



ESTIMATION OF GERMINATION PARAMETERS OF FOUR EUROPEAN ECOTYPES OF AMBROSIA *ARTEMISIIFOLIA*: CONTRIBUTION TO THE PREDICTIVE EMERGENCE MODEL

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INTRODUCTION

Ambrosia artemisiifolia (L.) – annual weed species from the Asteraceae family

Native to North/Central America

Great invasive potential – fastly spreading

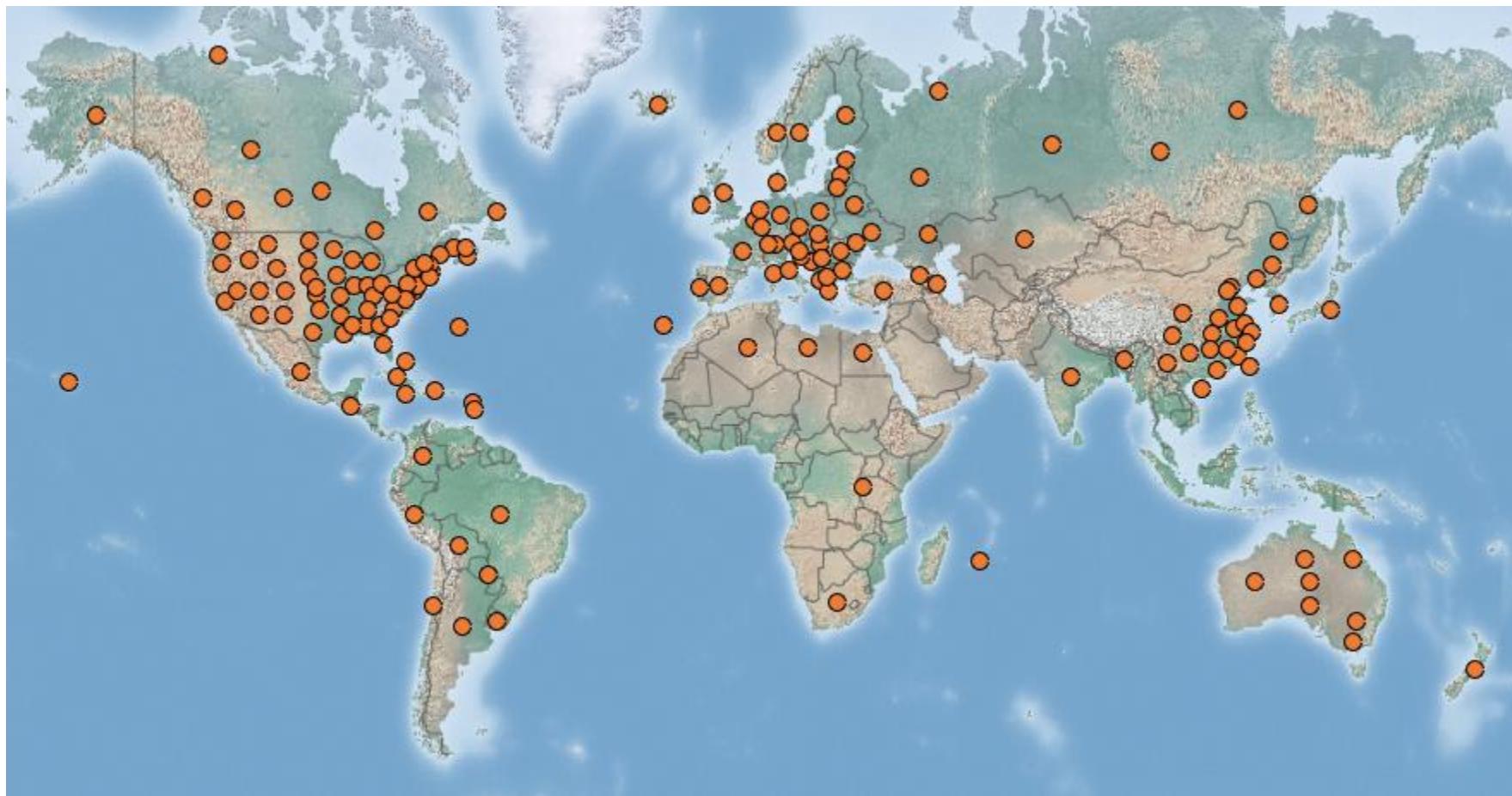
Can cause great problems in agriculture and for public health



