



SIMPOHERBI- 2019



CUSTO DA RESISTÊNCIA DE PLANTAS DANINHAS A HERBICIDAS NO BRASIL

FERNANDO STORNILO ADEGAS

1993	ALS (<i>Bidens pilosa</i>) ALS (<i>Euphorbia heterophylla</i>)
1996	ALS (<i>Bidens subalternas</i>)
1997	ACCCase (<i>Brachiaria plantaginea</i>)
1999	ALS (<i>Sagittaria montevidensis</i>) Auxina (<i>Echinochloa crus-pavonis</i>) Auxina (<i>Echinochloa crus-galli</i>)
2000	ALS (<i>Cyperus difformis</i>)
2001	ALS (<i>Fimbristylis miliacea</i>) ALS (<i>Raphanus sativus</i>)
2002	ACCCase (<i>Digitaria ciliaris</i>)
2003	ACCCase (<i>Eleusine indica</i>) EPSPs (<i>Lolium multiflorum</i>)
2004	ALS (<i>Parthenium hysterophorus</i>) ALS+PPO (<i>Euphorbia heterophylla</i>)
2005	EPSPs (<i>Conyza bonariensis</i>) EPSPs (<i>Conyza sumatrensis</i>)
2006	ALS (<i>Oryza sativa</i>) ALS+PSII (<i>Bidens subalternans</i>)
2008	EPSPs (<i>Digitaria insularis</i>)
2009	ALS+Auxina (<i>Echinochloa crus-galli</i>) ALS+PSII (<i>Sagittaria montevidensis</i>)
2010	ALS (<i>Lolium multiflorum</i>) ACCCase+EPSPs (<i>Lolium multiflorum</i>) ACCCase (<i>Avena fatua</i>) EPSPs (<i>Conyza sumatrensis</i>)

2011	ALS (<i>Conyza sumatrensis</i>) ALS+EPSPs (<i>Conyza sumatrensis</i>) ALS+PSII (<i>Amarathus retroflexus</i>) ALS+PSII (<i>Amarathus viridis</i>)
2012	ALS (<i>Amarathus retroflexus</i>)
2013	ALS (<i>Raphanus raphanistrum</i>) ALS (<i>Ageratum conyzoides</i>)
2014	EPSPs (<i>Chloris elata</i>) PPO (<i>Amarathus retroflexus</i>) ALS (<i>Cyperus iria</i>)
2015	EPSPs (<i>Amaranthus palmeri</i>) ALS (<i>Echium plantagineum</i>) ACCCase+ALS+Inib Cel (<i>Echi crus-galli</i>)
2016	EPSPs (<i>Eleusine indica</i>) EPSPs+ALS (<i>Amaranthus palmeri</i>) ACCCase (<i>Digitaria insularis</i>) ALS+PSII (<i>Bidens pilosa</i>) ACCCase+ALS (<i>Lolium multiflorum</i>) PSI (<i>Conyza sumatrensis</i>)
2017	PPO (<i>Conyza sumatrensis</i>) ALS+PSI+EPSPs (<i>Conyza sumatrensis</i>) ALS+EPSPs (<i>Lolium multiflorum</i>) EPSPs+ACCCase (<i>Eleusine indica</i>) PSI+PSII+PPO+EPSPs+Aux (<i>C. sumatr</i>)

BRASIL – 50 CASOS

1993 – 2019

25 anos

50 casos

2,0 casos/ano

FASE 1

ALS, ACCase,...

FASE 2

EPSPs

1993

2003

2019



24

Soja



7

Trigo



6

Algodão



2

Milho



Sistema Grãos
39

1993 – 2003

11 anos

13 casos

1,2 casos/ano

FASE 1

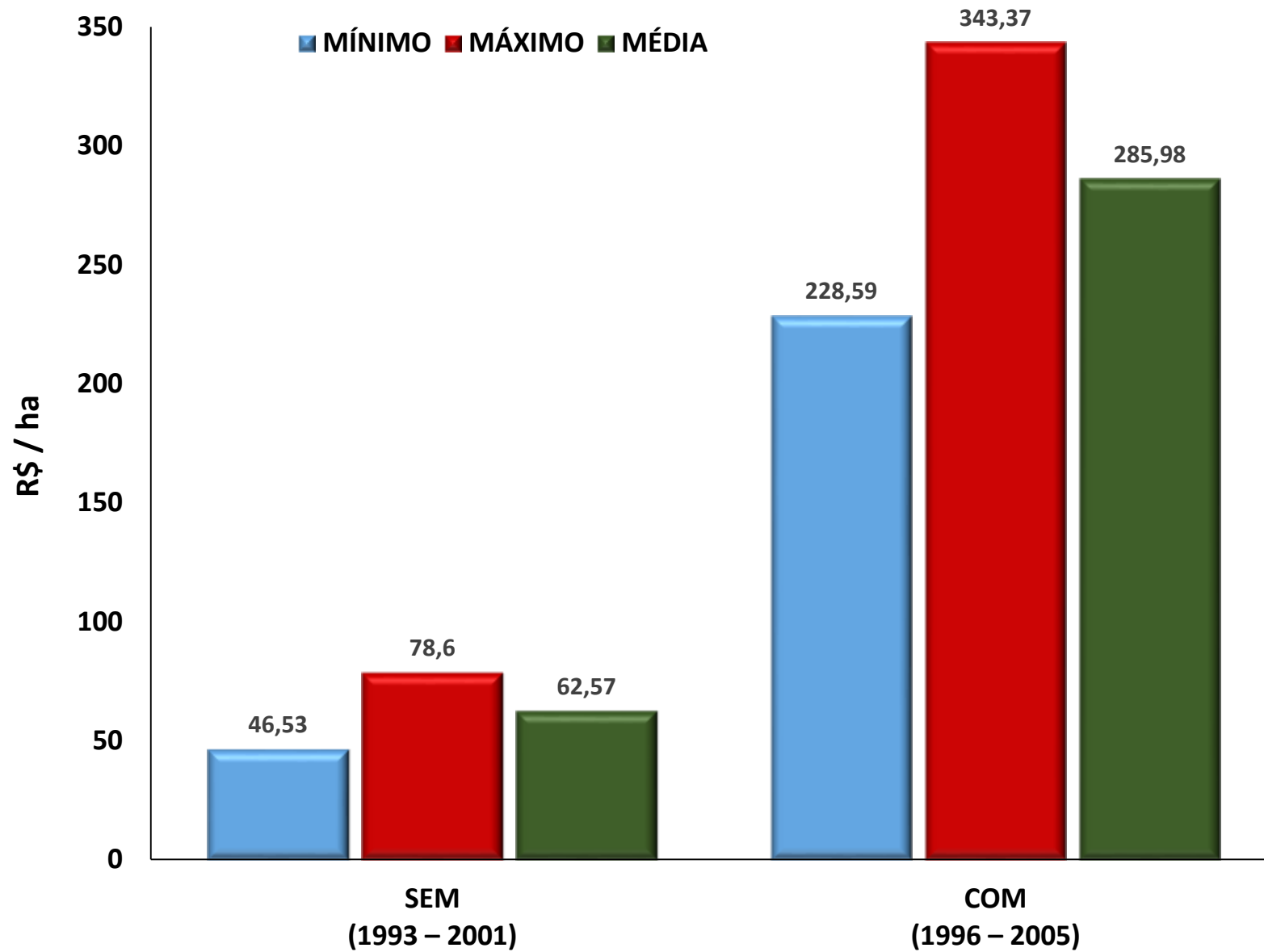
ALS, ACCase,...

