

Weed Watch - Palmer amaranth

Origin and Range

Palmer amaranth (PA) is native to the desert southwest and northern Mexico and has spread throughout the Southern, Eastern and Midwestern U.S. It is currently known to have spread to at least 28 states including Minnesota and South Dakota but has not been reported in Montana. It is spreading through contaminated seed, hay or feed purchases, on custom combining or other machinery. PA is considered a noxious weed in Delaware, Minnesota and Ohio was recently found as a contaminant in conservation plantings in Illinois, Indiana, Iowa, Minnesota and Ohio. It was a contaminant in CRP seed mixes but pollinator, wildlife habitat and cover crop plantings may also been contaminated. Producers with recent conservation plantings should check their fields to ensure this invasive weed is not brought into Montana.

Identification

Palmer Amaranth (*Amaranthus palmeri* S. Watson) is an annual in the pigweed family that can grow 1 – 8 feet tall. It has one reddish central stem that is smooth with relatively no hairs with many lateral branches. In comparison, redroot pigweed seedlings are pubescent on the stems and leaves. PA leaves are alternate and grow symmetrically around the stem, giving it a poinsettia appearance when viewed from above. Leaves are hairless, lance to diamond-shaped, 2 – 8 inches long, ½ - 2 ½ inches wide, and have a prominent whitish vein on the leaf underside. Some, not all, plants have a whitish V-shaped mark on the top surface and a single spine in the leaf-tip notch. The leaf petiole (attaches the leaf blade to the stem) is longer than the leaf itself. PA female plants have a long terminal seed head that can reach three feet long. The seed heads have stiff, sharp bracts that give it a prickly feel. It is a prolific seed producer, producing 100,000 – 500,000 small brown-black seeds per plant which remain viable for 3 to 5 years.

Impacts

PA is an aggressive pigweed species with a rapid growth rate, growing 2 to 3 inches per day and has the potential to become a major agronomic problem in Western states. In the Midwest, it has been documented to emerge from May through September, forcing producers to manage it throughout the year. It can cause yield losses up to 91% in corn and 79% in soybeans. It can hybridize with other pigweeds including redroot pigweed. Its dioecious reproduction (separate male and female plants) forces outcrossing and genetic diversity which allows it to readily adapt to new environments and quickly develop resistance to herbicides. It has evolved resistance to the following herbicides and modes of action: ALS inhibitors, triazines, HPPD inhibitors, dinitroanilines and glyphosate. In addition, PA can be toxic to livestock due to presence of oxalates and nitrates.

Anyone who has planted wildlife, pollinator, or other conservation plantings where seed may have originated from sources in the South or Midwest should inspect and monitor plantings for the presence of PA. Every effort should be taken to ensure that any plants are found and destroyed before they set seed. This is especially true if the planting will be grown to maturity for fall grazing, pollinator or wildlife habitat enhancement.

Montana Considerations

Federal Seed Act law requires that all agricultural and vegetable seed sold in the U.S. have a label that includes: name and address of the seed labeler, lot number, germination rate and date, origin, percent of each component, percent weed seed, percent noxious weeds and amount of inert material. Seed labels list only species that are considered noxious weeds in the states where it is shipped from or the state where it is sold. Palmer amaranth is not on the Montana noxious weed list and therefore PA would not be listed as a noxious weed species on seed labels in Montana. Seed that contains species on the Montana noxious weed list or seed that contains more than 2% weed seed cannot be sold in Montana. The 'Laboratory Report of Analysis' from a seed lab lists other crop seeds, weed seeds and noxious weed seeds by species and number of seeds per pound each species. Since Palmer amaranth seed is visually indistinguishable from other *Amaranthus* species, if any pigweed seed is found in a lot it will be listed only as *amaranth sp.* A new DNA test recognized by the Minnesota Department of Agriculture differentiates Palmer amaranth from other amaranth species but is currently only available on a limited basis.

Options for Preventing Spread of Palmer Amaranth

- Use seed from reliable and trusted sources and consider purchasing certified seed if possible.
- Review seed mix label prior to purchasing seed; check percent pure seed, inert matter, other crop, weed seed, test date, germination, hard or dormant seed, pure live seed (PLS) and origin.
- Ask for 'Laboratory Report of Analysis' for your mix or all individual species in the mix. Check species and amount (number of seeds/pound) of other crop seeds, weed seeds and noxious weed seeds (if any).
- If dealer won't provide label or "Lab Report of Analysis" consider other vendors or obtain analysis for all individual species and mix yourself.
- Sample the purchased seed prior to planting and send in a sample and request a "Noxious Weed Only Seed Analysis" that includes amaranth species. Consult with the seed lab for the appropriate test as prices vary based on noxious weed species.
- If Amaranth species are listed under weed seeds; consider different species or a different vendor.
- If a mix with amaranth species has already been or will be planted, be prepared to take steps in the field to ensure Palmer amaranth is not present or is eradicated prior to seed set.
- Walk fields after emergence to ensure Palmer amaranth or other noxious weeds are not in your new plantings. Use seedling and mature plant keys to identify amaranth species.
- Since Palmer amaranth is resistant to many common herbicides, pulling the entire plant prior to seed set is an effective method of control. Place the plant in a plastic bag while in the field, and then ferment, burn, or dispose of properly.
- Scout fields for several years and use appropriate weed control to ensure Palmer amaranth or other noxious weeds are not introduced into Montana.

NRCS Agronomy Technical Note 92 'Palmer Amaranth (*Amaranthus palmeri* S. Watson)' has additional information and pictures contact your state or local NRCS office to obtain a copy.