



**Table S1.** Statistical analyses Resistance profile test.

Explanatory power and importance of the aleatory effects on the non-linear mixed model for the variates fresh biomass (FW), dry biomass DW, control and survival with glyphosate at two doses (X and 2X; X=1080 g ea ha<sup>-1</sup>) compared with the untreated check (UTC).

**Fresh biomass:**

Var.	Fixed effect	Random effect		Model	Log-Lik	AIC	BIC	Test	L.ratio	df	p-value
		P	P*R								
FW				1 lme.0	-360.2150	726.4300	735.6555			3	
	Dose			<b>2 lme.1</b>	<b>-338.8589</b>	<b>685.7179</b>	<b>698.0186</b>	<b>1 vs 2</b>	<b>42.7121</b>	<b>4</b>	<b>&lt;.0001</b>
	Dose	X		3 lme.1ML	-368.2990	742.5981	751.8609			3	
	Dose		X	4 lme.1ML	-337.8763	683.7526	696.1030	3 vs 4	60.84552	4	<.0001

**Multiple Comparisons of Means: Tukey Contrasts**

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
1 - 0 = 0	-1.6809	0.3402	-4.940	< 1e-04 ***
2 - 0 = 0	-2.9452	0.3402	-8.656	< 1e-04 ***
2 - 1 = 0	-1.2643	0.3402	-3.716	0.000577 ***

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

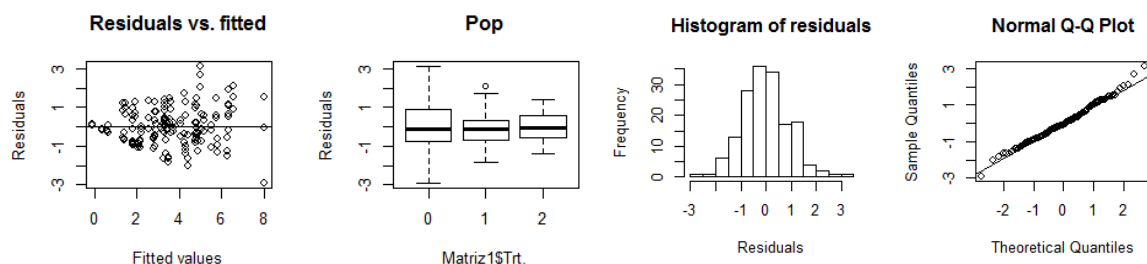
(Adjusted p values reported -- single-step method)

**Normality and homoscedacity tests**

Shapiro-Wilk normality test

data: residuals(lme.1)

W = 0.99201, p-value = 0.5063



**Table S1.** Statistical analyses Resistance profile test (continuation).

### Dry biomass

Var.	Fixed effect	Random effect		Model	Log-Lik	AIC	BIC	Test	L.ratio	df	p-value
		P	P*R								
DW				1 lme.0	-127.1350	260.2700	269.4955			3	
	Dose			<b>2 lme.1</b>	<b>-100.7269</b>	<b>209.4538</b>	<b>221.7545</b>	<b>1 vs 2</b>	<b>52.81618</b>	<b>4</b>	<b>&lt;.0001</b>
	Dose	X		3 lme.1ML	-122.07611	250.1522	259.4150			3	
	Dose		X	4 lme.1ML	-96.83748	201.6750	214.0254	<b>3 vs 4</b>	<b>50.47725</b>	<b>4</b>	<b>&lt;.0001</b>

### Multiple Comparisons of Means: Tukey Contrasts

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
1 - 0 = 0	-0.27833	0.07621	-3.652	0.000767 ***
2 - 0 = 0	-0.58852	0.07621	-7.723	< 1e-04 ***
2 - 1 = 0	-0.31019	0.07621	-4.070	0.000155 ***

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Adjusted p values reported -- single-step method)