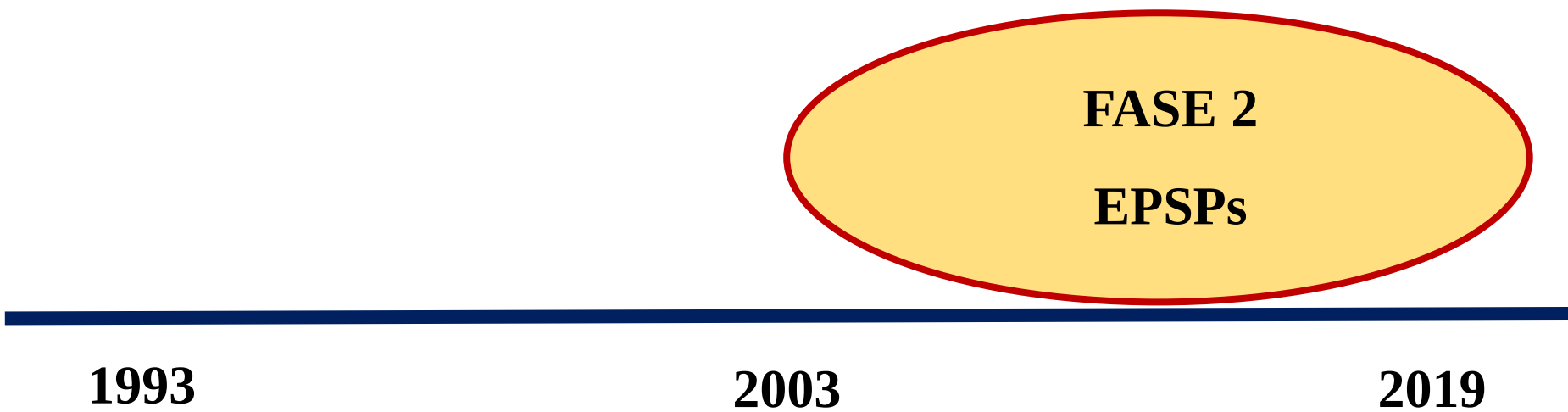
1993

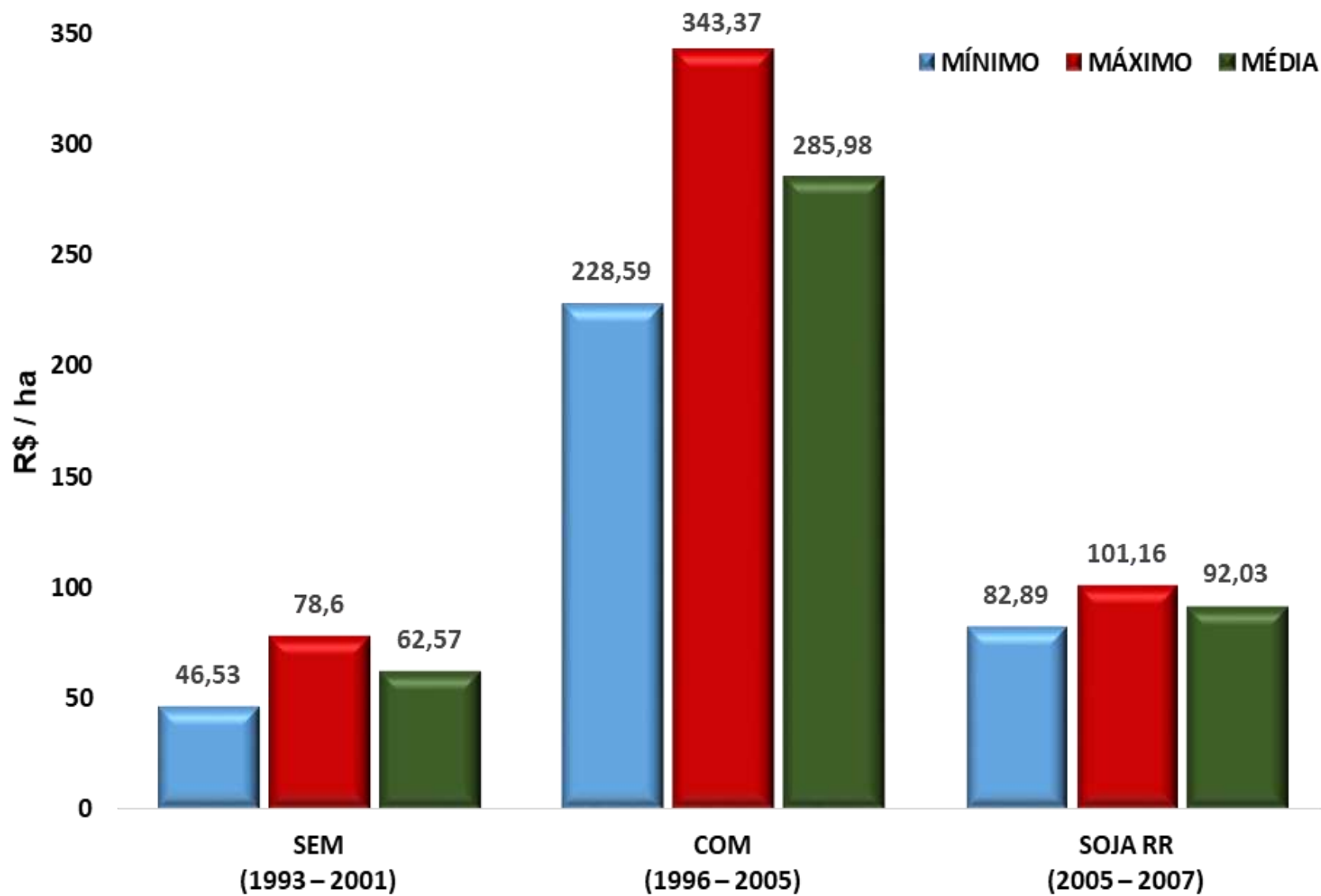
2003

2019









RESISTÊNCIA AO GLIFOSATO (EPSPs)

