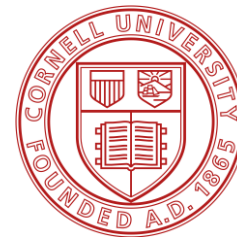


Weed Seed Movement and Equipment Clean Out

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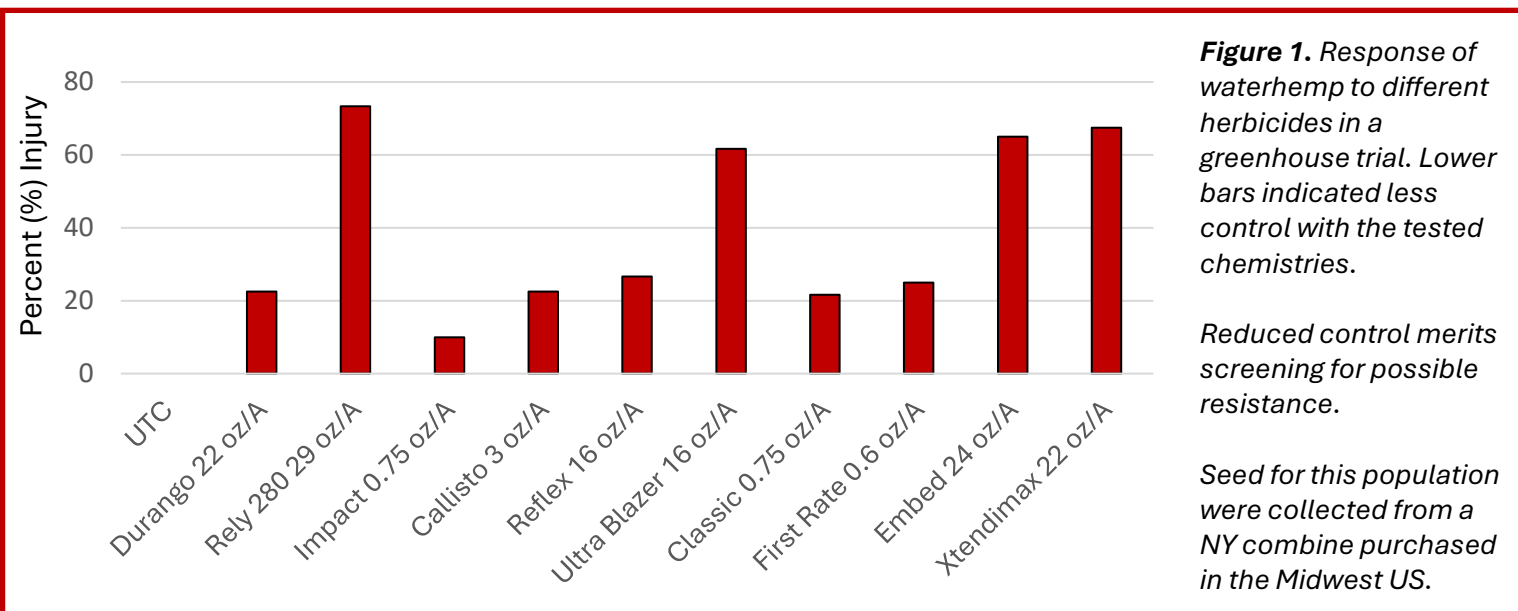
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WHY CARE? Weeds that escape in-season control may produce significant quantities of seed, which are threats to future yields. While most seed is deposited in the same field in which it is produced, some may be transported between sites on field equipment, such as combines (Figure 1).

University personnel have reported harvesters as being important mechanisms of seed dispersal for some economically important weed species, including herbicide-resistant biotypes of Palmer amaranth (*Amaranthus palmeri*) and waterhemp (*Amaranthus tuberculatus*). It is believed that most of our populations (of both) species entered the NYS on contaminated equipment.

ADDED BENEFITS. The removal of debris may have additional economic benefits (beyond its impacts on weed control efforts) if it prevents unnecessary wear-and-tear and helps to preserve equipment functionality over time.



THE NUMBERS GAME. Iowa State, North Dakota State University, and Nebraskascientists reported up to 150 lbs. of biomaterial (e.g., chaff, grain, etc.) is retained in harvesters after a field operation; that may include thousands, tens of thousands, hundreds of thousands, of weed seed stowaways.