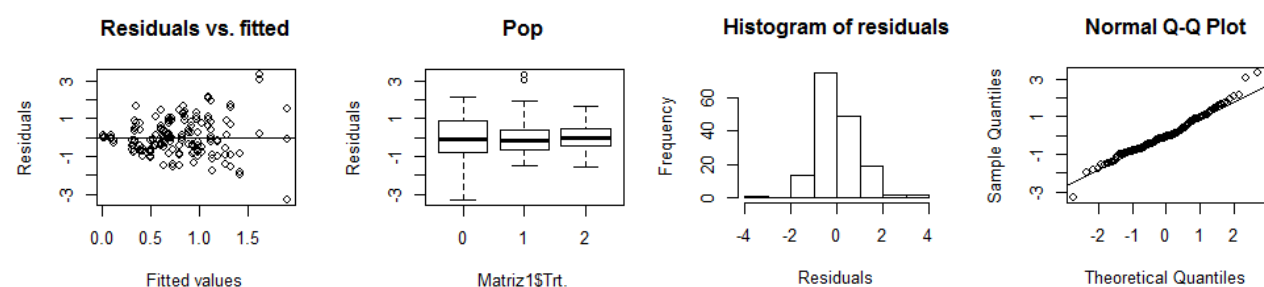
### Normality and homoscedacity test

Pearson.test(residuals(lme.1))

Pearson chi-square normality test

data: residuals(lme.1)

P = 18.543, p-value = 0.138



**Table S1.** Statistical analyses Resistance profile test (continuation).

# Control

Var.	Fixed effect	Random effect		Model	Log-Lik	AIC	BIC	Test	L.ratio	df	p-value
		P	P*R								
Control				1 lme.0	-778.0623	1562.125	1571.350			3	
	Dose			<b>2 lme.1</b>	<b>-743.8491</b>	<b>1495.698</b>	<b>1507.999</b>	<b>1 vs 2</b>	<b>68.42636</b>	<b>4</b>	<b>&lt;.0001</b>
	Dose	X		3 lme.1ML	-815.4205	1636.841	1646.104			3	
	Dose		X	4 lme.1ML	-748.0930	1504.186	1516.536	<b>3 vs 4</b>	<b>134.655</b>	<b>4</b>	<b>&lt;.0001</b>

## Multiple Comparisons of Means: Tukey Contrasts

Linear Hypotheses:

	Estimate	Std. Error	z value	Pr(> z )
1 - 0 = 0	42.556	4.039	10.536	< 1e-06 ***
2 - 0 = 0	62.111	4.039	15.378	< 1e-06 ***
2 - 1 = 0	19.556	4.039	4.842	3.51e-06 ***

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

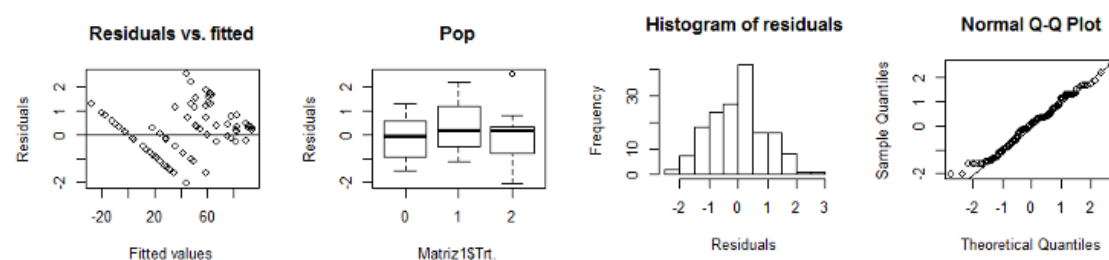
(Adjusted p values reported -- single-step method)

## Normality and homoscedacity test

Shapiro-Wilk normality test

data: residuals(lme.1)

W = 0.9846, p-value = 0.06967



**Table S1.** Statistical analyses Resistance profile test (continuation).

## Survival

Var.	Fixed effect	Random effect		Model	Log-Lik	AIC	BIC	Test	L.ratio	df	p-value
		P	P*R								
Survi-val				1 lme.0	-54.25396	114.50792	123.73344			3	
	Dose			<b>2 lme.1</b>	<b>-38.80372</b>	<b>85.60745</b>	<b>97.90814</b>	<b>1 vs 2</b>	<b>30.90048</b>	<b>4</b>	<b>&lt;.0001</b>
	Dose	X		3 lme.1ML	-48.33282	102.66564	111.92843			3	
	Dose		X	4 lme.1ML	-33.97487	75.94974	88.30012	<b>3 vs 4</b>	<b>28.7159</b>	<b>4</b>	<b>&lt;.0001</b>

## Multiple Comparisons of Means: Tukey Contrasts

Linear Hypotheses:

Estimate Std. Error z value Pr(>|z|)

