



# Palmer amaranth Identification and Management

## Curtis Thompson

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# Palmer amaranth characteristics

- There are **few or no hairs** on this species, **stem and leaf surfaces are smooth** (distinguishes Palmer amaranth from redroot pigweed, smooth pigweed and Powell amaranth).  
**The petioles are often as long or longer than the leaf blades.**  
Plant often has a **poinsettia-like appearance** with symmetrical leaf arrangement.  
The leaves occasionally have a **v-shaped variegation**.







## Palmer amaranth



Petiole

Leafblade

Spiny amaranth  
is the only other  
pigweed with  
this long petiole.

Spiny amaranth





# Palmer amaranth characteristics, reproductive

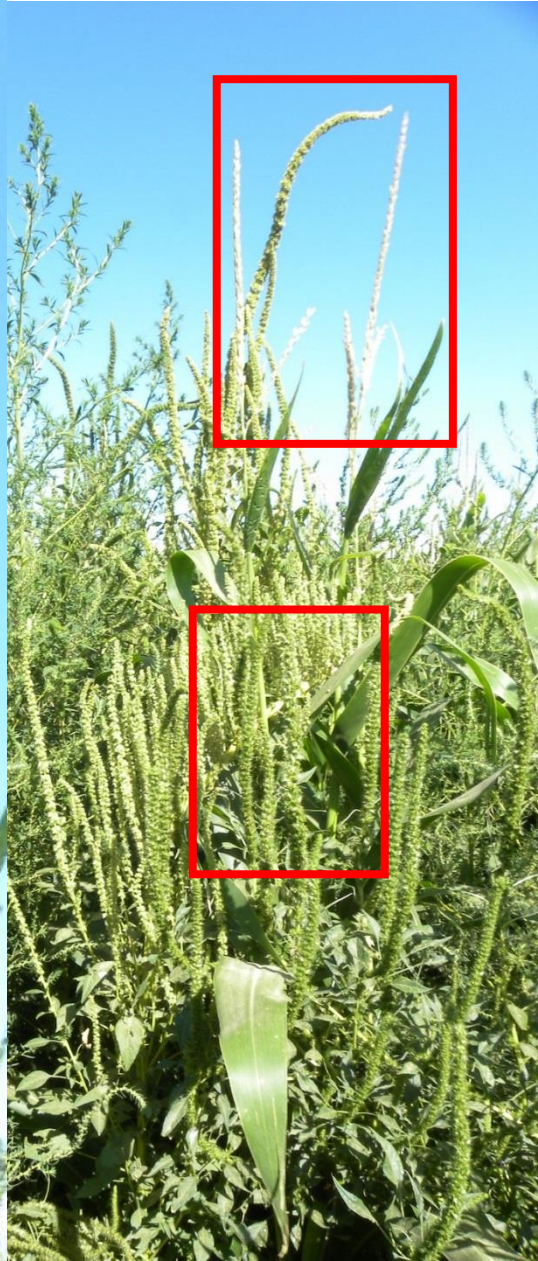
- Flowering structure is 1 to 2 feet long, thick, and at the top, mostly non-branched.

**Each plant is either male or female;** male flowering structure feels soft and sheds pollen, while female flowering structure feels prickly and contains seed.