ISOLADA

1. *Amaranthus palmeri*
2. *Chloris elata*
3. *Conyza bonariensis*
4. *Conyza canadensis*
5. *Conyza sumatrensis*
6. *Digitaria insularis*
7. *Eleusine indica*
8. *Lolium multiflorum*

MULTÍPLA

1. *Amaranthus palmeri* (ALS)
2. *Conyza sumatrensis* (ALS)
3. *Conyza sumatrensis* (ALS+PSI)
4. *Lolium multiflorum* (ACCCase)
5. *Lolium multiflorum* (ALS)

2003 – 2019

15 anos

15 casos

1,0 caso/ano

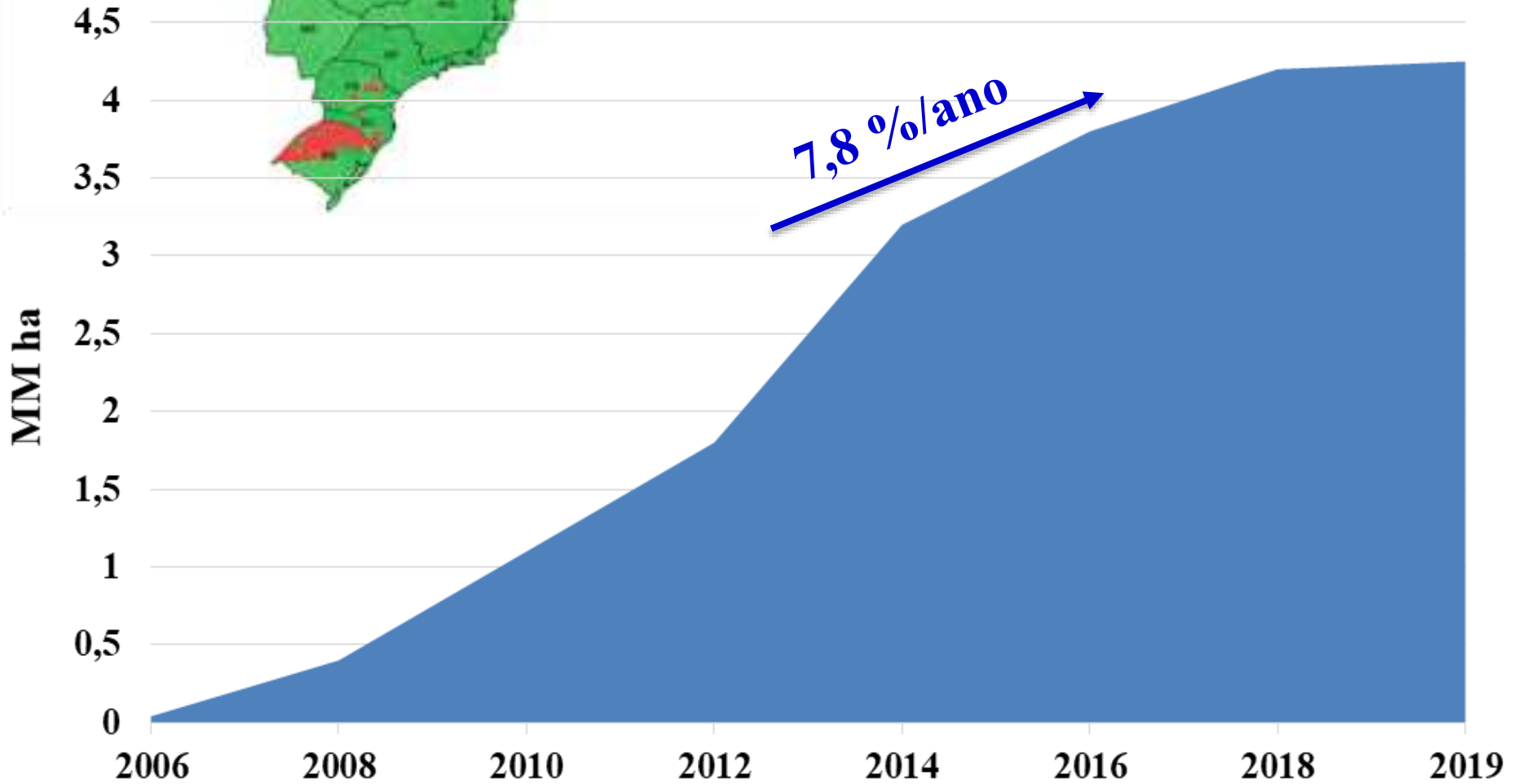
Azevém

(*Lolium multiflorum*)