1 - 0 == 0 -0.1296 0.0529 -2.451 0.03782 \*

2 - 0 == 0 -0.2963 0.0529 -5.601 < 0.001 \*\*\*

2 - 1 == 0 -0.1667 0.0529 -3.151 0.00465 \*\*

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

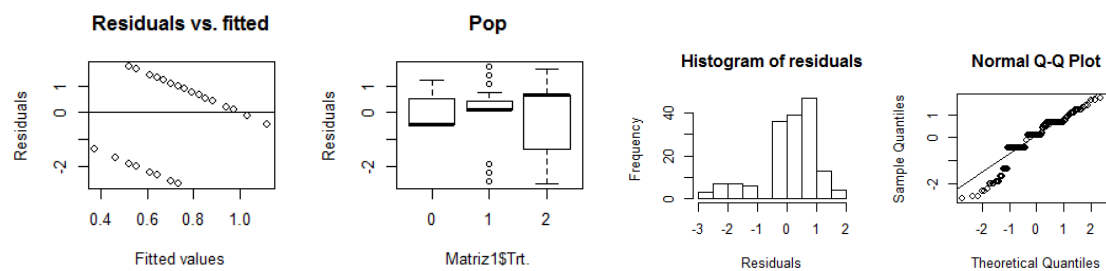
(Adjusted p values reported -- single-step method)

## Normality and homoscedacity test

Pearson chi-square normality test

data: residuals(lme.1)

P = 256.57, p-value < 2.2e-16



**Table S2.** *E. bonariensis* response to glyphosate from different agroecosystems (resistance profile test).

Crop/ Landscape	Plantain			Red beans		Papaya	Banana	Passion-fruit	Cassava	Urban area
Code	P <sub>9</sub>	P <sub>10</sub>	P <sub>14</sub>	P <sub>12</sub>	P <sub>19</sub>	P <sub>15</sub>	P <sub>18</sub>	P <sub>20</sub>	P <sub>4</sub>	P <sub>13</sub>
<b>Survival<sup>a</sup></b>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>
<b>Control<sup>b</sup></b>	R <sub>2</sub>	R <sub>1</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>
<b>Rel-FW<sup>b</sup></b>	R <sub>2</sub>	R <sub>1</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>
<b>Rel-DW<sup>b</sup></b>	R <sub>2</sub>	R <sub>1</sub>	R <sub>1</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>2</sub>	R <sub>2</sub>
<b>Overall (mode)</b>	<b>R<sub>2</sub></b>	<b>R<sub>1</sub></b>	<b>R<sub>1</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>2</sub></b>

<sup>a</sup>Adapted from Beres et al., 2018 [26]<sup>b</sup>Adapted from Panozzo et al., 2015 [25] and Zabala et al., 2019 [22]; Rel-FW= relative fresh weight, Rel-DW= relative dry weight**Table S3.** Statistical analyses Dose-response test.**Variate: Survival rate**

Model selection:

Model	logLik	AIC	Lack.of.fit	Res.var
<b>LL.2</b>	<b>-6.618261217</b>	<b>35.23652243</b>	<b>0.99596638</b>	<b>0.069306089</b>
LL.2.1	-6.618261217	35.23652243	0.99596638	0.069306089
LL.2.2	-6.618511745	35.23702349	0.99596508	0.069306338
LL.2.3	-6.409354185	44.81870837	0.97352653	0.071863544
LL.3u	-6.619354273	45.23870855	0.96768999	0.072079459
LL.2.3u	-6.620356212	45.24071242	0.96766015	0.07208049
bcl3	-5.556161221	53.11232244	0.91878477	0.073950994

**Model parameters: Survival rate**

	coefficients.lph.LL2.	Std. Error	t-value	p-value	
b:15	1.835409446	0.7108	2.58232	0.010921	*
b:10	0.93010475	0.3044	3.05564	0.002726	**
b:7	1.881152422	0.6927	2.71560	0.007515	**
b:5	0.833306816	0.5914	1.40902	0.161218	
b:3	7.794235361	114.0000	0.06837	0.945594	
e:15	6638.014633	1682.4000	3.94556	0.000130	***
e:10	6857.933205	2549.6000	2.68981	0.008087	**
e:7	326.6373824	79.5520	4.10596	0.070720	***
e:5	45454.88929	58863.0000	0.77221	0.441392	
e:3	651.2751405	1346.4000	0.48372	0.629412	

Res. Std.err: 0.2632605 (130 degrees of freedom)

**Lack-of-fit test: Survival rate**

Model	Df	RSS	Df	F.value	p.value
ANOVA	105	8.25			
DRC Model	130	9.00979163	25	0.38680301	0.99596638

