

Adaptation of Palmer amaranth to the upper Midwest

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2 ABSTRACT

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5 according to article type.

6 **Keywords:** Text Text Text Text Text Text Evolution Weed

INTRODUCTION

7 kgghkg

MATERIAL AND METHODS

8 Plant material and growing conditions

9 The study was performed with a *A. palmeri* accession (Per1) from Perkins County, Nebraska. Per1
10 accession collection is documented in (Oliveira et al., 2021), with no reported herbicide resistance. Seeds
11 were planted in plastic trays containing potting-mix. Emerged seedlings (1 cm) were transplanted into
12 200 cm³ plastic pots (a plant pot⁻¹). Palmer amaranth seedlings were supplied with adequate water and
13 kept under greenhouse conditions at Arlington, Clay Center, Lincoln, and Macomb; and kept outdoors in
14 Grant. At 7 to 10 cm height, Palmer amaranth seedlings were transplanted to the field for the onset of the
15 experiment.

16 Field study

17 The experiment was conducted under field conditions at five locations: Arlington (Washington County,
18 Wisconsin), Clay Center (Clay County, Nebraska), Grant (Perkins County, Nebraska), Lincoln (Lancaster
19 County, Nebraska), and Macomb (McDonough County, Illinois)

20 Palmer amaranth flowering was monitored every other day throughout the study. When a plant started
21 flowering, it was identified as male or female. Plant height was measured from soil surface to the plant
22 apical meristem. Then, aboveground plant biomass was harvest near soil surface and oven dried at 65 C
23 until reaching constant weight before the weight of biomass (g plant⁻¹) was recorded.

24 Statistical analyses

25 The statistical analyses were performed using R statistical software version 4.0.1.

26 The cumulative Palmer amaranth flowering estimation was determined using a three parameter log
27 logistic Weibull function of the drc package .

$$Y(x) = 0 + (d - 0) \exp(-\exp(b(\log(x) - e)))$$

28 In this model, Y is the Palmer amaranth cumulative flowering, d is the upper limit (set to 100), and e is the
29 XXX, and x day of year.

RESULTS

30 Subsection 1

31 You can use R chunks directly to plot graphs.

```
x <- 0:100
set.seed(999)
y <- 2 * (x + rnorm(length(x), sd = 3) + 3)
plot(x, y)
```

32 Subsection 2

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34 manuscript. Figures will then be automatically embedded at the bottom of the submitted manuscript. Kindly
35 ensure that each table and figure is mentioned in the text and in numerical order. Permission must be
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37 compulsory to follow figure instructions. Figures which are not according to the guidelines will cause
38 substantial delay during the production process.

1 DISCUSSION

DISCLOSURE/CONFLICT-OF-INTEREST STATEMENT

39 The authors declare that the research was conducted in the absence of any commercial or financial
40 relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

41 The statement about the authors and contributors can be up to several sentences long, describing the tasks
42 of individual authors referred to by their initials and should be included at the end of the manuscript before
43 the References section.

ACKNOWLEDGMENTS

44 Funding:

2 SUPPLEMENTAL DATA

45 Supplementary Material should be uploaded separately on submission, if there are Supplementary Figures,
46 please include the caption in the same file as the figure. LaTeX Supplementary Material templates can be
47 found in the Frontiers LaTeX folder

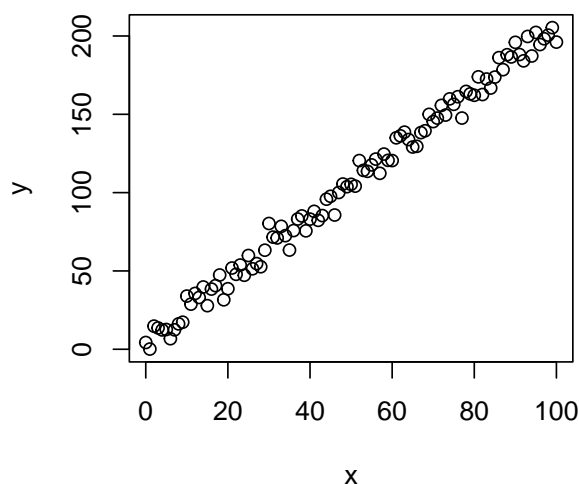


Figure 1. Figure caption

3 REFERENCES

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49 references at the end of the document instead. There are no convenient solution for now to force Pandoc to
50 do otherwise. The easiest way to get around this problem is to edit the LaTeX file created by Pandoc before
51 compiling it again using the traditional LaTeX commands.

FIGURES

52 Oliveira, M. C., Giacomini, D. A., Arsenijevic, N., Vieira, G., Tranel, P. J., and Werle, R. (2021).
53 Distribution and validation of genotypic and phenotypic glyphosate and PPO-inhibitor resistance in
54 Palmer amaranth (*Amaranthus palmeri*) from southwestern Nebraska. *Weed Technology* 35, 65–76.
55 doi:10.1017/wet.2020.74.