Glyphosate – 6,0 L/ha

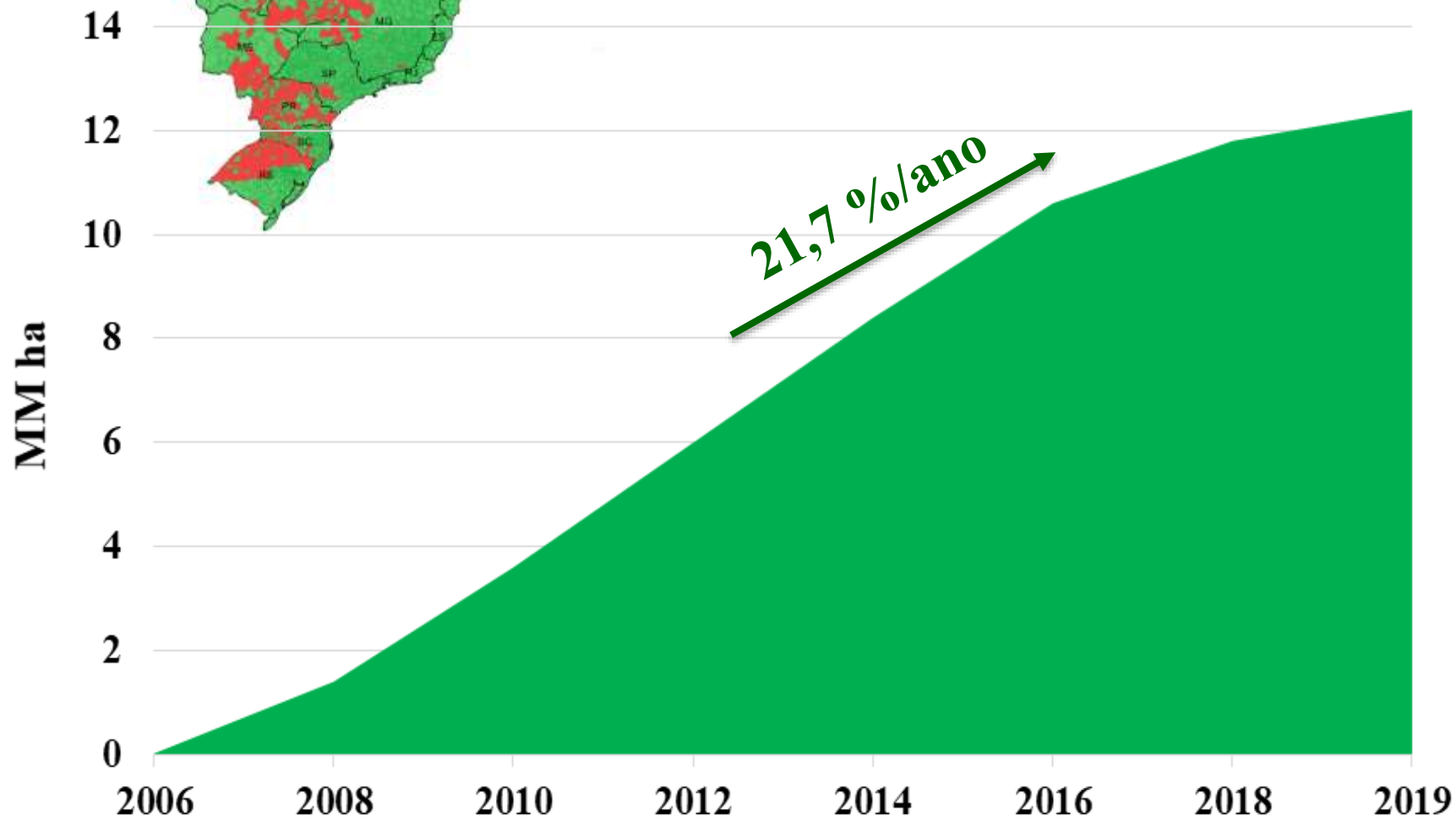
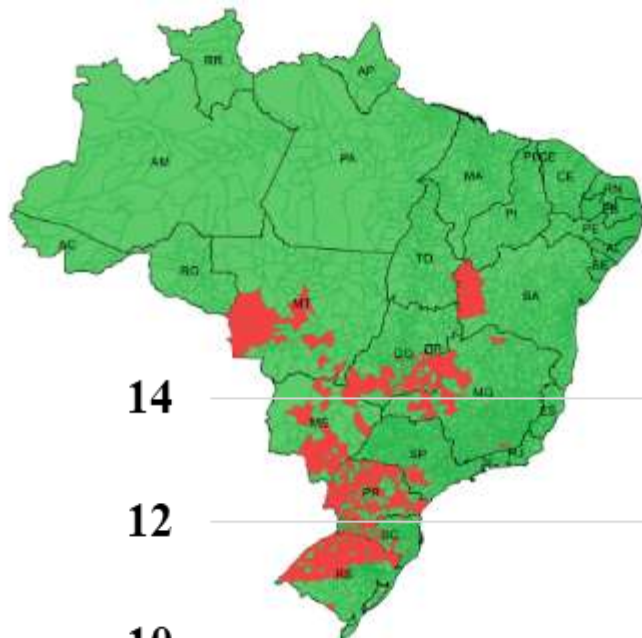
Azevém





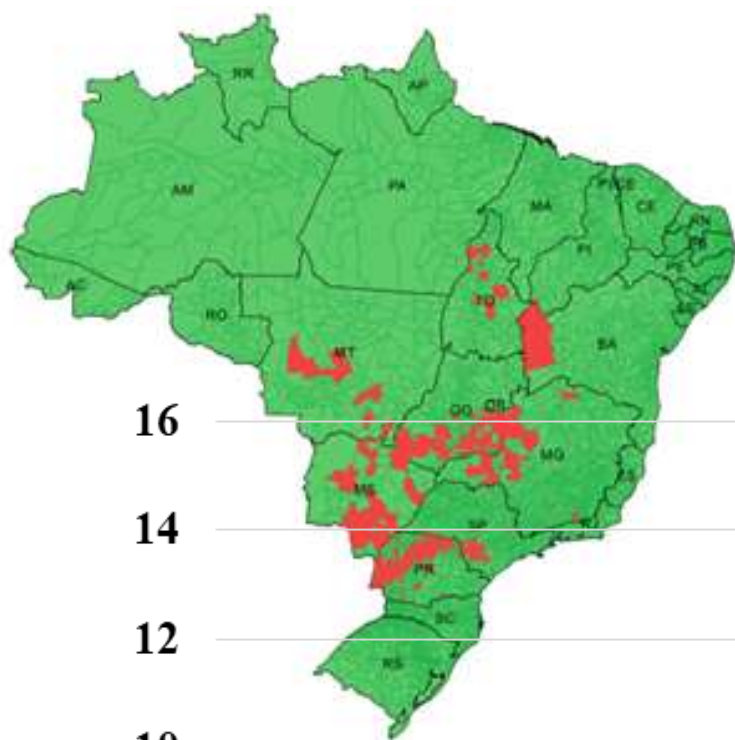
BUVA (*Conyza* spp.)

