
Palmer Amaranth in Commercial Feed Pilot Summary Report

A summary of the sample collection and findings for the 2023 and 2024 pilot study on
the risk of Palmer amaranth in the Minnesota commercial feed supply

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Purpose and Background

Palmer amaranth (*Amaranthus palmeri*) is a prohibited noxious weed that has developed resistance to multiple classes of herbicides and can cause extensive crop losses. Palmer amaranth has been documented in most U.S. states, including much of the Midwest. While not yet documented to have established populations in Minnesota, new infestations are reported each year. The plant invades new areas when its seeds are unintentionally transported through several key pathways.

This pilot program aims to better understand the risk for Palmer amaranth spreading through feed pathways, raise awareness, help find solutions to prevent its spread, and protect agricultural operations throughout the state.

The Minnesota Department of Agriculture (MDA) regulates noxious weeds in animal feed using multiple tools:

- The [Minnesota Commercial Feed Law](#) prohibits the sale of adulterated feed.
- The [Minnesota's Noxious Weed Law](#) prohibits the transportation, propagation, or sale of noxious weeds.
- The Minnesota [Seed Law and Screenings Act](#) prohibits or restricts noxious weed seeds in seed lots or screenings. Screenings are a byproduct of seed production that may be used as feed.

Traceback investigations from infested sites in Minnesota have identified millet and sunflowers as possible higher-risk commodities for the spread of Palmer amaranth. This pilot program focused on these whole grain commodities by collecting commercial feed and feed ingredient samples from feed manufacturing facilities.

Inspection and Sample Collection

The MDA proactively notified feed manufacturing facilities that seed and feed inspectors would be conducting joint inspections to collect feed samples and test them for noxious weed seeds. The goal was to better understand the risk for Palmer amaranth in feed pathways.

Prior to inspections in 2023, the MDA held a meeting and presented the pilot program to stakeholders. A factsheet was also posted to the MDA website: www.mda.state.mn.us/plants-insects/palmer-amaranth-location-sources.

In September and October of 2023 and 2024, inspectors from the Commercial Feed Program and Seed Regulatory Program jointly conducted inspections at 16 sites. Using a list of higher-risk commodities, they jointly determined which materials to sample at each site, ultimately collecting approximately 50 samples during each year of the pilot program (101 total samples over 2 years). Standard procedures were followed to collect a minimum 500-gram sample representative of the commercial feed or feed ingredient.

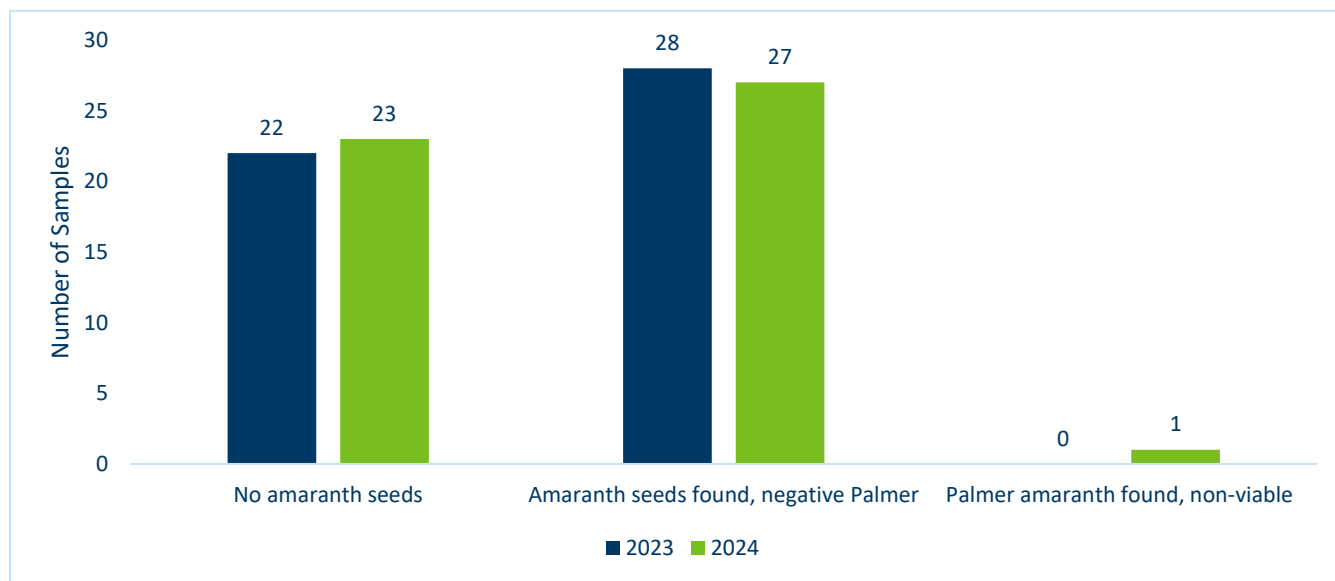
Palmer Amaranth Testing and Results

Feed samples were submitted to the MDA Plant and Seed Analysis lab for testing. Analysts visually inspected each sample for amaranth seeds using rules from the Association of Official Seed Analyst (AOSA). Any amaranth seeds found were submitted for genetic testing to determine the presence of Palmer amaranth.

After two years of the study, one out of 101 total samples (1%) tested positive for Palmer amaranth, but the seeds were not viable.