# FEMALE



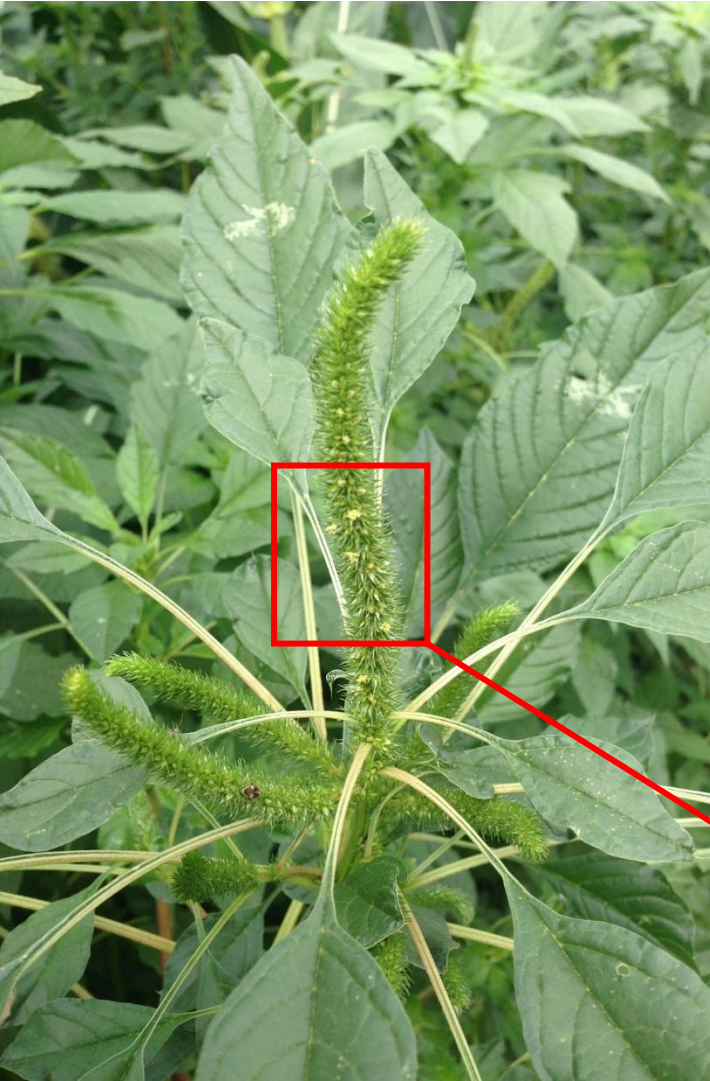


MALE earliest to develop and often mature earlier in the fall





MALE





**Is Palmer amaranth seed distinguishable from other pigweed?**





**Seed not distinguishable from  
other pigweed.**





**A Handbook for Identification by Linda W. Davis**

# **Weed Seeds of the Great Plains**



**Excellent  
resource for weed  
seed pictures.**





**22. *Amaranthus palmeri***

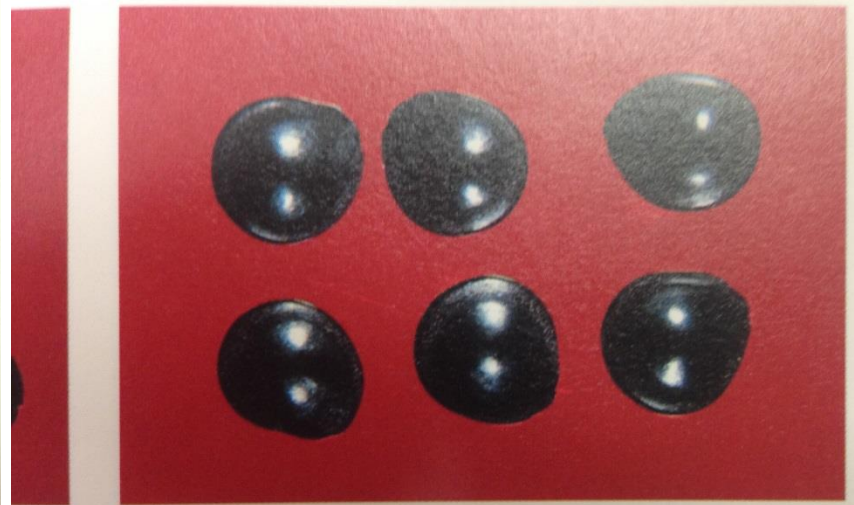
Palmer's pigweed

9.6x

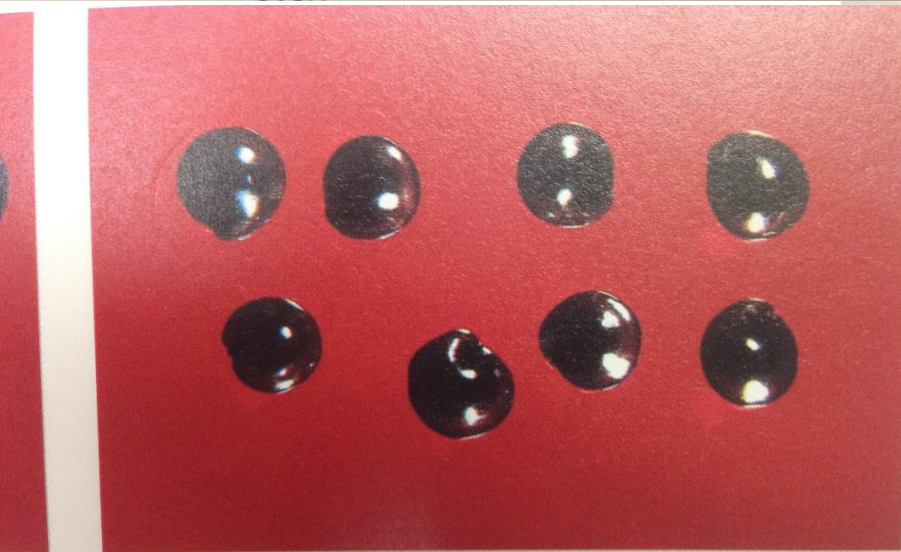




22. *Amaranthus palmeri*  
Palmer's pigweed  
9.6x



20. *Amaranthus graecizans*  
Prostrate pigweed  
9.6x



24. *Amaranthus rudis*  
Water-hemp  
9.6x



23. *Amaranthus retroflexus*  
Rough pigweed  
9.6x



24. *Amaranthus*  
V  
9



# Google pigweed identification

## P I G W E E D

## IDENTIFICATION

### A Pictorial Guide to the Common Pigweeds of the Great Plains

*Several pigweed species are found in the Great Plains. Pigweeds commonly reduce crop yields and*

*interfere with harvest. One means of controlling these weeds is through the use of herbicides. Recent research indicates that some pigweed species respond differently to various herbicides; therefore, proper identification is needed for good control.*

*Pigweed identification can be difficult, especially in the early stages of seedling growth as many species look the same. Once mature, identification is less difficult but not altogether straight forward. Key features of seedling and mature plants that aid in distinguishing the pigweed species are presented in this guide. However, it is important to note that "typical" plants of each species are shown, and that variation in shape and form exists within each species. Furthermore, some pigweed species may cross to produce hybrids. These hybrid plants may exhibit characteristics of both parents.*

A generalized distribution map; photographs of seed, seedling, and mature plants; and text describing other identifying features are presented for each species. The species are grouped with others that have similar shape and form.

- ▶ redroot pigweed
- ▶ smooth pigweed
- ▶ Powell amaranth