Buva

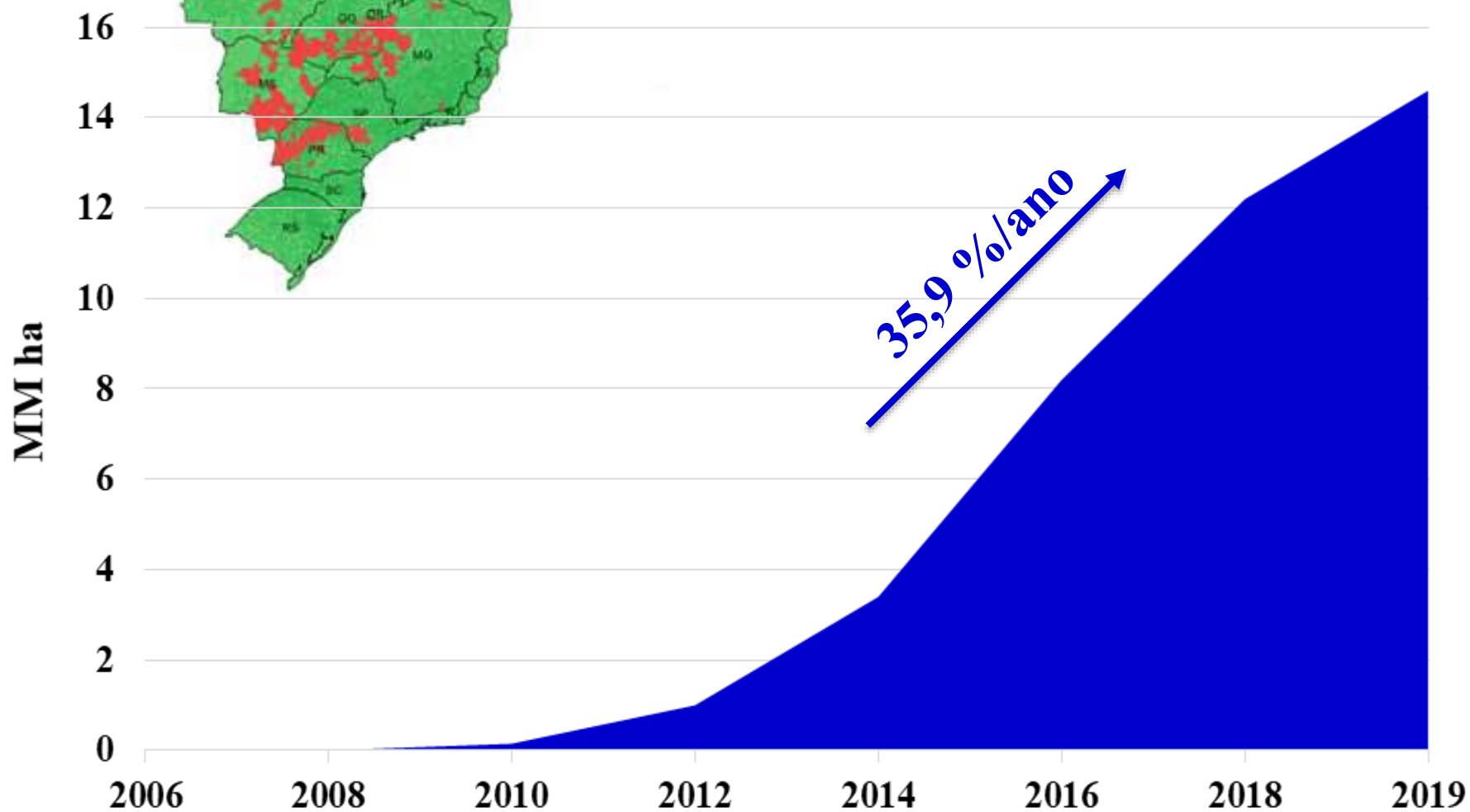


Capim-amargoso (*Digitaria insularis*)





Amargoso



RESISTÊNCIA...

20,1 Milhões ha

ISOLADO

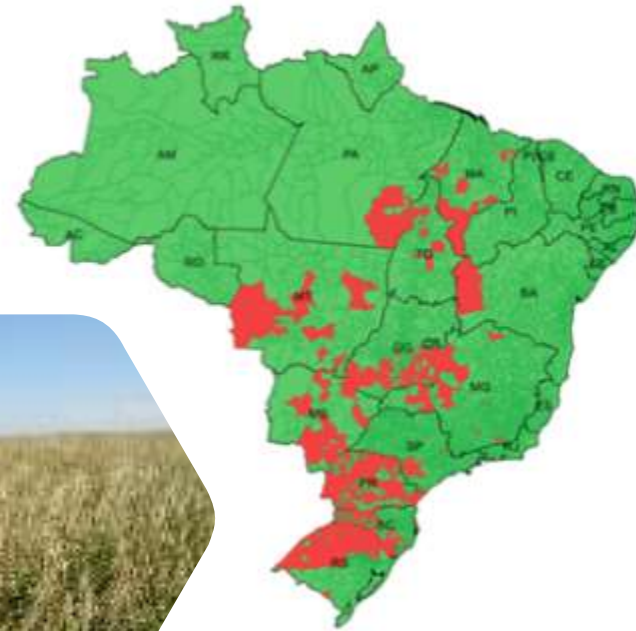
0,8



7,7



5,5



3,4



buva

2,7



amargoso

MISTO

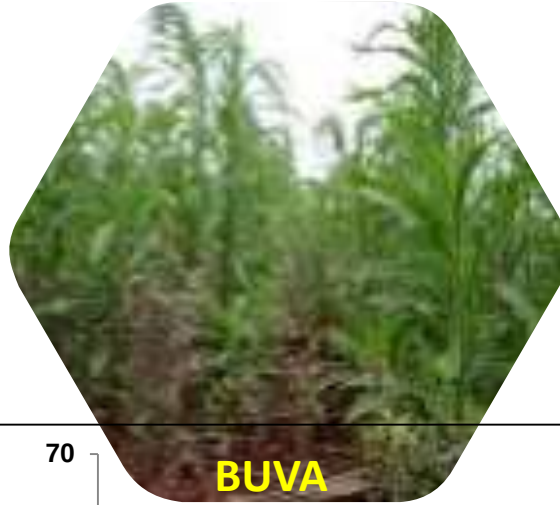
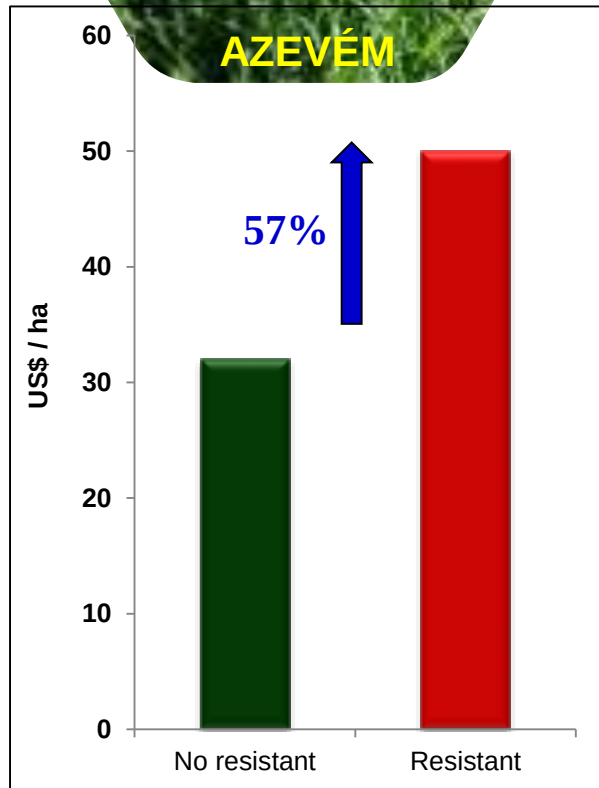
CUSTO DA RESISTÊNCIA / INFESTAÇÃO