**Supplementary table S3.** Statistical analyses Dose-response test (continuation)**ED Estimations: Survival rate**

Estimate	Std. Error
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e:15:50	8.773.5	0.259
e:15:80	9.553.2	0.432
e:15:90	10.009.3	0.586
e:10:50	8.748.2	0.457
e:10:80	10.349.5	0.694
e:10:90	11.286.2	0.994
e:7:50	573.0	0.275
e:7:80	649.6	0.391
e:7:90	694.4	0.520
e:5:50	1.077.2	1.378
e:5:80	12.646.5	2.819
e:5:90	13.742.8	3.719
e:3:50	606.1	9.135
e:3:80	615.4	10.768
e:3:90	620.8	11.763

**Variate: Visual control**

## Model selection

Model	logLik	AIC	Lack.of.fit	Res.var
LL.4	-486.60090	1015.20200	0.88333	71.35836
L3m	<b>-495.62560</b>	<b>1013.25100</b>	<b>0.50620</b>	<b>68.95520</b>
BC.5	-482.38710	1016.77400	0.99519	70.11084
bcl4	-482.38710	1016.77400	0.99519	70.11084
LL.5	-484.69470	1021.38900	0.83766	72.46064

### Lack-of-fit test: Visual control

<b>L3m</b>	<b>ModelDf</b>	<b>RSS</b>	<b>Df</b>	<b>F.value</b>	<b>p.value</b>
ANOVA	105	7906.25			
DRC Model	130	9741.31743	25	0.97483424	0.506233

**Table S3.** Statistical analyses Dose-response test (continuation).

**Parameter estimates: Visual control**

	Estimate	Std. Error	t-value	p-value	
b:15	-7.847149	14.06143	-0.5581	0.5778	
b:10	-20.143684	167.274198	-0.1204	0.90434	
b:7	-3.637575	0.877433	-4.1457	6.20E-05	***
b:5	-0.94251	0.155807	-6.0492	1.565E-08	***
b:3	-2.138665	0.303581	-7.0448	1.102E-10	***
d:15	92.495553	4.156758	22.2519	2.20E-16	***
d:10	90.416561	2.397196	37.7176	2.20E-16	***
d:7	99.440929	2.111516	47.0946	2.20E-16	***
d:5	103.282865	9.755448	10.5872	2.20E-16	***
d:3	100.767928	2.265515	44.479	2.20E-16	***
e:15	8.410814	0.37562	22.3918	2.20E-16	***
e:10	7.000015	3.529983	1.983	0.04956	
e:7	4.855522	0.071406	67.9992	2.20E-16	***
e:5	7.248242	0.300889	24.0894	2.20E-16	***
e:3	5.034367	0.07776	64.742	2.20E-16	***

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 8.303917 (125 degrees of freedom)

**ED Estimates: Visual control**

	Estimate	Std. Error
e:15:50	8,410.8	0.3756
e:15:80	8,587	0.0777
e:15:90	8,691	0.1412
e:10:50	7,000	3.5300
e:10:80	7,069	3.8380
e:10:90	7,109	4.0448
e:7:50	486	0.0714
e:7:80	524	0.1486
e:7:90	546	0.1996
e:5:50	7,248	0.3009
e:5:80	8,719	0.5185
e:5:90	9,579	0.6541
e:3:50	503	0.0778
e:3:80	568	0.1264
e:3:90	606	0.1722

**Table S3.** Statistical analyses Dose-response test (continuation).

**Variate: Dry weight**

**Populations: P<sub>3</sub>, P<sub>7</sub> and P<sub>5</sub>**

**Model selection**

	<b>logLik</b>	<b>IC</b>	<b>Lack of fit</b>	<b>Res. Var</b>
<b>LL.4</b>	<b>-11.19895</b>	<b>48.3979</b>	<b>0.96181</b>	<b>0.08918123</b>
LL.4	-11.19895	48.3979	0.96181	0.08918123
LL2.3	-15.93628	51.8726	0.54792	0.09583636
BC.4	-13.92664	53.8533	0.59821	0.09516533
BC.5	-11.01851	54.0370	0.84369	0.09265973

