



# Mapping of herbicide resistant weeds in Italy

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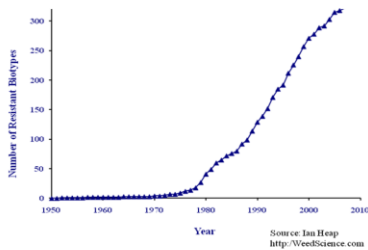
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European Weed Research Society

2 Workshop of the Weed mapping working group, Jokioinen 23 September 2011

# Herbicide resistance

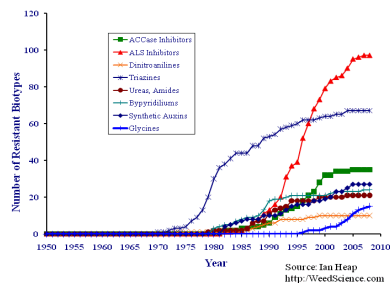


Naturally and inheritable ability of some weed biotypes to survive an herbicide treatment that would control that weed population

**Worldwide increasing issue !!**

## Resistant biotype

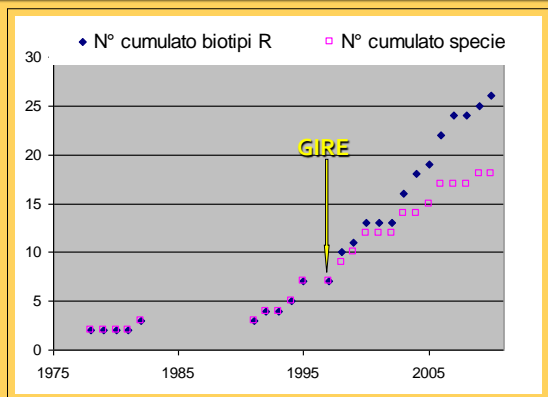
Group of individuals that share many physiological features including the capacity of survival one, or more, herbicides belonging the same group, used under normal conditions.



# Resistance in Italy

## Cronological evolution of biotypes number and species in Italy

E.g. - Echinochloa spp: 5 R biotypes  
- Lolium spp: 4 R biotypes



- 27 resistant biotypes
- Involving 18 species (13 monocot)
- 13 regions interested
- GIRE estimate: 20000 ha infested
- Many crops involved: rice, durum wheat, maize, soybean and perennial crops

# Resistant weeds mapping

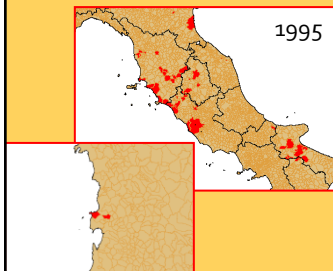
- **AIM:**
  - Regular update of the situation of the herbicide resistance weeds in different cropping systems all over the country
- **USED BY:**
  - **Regional institutions** may provide dispensations for particular problems (e.g. MCPA in rice and terbutylazine in maize)
  - **Industries** to evaluate the impact of resistance on business
  - **Researchers** for scientific purposes
- **HOW:**
  - Mapping is based on **targeted complain monitoring**, NOT on random serving
  - about 10 confirmed resistant pops (i.e. farm) to publish a new map
  - A municipality turns color when at least one R pop is confirmed

## Cases study: *Lolium* spp. and *Echinochloa* spp.

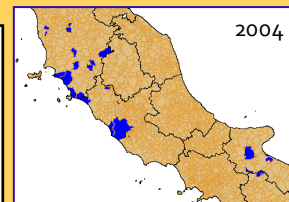
Species	First R population	Herbicides group	HRAC group	Cultures	Regions
<i>Lolium</i> spp.	1995	ACCCase inhibitors	A	Durum wheat	Emilia Romagna, Tuscany, Apulia, Umbria, Molise and Lazio, Sardinia
<i>Lolium</i> spp.	2004	ALS inhibitors	B	Durum wheat	Tuscany, Apulia and Lazio
<i>Lolium rigidum</i>	2007	Glyphosate	G	Vineyard, Olive grove	Piedmont and Apulia
<i>Lolium</i> spp.	2010	ACCCase inhibitors	A	Lucerne	Emilia Romagna
<i>Echinochloa crus-galli</i>	2000	Propanil	C2	Rice	Piedmont, Lombardy and Tuscany
<i>Echinochloa</i> spp.	2005	ALS inhibitors	B	Maize	Veneto, Piedmont, Emilia Romagna, Tuscany
<i>Echinochloa</i> spp.	2006	ALS inhibitors	B	Rice	Piedmont, Lombardy, Emilia Romagna, Sardinia
<i>Echinochloa</i> spp.	2010	ACCCase inhibitors	A	Rice	Lombardy

