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CONFERENCE

BUDAPEST, HUNGARY



International Ragweed Society

RAGWEED: THE STORY OF A POLLUTANT

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Ambrosia artemisiifolia belongs to the Asteraceae family. It is an annual plant, whose maintenance in each environment is related to its reproductive success. It is an invasive exotic species, native to North America, capable of growing in our latitudes (45°N) and able to produce a large quantity of pollen and mature seeds.



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The **World Health Organization (WHO)** classifies allergic diseases as the **fourth largest health problem** in the world and considers them to be "a major public health problem in terms of quality of life, loss of working and teaching days, drug costs and even mortality". In France, especially in the Rhône-Alpes region, 13 to 21% of the exposed population is allergic to ragweed (Rhône-Alpes ORS study).



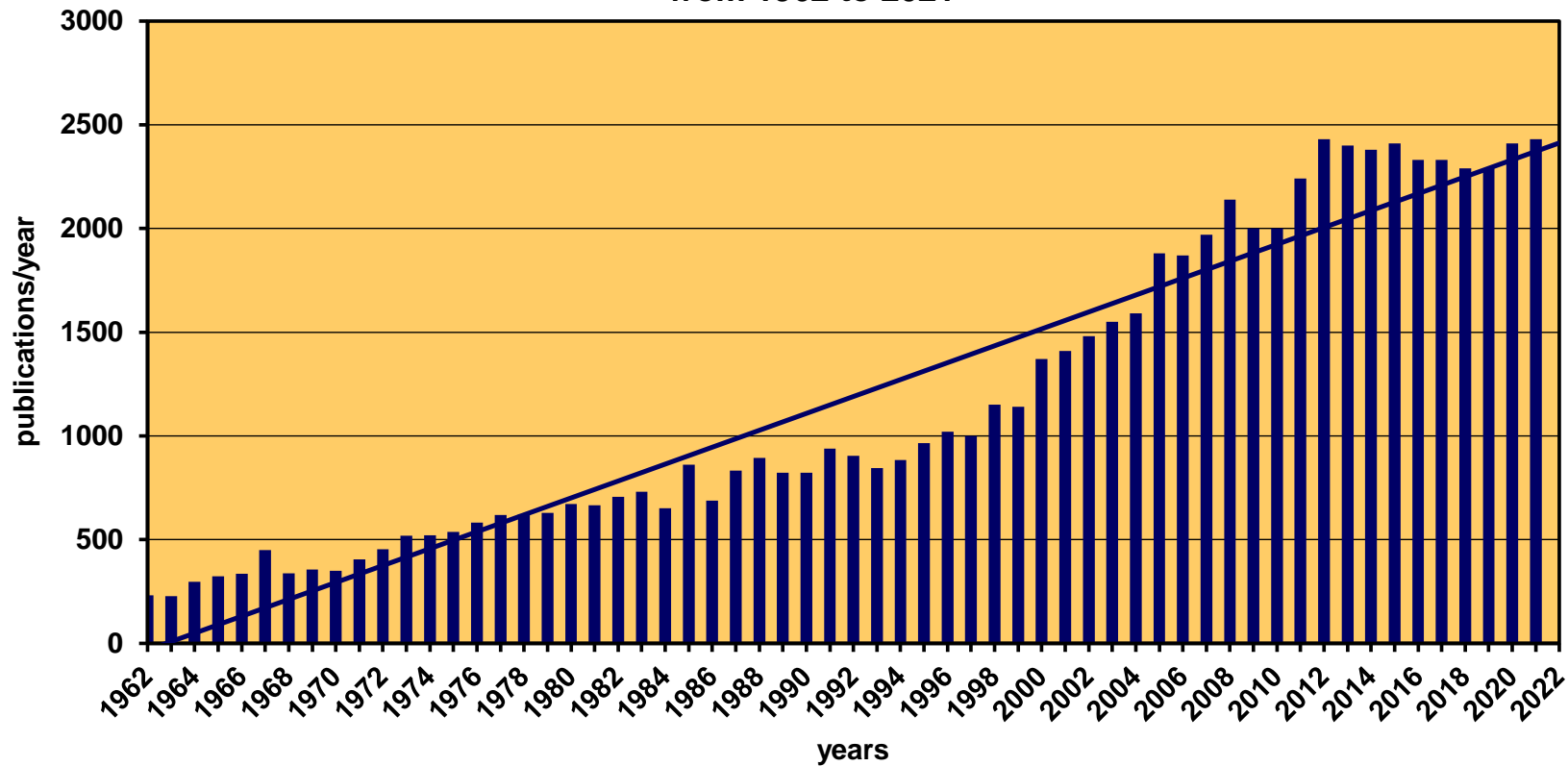
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Annual number of publications on ragweed referenced in Google Scholar®
from 1962 to 2021





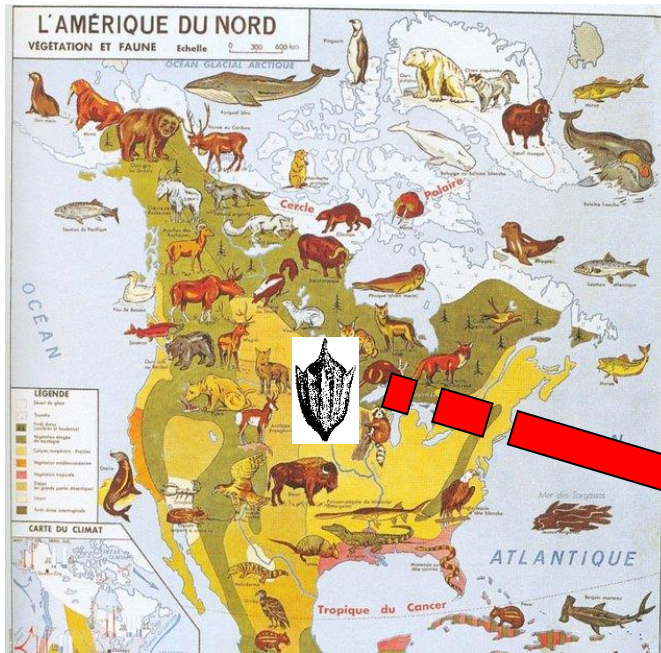
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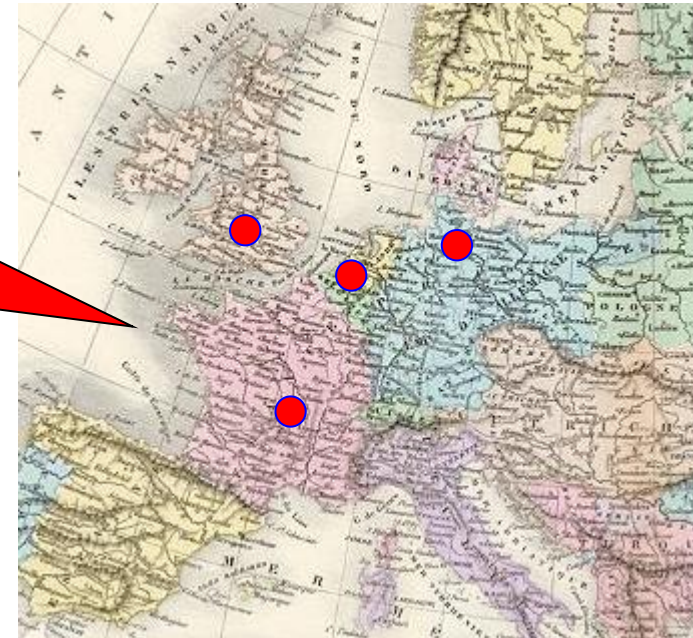
Ragweed History

Ambrosia artemisiifolia in Europe

- **1860-1870** – first introductions into Europe from North America:



- Germany ~ 1863
- France ~ 1863
- Great Britain ~ 1865
- Netherlands ~ 1870

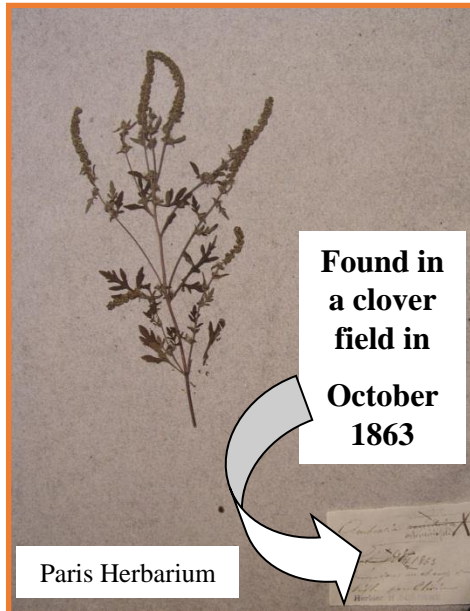


- **Very close dates: a same vector in the different countries?**

Chauvel B. and Martinez Q. IRC 2012

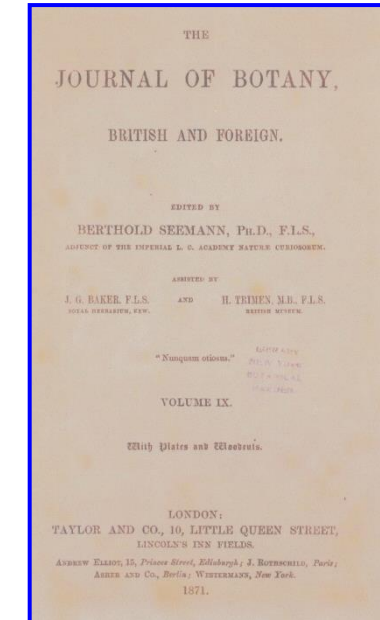
Map from Jacobs after Fremin, 1860

How to identify the first introduction vector(s)?