- 2023 results: Visual inspections identified seeds from amaranth species in 28 of 50 samples. Genetic testing confirmed that none of these 28 samples contained Palmer amaranth.
- 2024 results: Visual inspections identified amaranth seeds in 27 of 51 samples. Genetic testing detected Palmer amaranth in one sample. Further viability testing confirmed amaranth seeds were not viable.

Figure 1. Amaranth seed testing results for 2023 and 2024. A total of 50 samples were tested in 2023, and 51 samples were tested in 2024.



Noxious Weed Seed Findings

Compliance with the Minnesota Commercial Feed Law, Noxious Weed Law, Seed Law, and Screenings Act is determined by the presence and quantity of noxious weed seeds. Feed samples are considered adulterated if they contain prohibited noxious weed seeds or exceed the legal limit of 90 restricted noxious weed seeds per pound.

Prohibited and Restricted Noxious Weed Seeds

- Prohibited noxious weed seeds were found in both years. Any sample containing prohibited species is considered adulterated.
 - 2023: Four samples contained prohibited species.
 - 2024: Three samples contained prohibited species.
- Restricted noxious weed seeds were also found both years.
 - 2023: All six samples with restricted species were within the legal limit.
 - 2024: Two of 13 samples exceeded the legal limit and were considered adulterated.

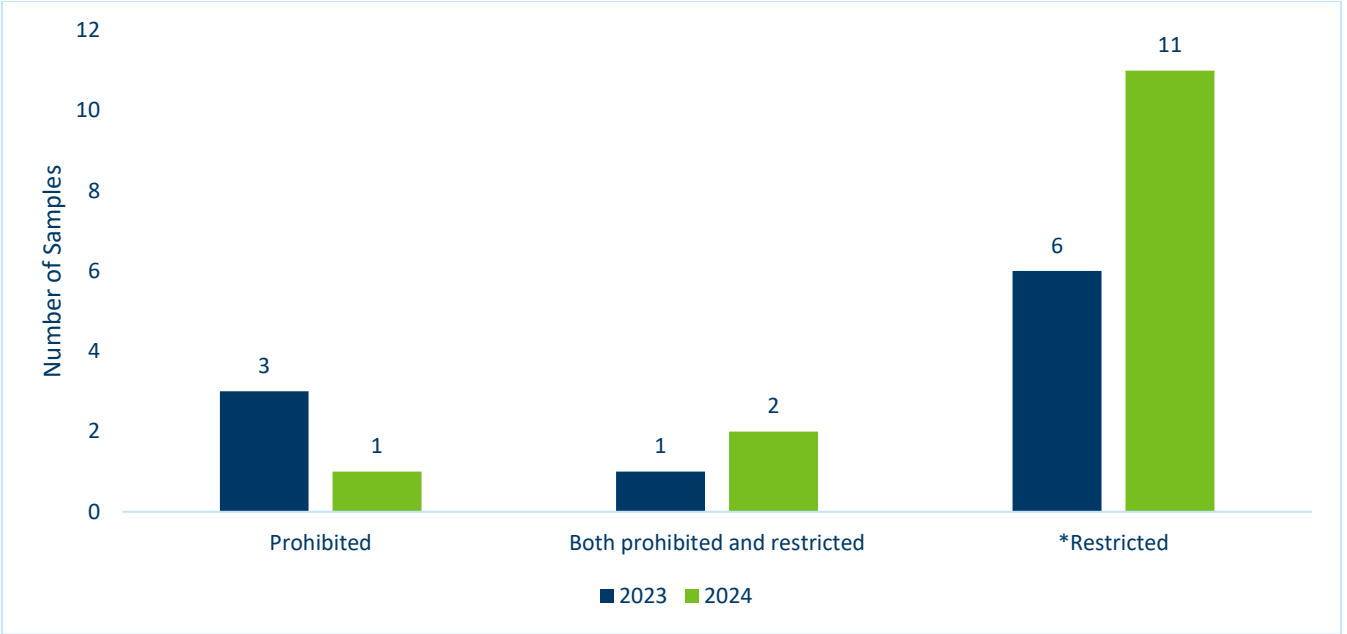
All restricted noxious weed seed species listed under Minnesota law were detected in the study, except for horsenettle (*Solanum carolinense*).

A full list of prohibited and restricted noxious weed seed species is available on the [Prohibited and Restricted Weed Seeds](#) webpage.

Feed Ingredients vs. Final Products

Both feed ingredients and final feed products were tested to assess potential differences in the presence of weed seeds. Noxious weed seeds were found in both, but the study did not determine whether one posed a higher risk of containing noxious weed seeds than the other.

Figure 2: Number of feed samples collected in 2023 and 2024 containing prohibited noxious weed seeds, both prohibited and restricted noxious weed seeds, and restricted noxious weed seeds.



Follow-up with Feed Locations

The MDA provided all inspected firms with a packet containing a cover letter, contact information, sample reports, and lab results. These reports helped firms understand the findings and make informed decisions. Follow-up actions were left to the firms. However, in 2024, reports for noncompliant samples included recommended procedural corrections to help prevent future violations related to noxious weed contamination in feed.

Next Steps for the Pilot Program

The Commercial Feed Program and Seed Regulatory Program plan to continue the pilot program for one more year. The MDA remains committed to mitigating the risk of herbicide-resistant weeds infiltrating the state, while also focusing on reducing potential future impacts and costs to agriculture. The Commercial Feed and Seed Programs will build on the positive outcomes observed through the collaborative efforts of the pilot program to provide ongoing support to Minnesota's agriculture industries.