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Weed Alert: First report of Palmer amaranth in Connecticut- watch out for this pigweed!

In summer 2019, a population of Palmer amaranth was identified in pumpkin fields in East Windsor, Hartford by the Connecticut Agricultural Experiment Station weed scientist Dr. Jatinder Aulakh. This is the first report of Palmer amaranth in Connecticut.

Palmer amaranth (*Amaranthus palmeri* S. Wats.) is a highly invasive summer annual plant in the pigweed (*Amaranthaceae)* family. It is an extremely problematic weed in several crops which include: cotton, corn, soybean, cucurbits, and several vegetable crops (Aulakh et al 2012; Chahal et al 2015; Massinga et al 2001). Historically, Palmer amaranth was located in the southern United States; however, human activities including seed, feed, and equipment transportation has led to its spread into the northern United States. Palmer amaranth is a dioecious plant with separate male and female plants. It reproduces by seed; a single female plant can produce more than 600,000 seeds (Keely et al 1987; Massinga et al 2001). Preventing the pioneer Palmer amaranth plants from producing seed is the first line of defense and also the most effective strategy to prevent its establishment into new areas. Therefore, do not allow even a single Palmer amaranth plant to produce seed else it may result in serious management issues in the following years and may also result in increased herbicide costs as well as significant losses in crop yield.

What is most concerning about this pigweed is its ability to rapidly evolve resistance to herbicides. In the United States, Palmer amaranth has evolved resistance to many herbicides including ALS-inhibitors (chlorimuron, imazaquin, imazethapyr, pyrithiobac etc.), EPSPS-synthase inhibitors (glyphosate), HPPD inhibitors (mesotrione, tembotrione, topramezone etc), long-chain fatty acid inhibitors (*S*-metolachlor etc), microtubule inhibitors (pendimethalin, trifluralin), photosystem-II inhibitors (atrazine, simazine etc.), PPO inhibitors (lactofen, fomesafen etc), and synthetic auxins (2,4-D, dicamba). In fact, the same population was found to be resistant to at least 5 different herbicide modes-of-action in Arkansas, and Kansas (Heap 2019).

Palmer amaranth is the most aggressive of all the pigweeds (Horak and Loughlin 2000). It should not be underestimated as one of the other pigweeds such as Powel amaranth, redroot pigweed, tumble pigweed, and prostrate pigweed at your farm. Palmer

amaranth has been reported for the highest plant dry weight, leaf area, height, and growth rate compared with other pigweeds, including common waterhemp, redroot pigweed, and tumble pigweed (Horak 1997; Horak and Loughlin 2000).

Palmer amaranth is capable of causing significant losses in crop yield even at very low densities; Palmer amaranth densities of 6 to 8 plants per meter of corn row caused 38% and 44% loss in corn grain and forage yields, respectively (Massinga and Currie 2002). Palmer amaranth is also an important host for nematodes in tobacco (Tedford and Fortnum 1998).Therefore, be proactive and familiarize yourself with Palmer amaranth identification and scout it in crop fields, borders, ditches and around dairies to prevent its establishment.

Palmer amaranth in a pumpkin field in East Windsor, Hartford Connecticut. Photo Source Jatinder S. Aulakh, CAES Windsor Connecticut.

Palmer amaranth identification:
Following are some pictures to help you identify Palmer amaranth in different stages of growth.

A Palmer amaranth seedling. Leaves are simple, alternate, ovate to lanceolate in shape, and without hairs. Photo source: Ohio State University.

A young Palmer amaranth plant. Palmer amaranth leaves often have white or purple, chevron-shaped water marks on the upper surface. Photo source: mda.state.mn.us.

For detailed information on distinguishing Palmer amaranth from other pigweeds, please visit the following website: https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=27466

Palmer amaranth top view. Palmer amaranth petioles (leaf stalks) are as long as or longer than the diamond shaped leaf blades and the leaves occasionally has a hair at the tip of the leaf. Photo source: ag.purdue.edu.

Average plant height is 6 to 7 feet but can reach up to 10 feet. Arrow in the picture points at a female Palmer amaranth plant in a corn field. Photo source: Dwight Lingenfelter, Pennsylvania State University.

Please report any new cases of its presence in Connecticut to the Connecticut Agricultural Experiment Station. If you suspect Palmer amaranth at your farm, please contact: Dr. Jatinder S. Aulakh, Assistant Weed Scientist. Email: Jatinder.Aulakh@ct.gov or dial 860-683-4984.

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