Palmer amaranth

Amaranthus palmeri S. Watson
(aka Palmer pigweed, carelessweed, dioecious amaranth)

ALBERTA REGULATORY STATUS:
WEED CONTROL ACT
PROHIBITED NOXIOUS
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Ross Recker, Universirt of Wisconsin-Madison, Bugwood.org

M. Cowbrough, Ontario Ministry of Agriculture, Food and Rural Affairs, Kings Printer for Ontario, 2024

Overview:

Amaranthus palmeri is an annual forb in the Amaranth family, native to northwestern Mexico and the southwestern United States. It was first reported outside of its native range in Virginia in 1915, likely spread by human transport of seeds.[1] Palmer amaranth has expanded into Manitoba, with threats of its spread into the other prairie provinces in the near future.[2] There were two confirmed cases of Palmer amaranth near the Montana/ Alberta border in 2025; both plants were destroyed but Albertans should remain vigilant. It is spread mainly through contaminated feed, irrigation canals, and by hitching rides on equipment, migrating birds, and wind.[2]

Despite establishment outside of its native range for over a century, Palmer amaranth only began to be recognized as a major agricultural weed in the 1990's. Since then, it has become an increas-ing issue in the southern United States, where in 2009 it was listed as the most troublesome weed for cotton, second-most troublesome weed for soybean, and seventh-most troublesome weed for corn.[3] Currently, Palmer amaranth is recognized as one of the most widespread and economically devastating glyphosate-resistant weeds in agriculture.[1]

Habitat:

It is particularly well-adapted for sunny, hot, and dry conditions; Palmer amaranth colonizes culti-vated fields, roadsides, and disturbed habitats.[4]

Identification:

Stems: One central reddish-green stem up to 2m tall, smooth and hairless, with many lateral branches.[1]

Leaves: The first true leaves are rounded to egg-shaped with a blunt end that may show a slight notch. At this early stage, the leaf stalk is longer than the leaf blade. As the plant matures, the leaves change to a more oval or diamond shape with a pointed tip, and the edges are typically slightly wavy. Some plants also display a pale white or grey V-shaped marking.[4]

Flowers: Very small flowers (about 2–3.5mm wide) that are either male staminate) or female (pistillate), and these occur on separate plants. The flowers are tightly grouped together in long, narrow, cylindrical spikes that form at the top of the main stem and can reach up to 60cm in length. Similar but shorter flower spikes may also develop on side branches. Male and female plants can often be distinguished by touch: male flower spikes feel softer and less dense, while female spikes are rough and prickly due to stiff bracts surrounding the flowers.[1,4]

Seeds: Small (1-2mm long), smooth to the touch and are typically round to slightly flattened.[1]

Toxicity: May be toxic to livestock at high levels of nitrate accumulation which is most likely to occur during drought.[5]

Lookalike Species: Easily confused with other non-native amaranth species, such as pigweeds (redroot pigweed, Amaranthus retroflexus; green pigweed, Amaranthus powellii) and waterhemp (Amaranthus tuberculatus). Palmer amaranth can be distinguished from these species by its smooth, hairless stem and a petiole that is longer than the leaf blade.[4]

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Palmer Amaranth *(continued)*

Impacts:

Palmer amaranth can cause huge losses in yield of crops such as corn, cotton, soybean, peanut, grain sorghum and sweet potato1. Palmer amaranth's ability to grow rapidly and accumulate biomass allows it to outcompete other crops. Like other Amaranthus species, Palmer amaranth may exhibit allelopathic properties, negatively impacting the growth of plants nearby.[6] Further, Palmer amaranth present among crops interferes with harvesting equipment, as work has to be stopped to remove the thick amaranth plants from machinery.[7]

Prevention:

Palmer amaranth is not present in Alberta, so it is key to remain vigilant and prevent it from spreading into the province. It is recommended that farmers report any strange-looking pigweed with long petioles and smooth, hairless stems to their agronomist or research partners.[2] Additionally, always check and clean boots, clothes, and equipment and remove seeds and plant parts to prevent spread of invasive species.

Control:

Grazing: Not recommended due to potential toxic levels of nitrate that can be found in the plant, particularly under drought conditions.[5]

Mechanical: Physically removing Palmer amaranth can help reduce additions to the soil seed bank. Plants should be completely removed and destroyed, as uprooted plants may re-root or continue maturing seed if left in contact with soil.[8] These methods are most effective when combined with other management strategies as part of an integrated approach.[1]

Cultural: Burning of mature plants using weed torches or prescribed burns can help control Palmer amaranth populations.[2] Deep tilage in the fall, follow-ed by planting and maturing cover crops such as cereal rye and winter pea, can also significantly reduce the amount of Palmer amaranth that ger-minates the following year.[1,9] Decreasing crop row widths is another method used to control Palmer amaranth, as increasing crop cover decreases the light available to germinating amaranth seeds.[10]

Chemical: In Canada, acifluorfen, bentazon, glyphotsate, bicyclopyrone, chlorimuron-ethyl, dimethenamid-p, flu-mioxazin, mesotrione, metribuzin, pyroxasulfone, tolpyralate, saflufenacil, s-metolachlor, 2-4-D, sulfentra-zone, and sulfentrazone are registered for use on Palmer Amaranth on agricultural crops.[11, 12] In the United States, Palmer amaranth has documented herbicide resistance to Groups 2, 3, 5, 9, and 14.[4] Always check product labels to confirm that the herbicide is registered for use on the target plant in Canada. Always read and follow label directions. Consult your local Agricultural Fieldman or Certified Pesticide Dispenser for more information.

Biological: None researched to date.

Joseph M. DiTomaso, University of California - Davis, Bugwood.org

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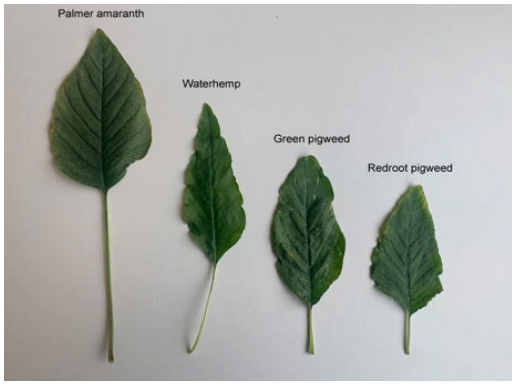

M. Cowbrough, Ontario Ministry Agriculture, Food & Rural Affairs.

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