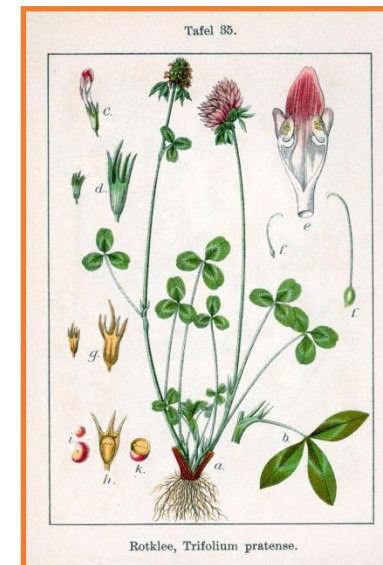
Source of references:

- * XIXth- and early XXth-century literature
- * Data on herbarium



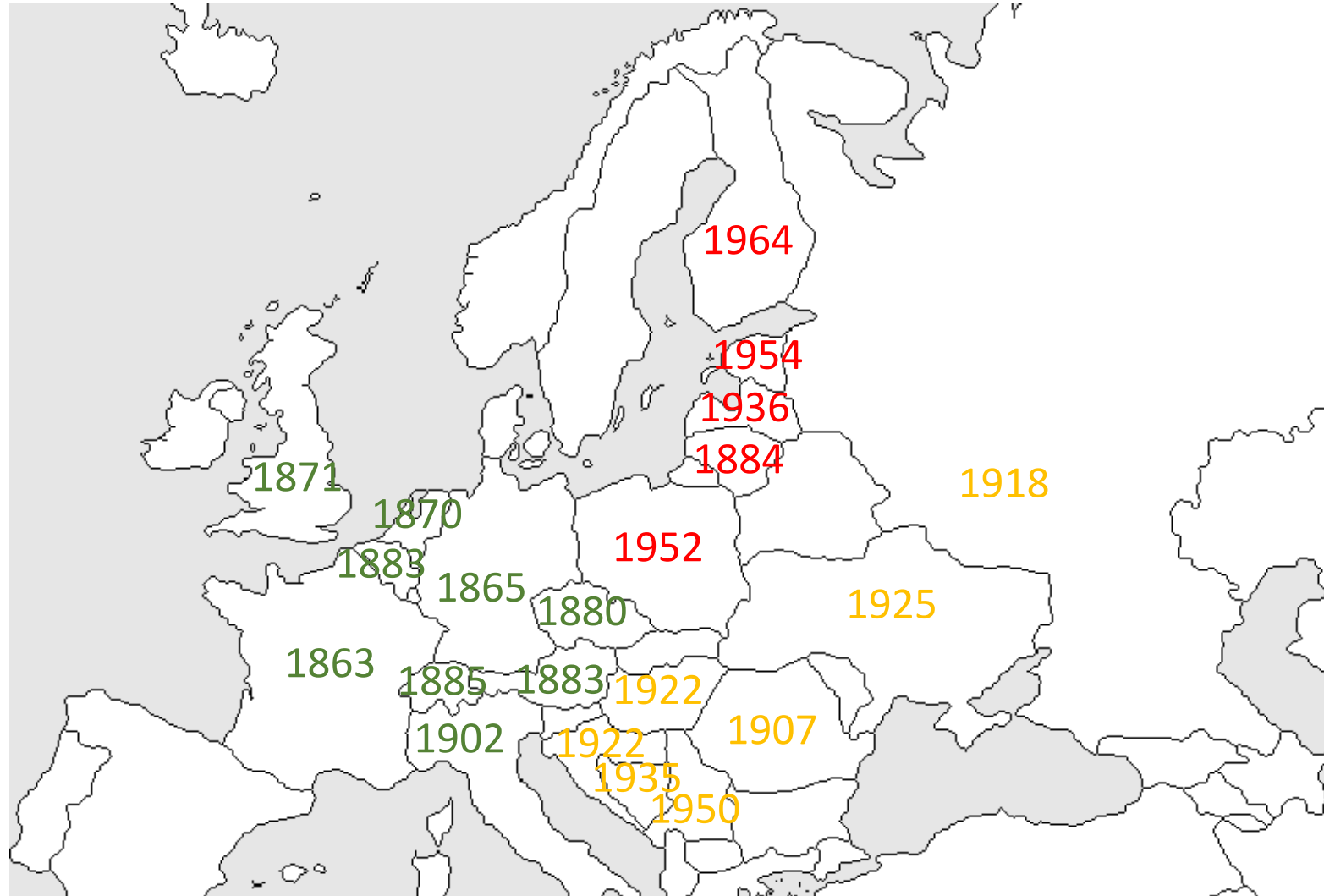
- **Red clover** is for sure the first vector of common ragweed introduction in Germany (Ascherson, 1874), in Great Britain (Hon, 1871), in the Netherlands (Anonymous, 1902) and in France (Olivier, 1876).
- Introduction to different points in each country with the same vector during many years.