- ▶ spiny amaranth
- ▶ tumble pigweed
- ▶ prostrate pigweed

- ▶ common waterhemp
- ▶ tall waterhemp
- ▶ Palmer amaranth

Cooperative Extension Service  
Kansas State University, Manhattan

### Pigweed Identification: A Pictorial Guide to the ... - KSRE Bookstore

<https://www.bookstore.ksre.ksu.edu/pubs/S80.pdf>

identification a Pictorial guide to the common. Pigweeds of the great Plains. Several pigweed species are found in the Great Plains. Pigweeds co

### Pigweed Identification - Agronomy

<http://www.agronomy.k-state.edu/documents/weed-management/ppt-pigweed-id.pdf>

Pigweed Identification. Developed by Michael Horak, Dallas Peterson,, Dennis Chessman ... Multiple Pigweed Species. Page 4. Page 5. Redroot P

M.J. Horak  
D.E. Peterson  
D.J. Chessman  
L.M. Wax

Kansas State University  
Kansas State University  
Kansas State University  
USDA-ARS, Urbana, IL

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Cooperative Extension Service, Kansas State University, Manhattan



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MS 10-94—20M



**Palmer amaranth**  
(*Amaranthus palmeri*)

SEED (photo 1)

- When seed are threshed, sepals are about twice the length of the seed. The seed capsule breaks apart into two cup-like sections.



1

IMMATURE (photos 2, 3, and 4)

- There are few or no hairs on this species, stem and leaf surfaces are smooth (distinguishes Palmer amaranth from redroot pigweed, smooth pigweed and Powell amaranth).
- The petioles are often as long or longer than the leaf blades.
- Plant often has a poinsettia-like appearance with symmetrical leaf arrangement.
- The leaves occasionally have a v-shaped variegation.



2



3



4

MATURE (photo 5)

- Flowering structure is 1 to 2 feet long, thick, and mostly non-branched.
- Each plant is either male or female; male flowering structure feels soft and sheds pollen, while female flowering structure feels prickly and contains seed.
- Leaves occasionally have a v-shaped variegation, but plants do not have spines.
- The petioles are as long or longer than the leaf blade.
- There are no hairs on the plant.
- Stem and leaf surfaces are smooth.



9



One page for each species.