Where can they be found in the combine? EVERYWHERE (Figure 2). Although the combine head and feeder house are likely areas for weed residue to accumulate, tissue and seeds can accrue in all parts of the harvester including the rotor, rock trap, grain tank, and unloading auger, etc...



Figure 2. From Iowa State University, University of Nebraska.

WEED SEEDS ARE NOT CREATED EQUAL. Smaller weed seeds, like those of common lambsquarters or pigweeds, like Palmer amaranth and waterhemp, may be more able to “hide” in tight areas of a combine compared to larger seeded species like ragweeds, burcucumber, or velvetleaf (Figure 3).

BEFORE YOU BEGIN. Eliminate problem weeds from fields before harvest. Avoid dense weedy patches in fields. Considering harvest order to prevent seed movement from weedy to clean fields. When possible, clean out equipment before moving between sites.

SAFETY FIRST! Before engaging in combine clean-out efforts, make sure all personnel are equipped with PPE, such as safety glasses, gloves, dust masks (N95 rating), and ear protection. Make sure that everyone involved is familiar with the safe operation of any equipment. Make sure

WHAT WILL YOU NEED? Shop-vac, high pressure compressor, cordless electric leaf blower, screwdrivers pocketknives, multi-tools.

BETWEEN FIELD CLEANOUT. The following was adapted from a NDSU bulletin on combine clean out in the field. <https://www.ndsu.edu/agriculture/extension/publications/recommended-procedures-between-field-combine-clean-out> It is expected to take 20-30 minutes.

1. Run the unloading auger empty for at least one minute.
2. Open the clean grain and tailings elevator doors, rock trap, and unloading auger sump.
3. Ensure all bystanders are at least 50 feet away. Optionally, remove the header from the combine before self-cleaning.
4. Start the combine and separator.
5. Adjust the cleaning shoe fan to full speed for maximum airflow, alternately opening and closing the cleaning shoe sieves electronically. Adjust the rotor to full speed for maximum air suction, alternately opening and closing the concaves.
6. Operate the combine in this manner for at least two minutes for self-cleaning.
7. Optionally, drive over end rows or rough terrain to dislodge material during operation.
8. Clean any remaining material from the rock trap.
9. Use a leaf blower or air compressor to remove material from the exterior of the combine, focusing on the head, feederhouse, axle, and straw spreader at the rear of the machine.
10. Remember to close the doors to the rock trap, clean the grain elevator, and unloading auger sump.

AM I DONE? A more thorough cleanout, especially at the end of season, is advised especially if your field have significant numbers of standing weeds at harvest. This will include removing the head, cleaning the grain tank, etc. See the following for more details: <https://www.canr.msu.edu/resources/recommended-procedures-for-a-complete-top-to-bottom-and-front-to-back-combine-cleanout> and https://crops.extension.iastate.edu/files/icm/between-field_combine_clean-out_fact_sheet_1.pdf (links active as of July 25, 2024). Remember that unwanted seed can also be picked up and spread on tires and on tillage and planting equipment. Remove clumped soil from implements and tractors to avoid spreading weed seeds, as well as devastating soil-borne pathogens.

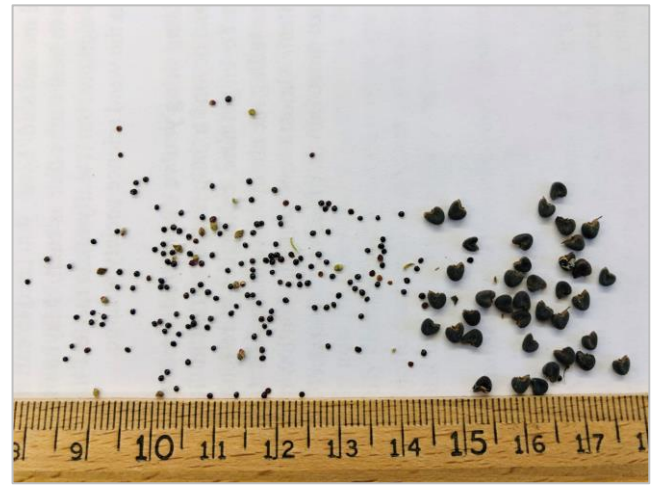


Figure 3. A comparison of pigweed (left) vs velvetleaf (right) weed seed size.