Chauvel B. and Martinez Q. IRC 2012



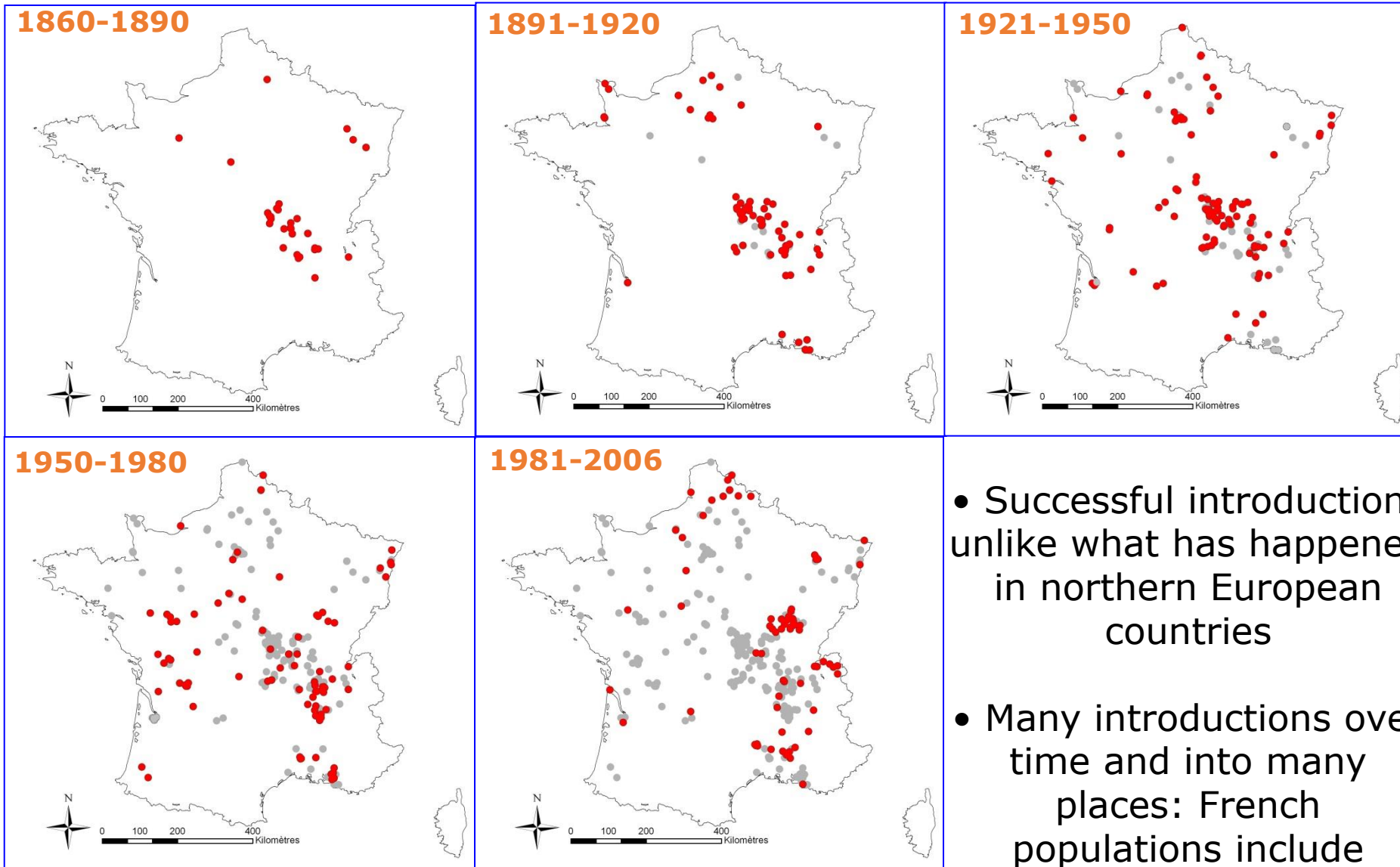
Trifolium pratense
Sturm, 1796

History of its introduction in Europe



**A gradual introduction, later in Central/Eastern Europe
than in Western Europe**

Spread across French *communes*

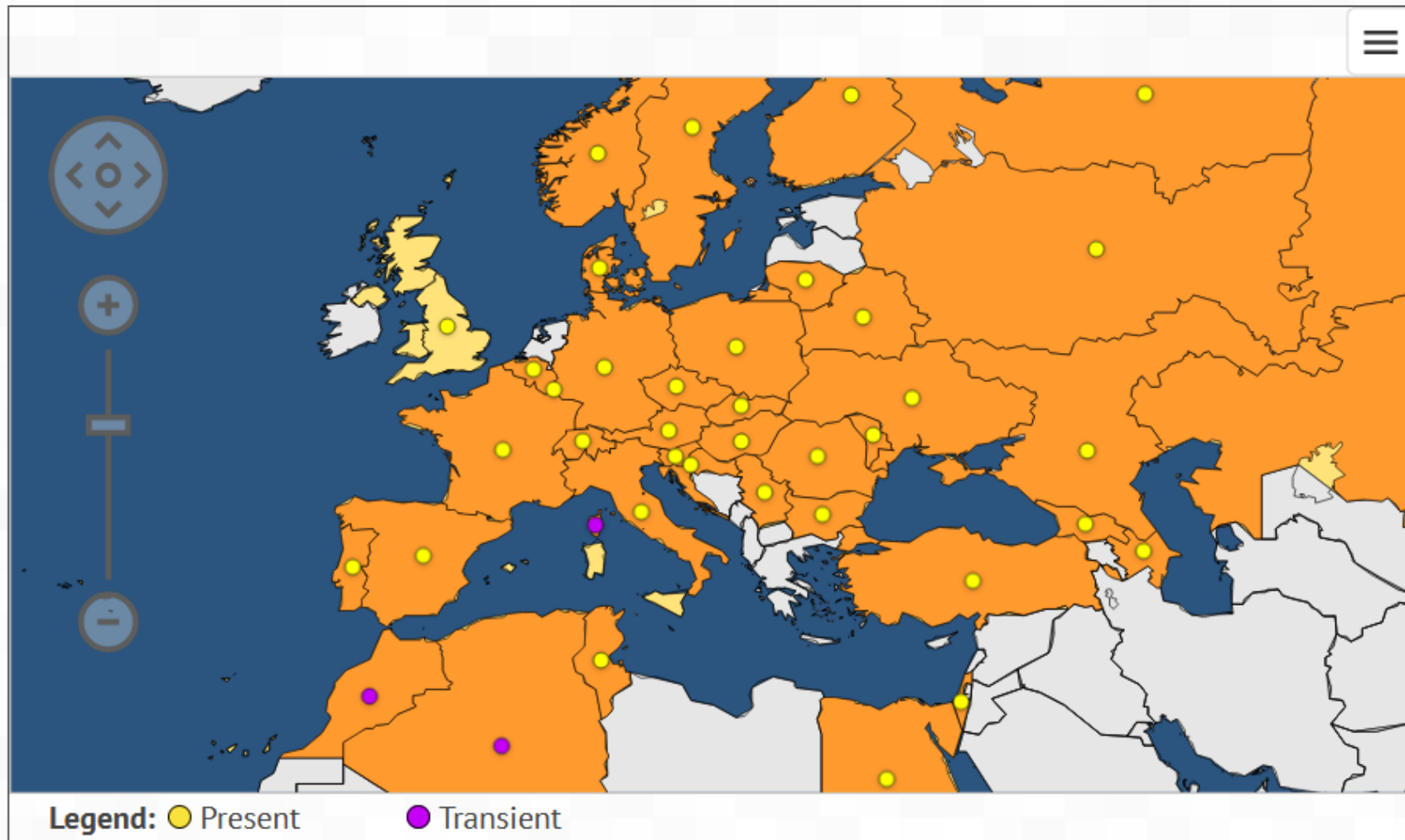


●: new locations

- Successful introductions unlike what has happened in northern European countries
- Many introductions over time and into many places: French populations include plants from various sources

Distribution

Last updated: 2022-04-01



<https://gd.eppo.int/taxon/AMBEL/distribution>

Some publications (1)

- Blamoutier P.1955: first communication about ragweed allergy in France. *International Archives of Allergy and Applied Immunology*, vol. 6, 1955, n° 3, pp. 189-189.
- *Ambrosia artemisiifolia* L. (common ragweed) was accidentally introduced into France in the 1860s. Its single vector of introduction in Europe was red clover seeds (*Trifolium pratense* L.), probably coming from Pennsylvania, United States at the time. *A. artemisiifolia* was later introduced into France in many places and at different times. Chauvel B et al: *Acta Botanica Gallica*, vol. 158, 2011, n° 3, pp. 309-327.
- *Ambrosia* arrived in Hungary from northern Mediterranean in the 1920s, and by the end of the 20th century it has become widely distributed. In Southern Hungary (northern part of Serbia-Montenegro included), *Ambrosia* pollen concentrations during the peak season are about one order of magnitude higher than the counts in the rest of Europe. Makra L et al: *Grana* 44: 57–64, 2005

Some publications (2)

- The most important habitat areas of ragweed and the highest pollen concentrations occur, in decreasing order of the pollen levels (1) in the south-western part of the European Russia, (2) in the southern and eastern parts of Ukraine, (3) in the Pannonian Plain in Central Europe, (4) in the Rhône-Alpes region in France, furthermore (5) in the Po River valley in Italy. Besides Europe, ragweed occurs in China, India, Japan and in other Asian countries, furthermore in Australia and the United States of America. Makra L et al.: *Applied Ecology and Environmental Research*, vol. 13, 2015, n° 2, pp. 489-512
- The Ambrosia species represent one of the most problematic groups of invasive weeds around the world. The ease with which they are introduced and spread in new countries, their generalist ecological requirements, and functional traits facilitate their invasion and subsequent naturalization in new areas. All of these aspects contribute to increasing their global social and economic impact, which is mostly related to pollen allergy. Montagnani C et al.: *Critical Reviews in Plant Sciences*, vol. 36, 2017, n° 3, pp. 139-178.
- Etc.



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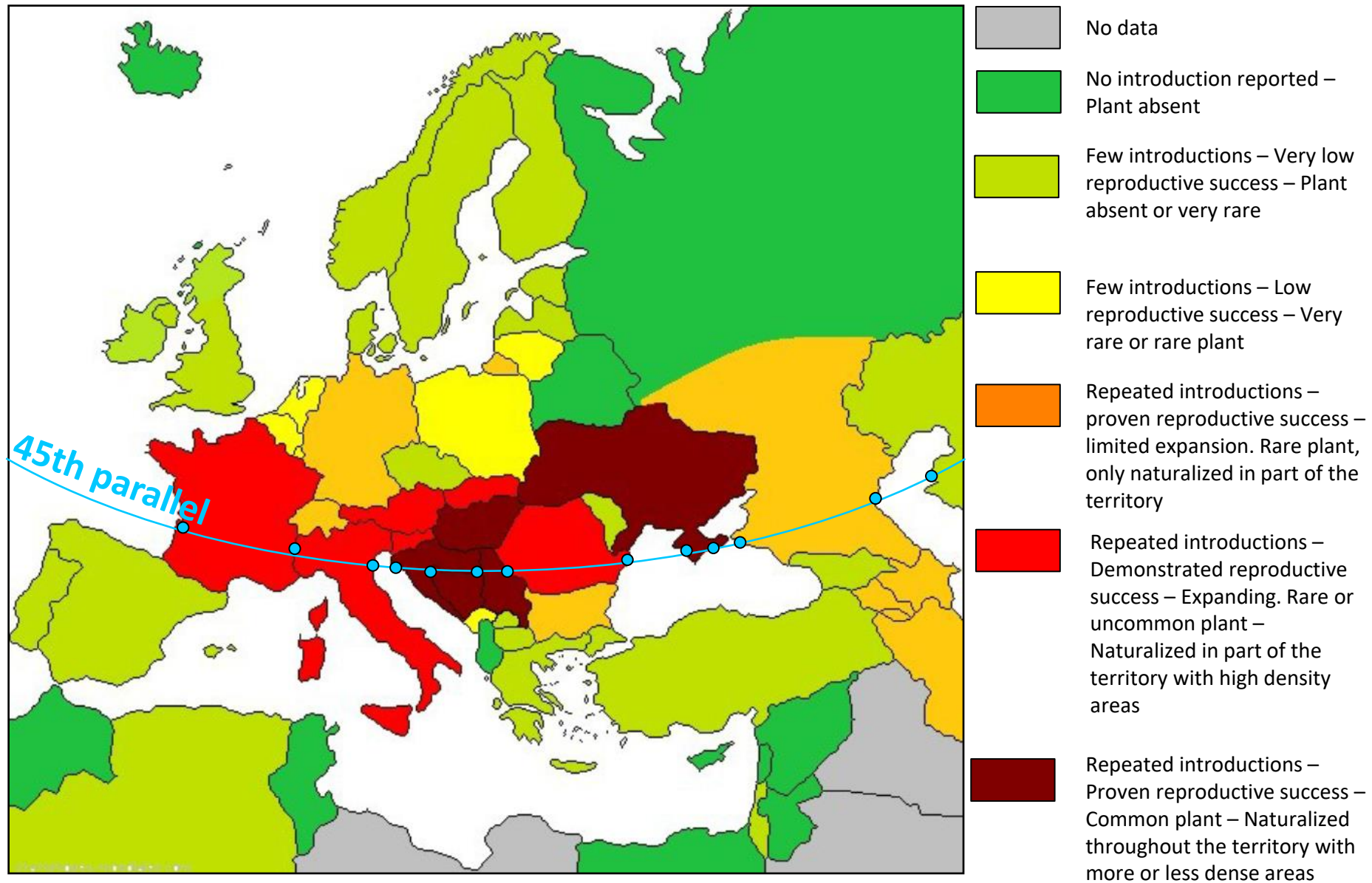
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Ragweed distribution/dissemination

Its current distribution

Source : Observatoire des ambrosies



Ecological plasticity

Habitats and soils

Presence in open habitats with very different soil textures. Mostly in France on sandy or sandy-loam soils.