RESISTÊNCIA A EPSPs	MÍNIMO (R\$ ha ⁻¹)	MÁXIMO (R\$ ha ⁻¹)	MÉDIO (R\$ ha ⁻¹)
SEM RESISTÊNCIA	95,40	144,60	120,00
AZEVÉM	118,60	236,70	177,65
BUVA	126,20	214,80	170,50
CAPIM-AMARGOSO	264,40	372,30	318,35
AZEVÉM + BUVA	141,90	253,20	197,55
BUVA + CAPIM AMARGOSO	293,80	479,50	386,65

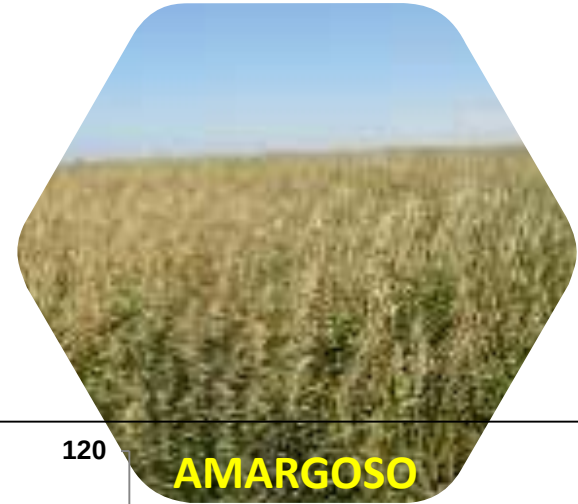
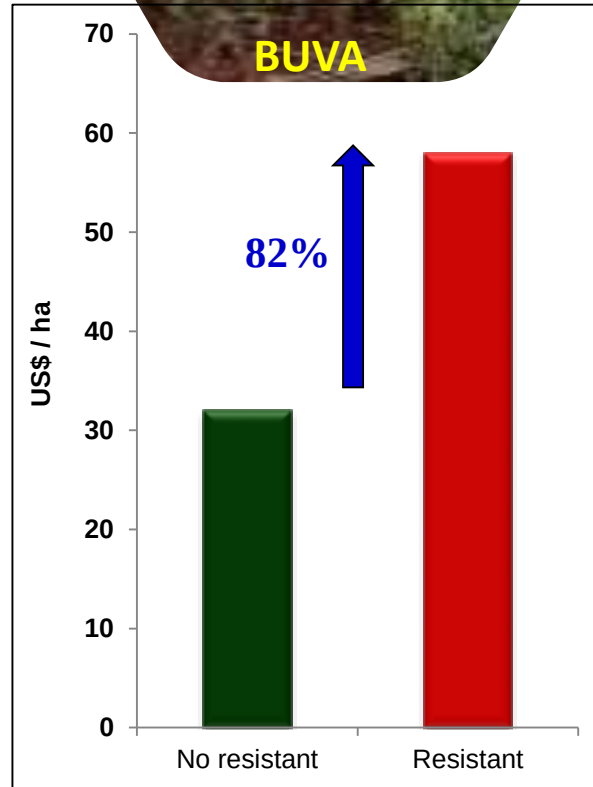
CUSTO DA RESISTÊNCIA / ESPÉCIE



