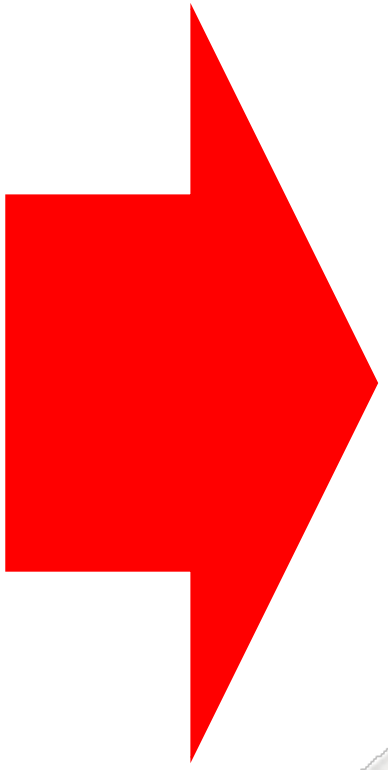
- Invasive alien species (IAS) are animals, plants or other organisms that are introduced into places outside their natural range, negatively impacting native biodiversity, ecosystem services or human well-being.
- IAS are one of the biggest causes of biodiversity loss and species extinctions, and are also a global threat to food security and livelihoods.
- IAS are compounded by climate change. Climate change facilitates the spread and establishment of many alien species and creates new opportunities for them to become invasive.
- IAS can reduce the resilience of natural habitats, agricultural systems and urban areas to climate change. Conversely, climate change reduces the resilience of habitats to biological invasions.
- It is essential that IAS be incorporated into climate change policies. This includes biosecurity measures to prevent the introduction of IAS to new regions as a result of climate change, and rapid response measures to monitor and eradicate alien species that may become invasive due to climate change.