# Palmer amaranth management

- Emerging in mid April through June, July, August.
- A lot of populations resistant to ALS inhibitors (2), glyphosate (9). Less frequently resistant to triazines (5), HPPD inhibitors (27) and PPO inhibitors (14).
- Growth regulators (4) ????
  - 2012, In Nebraska a grass seed field received multiple applications of 2,4-D which no longer controlled waterhemp. Waterhemp produced seed after receiving 2 gallon 2,4-D/acre.
- IF you have a few plants, put them in a plastic bag!
- HAND WEEDING IS BEING DONE!



# Palmer amaranth management

- Small (1 to 3 inches) pigweed are easier to control than large pigweed (8 inches or above control will fail)!
- 2,4-D > Dicamba > Fluroxypyr > Quinclorac > Chlorpyralid or picloram.
- ALS inhibitors, Cimmaron products, use to be very good BUT most are resistant to ALS inhibitors?? Plateau could be ok if not ALS resistant.
- In crop production we depend a lot on chloracetamides (15) Dual, Warrant, Degree, Outlook, etc PREEMERGENCE activity only.
- In crops we depend on PPO inhibitors (14) Valor, Authority etc. PRE.. Activity primarily.



# Palmer amaranth management

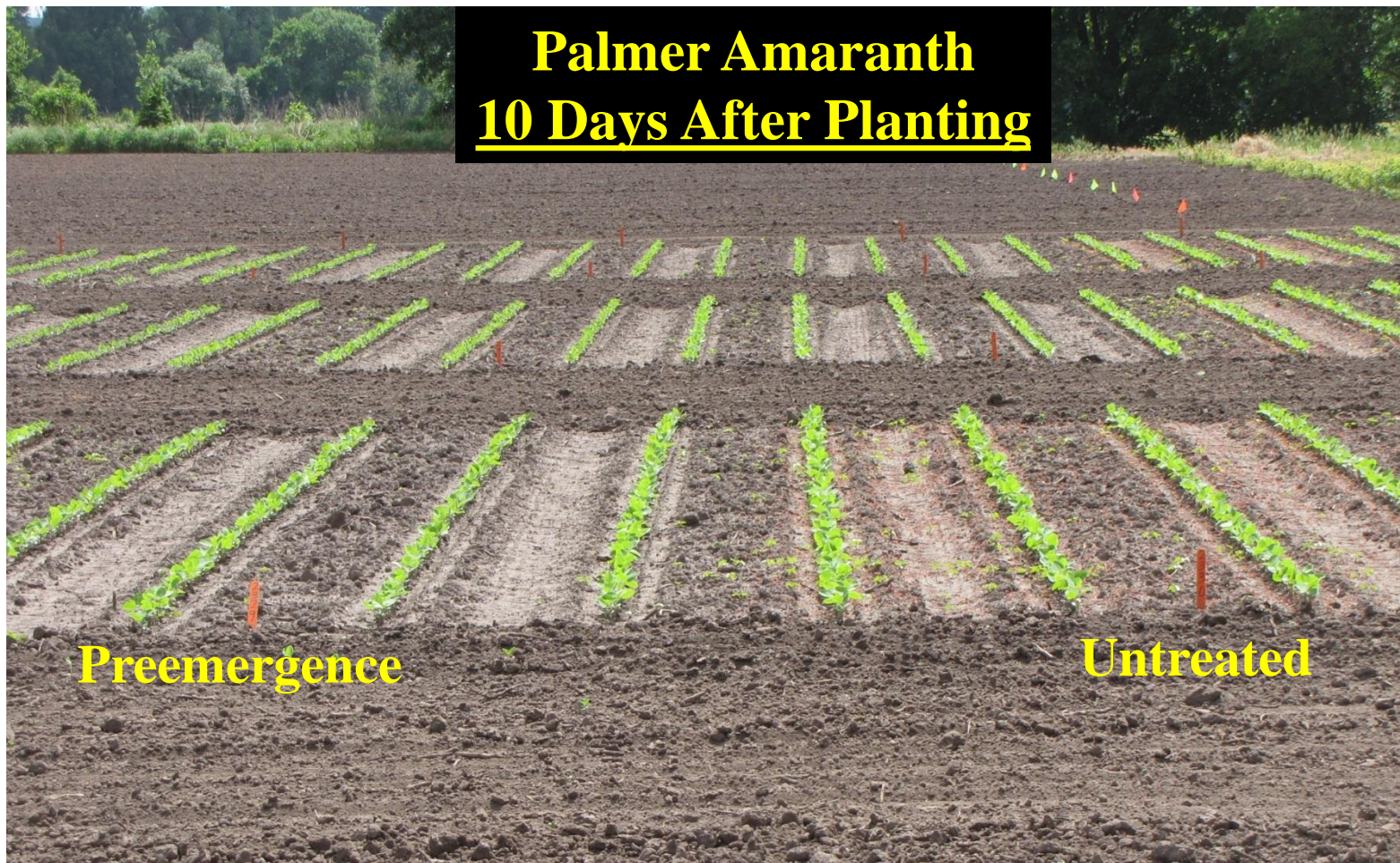
- Most effective method of control is to not let the Palmer amaranth ever emerge?
- We tell our Crop producers, an herbicide applied PRE that effectively controls Palmer is many fold better than depending on POST herbicides for control. BOTH may be needed.
- If spraying post, treat palmer amaranth when it is small, less than 4 inches!
- April emerging Palmer may be easier to control than late May or June emerging Palmer.