	<b>Estimate</b>	<b>Std. Error</b>	<b>t-value</b>	<b>p-value</b>	
b:7	3.27E+04	2.52E+04	12.963	0.199004	
b:5	1.05E+04	5.29E+03	19.838	0.051096	.
b:3	2.47E+04	7.34E+03	33.590	0.001254	**
c:7	1.69E+03	7.73E+02	21.915	0.031649	*
c:5	6.84E+01	4.00E+03	0.0171	0.986415	
c:3	1.76E+03	8.07E+02	21.781	0.032672	*
d:7	1.81E+04	1.49E+03	121.077	<2.2E-16	***
d:5	1.78E+04	1.39E+03	127.997	<2.2E-16	***
d:3	2.08E+04	1.49E+03	139.988	<2.2E-16	***
e:7	1.09E+06	1.50E+05	72.808	3.34E-10	***
e:5	1.94E+07	1.07E+07	18.062	0.075066	.
e:3	1.66E+06	2.70E+05	61.351	4.16E-05	***

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error:

0.2986323 (72 degrees of freedom)

**ED Estimates: Dry weight**

	<b>Estimate</b>	<b>Std. Error</b>
e:7:50	108.99	14.97
e:7:80	166.61	65.16
e:7:90	213.56	122.83
e:5:50	1,935.50	1,071.59
e:5:80	7,249.79	8,058.27
e:5:90	15.70	23,228.26
e:3:50	165.73	27.01
e:3:80	290.81	66.33
e:3:90	404.08	123.16



**Table S3.** Statistical analyses Dose-response test (continuation).

**Lack-of-fit test: Dry weight**

Model	Df	RSS	Df	F.value	p.value
ANOVA	63	6.1319			
DRC Model	72	6.421	9	0.3301	0.9618

**Variate: Dry weight**

**Populations: P<sub>7</sub>, P<sub>10</sub> and P<sub>15</sub>**

**Model selection:**

	logLik	IC	Lack.of.fit	Res.var
BC.5	-25.579545	83.1590907	0.08143591	0.13105608
BC.4	-31.425957	88.851914	0.01398097	0.14435362
LL.3	-66.323131	152.646261	1.4764E-11	0.31808831
LL.4	-63.923739	153.847479	6.687E-12	0.31294351
LL.2	-113.56494	241.129877	2.8669E-25	0.94191336

**Model Parameters: Dry weight**

	coefficients.cv.bc5.	Std.Err	t-value	p-value	
b:15	6.97786361	8.61E+00	0.8106	0.4204003	
b:10	13.0010515	1.21E+02	0.107	0.9150904	
b:7	3.25263659	2.72E+00	11.979	0.2350539	
c:15	0.39611472	1.83E-01	21.637	0.0339523	*
c:10	0.27208908	1.05E-01	26.035	0.01129	*
c:7	0.16725836	9.68E-02	17.271	0.088623	.
d:15	1.27069492	1.06E-01	11.934	<2.2e-16	***
d:10	0.91690971	1.56E-01	5.885	1.30E-07	***
d:7	1.80739142	1.81E-01	9.986	4.91E-15	***
e:15	4490.38218	1.20E+03	3.746	0.0003686	***
e:10	763.093737	1.25E+02	6.123	4.96E-08	***
e:7	92.1230096	1.60E+02	0.5751	0.5670681	
f:15	0.00070665	1.16E-04	6.118	5.05E-08	***
f:10	0.00499193	9.17E-04	5.443	7.51E-07	***
f:7	0.00522215	7.05E-02	0.0741	0.9411455	

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error:

0.3620167 (69 degrees of freedom)

**Table S3.** Statistical analyses Dose-response test (continuation).

**Lack-of-fit test: Dry weight**

Model	ModelDf	RSS	Df	F.value	p.value
ANOVA	63	7.6067			
DRC Model	69	9.0429	6	1.9824	0.0814

**Calculated ED: Dry weight**

	ED50	ED80	ED90
15	10330.81	16235.20	22661.99
10	1222.53	1495.91	1735.50
7	140.230	519.05	1543.00

**Variate: Relative biomass (Rel-DW)**

**Populations: P<sub>3</sub>, P<sub>7</sub> and P<sub>5</sub>**

**Model selection**

	LogLik	AIC	Lack of fit	Res var
<b>LL4.m</b>	<b>-345.229</b>	<b>710.4587</b>	<b>0.992759</b>	<b>243.5197</b>
LL.4	-345.221	716.4420	0.953892	253.6158
LL2.3	-349.719	719.4374	0.565437	270.9914
BC.4	-347.874	721.7473	0.591751	270.1505
BC.5	-345.079	722.1577	0.814939	263.7485
LL.5	-345.085	722.1706	0.813698	263.7890