## *Lolium* spp.

ACCCase-inhibitors in durum wheat



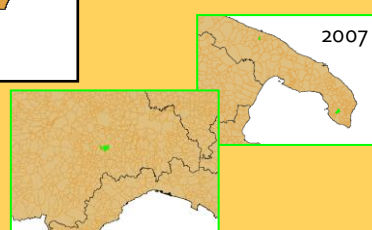
ALS-inhibitors in durum wheat



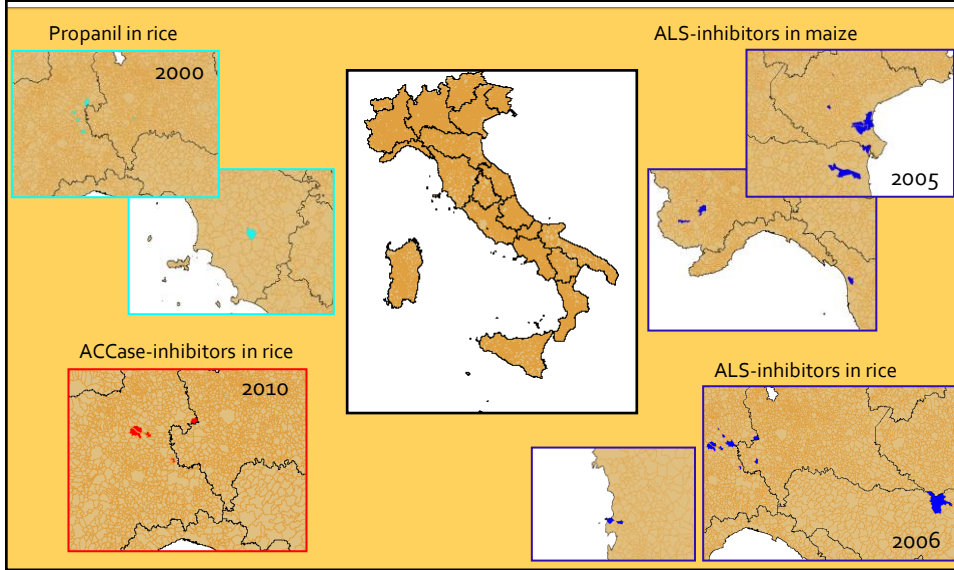
ACCCase-inhibitors in lucerne



Glyphosate in perennial crops



# Echinochloa spp.



GIRE®: Italian working group on herbicides resistance  
[www.resistenzaerbicidi.it](http://www.resistenzaerbicidi.it)

Multi stakeholders group involving academy, public researchers, agrochemical industry and technicians

The screenshot shows the website interface for GIRE (Gruppo Italiano Resistenza Erbicidi). Key elements include:

- Navigation Menu:** Home, Un po' di storia, Membri, Contatta il GIRE®, Come citare questo sito.
- Specie coinvolte (Involved species):** A list of species with corresponding images:
  - Alisma plantago-aquatica
  - Amaranthus retrofractus
  - Avena sterile
- Mappe di resistenza (Resistance map(s)):** A link provided for each species to view its distribution map.

### Mission of GIRE

Improve management of resistance encouraging cooperation and communication among public research and academic organisms, industries and operators.

## Concluding

Resistance monitoring is a key issue



The main aim is communicate where resistance is as soon as possible



Practical and scientific impact



## Thanks for your attention!

Thanks to EWRS for the financial support