## **Palmer Amaranth** **10 Days After Planting**

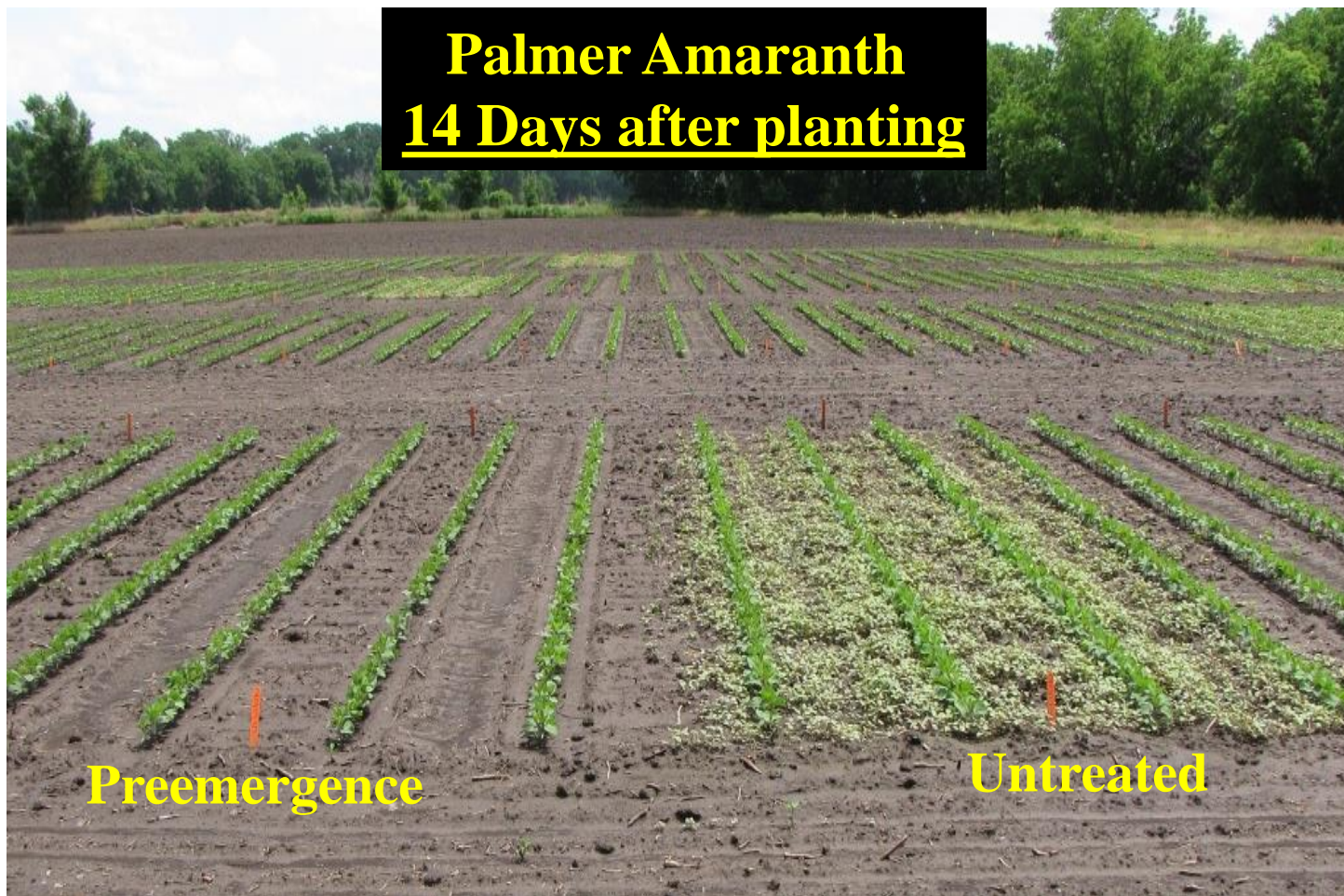
**Preemergence**

**Untreated**





**Palmer Amaranth**  
**14 Days after planting**