INTRODUCTION

Present in great part of
the world

In Europe since XIX
century (France)



Distribution of *Ambrosia artemisiifolia*
Source: Cabi

INTRODUCTION

Ecotypes from: France, Italy, Croatia and Serbia



INTRODUCTION

Ecotypes from:
France, Italy, Croatia and Serbia

| Country | % of agricultural land invaded |
|---------|--------------------------------|
| France | 4 |
| Italy | 5 |
| Croatia | 48 |
| Serbia | 38 |

| Country | Minimum concentration (grains m ⁻³ d ⁻¹) |
|---------|---|
| France | 5-6 |
| Italy | 5 |
| Croatia | 20-30 |
| Serbia | 8-10 |

Final report: ENV.B2/ETU/2010/0037: Assessing and controlling the spread and the effects of common ragweed in Europe

MATERIALS AND METHODS

Base temperature (T_b)

4 replicas x 50 seeds



Climatic chambers 12h
light/ 12h dark
photoperiod (1°C to 30°C)



Base water potential (Ψ_b)

4 replicas x 50 seeds



Climatic chambers 12h
light/ 12h dark photoperiod
(0 MPa to –2 MPa) at 24°C



drc and drcSeedGerm
packages in R

(Mesgaran, 2019)

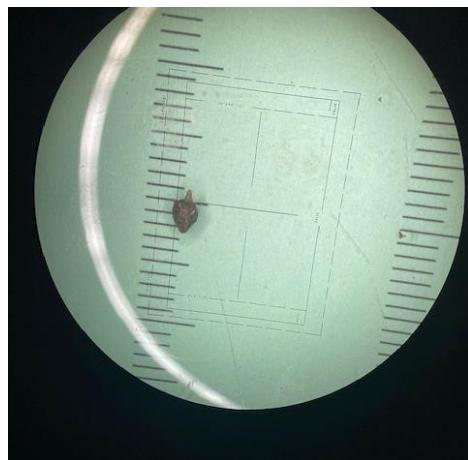
MATERIALS AND METHODS

Seed morphological traits

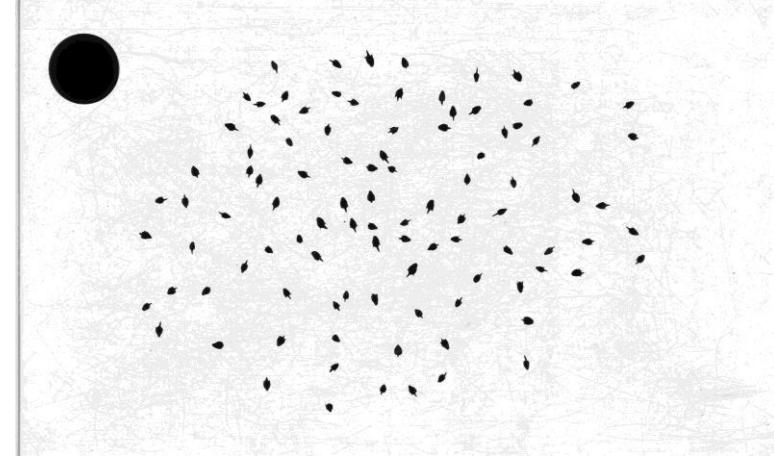
Weight of 100 seeds



Length and width



Area, perimeter, circularity

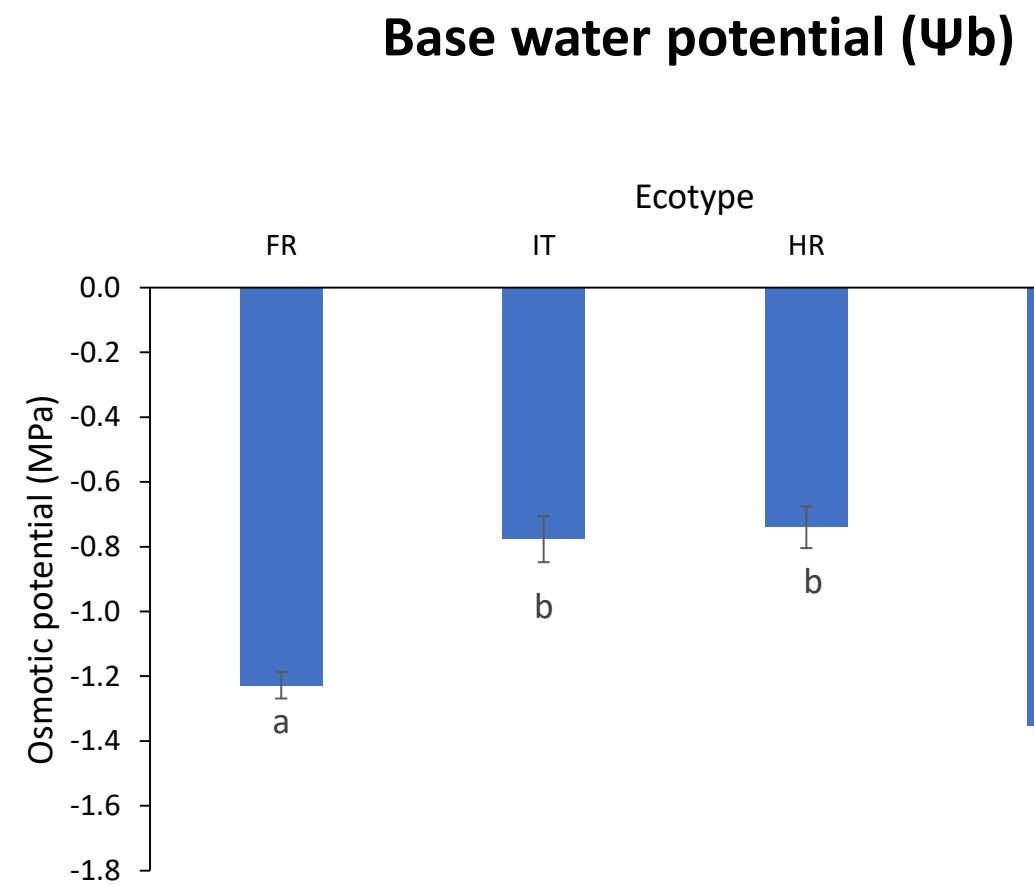
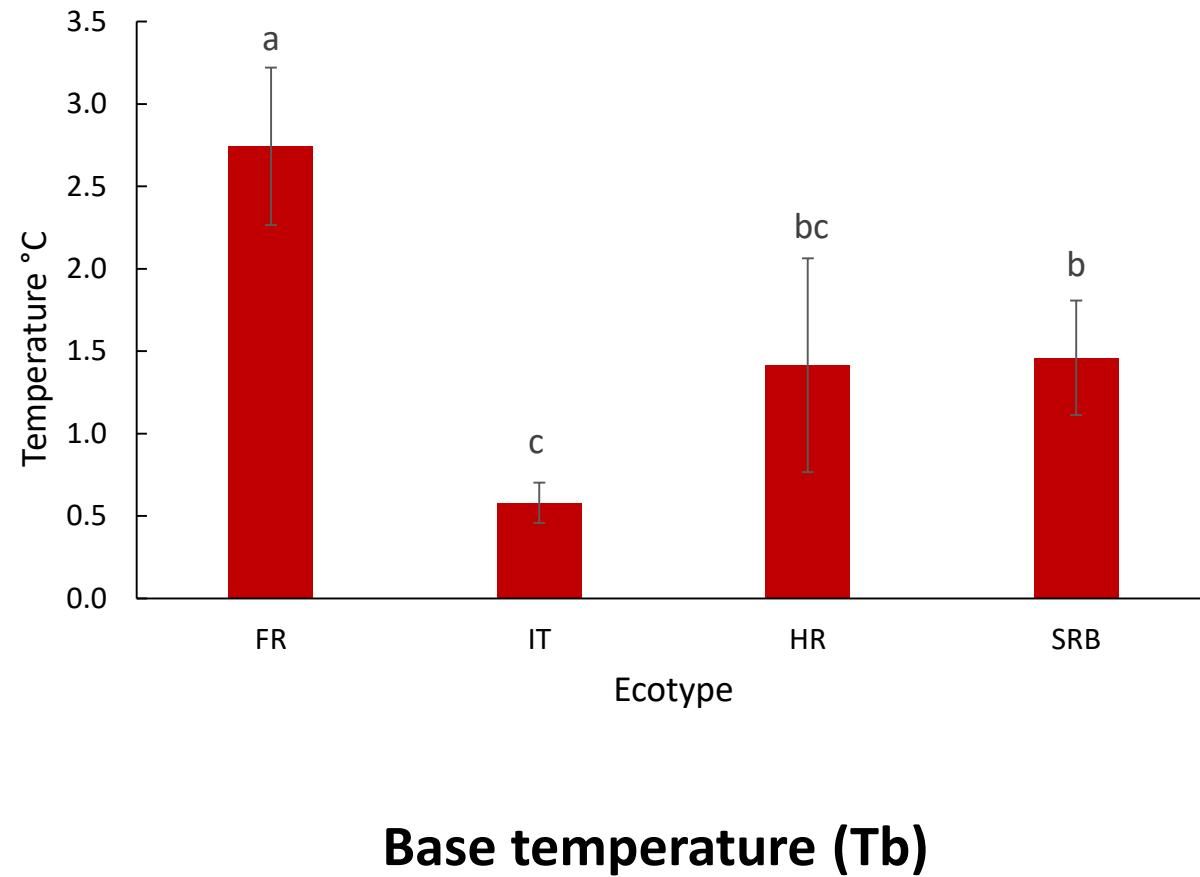