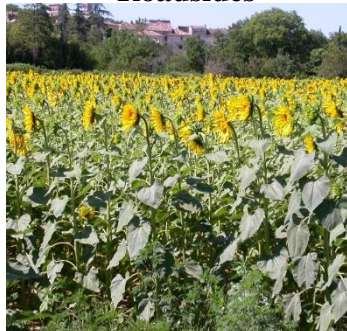
River



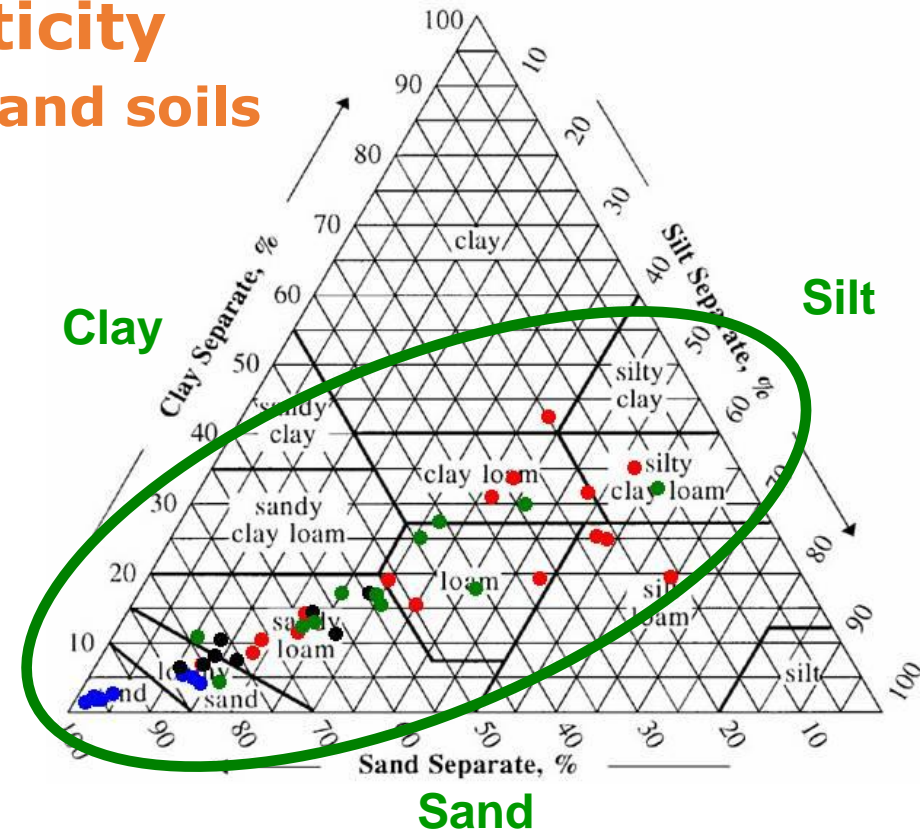
Gravel



Roadsides

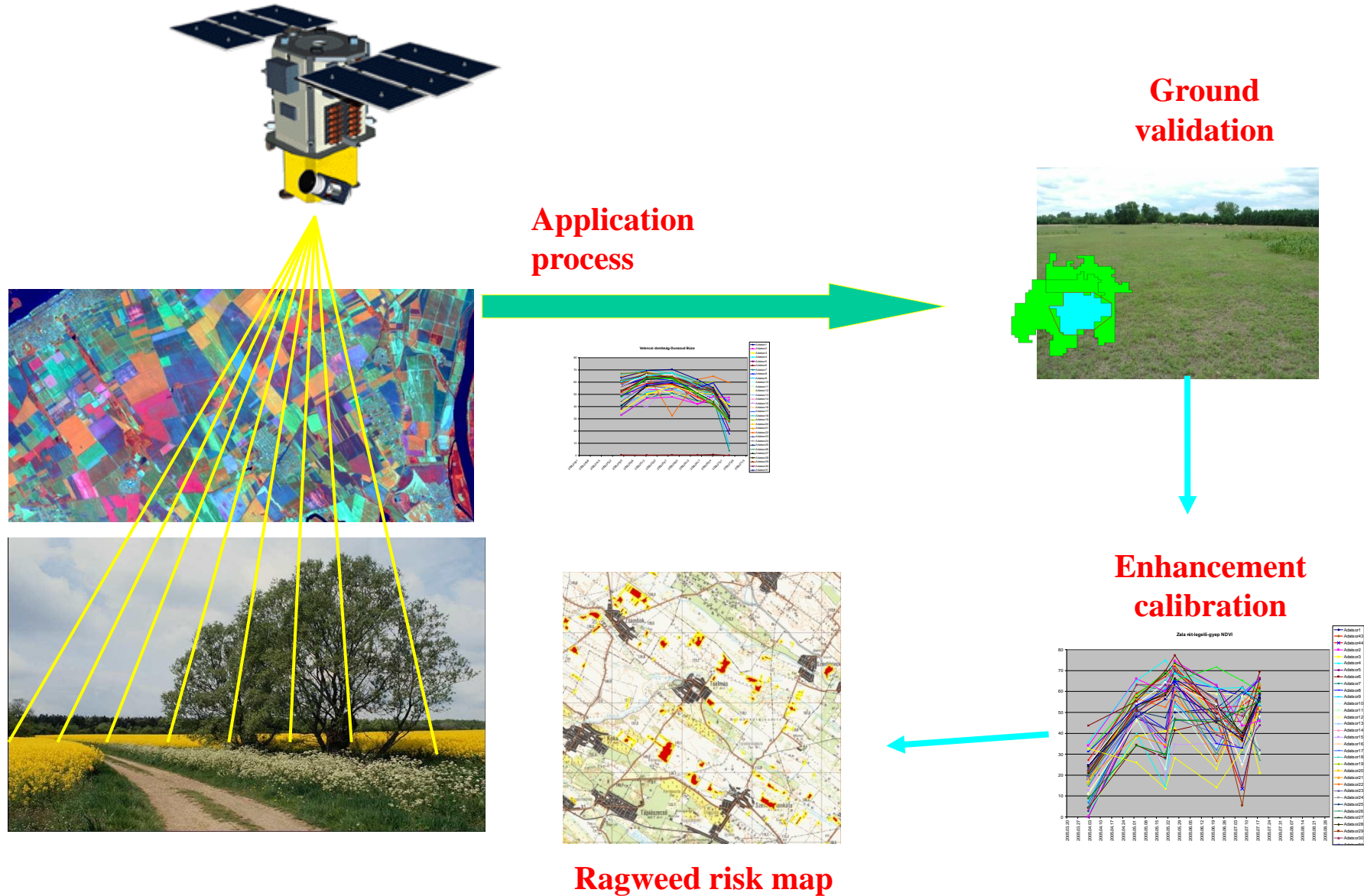


Fields

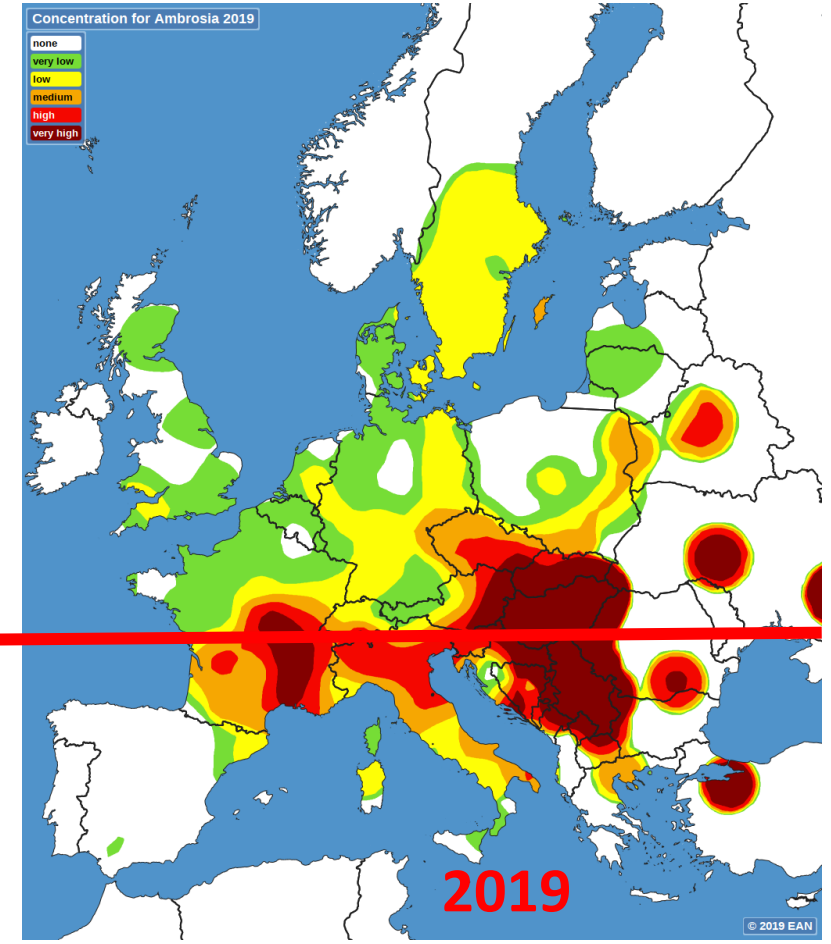
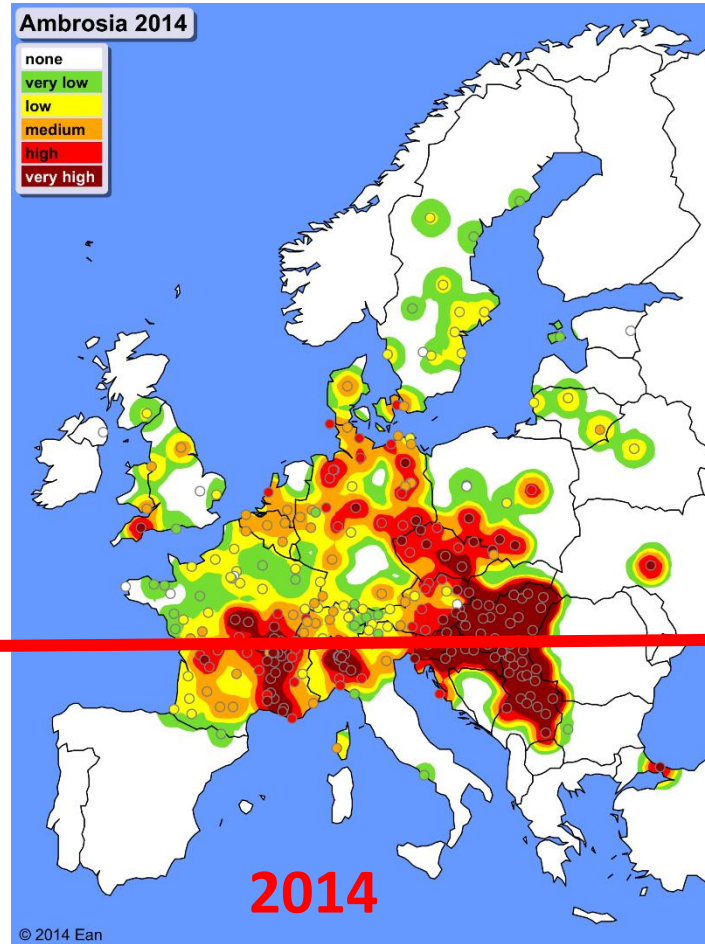
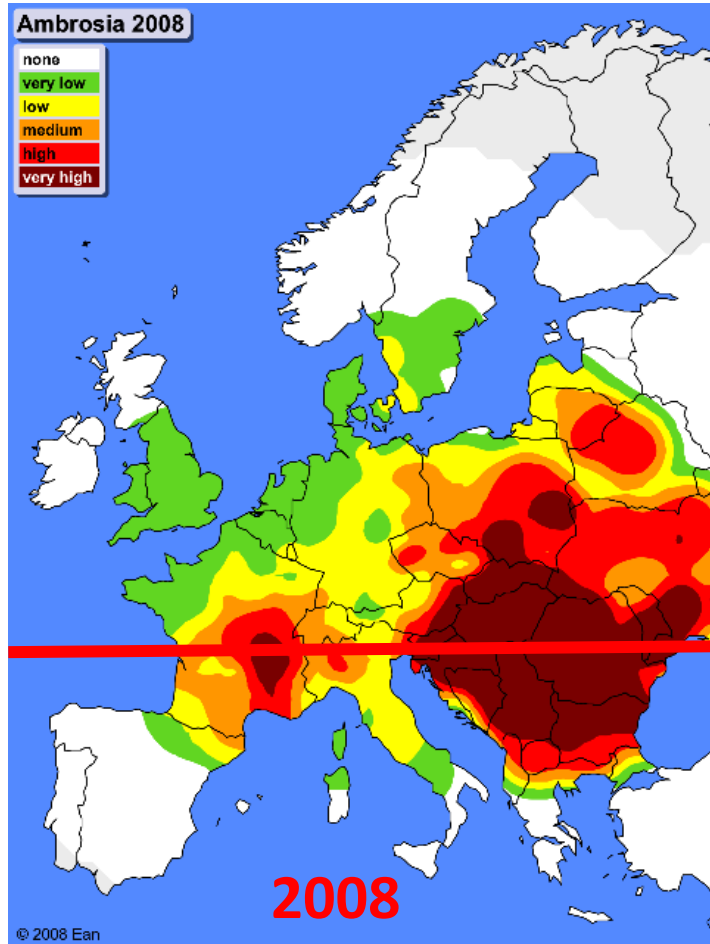