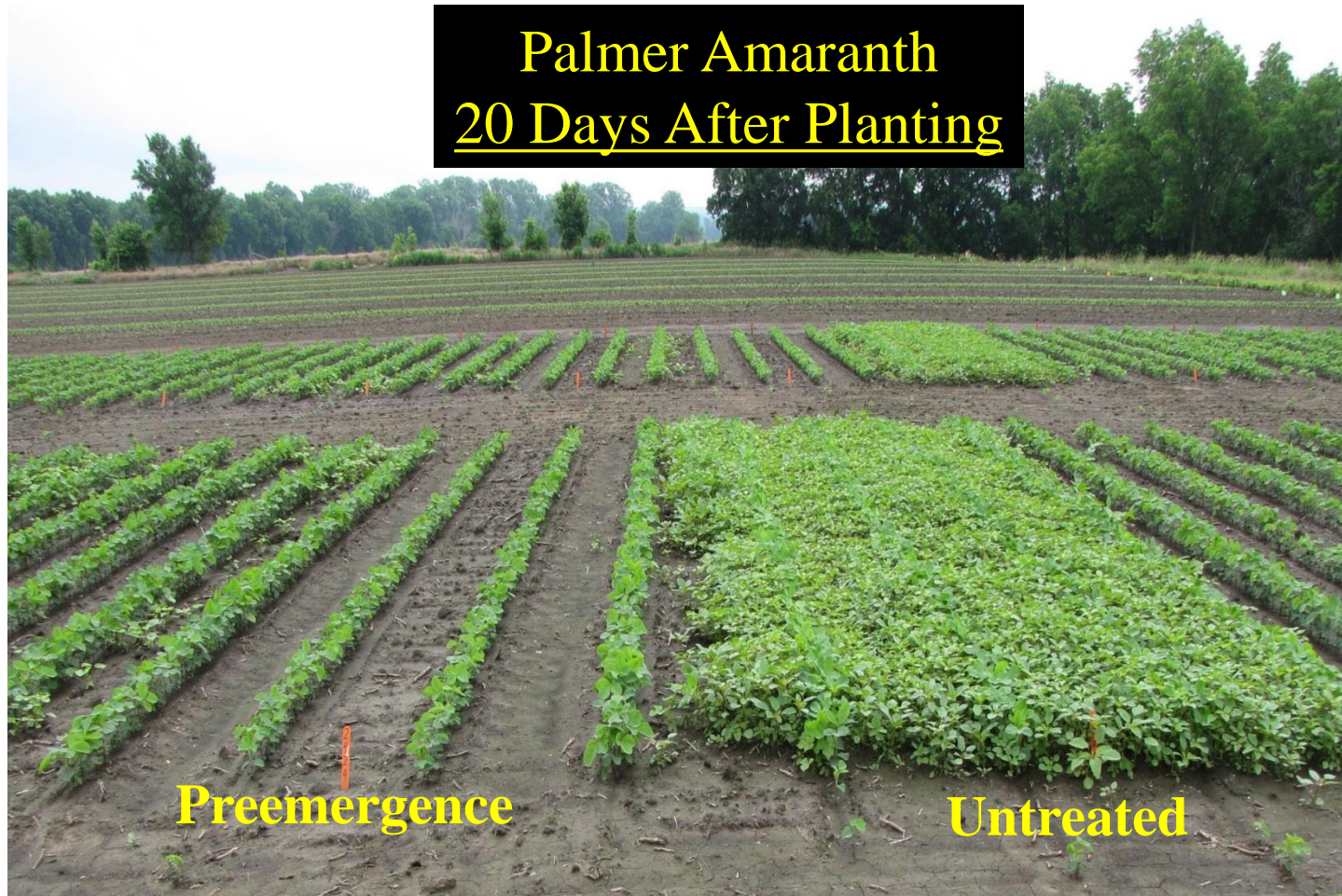


**Preemergence**

**Untreated**



**Palmer Amaranth**  
**20 Days After Planting**





# *Questions?*

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