Precise scale

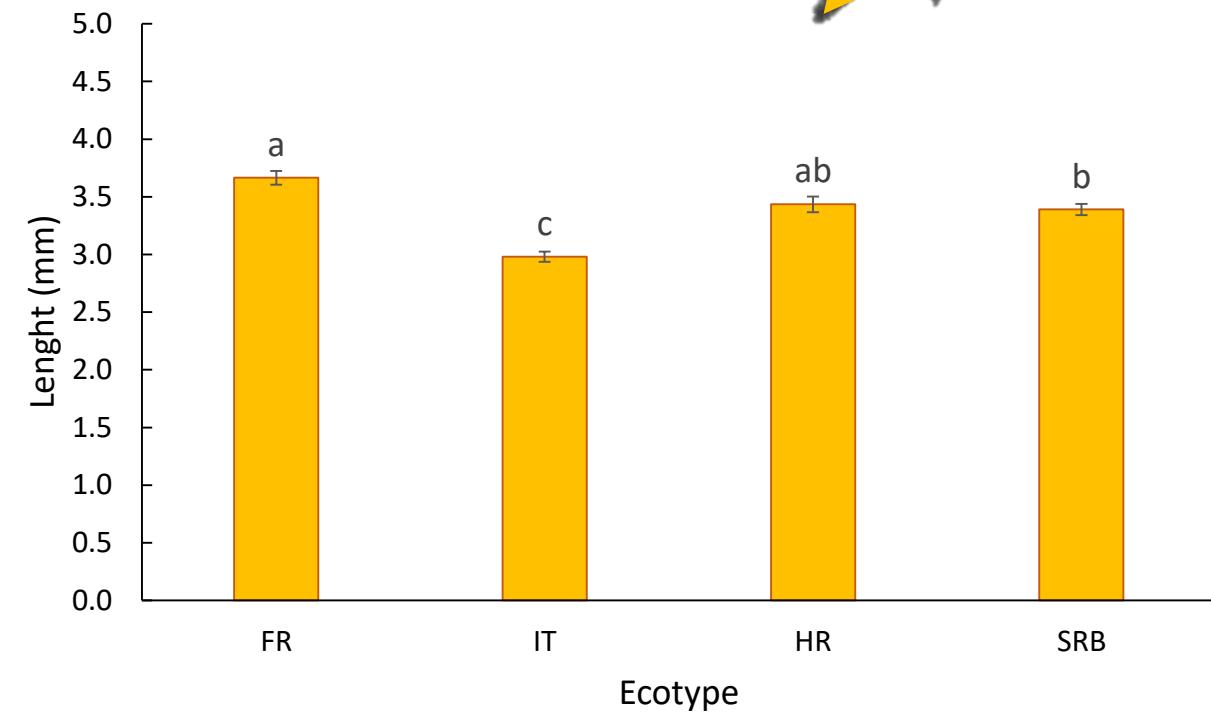
Microscope

ImageJ – Image analysis

