

NEWSLETTER OBSERVATORY OF HIGH-STAKE SPECIES FOR HUMAN HEALTH



OBSERVATOIRE DES ESPÈCES
A ENJEUX
POUR LA SANTÉ HUMAINE

In this issue

The composition of the seed stocks is disrupted by ragweed invasion

These plants are toxic for both humans and animals

The tree of heaven: beware of this invader in our cities!

THE COMPOSITION OF THE SEED STOCKS IS DISRUPTED BY RAGWEED INVASION

Science

Soil seed banks allow the natural regeneration plants. A recent study² monitored the composition of seeds buried in the soil during and after ragweed (*Ambrosia trifida*) invasion in a valley in China.

It is quite difficult to say whether invasive species do modify the native species' seed stocks or if it is due to a degradation before the invasion. Some species produce persistent seeds that can survive for more than a year.

In this study published in the Journal of Environmental Management, researchers decided to follow the **composition of seed stocks during and after the invasion of *Ambrosia trifida* in China.**

Indeed, ragweeds were introduced in 2010 in the Yili Valley, and **the area occupied by this species has been multiplied by more than 3000**; reaching almost 38 000 hectares in **2020**. The authors observed that the **surface of the valley was completely occupied by ragweeds as early as 6 years after the beginning of the invasion**, thus leading native species to disappear (Fig 2).

In addition, the **seed stock has been gradually enriched with ambrosia seeds**, reaching almost **75%** after 8 years of invasion (Fig 2).

Several studies confirm that an **effective invasion factor** for a species is its **ability to produce an important seed stock**. This could explain the total invasion observed in a very short time. Furthermore, *A. trifida* can reach up 2 to 4 meters in height, allowing it to culminate above the native species. Thus, this invasive species strongly competes for light and prevents other species to develop.

However, by removing these invasive plants from the valley, the **authors were not able to restore the original community**. According to them, this disappearance does not necessarily favour the resurgence of native species, but encourages the implantation of secondary invasive plants or weed species. In fact, the community found in the study after the end of the invasion was much less diverse and included some non-dominant native plants.

Actually, the invasion by *A. trifida* **limited the range of native seed stocks and the development of the latter which prevented the restoration of the original species.**

The authors conclude by suggesting **the use of chemical control** both on plants and soil, **coupled with the addition of seeds of perennial or annual species** to enrich the native seed stock.

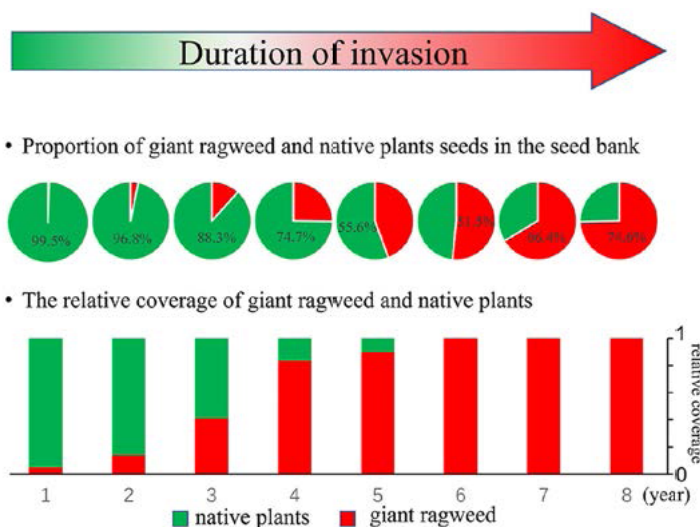


Fig 1 - Above, proportion of seeds (red) and native species (green) in the soil, each year. Below, area covered by ragweed (red) and native species (green) each year.

INFORMATION SOURCES

1. Wang et al. (2022) [Changes in the composition of the soil seed bank of grassland after giant ragweed \(*Ambrosia trifida* L.\) invasion](#)
2. Mousavi et al. (2019) [Year-to-year variation of the elemental and allergenic contents of *Ailanthus altissima* pollen grains: an allergomic study](#)

THESE PLANTS ARE TOXIC FOR BOTH HUMANS AND ANIMALS

In several areas, it is more and more common to find toxic plants, such as the **narrow-leaved ragwort (*Senecio inaequidens*)** or the **thorn apple (*Datura stramonium*)**, two species which are classified as invasive.

However, these plants are toxic to both humans and animals. It is possible to observe these two species in **environments which have been modified by humans** such as crops, wastelands, rubbles, as well as **natural environments** (riverbanks, meadows etc.).

If the thorn apple is eaten, it might induce **behavioral and neurological disorders** due to the presence of alkaloids that constitute the plant (mainly atropine and scopolamine). Consumption by animals in the wild is uncommon. However, when dried, the plant loses its repulsion factors and can thus cause accidents.

The Cape ragwort contains pyrrolizidine alkaloids. Its regular ingestion in small to medium quantities in the hay for cattle and especially equids is likely to **intoxicate the hepatic cells** and could lead to death in the short to medium term.

Tiny amounts are enough to trigger intoxication. It is thus important to be vigilant on any plant that would be found in animals' food.

Special attention must be given when last minute mowing is made, for instance in case of hay shortage as it was the case last summer due to the drought in several regions in France.

The main animals concerned are ruminants, horses and pigs. In addition, these two plant species are likely to contaminate animal productions such as milk or honey.



Fig 2 - Narrow-leaved ragwort (*Senecio inaequidens*) and the thorn apple (*Datura stramonium*)

THE TREE OF HEAVEN: BEWARE OF THIS INVADER IN OUR CITIES!

You might have seen it in your city: the **tree of heaven (*Ailanthus altissima*)** is a plant originally found in China and which was introduced in France in the 18th century. This species is now present on most of the territory thanks to its ability to adapt successfully.

Indeed, *A. altissima* can be especially found in anthropized areas such as wastelands, edges of railroads, roadsides, etc. It can even grow between the cracks of the concrete and bears easily with the urban pollution. Thanks to its significant reproductive ability, this plant multiplies exponentially and settles quickly in its new environment.

This tree is **considered as an alien invasive species in France** and is included in the **list of species of concern in the European Union**.

In addition, this species has a considerable impact on human health and was especially documented by the work of Mousavi et al. (2019)². Indeed, **from April to June, this species releases a large volume of pollen grains: up to 300 000 per individual!** This wind-borne pollen was reported as an emerging aeroallergen worldwide. It can cause severe allergic reactions for allergic individuals. Furthermore, **contact with the sap can also cause skin irritation**.

Beware: bearing equipment is highly recommended before any intervention.



Fig 3 - The tree of heaven (*Ailanthus altissima*)

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Follow all the Observatory actions on social medias:



Former Ragweed Observatory letters can be consulted [here](#)

SHORT NOTICE

“Fredonnons la Nature”, a FREDON France scientific podcast has been launched in the beginning of 2023 and deals **each month with a new species at stake**. The experts interviewed explain the means of recognition of these species, the control methods, etc.

The podcasts can be found following this link (in French only): <https://linktr.ee/fredonfrance>