National Pest Alert

Palmer Amaranth

Amaranthus palmeri

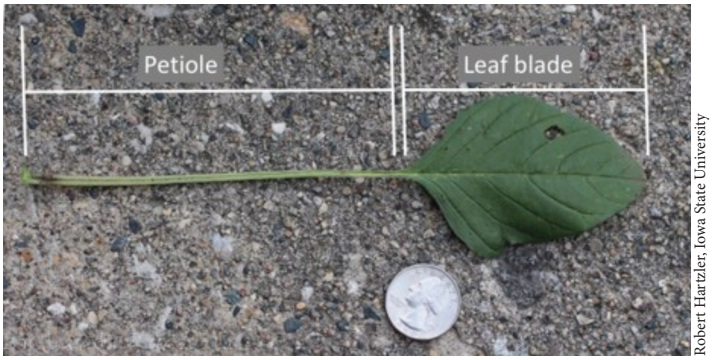
Palmer amaranth (*Amaranthus palmeri*) is native to the desert regions of northern Mexico and the southwestern United States, and has spread into the Midwest, the East Coast and portions of Canada. Palmer amaranth is a relatively new introduction in Iowa, Minnesota, South Dakota and Wisconsin. Palmer amaranth can be distributed by birds, through livestock feed, manure, grazing, wind, farm equipment etc. Amaranth expansion was accelerated in 2016 as an unintentional contaminant in some native seed mixes purchased by growers participating in conservation programs.

Palmer amaranth grows 1–3 inches in height per day, up to 6–8 feet tall and occasionally will reach 10 feet or more. Emergence occurs from early May through late summer and a single plant can produce over 200,000 seeds. Compounding the concern over the expansion of this highly aggressive, fast-growing weed is its resistance to herbicides. It is similar to waterhemp in its ability to rapidly evolve resistance to many herbicides used in weed management programs.

Identification of Palmer Amaranth Plants

Palmer amaranth is closely related to waterhemp (*Amaranthus tuberculatus*); to the untrained eye the two species look very similar. Fields in which Palmer amaranth has been introduced may also contain waterhemp. The following traits can distinguish these two species from each other. In addition, molecular tests are available to confirm the identification of Palmer amaranth.

- Both Palmer amaranth and waterhemp have hairless stems.
- Palmer amaranth will have some leaves, but not all, with petioles longer than the leaf blade.
- Seedheads of Palmer amaranth are usually longer and thicker than those of waterhemp.
- Female Palmer amaranth flowers have large, sharp bracts that are painful to touch when mature.
- Palmer amaranth usually has a much denser canopy than waterhemp.



Robert Hartzler, Iowa State University

A petiole longer than the leaf blade is the most reliable vegetative trait to distinguish the two pigweeds. Not all leaves on a Palmer amaranth will have this trait.

Diversify Weed Management Practices

Palmer amaranth, a summer annual, thrives in crops that have life cycles similar to amaranth (e.g., corn, soybean), so it is well adapted to production systems reliant on herbicides. One should evaluate how non-chemical tactics such as interrow cultivation, narrow-row spacing, and cover crops can be incorporated into weed management programs. Crops with life cycles different than Palmer amaranth, such as winter annual small grains or perennial forage species, are effective management tools that create an unfavorable environment for Palmer amaranth survival and reproduction.

Purchasing Seed for New Conservation Plantings

Purchase seed, including that used for pollinator plantings, cover crops, native species, and other conservation plantings, from a reputable company. Request a mix that does not contain Palmer amaranth, and review your seed tag to ensure it has been tested prior to planting. Visual

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identification of Palmer amaranth seed is nearly impossible because the seed of different pigweed species look similar. Seed growers test each seed lot for germination and purity, and end-users can request the laboratory tests for each species in your seed mix. If the seed test indicates the presence of "pigweed" or "Amaranthus spp." then don't purchase the seed unless the pigweed seed has been genetically tested and determined not to be Palmer amaranth. Many seed companies are now using a genetic test to positively identify Palmer amaranth seed from other pigweed species. Although the conservation seed industry is now aware of the Palmer amaranth issue, producers should still discuss seed purchases with local NRCS personnel and University Extension specialists to help ensure that the seed mix is amaranth-free.

Preventing Spread to Production Acreage

The primary concern with Palmer amaranth is that it will move from conservation plantings into crop fields. The greatest risk is with fields immediately adjacent to conservation plantings. Establish a 50 ft. buffer of an appropriate species of perennial grass to minimize Palmer amaranth spread to adjacent fields. If Palmer amaranth emerges in the grassed buffer strip, tools mentioned below should be considered during management discussions with NRCS personnel and University Extension Specialists for control throughout the growing season.

Management Options in Conservation Programs

Preventing the introduction, establishment, and spread of Palmer amaranth is the best management approach. Since Palmer amaranth is a recent introduction in many Midwest states a permanent seedbank may not be established. The objective should be eradication in new conservation plantings and producers can achieve this by preventing any Palmer amaranth plants from maturing and producing seed. Palmer amaranth present in Conservation Program plantings should be removed before plants produce seedheads and seeds mature. Infested acreage will require monitoring and treatment for several years to deplete the Palmer amaranth seedbank.

Mowing is recommended during establishment of native plantings. While mowing will not completely control Palmer amaranth, it will help get the native plants established, which will suppress the long-term effects of Palmer. Mowing will also reduce the number of plants that need to be removed by other strategies. Initiate control strategies before seedheads expand, and well before seed maturity. Hand weeding is an effective strategy for fields with low densities of Palmer amaranth. Plants should be carefully removed and destroyed if seedheads are fully expanded. Palmer amaranth resumes growth after mowing more quickly than other plants, making the weed easier to locate.

Chemical options for Palmer amaranth management include spot treatments of 2,4-D, dicamba, or glyphosate. Dicamba or 2,4-D will not kill grasses and are the preferred option. Multiple applications may be necessary due to prolonged emergence of Palmer amaranth. If using herbicides after mowing, delay the applications for two weeks to allow new growth to develop. Some Palmer amaranth populations have shown resistance to glyphosate. Also consider mechanical removal and/or spot burning.

Robert Hartzler, Iowa State University

Palmer amaranth in conservation planting.

In fields with high densities of Palmer amaranth it may not be economically feasible to selectively remove the Palmer amaranth while maintaining the vegetation specified in the Conservation contract. To maintain the integrity of the contracted vegetation, use mowing, hand weeding, and spot treatments with herbicides. However, broadcast application of either 2,4-D or dicamba may be necessary to eradicate Palmer amaranth from the program acreage. Any method of control (mechanical, chemical) should be made while Palmer amaranth is small and actively growing. The planting may need to be over-seeded with an appropriate grass species to provide competition and adequate cover depending on how much bare soil remains after herbicide application. Additional control treatments are likely to be required in subsequent years to provide continued control of Palmer amaranth.

For more information about Palmer amaranth control recommendations and state resources visit our Web site at:
ncipmc.org/action/alerts/palmer.php

For information about the Pest Alert program, please contact Laura Iles, co-director of the North Central IPM Center, at ljesse@iastate.edu

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