**Lack-of-fit test: Relative biomass (Rel-DW)**

Model	ModelDf	RSS	Df	F.value	p.value
ANOVA	63	17390			
DRC Model	75	18264	12	0.2637	0.9928

**Model Parameters: Relative biomass (Rel-DW)**

	coefficients	Std. Error	t-value	p-value	
b:7	3.26571452	2.37418	13.755	0.173066	
b:5	1.010904628	0.35181	28.734	0.005279	**
b:3	2.470450952	0.75235	32.836	0.001558	**
c:7	9.374533251	4.03979	23.205	0.023033	*
c:5	-0.837888162	19.35525	-0.0433	0.965585	
c:3	8.470483202	4.2122	20.109	0.047926	*
e:7	108.9986323	12.72486	85.658	9.98E-10	***
e:5	1950.336522	1053.76349	18.508	0.068132	.
e:3	166.0215529	25.02117	66.352	4.45E-09	***

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual Standard Error 15.60512 (75 degrees of freedom)

**Table S3.** Statistical analyses Dose-response test (continuation).

**ED Estimates: Relative biomass (Rel-DW)**

	<b>Estimate</b>	<b>Std. Error</b>
e:7:50	108.9986323	12.7248649
e:7:80	166.6398488	61.12725758
e:7:90	213.609848	115.7442812
e:5:50	1950.336522	1053.763489
e:5:80	7685.55303	7412.821934
e:5:90	17141.88782	21098.31143
e:3:50	166.0215529	25.02117105
e:3:80	290.9839015	71.35694815
e:3:90	404.0424083	133.4583316

**Variate: Relative biomass (Rel-DW)**

**Populations: P<sub>7</sub>, P<sub>10</sub> and P<sub>15</sub>**

**Model selection**

	<b>logLik</b>	<b>IC</b>	<b>Lack.of.fit</b>	<b>Res.var</b>
<b>BC.5</b>	<b>-415.60659</b>	<b>857.213186</b>	<b>0.14358344</b>	<b>1355.1517</b>
LL.5	-458.91203	949.824051	3.737E-15	3965.19387
LL.4	-470.82569	961.651379	2.1557E-16	4844.44075
LL.3	-505.24061	1024.48122	3.4465E-26	10569.9388

**Lack-of-fit test: Relative biomass (Rel-DW)**

<b>Model</b>	<b>ModelDf</b>	<b>RSS</b>	<b>Df</b>	<b>F.value</b>	<b>p.value</b>
ANOVA	63	79687			
DRC Model	72	97571	9	1.571	0.1436

**Model Parameters: Relative biomass (Rel-DW)**

	<b>coefficients.</b>	<b>Std.Err</b>	<b>t-value</b>	<b>p-value</b>	
b:15	8.71136612	35.483	0.2455	0.806763	
b:10	13.0233784	115.07	0.1132	0.910202	
b:7	3.37090327	5.3814	0.6264	0.533033	
c:15	33.7046305	18.469	1.8249	0.072165	.
c:10	35.9727509	10.627	3.3849	0.001156	**
c:7	9.2244268	10.057	0.9172	0.362101	
e:15	4652.45619	1.3973	13.973	0.166617	
e:10	752.996658	26.3369	263.369	<2.2E-16	***
e:7	67.5610202	205.4	0.3289	0.743163	
f:15	0.06409517	7.3763	73.763	2.22E-10	***
f:10	0.75487964	12.0667	120.667	<2.2E-16	***
f:7	1.58035271	19.751	0.08	0.936447	

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 36.81239 (72 degrees of freedom)

**Table S3.** Statistical analyses Dose-response test (continuation)

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**ED Calculated: Relative biomass (Rel-DW)**

	<b>ED50 Calc</b>	<b>ED80 Calc</b>	<b>ED90 Calc</b>
15	407.26	2603.50	11248.11
10	9102.33	12703.40	16232.94
7	1283.01	1567.13	1817.95

---

**Table S4.** Statistical analyses alternative herbicides evaluation.

**Explanatory variable:** Relative biomass (Rel-DW)

**Anova Table**

	Df	Sum Sq	Mean Sq	F Value	Pr(>F)	
Trat	4	9566	2391.4	21.463	5.85E-10	***
Pob	2	5823	2911.3	26.129	2.94E-08	***
Trat:Pob	8	7939	992.3	8.906	3.25E-07	***
Residuals	45	5014	111.4			