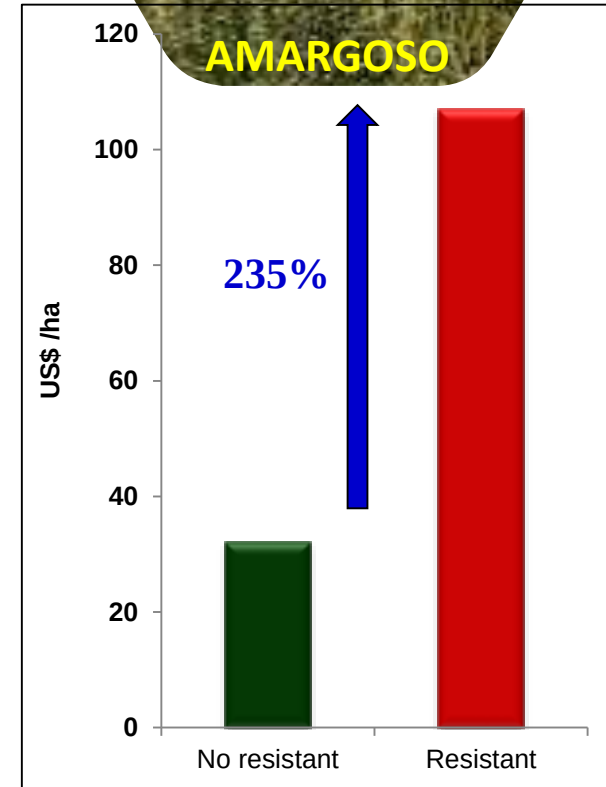
AZEVÉM



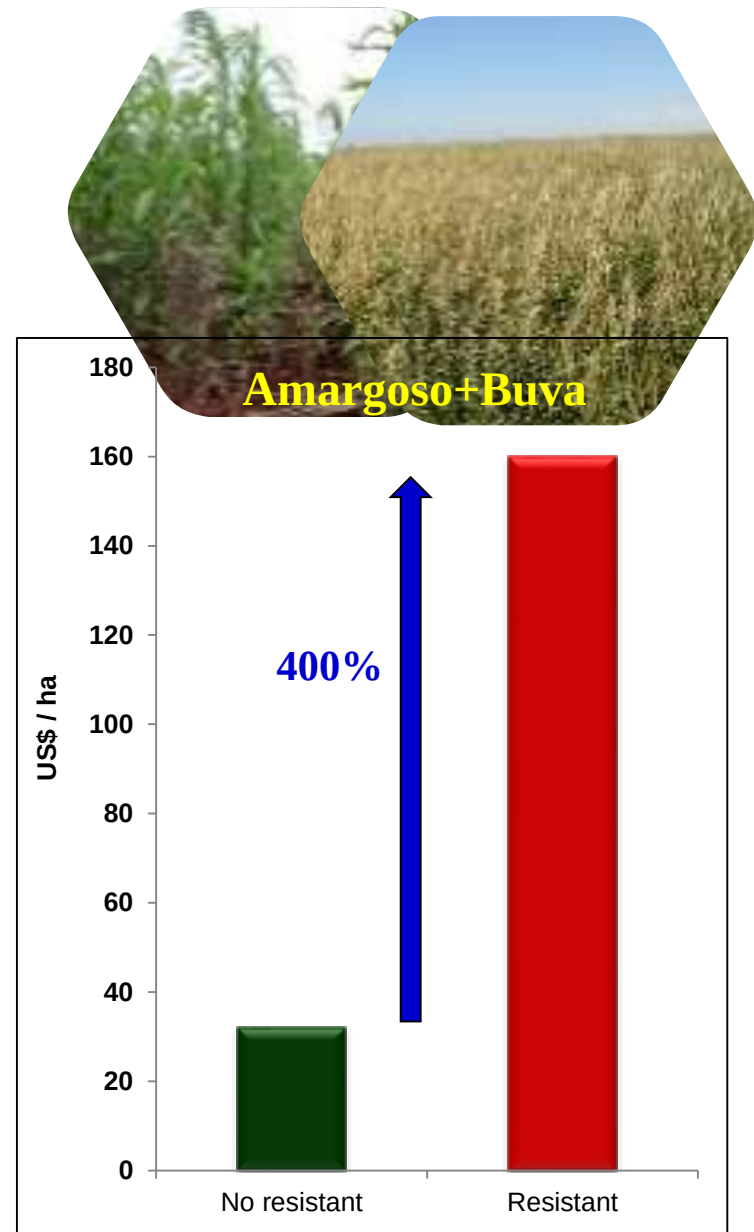
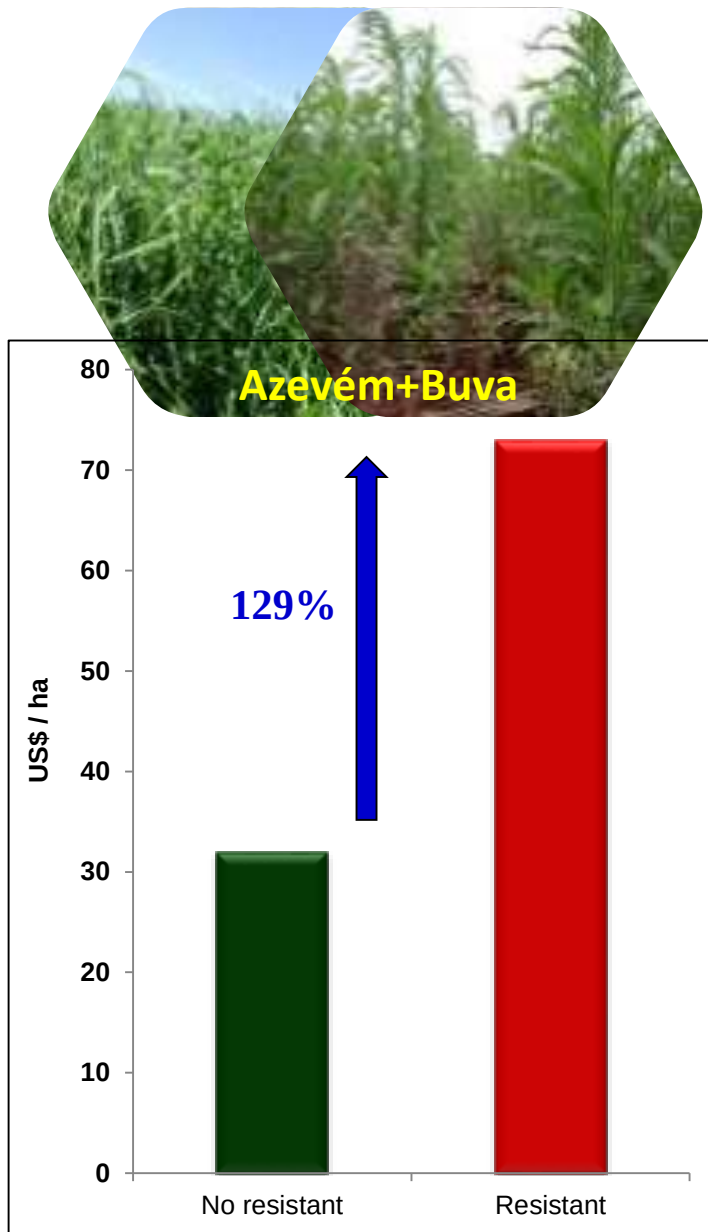
BUVA