	Min	Max
pH KCl	4,09	8,64
C/N	0,68	38,7
N (g/Kg)	0,1	5,43
C (g/Kg)	0,33	121
Soil organic matter (g/Kg)	0,58	204
Calcium (CaCO ₃) total (g/Kg)	0,77	27,7

Process of remote sensing ragweed risk maps



Ragweed in Europe



Around the 45th parallel




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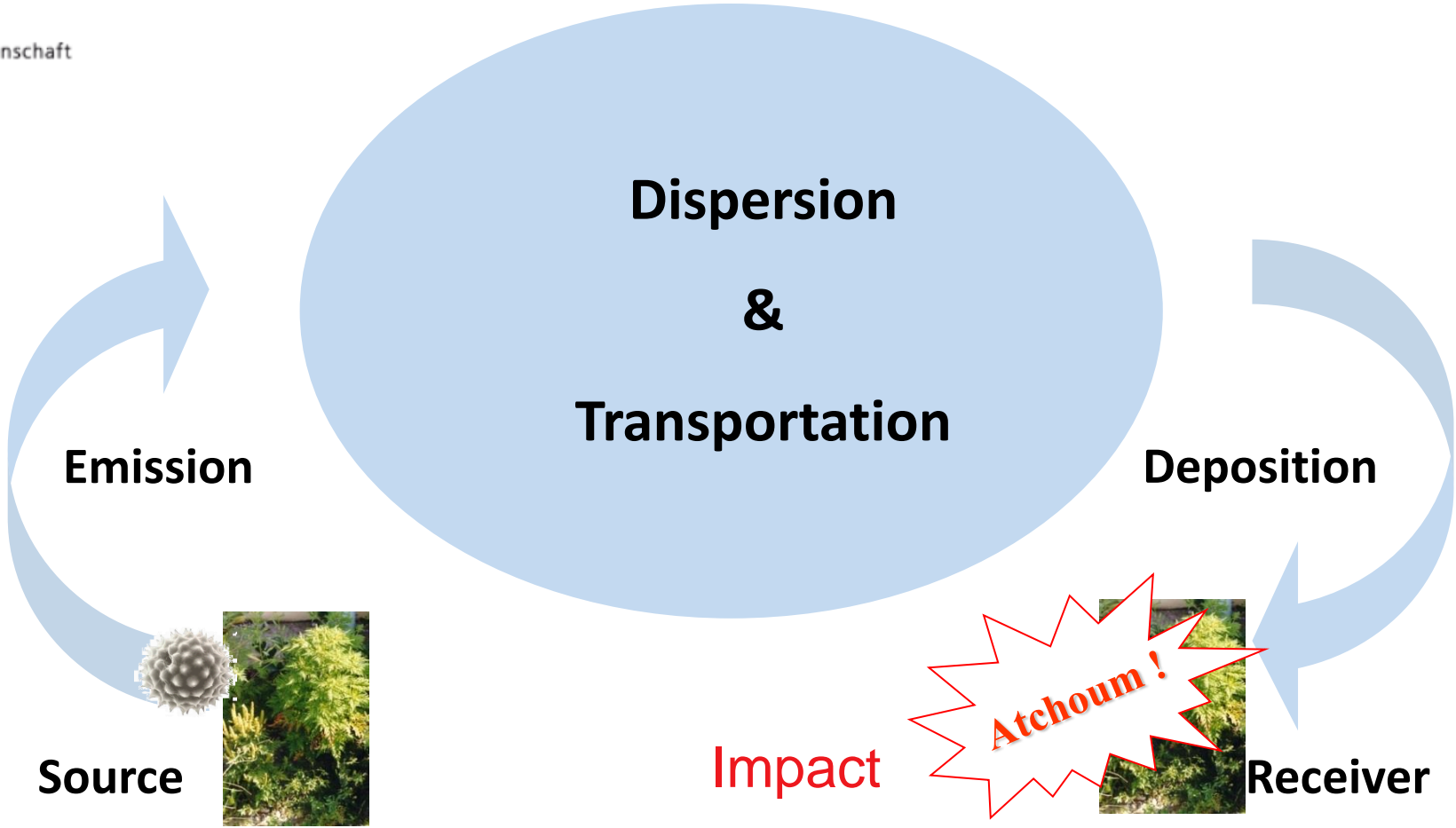
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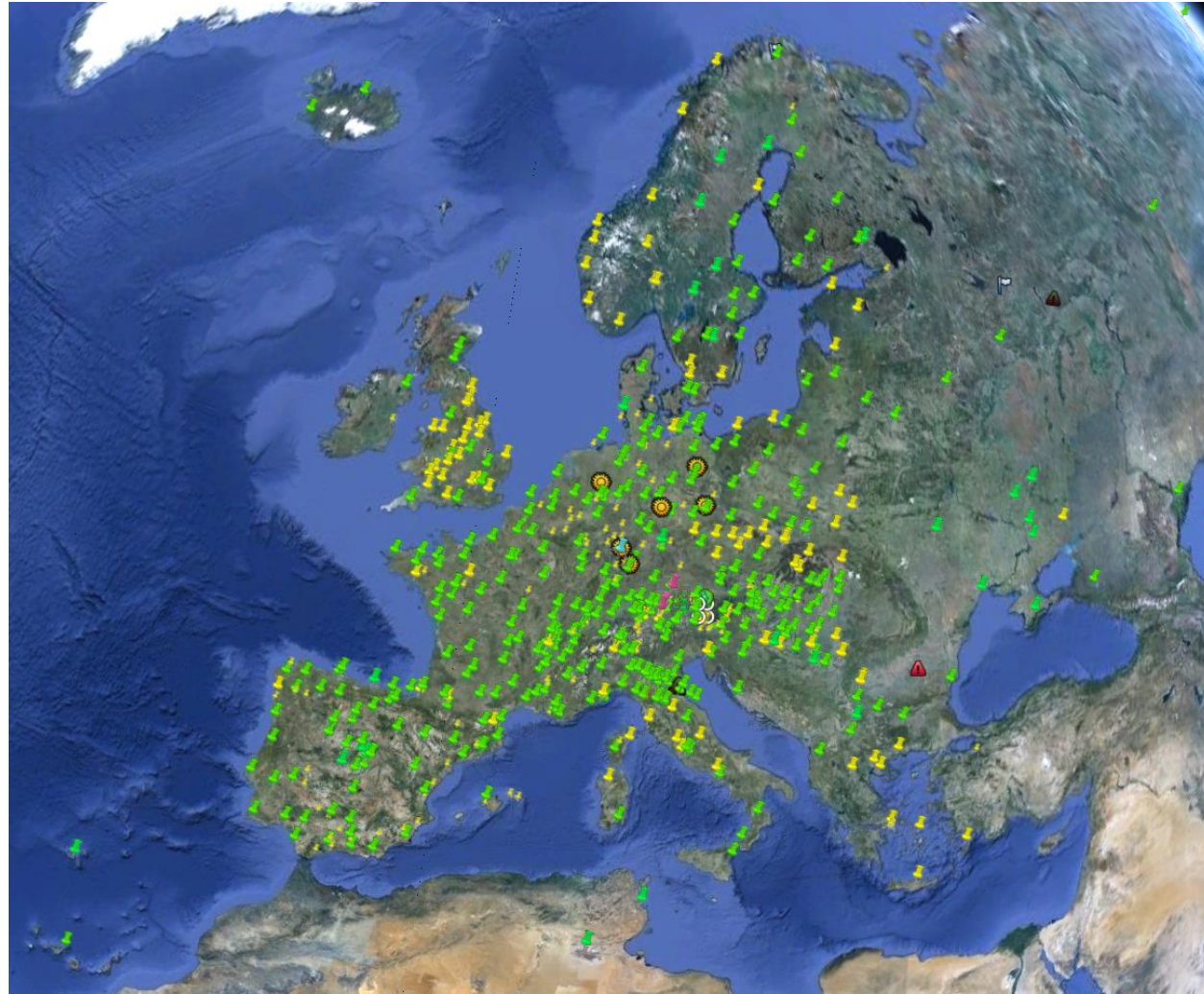
AEROBIOLOGY