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Population 20						
	Df	Sum Sq	Mean Sq	F Value	Pr(>F)	
Trat	4	11932	2983.1	19.81	7.53E-06	***
Residuals	15	2258	150.6			

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Tukey Print (TkRDW20)								
	MSerror	Df	Mean	CV	MSD			
	150.5535	15	48.64553	25.22333	26.79151			
\$parameters								
	test	name.t	ntr	Studentized Range	alpha			
	Tukey	Trat	5	4.366985	0.05			
\$means								
	Rel.DW	std	r	Min	Max	Q25	Q50	Q75
T1	71.18156	20.106932	4	53.025937	99.13545	59.07781	66.28242	78.38617
T2	73.77522	15.551282	4	55.331412	93.37176	68.29971	73.19885	78.67435
T3	13.83285	8.205247	4	2.305476	20.74928	10.95101	16.13833	19.02017
T4	58.78963	4.102624	4	55.331412	64.55331	56.19597	57.63689	60.23055
T5	25.64841	4.741196	4	19.596542	31.12392	23.91931	25.9366	27.66571
\$comparison								
NULL								
\$groups								
	Rel.DW	groups						
T2	73.77522	a						
T1	71.18156	a						
T4	58.78963	a						
T5	25.64841	b						
T3	13.83285	b						

**Table S4.** Statistical analyses alternative herbicides evaluation (cont.)

Population 10
---------------

	Df	Sum Sq	Mean Sq	F Value	Pr(>F)	
Trat	4	3462	865.4	5.887	0.0047	**
Residuals	15	2205	147			

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Tukey	print(TkRDW10)							
	MSerror	Df	Mean	CV	MSD			
	147.0134	15	31.53005	38.45509	26.47465			
	\$parameters							
	test	name.t	ntr	StudentizedRange	alpha			
	Tukey	Trat	5	4.366985	0.05			
\$means								
	Rel.DW	std	r	Min	Max	Q25	Q50	Q75
T1	51.36612	15.222282	4	36.065574	72.13115	43.442623	48.63388	56.55738
T2	14.48087	13.661202	4	4.371585	33.87978	5.191257	9.836066	19.12568
T3	31.42077	7.591499	4	20.765027	38.25137	28.961749	33.333333	35.79235
T4	39.61749	3.61097	4	37.15847	44.80874	37.15847	38.251366	40.71038
T5	20.76503	15.686011	4	6.557377	42.62295	11.47541	16.939891	26.22951
\$groups								
	Rel.DW	groups						
T1	51.36612	a						
T4	39.61749	ab						
T3	31.42077	ab						
T5	20.76503	b						
T2	14.48087	b						
	Population 15							
	Df	Sum Sq	Mean Sq	F Value	Pr(>F)			
Trat	4	2110.2	527.6	14.37	5.13E-05		***	
Residuals	15	550.5	36.7					

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

	MSerror	Df	Mean	CV	MSD			
	36.70068	15	25.35714	23.89113	13.22783			
	\$parameters							
	test	name.t	ntr	StudentizedRange	alpha			
	Tukey	Trat	5	4.366985	0.05			

Table S4. Statistical analyses alternative herbicides evaluation (continuation).

\$means								
	Rel.DW	std	r	Min	Max	Q25	Q50	Q75
T1	43.57143	7.514159	4	37.14286	54.28571	39.28571	41.42857	45.71429
T2	20	3.086067	4	17.14286	24.28571	18.21429	19.28571	21.07143
T3	12.85714	1.166424	4	11.42857	14.28571	12.5	12.85714	13.21429
T4	22.85714	3.499271	4	18.57143	27.14286	21.78571	22.85714	23.92857

T5	27.5	10.193702	4	17.14286	41.42857	22.5	25.71429	30.71429
\$groups	Rel.DW	groups						
T1	43.57143	a						
T5	27.5	b						
T4	22.85714	bc						
T2	20	bc						
T3	12.85714	c						

#### Explanatoty variable: Visual Control 14 DAA

ANOVA							
	Df	Sum Sq	Mean Sq	F value	Pr(>F)		
Trat	4	15585	3896	8.88	4.34E-06	***	
Pob	2	6928	3464	7.89	0.000695	***	
Time	1	2253	2253	5.13	0.025857	*	
Trat:Pob	8	7216	902	2.06	0.048603	*	
Trat:Time	4	1424	356	0.81	0.521385		
Pob:Time	2	1858	929	2.12	0.126395		
Trat:Pob:Time	8	6703	838	1.91	0.068158	.	
Residuals	90	39500	439				