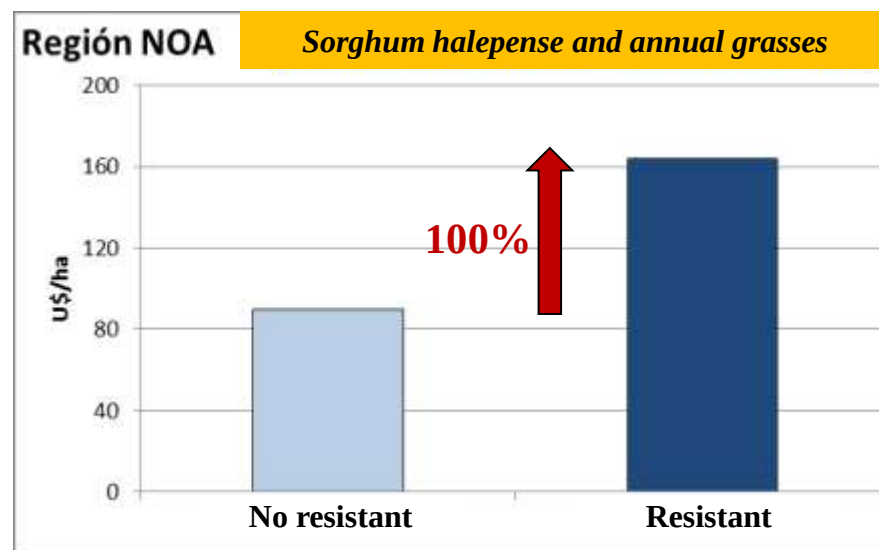
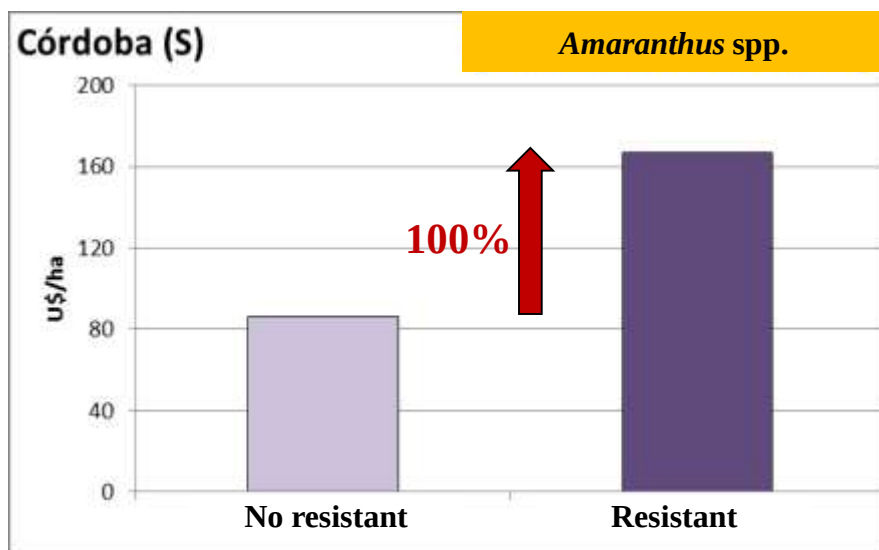
AMARGOSO



CUSTO DA RESISTÊNCIA / MISTA

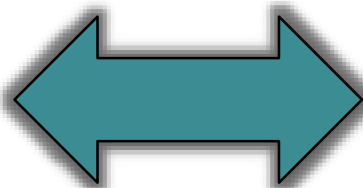


AUMENTO DE CUSTO - ARGENTINA

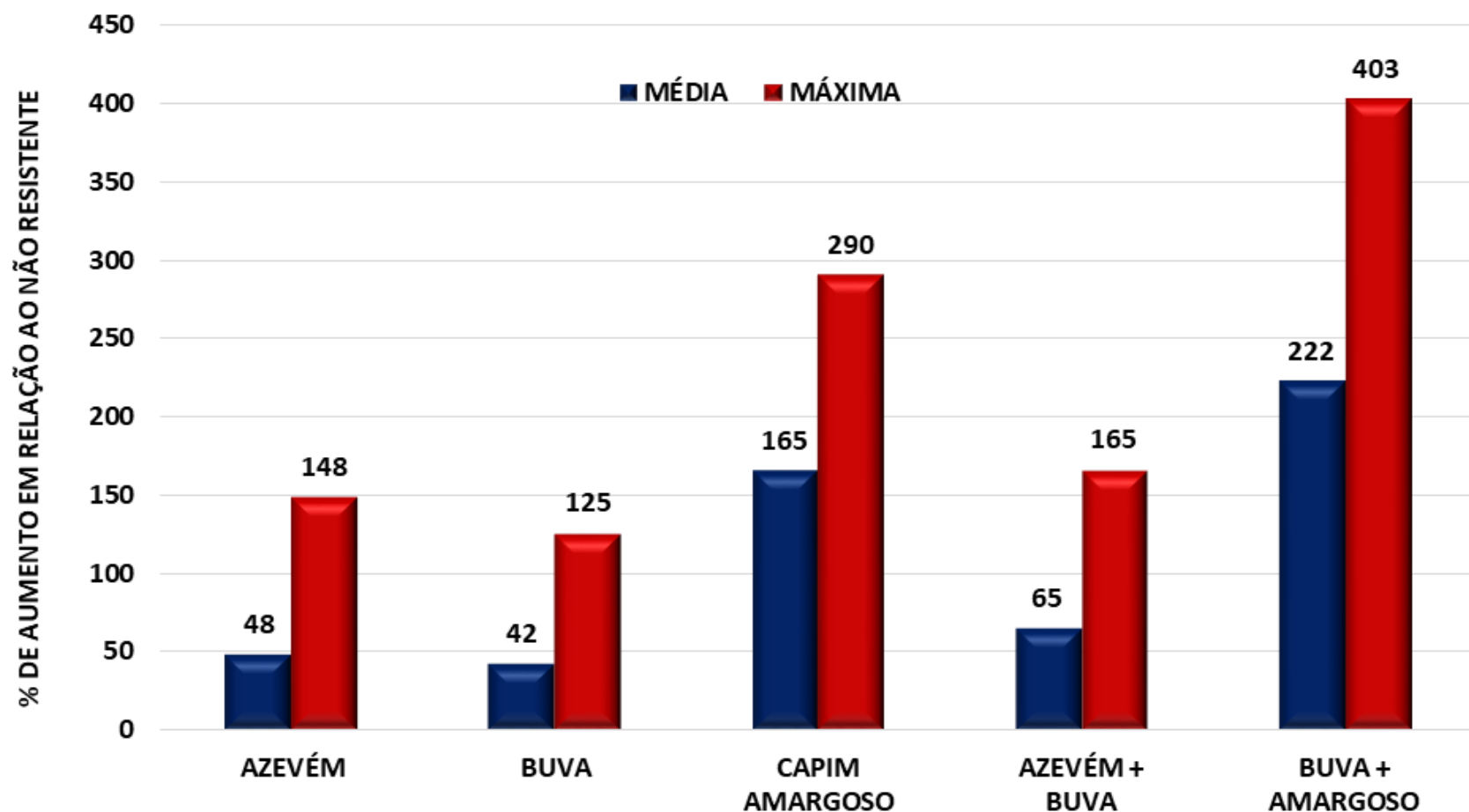


Fonte: D. Tuesca

**4,91 bilhões
(custo/ano)**



**9,0 bilhões
(c/ matocompetição)**





OBRIGADO !!!



Embrapa
Soja



Fernando S. Adegas
fernando.adegas@embrapa.br
(43) 3371-6112