Aerobiology: a multidisciplinary approach

 Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

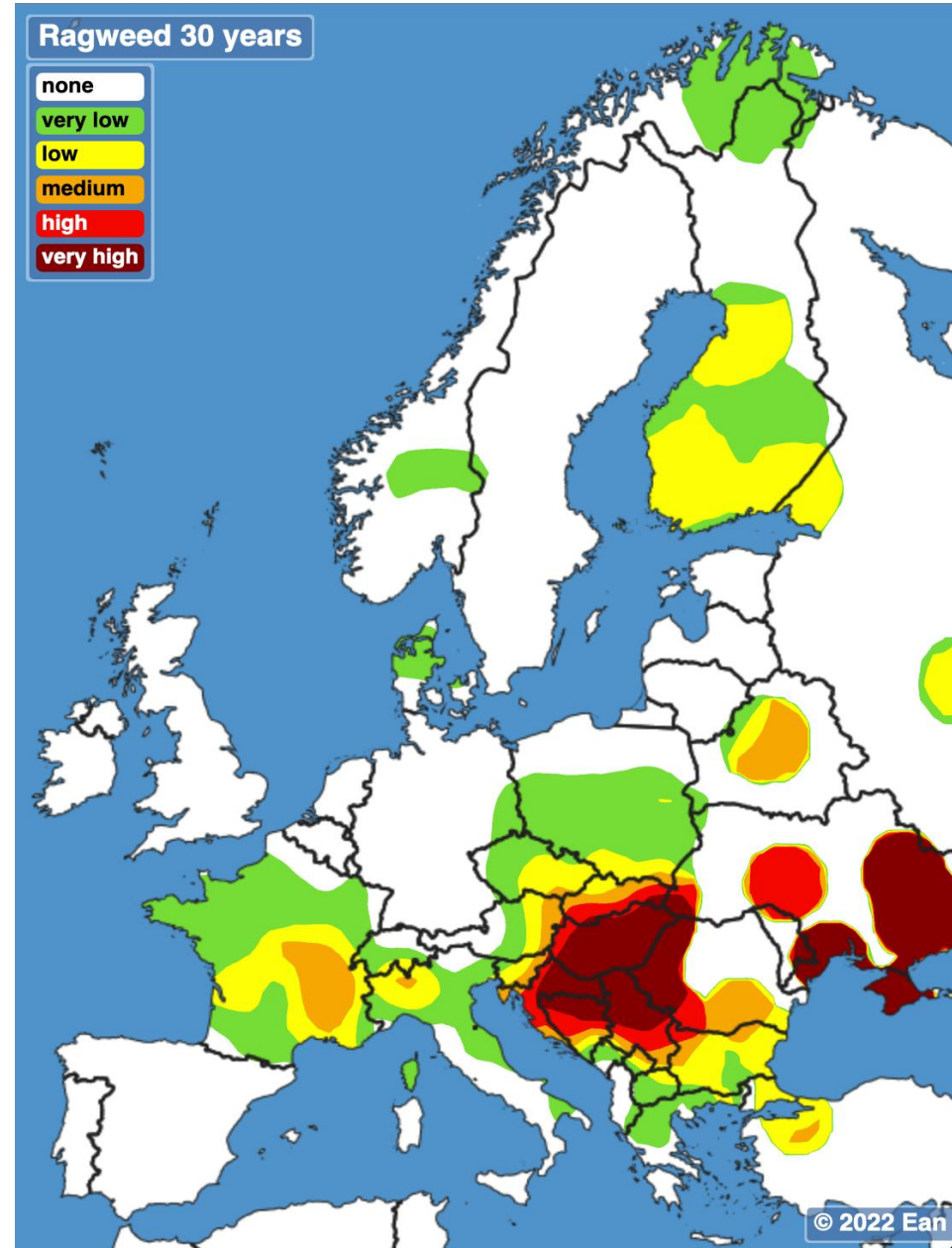


Pollens stations in Europe



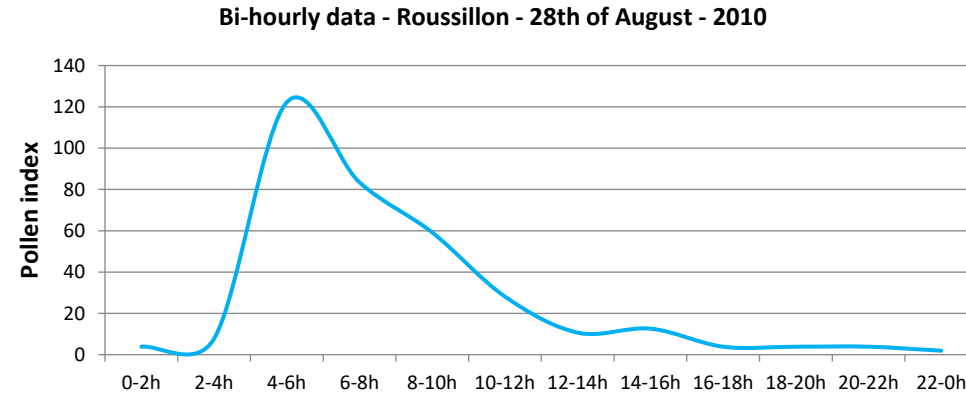
E.A.N.

Ragweed pollen during 30 years (1992-2021)

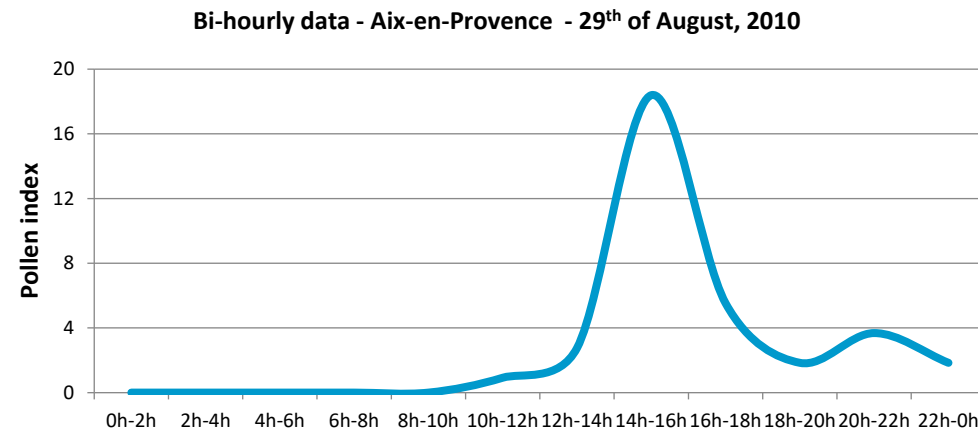


Bi-hourly data

- ⦿ Ragweed pollinates in the morning, between 4 and 10 am.