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

#### Population P20

Control 14DAA

	Df	Sum Sq	Mean Sq	F value	Pr(>F)	
Trat	4	11907	2977	35.42	1.77E-07	***
Residuals	15	1260	84			

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

#### HSD Tukey test

groups	Control14	groups
T3	83.75	a
T2	82.5	a
T5	80	a
T4	56.65	b
T1	20	c

**Table S4.** Statistical analyses alternative herbicides evaluation (continuation)

#### Population P10

Control 14DAA

	Df	Sum Sq	Mean Sq	F value	Pr(>F)	
Trat	4	2762	690.6	4.207	0.0176	*
Residuals	15	2462	164.2			

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

#### HSD Tukey test

\$groups	Control14	groups
T2	85	a
T5	80	ab

T4	78.75	ab
T3	66.25	ab
T1	52.5	b

<b>Population P15</b>						
Control 14DAT						
	<b>Df</b>	<b>Sum Sq</b>	<b>Mean Sq</b>	<b>F value</b>	<b>Pr(&gt;F)</b>	
Trat	4	1482	370.6	2.695	0.0712	.
Residuals	15	2062	137.5			

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

<b>HSD Tukey test</b>		
\$groups	Control14	groups
T2	83.75	a
T4	81.25	a
T3	80	a
T5	72.5	a
T1	60	a

Explanatoty variable:

Visual Control 28 DAT

<b>Population P20</b>						
Control 28DAA						
	<b>Df</b>	<b>Sum Sq</b>	<b>Mean Sq</b>	<b>F value</b>	<b>Pr(&gt;F)</b>	
Trat	4	18225	4556	53.87	1.01E-08	***
Residuals	15	1269	85			

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Table S4.

Statistical analyses alternative herbicides evaluation (continuation).

<b>HSD Tukey test</b>		
\$groups	Control28	groups
T5	90.00	a
T3	86.25	a
T1	30.00	b
T2	25.00	b
T4	25.00	b

<b>Population P10</b>						
Control 28DAA						
	<b>Df</b>	<b>Sum Sq</b>	<b>Mean Sq</b>	<b>F value</b>	<b>Pr(&gt;F)</b>	
Trat	4	13595	3399	13.53	7.27E-05	***
Residuals	15	3769	251			

----

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

<b>HSD Tukey test</b>		
\$groups	Control28	groups
T2	88.75	a
T5	82.5	a
T4	47.5	b
T3	40	b
T1	20	b





**Table S5.** Studies on resistance to glyphosate levels in *E. bonariensis*.

Country	Class	Stage	ED <sub>50</sub> g ae ha <sup>-1</sup>				Reference
			Control	Survival	DW	FW	
Colombia	S	rosette			729.4 <sup>a</sup>		Quintero-Pertuz et al., 2021 [16]
	R	rosette			2,545.2 <sup>a</sup>		
	R	rosette			6,264.1 <sup>a</sup>		
Brazil	S	rosette	88.4	-	34.8		Gomes, 2014 [39]
Spain	S	rosette	15.7	-	-		González-Torralva et al., 2010 [40]
	S	bolting	86.6	-	-		
		flowering	117.5				
Spain	S	rosette				50.7 <sup>a</sup>	González-Torralva et al., 2012 [44]
	R	rosette				311.2 <sup>a</sup>	
Spain	S	rosette		327.2	75.2 <sup>a</sup>		Tahmasebi et al., 2018 [19]
	R	rosette		4,985	1,129.9 <sup>a</sup>		
South Africa	S	rosette	88.5	-	-		Okumu et al., 2019 [43]
	S	rosette	268.0	-	-		
	R	rosette	344.1				
Argentina	R	rosette	3,908.4				Puricelli et al., 2015 [18]
	S	rosette	88	-	-		
	S	bolting	182	-	-		
	R	rosette	308.8				
United States	R	bolting	861.2				Moretti et al., 2016 [41]
	S	rosette	-	607	219		
	S	rosette	-	1016	335		
	R	rosette	-	40,862	1,279		
	R	rosette	-	56,153	14,261		

<sup>a</sup> Evaluated as relative biomass

S= Glyphosate susceptible; R=Glyphosate resistant