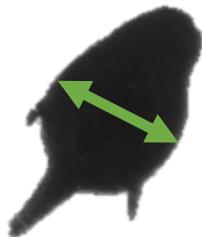
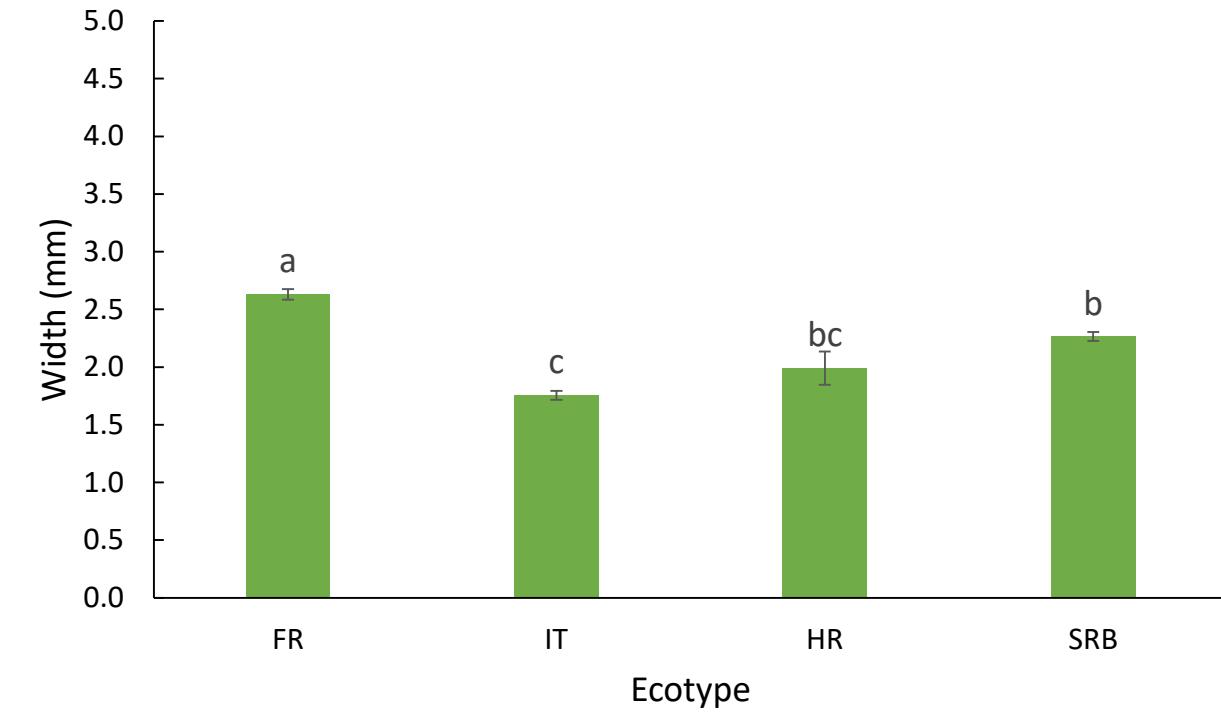
RESULTS



