From the Lab Bench…

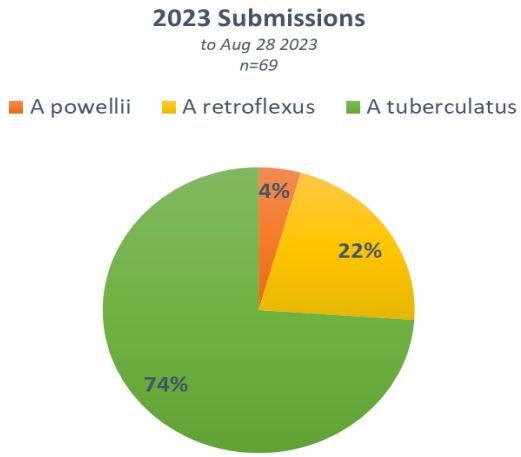
2023 Amaranth Weed Species ID

PSI provides DNA-based testing to determine the species of weedy Amaranth that may be present in growers fields.

What we have seen this year:

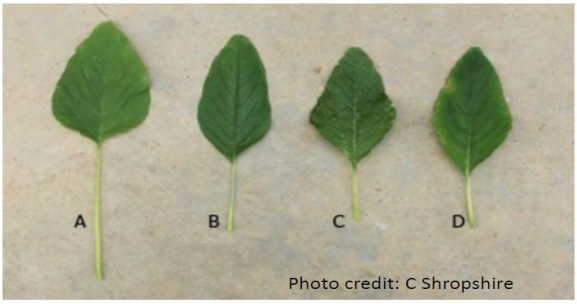
PSI has assayed 69 submissions* of Amaranth tissue in 2023. Almost 3/4 of the samples have been *A tuberculatus* (Tall Waterhemp), a Tier 1 Noxious weed.

**A submission can include up to 8 individual samples from within a field.*



Why is species ID important?

Three Amaranthus species found in MB- Palmer Amaranth (*A palmeri*); Tall Waterhemp (*A tuberculatus*) and Smooth Pigweed (*A hybridus*) are Tier 1 Noxious Weed- and under the Manitoba Noxious Weeds Act must be destroyed once identified. Other Amaranth species in Manitoba like Red Root Pigweed (*A retroflexus*) and Green/Powell Pigweed *(A powellii*) are not Tier 1 Noxious weeds. Visual identification of Amaranth species at the vegetative stage in fields can be complicated due to their ability to freely outcross or hybridize with other pigweed species as well as the impact of the growing season. Traditional bioassays require seed production to confirm identity of the species, which results in thousands of seeds per plant being produced and remain in the field.



A = Palmer Amaranth female leaf (Tier 1 Noxious)
B = Tall Waterhemp (Tier 1 Noxious)
C = Powell Amaranth
D = Red Root Pigweed

What's coming:

Herbicide resistance in Amaranths is an emerging issue. Resistance to different herbicide groups, products within groups and differences between species have been documented in other jurisdictions.

To provide in-province capacity to determine presence of herbicide resistance, PSI has licensed a series of target site (TS) herbicide resistance (HR) markers for different Amaranth species from AAFC. Once validated, these lab-developed markers will allow PSI to determine the species as well as presence of certain TS resistance. This provides important management guidance for growers.

Advantages of DNA-based testing:

- Removes the 'it looks like' discussion
- Uses young, rapidly growing material (green tissue is essential as it is rich in DNA)
- Can be conducted 2 weeks after spraying
- Is rapid- tests take less than 24 hours from sample submission to result