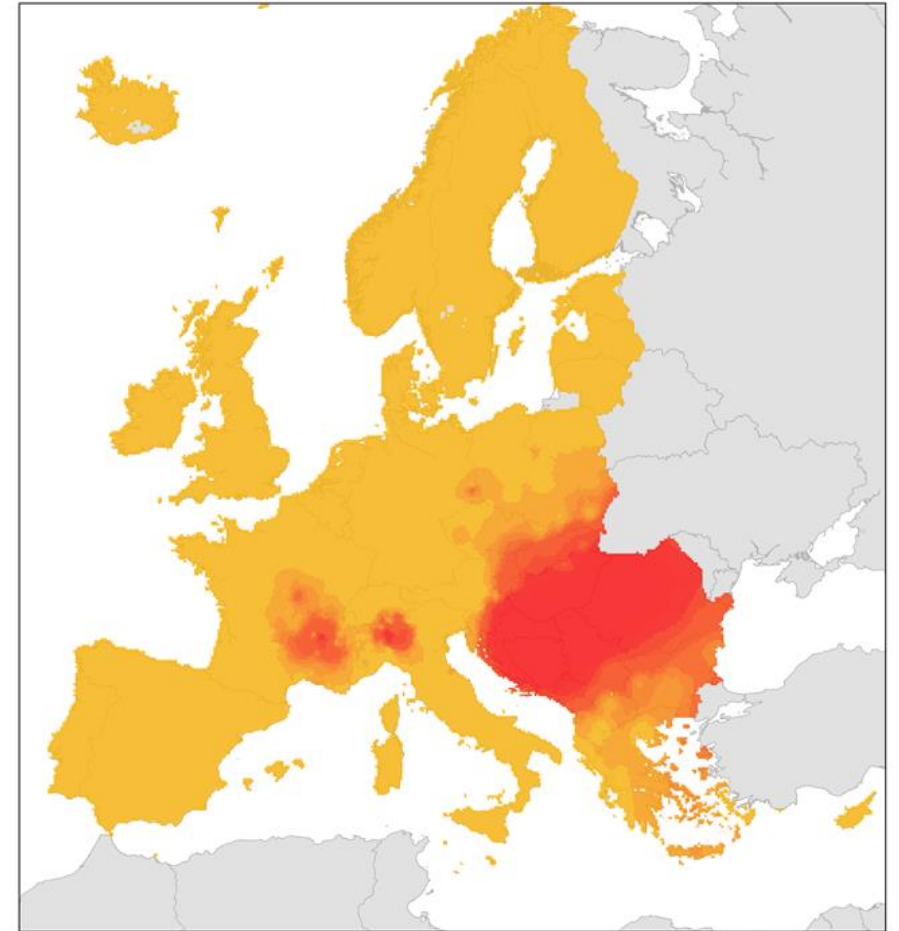


- ⦿ On the stations which are located not so far of the infested areas, ragweed pollens are present between 1 and 6 pm



Seasonal *Ambrosia* pollen counts

- Interpolation of pollen data from 296 pollen monitoring stations
- Interpolation of data points
- Threshold above which humans express symptoms: 6-10 pollen grains per m³ and day



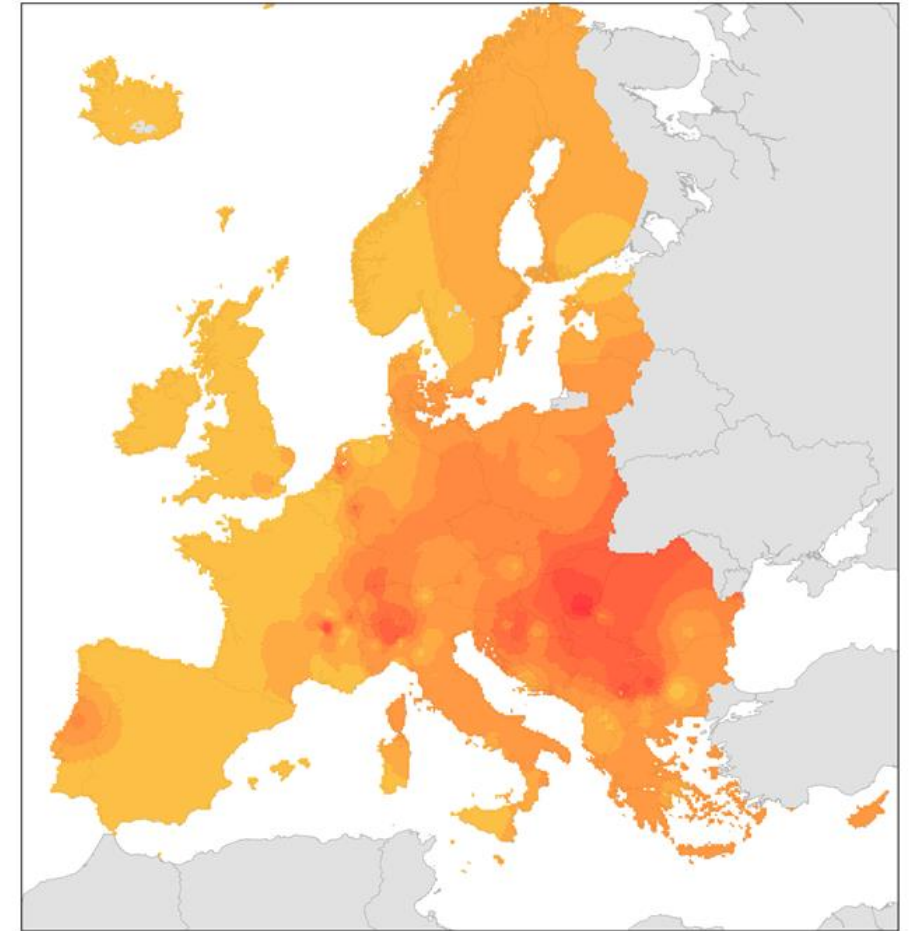
(Schaffner et al., *Nature Comm* 2020)

Ambrosia sensitisation rates

- European pollen monitoring program: 296 stations

Before 2013:

- 13.4 million persons suffering from ragweed allergies
- Costs of approx. € 7.4 billion annually



Ambrosia sensitisation rate (%)



(Schaffner et al., *Nature Comm* 2020)

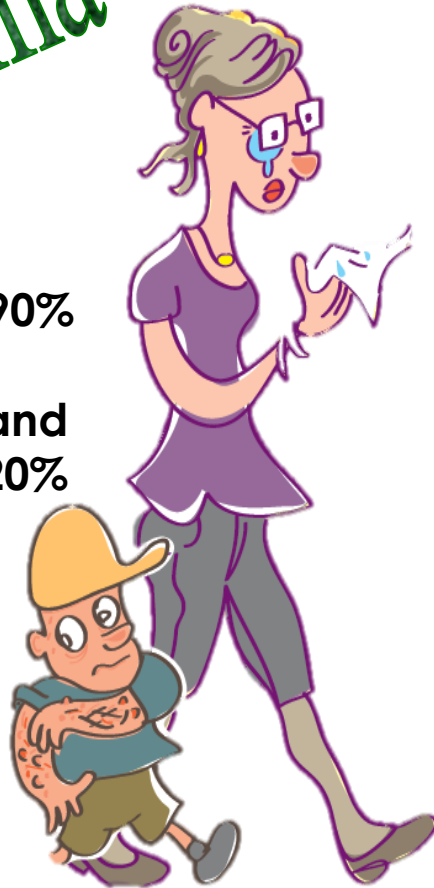
Pollen allergy

Asthma

Rhinitis 90%

Urticaria and
eczema 20%

I am itchy



Conjunctivitis

*I weep
for
its prick*

Conjunctivitis 75%

I cough

Tracheitis, asthma
50%





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Ragweed: a pollutant?

Ragweed: a pollutant?

The most commonly used **definition of pollutant** is: a biological, physical or chemical component, which beyond a certain threshold, and sometimes under certain conditions, develops **negative impacts** on all or part of an ecosystem or environment in general.

Within the framework of the European commission, **a substance is considered as a pollutant if it is of anthropogenic origin, if it has a health impact, and if only the man can help to its elimination.**

The question is, **whether ragweed pollen can be considered as a pollutant?** A lot of work, article, research projects, etc. are published about ragweed and ragweed pollen. Since more than 50 years, ragweed became more and more important.

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International Ragweed Society

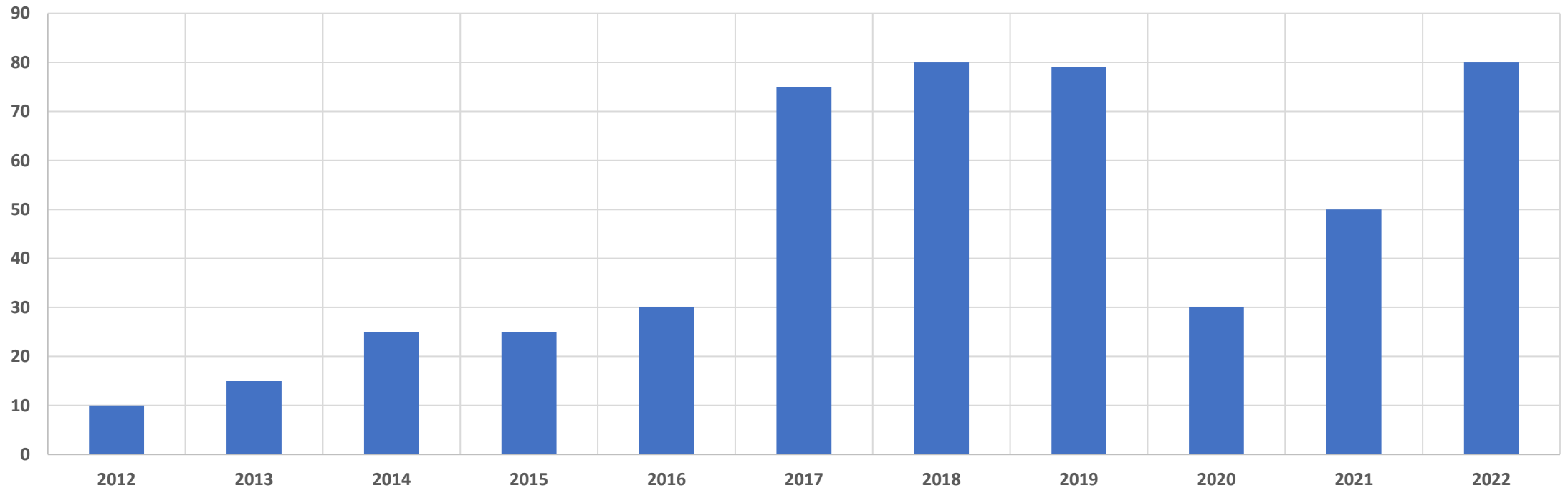
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The creation of the **International Ragweed Society** by our colleague Professor Tamás KOMÍVES in Budapest 14 years ago, is an example of the necessity and the wish of number of research teams to work on this topic.