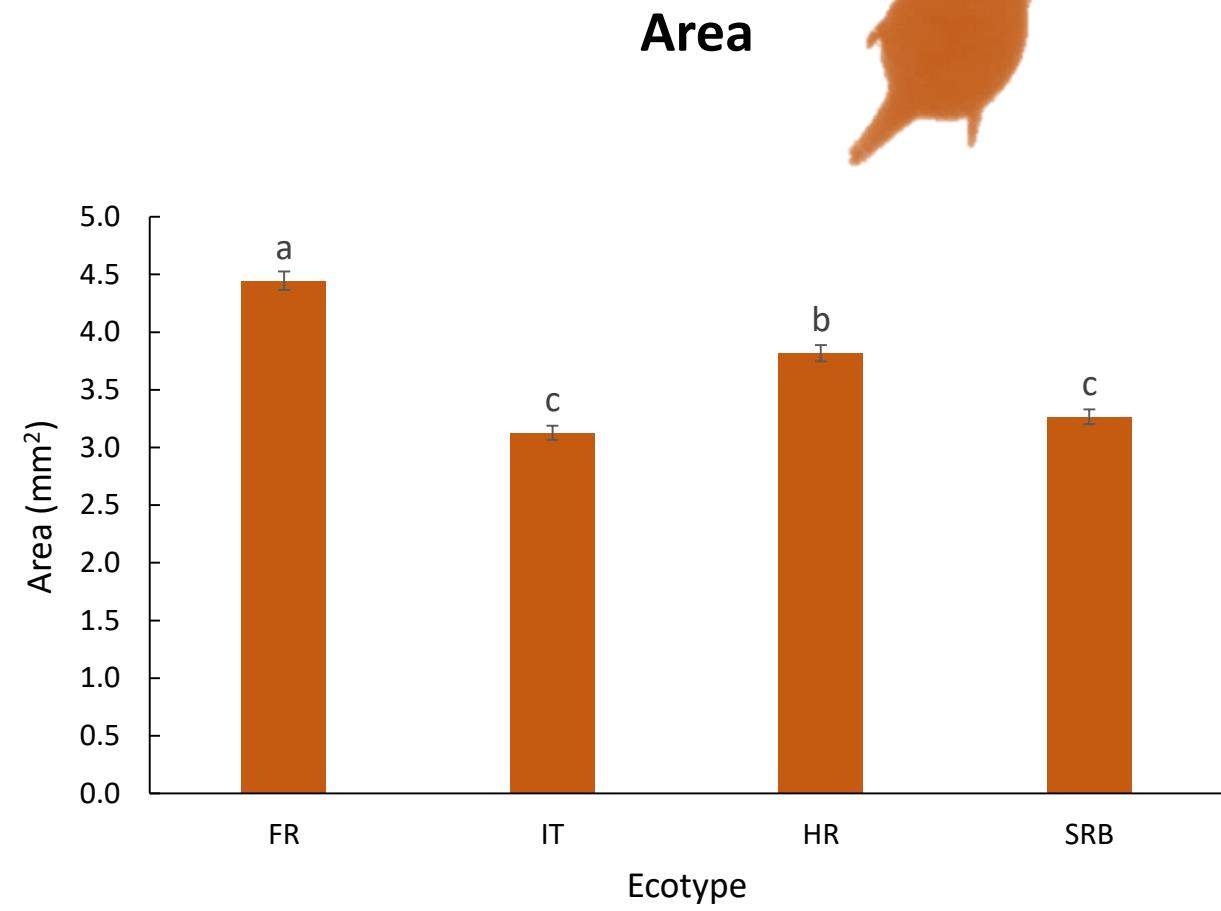
RESULTS



RESULTS

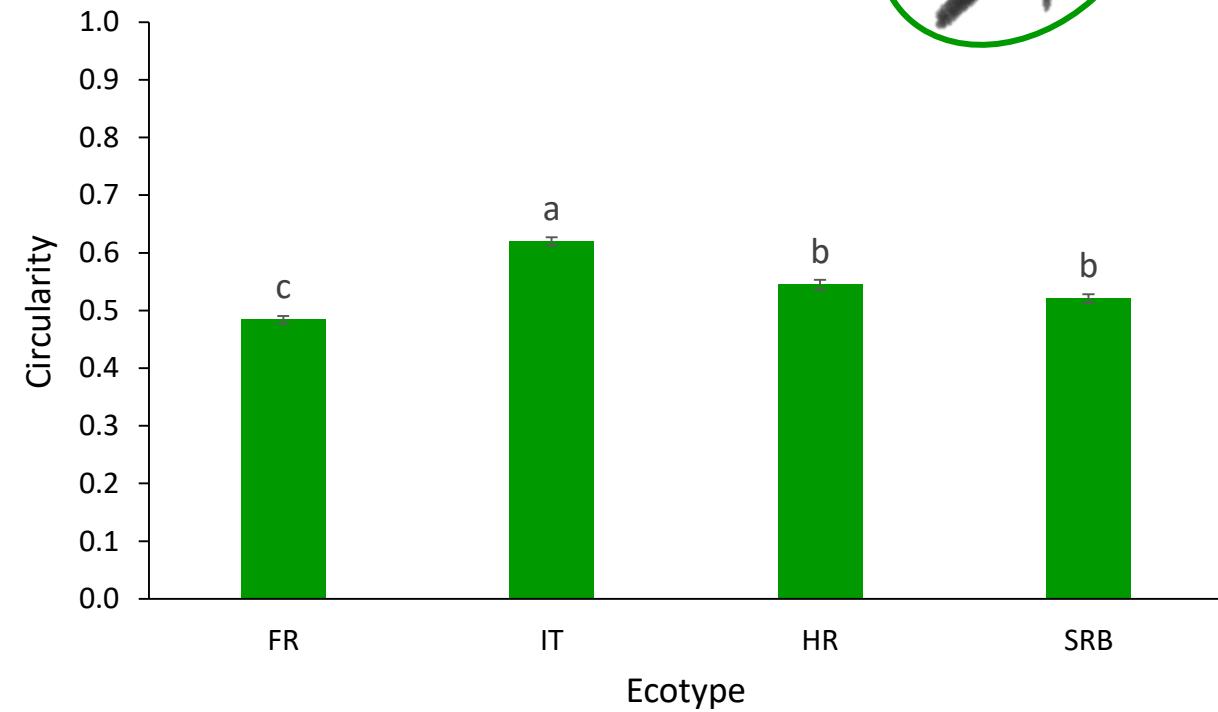