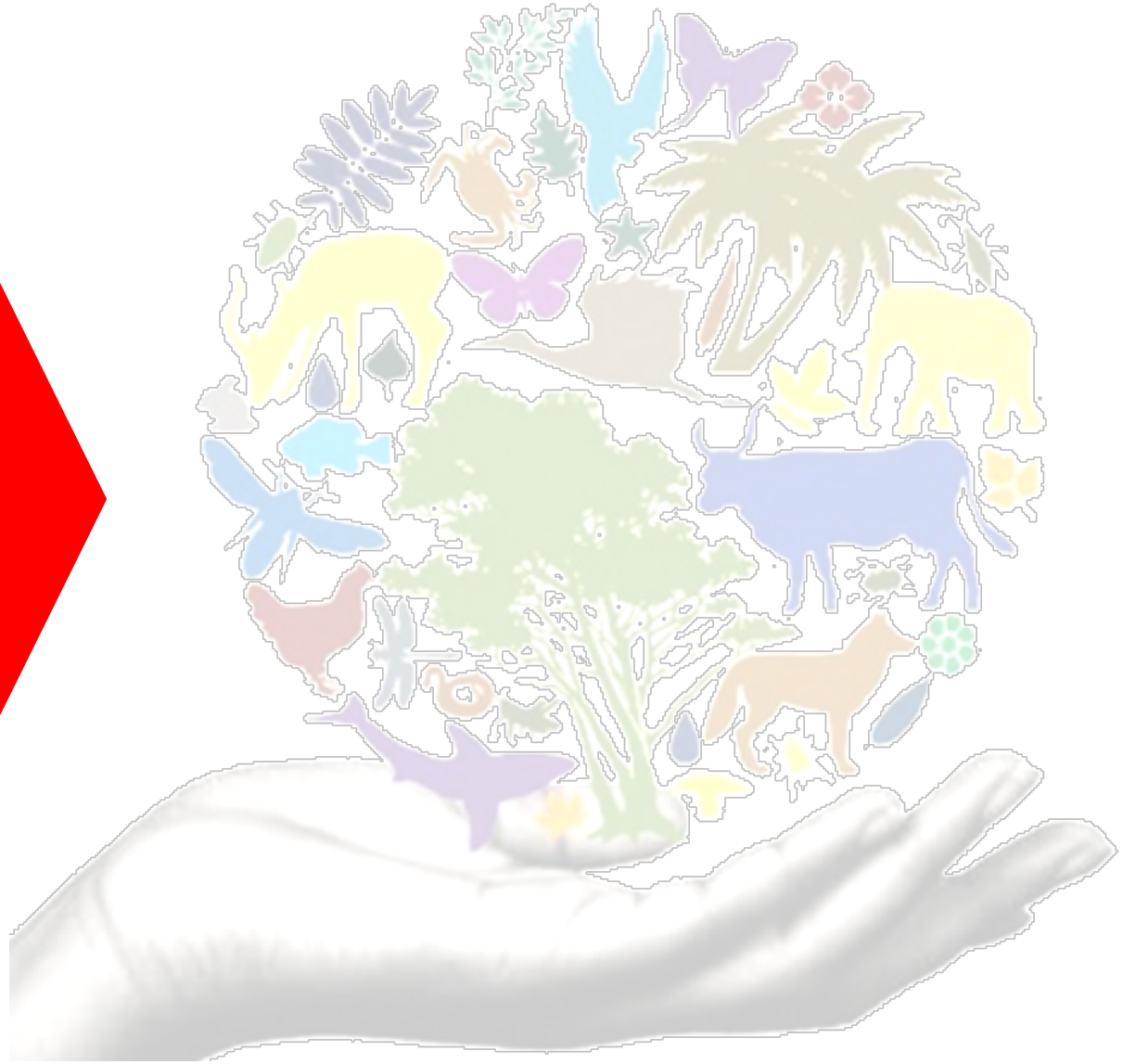
CAMBIAMENTI CLIMATICI E ORGANISMI ALIENI SONO UNA MINACCIA PER LA BIODIVERSITÀ



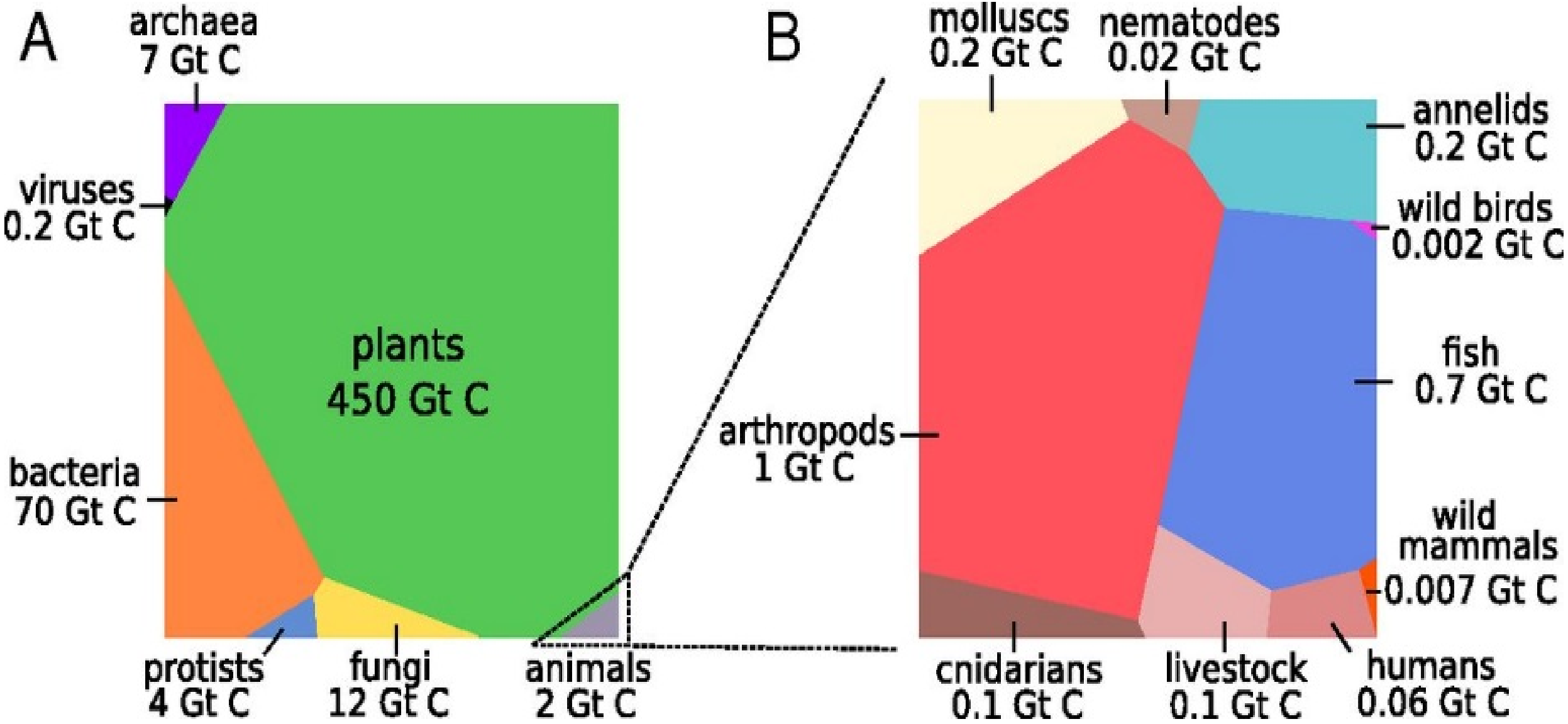
CAMBIAMENTI CLIMATICI E ORGANISMI ALIENI SONO UNA MINACCIA PER LA BIODIVERSITÀ

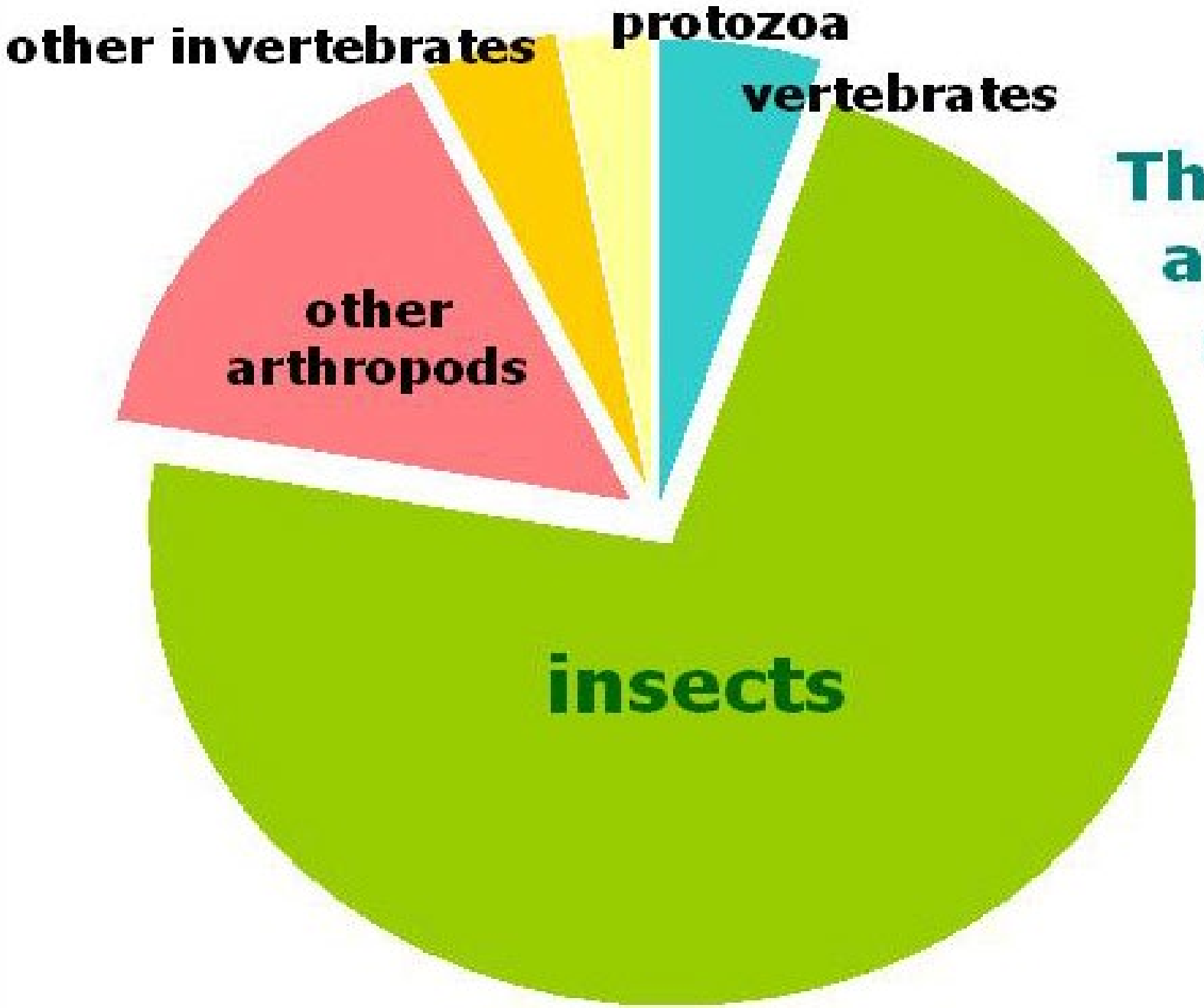






BIOMASSA


A
archaea
7 Gt C
viruses
0.2 Gt C
plants
450 Gt C
bacteria
70 Gt C
protists
4 Gt C
fungi
12 Gt C
animals
2 Gt C
B
molluscs
0.2 Gt C
nematodes
0.02 Gt C
annelids
0.2 Gt C
wild birds
0.002 Gt C
arthropods
1 Gt C
fish
0.7 Gt C
wild
mammals
0.007 Gt C
cnidarians
0.1 Gt C
livestock
0.1 Gt C
humans
0.06 Gt C



The relative abundance of species of animals on earth

(adapted from Southworth, 1978)

ANIMALS

Why insect populations are plummeting—and why it matters

A new study suggests that 40 percent of insect species are in decline, a sobering finding that has jarred researchers worldwide.

