



## Discussion

In 2016, there was a tremendous increase in planting of native seed mixes across Iowa due to government programs like the Conservation Reserve Program (CRP). Pollinator habitat (CP 42) was one of the more popular programs due to cost share for establishment, signing incentives, and annual rental payments competitive with cash rent rates. Other programs such as wildlife food plots, native grass and forb plantings, and permanent wildlife habitat also encouraged planting of native seed mixes. In Iowa, approximately 200,000 acres were planted with native seeds in 2016, and some counties had up to 200 fields entered into these programs. Pollinator habitat required as little as 0.5 acres for enrollment, allowing these to be easier incorporated into landscapes, even within crop fields.

The primary means of introduction of Palmer amaranth in conservation plantings has been use of native seed mixes contaminated with Palmer amaranth seed. We have obtained samples of several of the seed mixes used in fields with Palmer amaranth infestations, isolated *Amaranthus* spp. seed in the seed mix, and confirmed the plants as Palmer amaranth following greenhouse grow-outs. Seed tags obtained from some Iowa landowners with Palmer amaranth in newly-seeded conservation plantings indicated the seed mixture had 0.00% weed seed. This indicates there is not only an issue with weed seed movement in seed mixes but also problems with seed testing procedures.

We have visited the largest Iowa producer of native seeds, inspected their production fields, and were unable to find Palmer amaranth. The huge increase in demand for seed of native prairie plants in 2016 resulted in local seed producers being unable to meet this demand. Most Iowa producers purchased seed of several species from outside vendors. The producers believe that these imported seed were the source of the Palmer amaranth.

Introduction of Palmer amaranth via contaminated native seed has occurred in other states as well. Ohio documented contaminated seed native seed mixes as a problem in 2014; the native seed contaminated with Palmer amaranth was imported from Texas. Both Illinois and Minnesota identified new conservation plantings this summer where Palmer amaranth was introduced, but the number of new introductions in those states appear to be a fraction of that in Iowa during 2016 (Fig. 2). Minnesota identified black-eyed Susan seed imported from Texas was the source of Palmer amaranth in seed mixes used in their state.

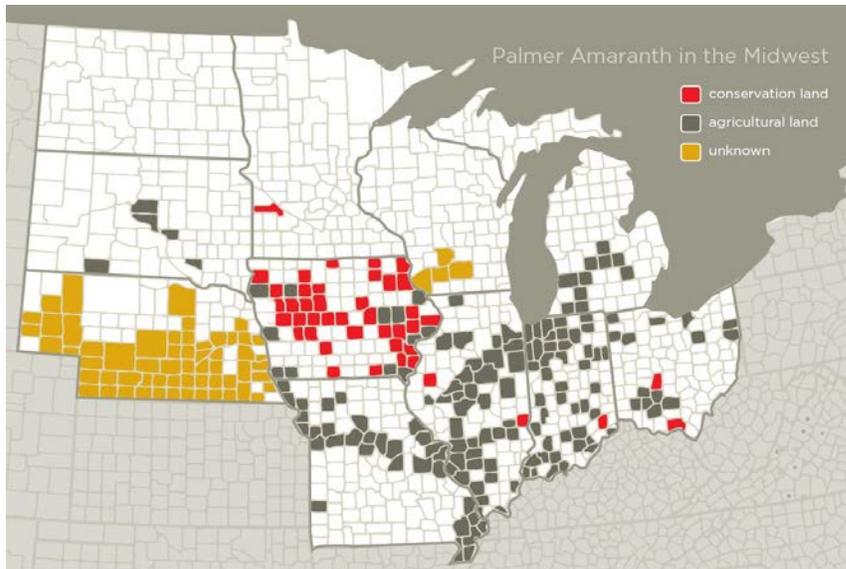


Figure 2. Weed scientists across the Midwest are finding Palmer amaranth. Grey counties indicate Palmer amaranth was first found in an agricultural field, whereas red indicates it was first found in conservation program land. Yellow signifies the source of introduction was not identified. Credit: Julie McMahon, University of Illinois.

While we have confirmed Palmer amaranth in 35 counties due to conservation plantings, we are confident the number of introductions is much higher, and we have no idea how many fields in individual counties might have had Palmer amaranth introduced. We are working with FSA and NRCS to notify participating landowners of the problem, and hope to conduct a random survey of the 2016 conservation plantings during 2017 in an attempt to answer these questions.

Since few Iowa farmers have drills appropriate for planting native species, most planting is done by custom operators. Drills typically are not cleaned when moving from job to job, and carryover seed is often left in the drill. This undoubtedly increased the number of fields to which Palmer amaranth was introduced. An example of this was provided by one participating landowner. This person enrolled 8 acres in pollinator habitat and 54 acres in a grass-based CRP program. The pollinator habitat was planted first, and the remaining seed was left in the drill when moving to the grass planting. They hand rogued 300 Palmer amaranth from the 8 acre pollinator habitat and 50 from the 54 acre CRP field. This suggests that approximately 1-2 acres of pollinator habitat seed was left in the drill when moving between fields. We fear this type of equipment contamination probably greatly increased the number of fields where Palmer amaranth was introduced.

Other states have also reported the presence of Palmer amaranth and other weed seed in bird seed, hay, animal feed, equipment movement, and movement of Palmer amaranth seed via migrating waterfowl. The many paths of Palmer amaranth movement will require a higher level of management for those near high-risk areas or using any type of feed from an area known to have Palmer amaranth.

Palmer amaranth is now undoubtedly a permanent component of the Iowa flora, however steps can be taken to minimize the risk contamination of native seed poses to Wisconsin agriculture. Landowners should purchase locally-produced seed whenever possible and communicate with producers to ensure seed produced out-of-state does not come from known high-risk areas.