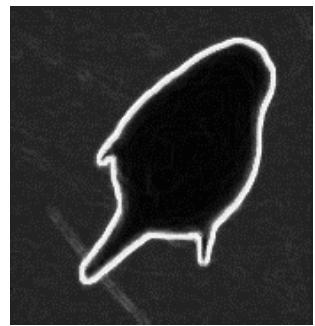
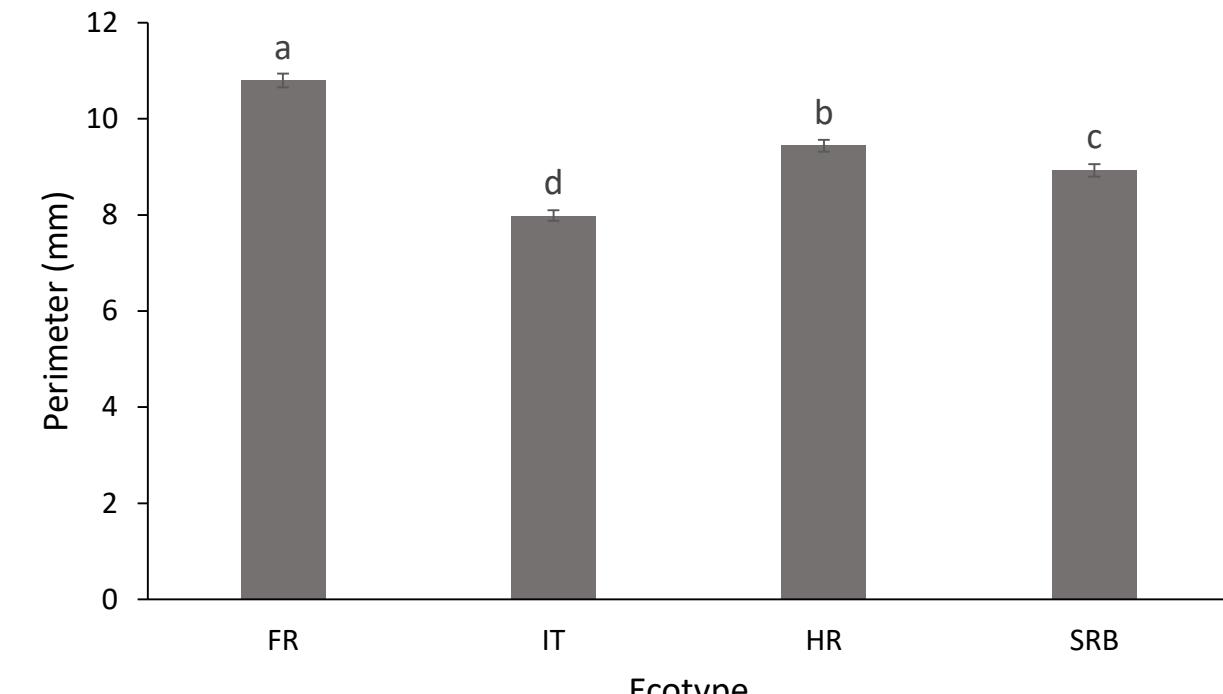