4 MINUTE READ

BY DOUGLAS MAIN

PUBLISHED FEBRUARY 14, 2019

Internazionale

11/17 gennaio 2019

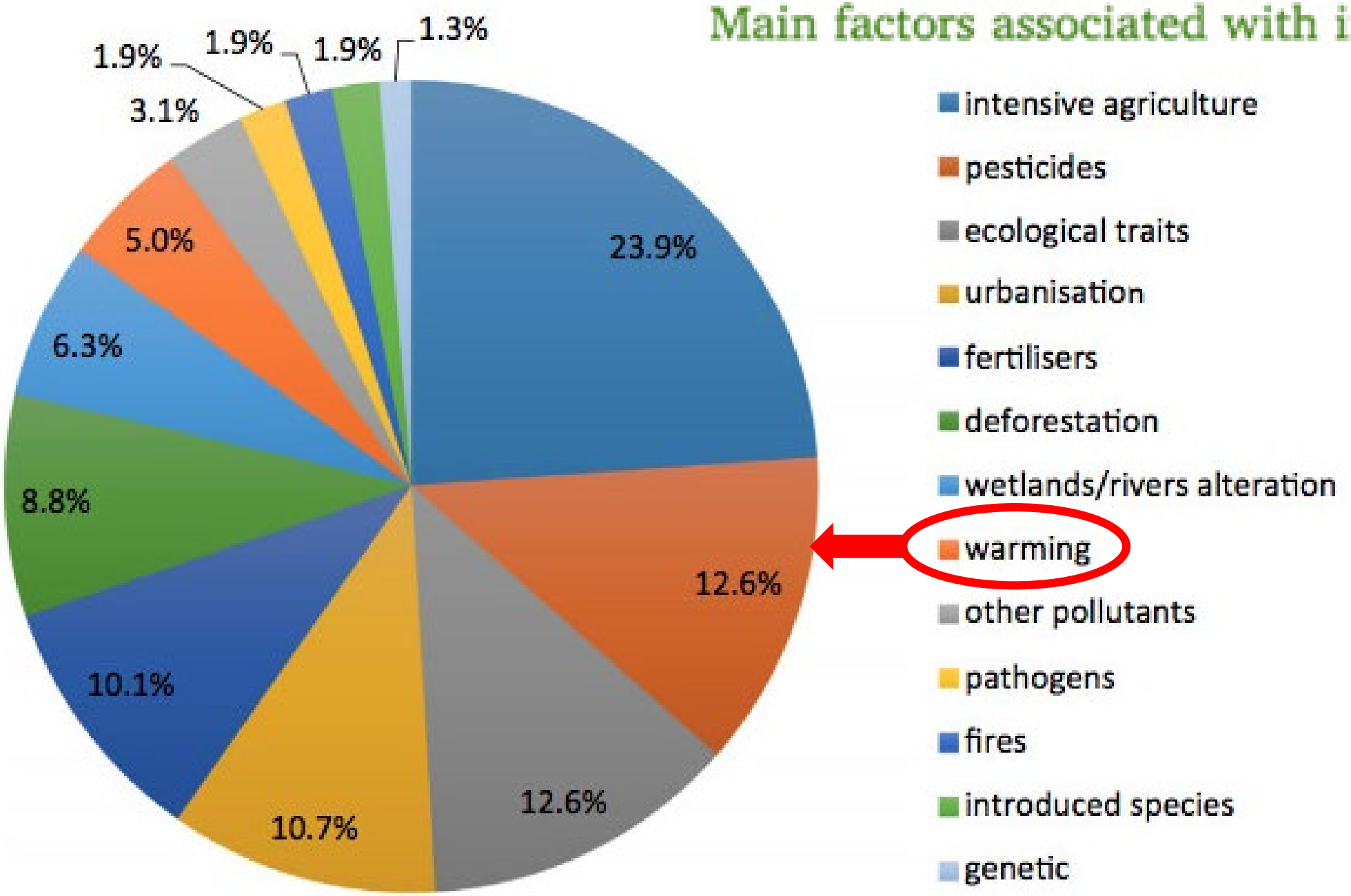
Un mondo senza insetti

Cosa succederà al pianeta e alla vita degli esseri umani se gli insetti continuano a diminuire

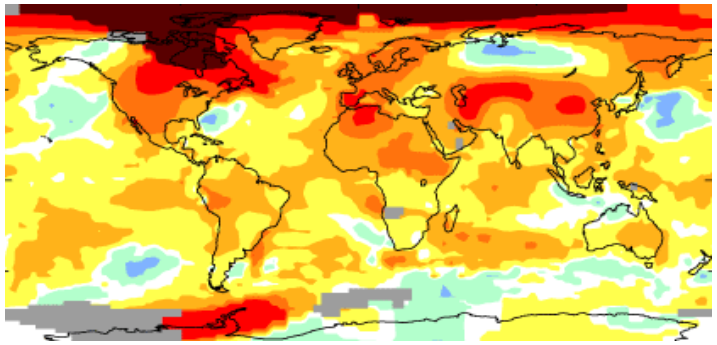
Un mondo senza insetti

Cosa succederà al pianeta e alla vita degli esseri umani se gli insetti continuano a diminuire

Main factors associated with insect declines



MA LA BIODIVERSITÀ È SICURAMENTE UNA RISORSA PER CONTROBILANCIARE L'EFFETTO DEI CAMBIAMENTI CLIMATICI E DEGLI ORGANISMI ALIENI



MA LA BIODIVERSITÀ È SICURAMENTE UNA RISORSA PER CONTROBILANCIARE L'EFFETTO DEI CAMBIAMENTI CLIMATICI E DEGLI ORGANISMI ALIENI

LA BIODIVERSITÀ AGRARIA È UNA RISORSA IMPRESCINDIBILE

COME LO È LA COMPLESSITÀ DEI PAESAGGI AGRARI

AGROECOSISTEMI PIÙ COMPLESSI E RICCHI DI BIODIVERSITÀ SONO PIÙ RESILIENTI AGLI EFFETTI DEL CLIMA E DEI NUOVI E VECCHI PARASSITI