The creation of the **International Ragweed Day (IRD)** at the beginning of the summer, each year is an important event to sensitize the population, the territorial authorities, the health authorities and the medical profession on the importance of recognizing the plant and knowing the means of eviction.
But still a lot of work remains to be done!

INTERNATIONAL RAGWEED DAY

Numbers of French events for International ragweed day



INTERNATIONAL RAGWEED DAY

Dissemination of information:

- since 2002 – actions against *Ambrosia*
- since 2004 – legal commitment to eradicate *Ambrosia*

SISAK BEZ AMBROZIJE

ISTRAŽILI SMO: Rasprostranjenost, osobine, alergija, suzbijanje, te preparate za djelovanje kako bismo se zaštitili od ambrozije

AMBROZIJA (*Ambrosia artemisiifolia*)

RASPROSTRANJENOST
Sunčana, neobrađena zemljišta: r šuma i poljskih putova, uz javne pr vodotoke i kanale, na zapuštenim d vrtovima.

OSOBINE
Jednogodišnja biljka 1-1,5m visine, niže se Cvate od početka kolovoza do početka prv Jedna biljka proizvede i do 8 milijardi zrn Pelud ambrozije se širi oko 1 km u okrag ga raznosi i na stotine kilometara.

ALERGIJA
Pelud ambrozije je najjači alergen. 10% stanovništva je na njega alergično, a godina peludi u zraku je 5 puta više. Koncentracija peluda je najviša u jutarnj dopodne; povećava se tijekom kišnog pr a smanjuje kišnim ljetom. Znakovi alergije: kihanje, svrbež nosa, v nosa, pečenje u očima, otežano disanje, u

SUZBIJANJE
Agrotehničkim mjerama: obradom tla, pr sjetvom i gnojidbom kulture, pridržavanj
Mehaničkim mjerama: okopavanjem, plij redovitom (višekratnom) košnjom, međur kultivacijom.
Kemijskim mjerama: uporabom učinko

PREDLAŽEMO: ako je napadnuta ambrozija početkom travnja, kada ambrozija niša. Akcija obaviti s djelatnicima Komunalca Sisak prema detekciji koje smo učili u rujnu.

PREPORUKA ZA DJELOVANJE
Izbjegavati izlaziti iz kuće ujutro od 5-10 suh i vjetrovitih dana kada je koncentra Obavijati poslove izvan kuće neposredno poslijepodne i predveče.
Držite zatvorene prozore, perite kosu prij ruke, ne sušite odjeću izvan kuće, koristite koji smanjuje količinu peluda za 90%.
Izbjegavajte pušenje, sprejave protiv insek iritansi.

URADILI SMO: Odredili mjesta obrada ambrozijom na području Viktorovca i ostalih lokacija gdje žive stenci OS Viktorovac, Sisak

ŽIVOT U SISKU BEZ AMBROZIJE





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IRS PHOTOS

Buenos Aires 2010





Rho 2014

RAGWEEED POLLEN AS BIOLOGICAL POLLUTANT IN NORTHERN ITALY
in Basso, P. Bortolotti, S. Cappelletti, C. Tassinari, M. Spigolon, D. De Agostini, M. T. Montagnani, M. Albanese

INTRODUCTION and AIM
An allergen defines the presence of different kinds of allergens (pollen, chemical or biological) in the air. Ragweed pollen is a biological pollutant. The term "biological pollutant" indicates both allergens and pathogens. Ragweed pollen is a biological pollutant. The term "biological pollutant" indicates both allergens and pathogens. Ragweed pollen is a biological pollutant. The term "biological pollutant" indicates both allergens and pathogens.

METHODS
The study includes a review of the evidence of ragweed pollen and its relation to pollution in two of the most important cities in Northern Italy: the North Adriatic Sea and the Po River valley.

RESULTS
The study shows that ragweed pollen is present in the air of Northern Italy. The results show that ragweed pollen is present in the air of Northern Italy. The results show that ragweed pollen is present in the air of Northern Italy.

CONCLUSION
The study shows that ragweed pollen is present in the air of Northern Italy. The results show that ragweed pollen is present in the air of Northern Italy. The results show that ragweed pollen is present in the air of Northern Italy.



Has the allergy to pollen favoured the invasion of common ragweed?

Bruno Chauvel, Marilou Mottet & Rebecca Bilon

Lyon, 19th July 2016

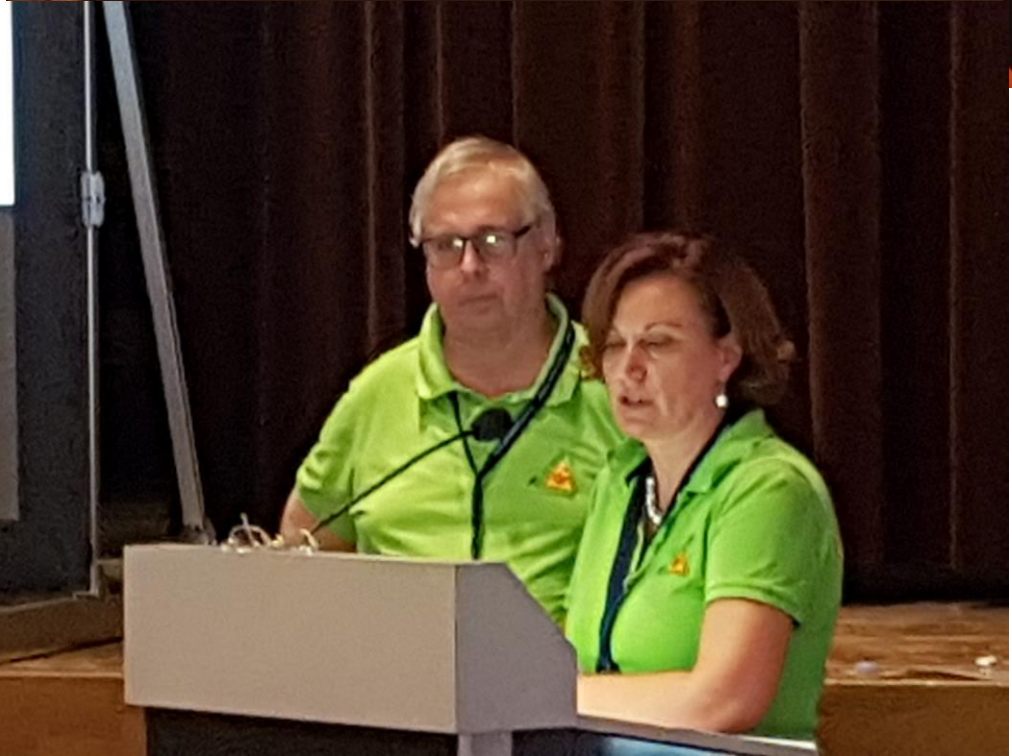
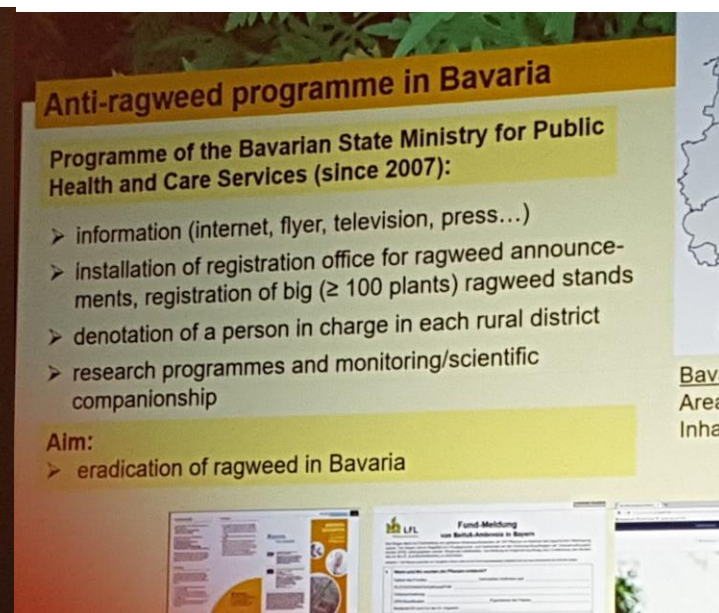
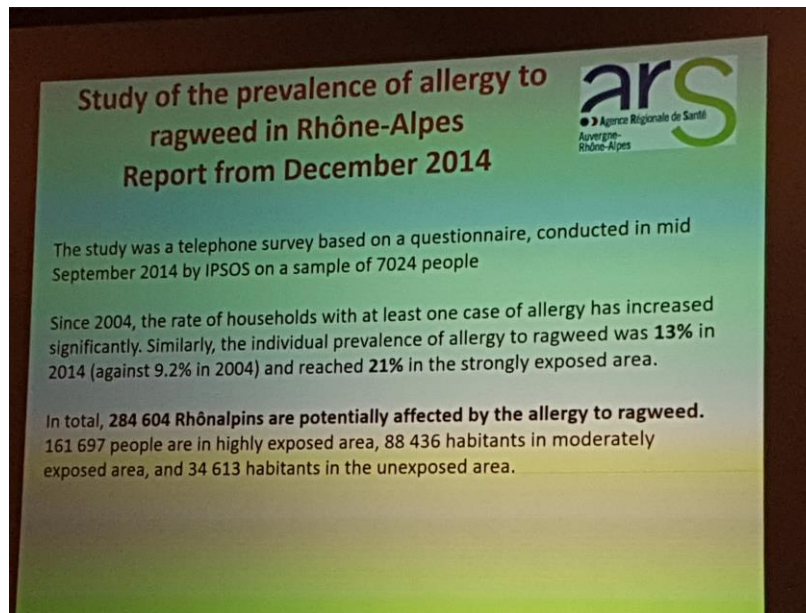


Lyon 2016





Vianden 2016





Parma 2018



Thank you for your attention



www.pollens.fr
<http://internationalragweedsociety.org/>