Width



Area

RESULTS



CONCLUSIONS

All of the ecotypes show certain differences



High adaptability of the species

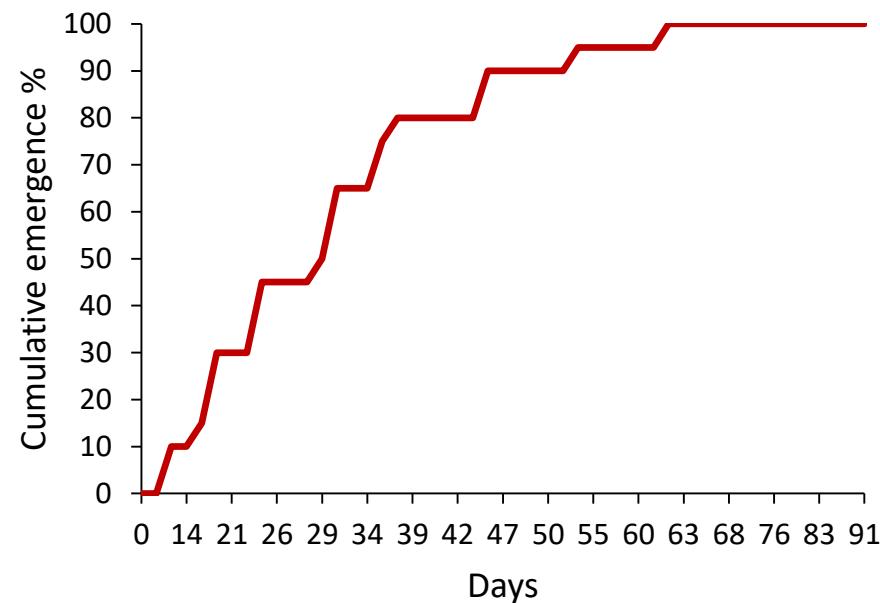


Possible different ways of introduction

FUTURE PERSPECTIVES

Field emergence trials

Developing an emergence predictive model





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THANK YOU FOR YOUR ATTENTION



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IRS 2022
INTERNATIONAL RAGWEED SOCIETY
CONFERENCE
BUDAPEST, HUNGARY

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INTRODUCTION

Ecotypes from:
France, Italy, Croatia and Serbia

| Country | Tb | St.err. |
|---------|------|---------|
| France | 2.74 | 0.48 |
| Italy | 0.58 | 0.12 |
| Croatia | 1.46 | 0.35 |
| Serbia | 1.42 | 0.65 |

| Country | Ψb | St.err. |
|---------|----------|---------|
| France | -1.23 | 0.04 |
| Italy | -0.78 | 0.07 |
| Croatia | -0.74 | 0.06 |
| Serbia | -1.35 | 0.18 |