INRA SCIENCE & IMPACT

INRA METAPROGRAMMES

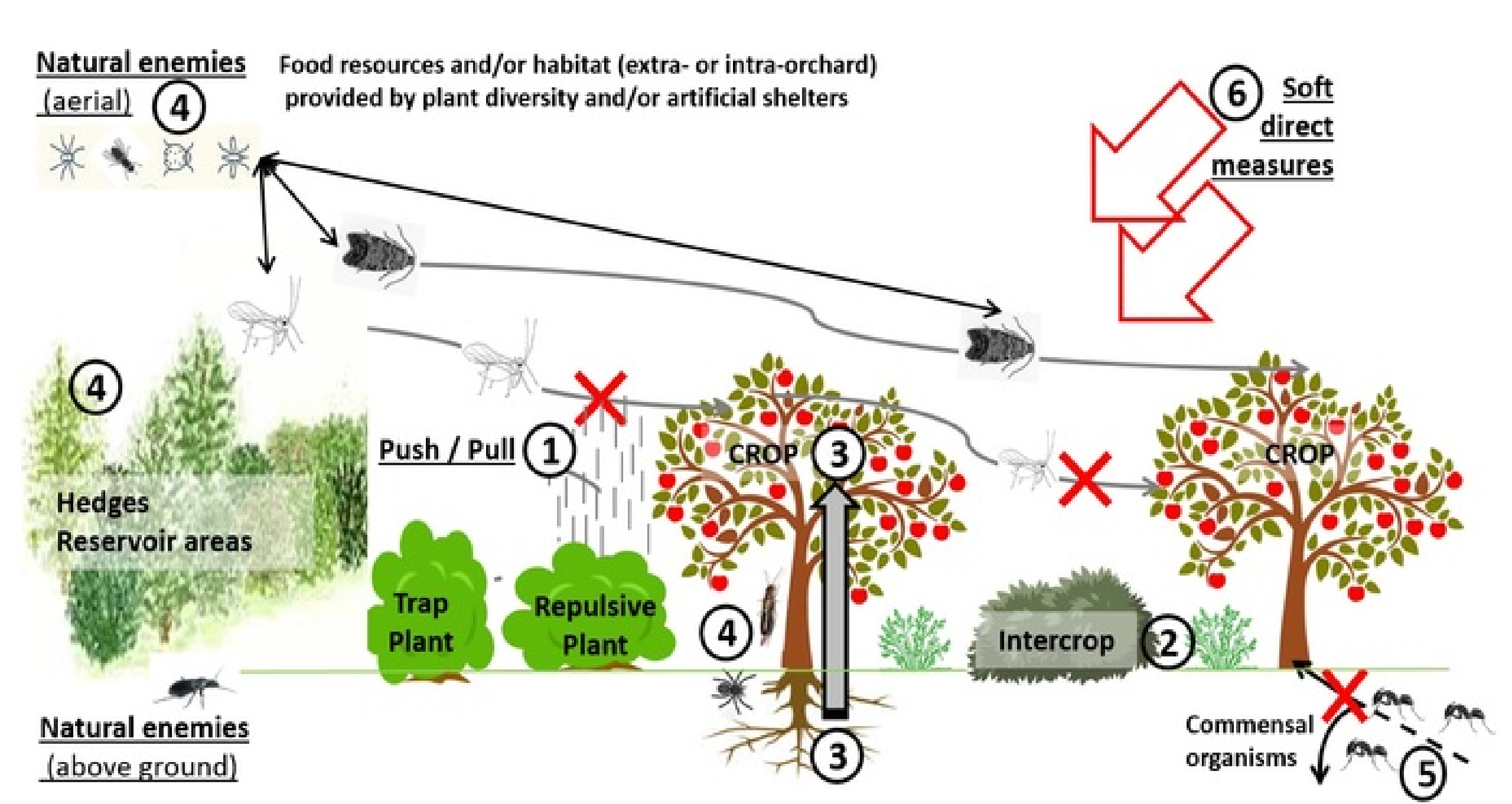
SUSTAINABLE MANAGEMENT OF CROP HEALTH

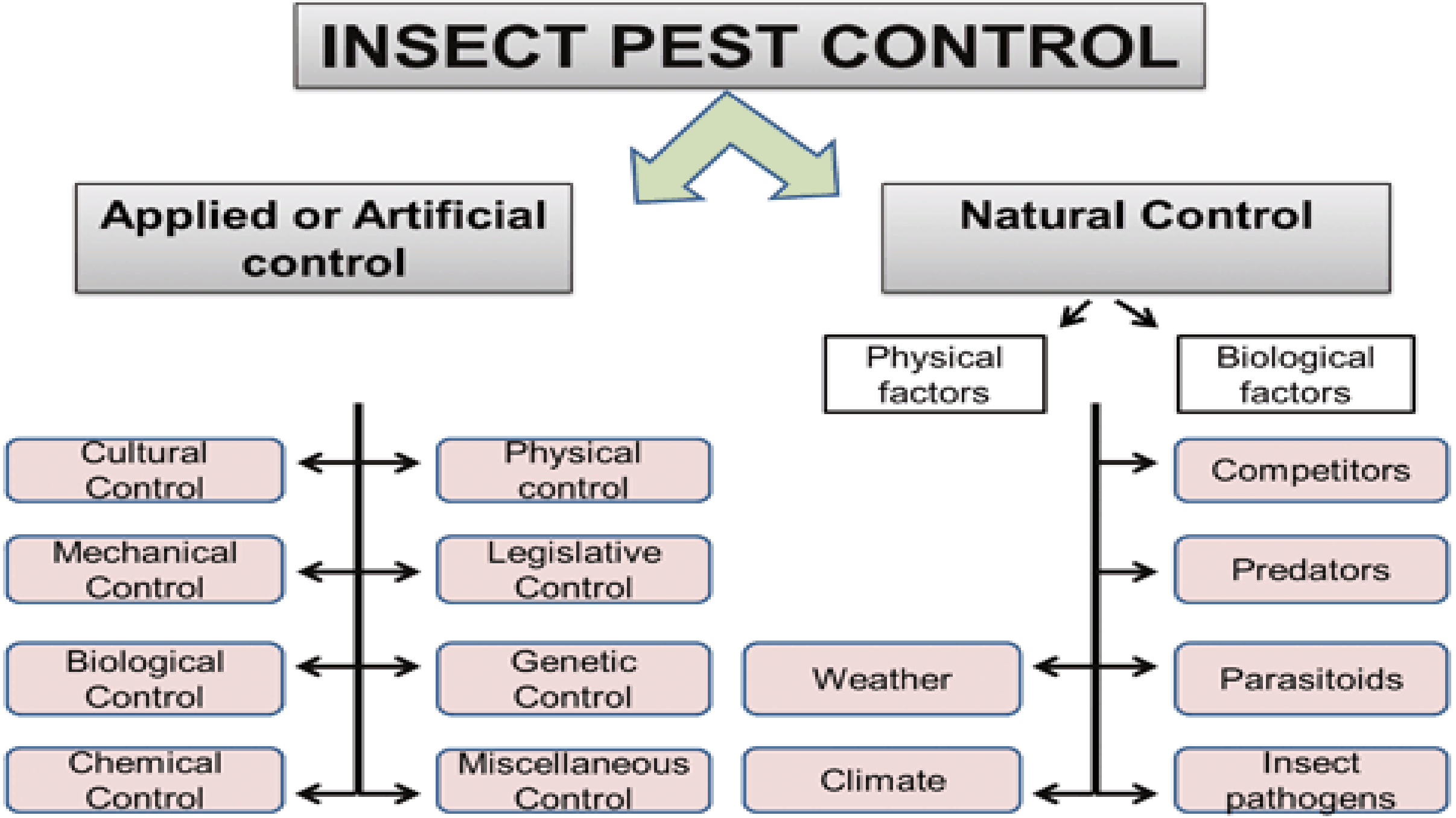
Join us on

HOME | NEWS | PRESENTATION | KEY CHALLENGES | EVENTS | CONTACT

Developing apple pest control strategies through an integrated agro-ecosystem approach

The aim of the project, coordinated by Aude Alaphilippe, is to design and assess the efficiency and sustainability of combinations of practice alternatives to chemicals for controlling pests in apples. The integrated approach of the project will take into account agro-ecosystem management, orchard design and practices, as well as economic restraints. Such global perspective along with the involvement of growers in the design process is important for further adoption of the redesigned systems, and also to benefit from experienced stakeholders.


Natural enemies
(aerial)
4
Food resources and/or habitat (extra- or intra-orchard)
provided by plant diversity and/or artificial shelters
6
Soft
direct
measures
4
Hedges
Reservoir areas
Push / Pull
1
CROP
3
CROP
Trap
Plant
Repulsive
Plant
4
Intercrop
2
Natural enemies
(above ground)
3
Commensal
organisms
5


INSECT PEST CONTROL
Applied or Artificial control
Natural Control
Physical factors
Biological factors
Cultural Control
Mechanical Control
Biological Control
Chemical Control
Physical control
Legislative Control
Genetic Control
Miscellaneous Control
Weather
Climate
Competitors
Predators
Parasitoids
Insect pathogens

CAMBIAMENTI CLIMATICI ED INSETTI ALIENI

Paolo Fontana – World Biodiversity Association

Lusia, 18 maggio 2019

world biodiversity association onlus