

# Recommended Procedures for a Complete, Top-to-Bottom and Front-to-Back Combine Cleanout

Dr. Mark Hanna, Iowa State University, Darren Jarboe, Iowa State University, and Mike Staton, Michigan State University Extension

Herbicide-resistant weeds such as palmer amaranth, waterhemp and marestail are spreading across the state increasing weed control costs and yield losses in soybeans. Because of this, producers need to take action to prevent or reduce the spread of these weeds. Combines have been identified as one of the main culprits in spreading weed seed from field to field and cleaning the combine can play an important role in reducing this problem. This factsheet lists the recommended steps required to perform a thorough, top-to-bottom and front-to-back combine cleanout.

## YouTube video:

The Michigan Soybean Promotion Committee produced a short and very practical video presentation on cleaning a combine to prevent the spread of herbicide-resistant weeds. The video can be viewed at the following link: <https://youtu.be/YEke-cLVXVc>.

## Quick in-field self-cleanout:

Perform a self-cleanout before leaving the field and prior to beginning a complete, top-to-bottom and front-to-back cleaning. The procedure for the self-cleanout is listed below:

- Remove the combine head and open the doors of the rock trap, bottom of the clean grain elevator and the unloading auger sump.
- Clear the area around the combine to avoid injury from flying debris.
- Allow the combine to “self-clean” by starting it up and running it with the thresher and separator at full speed, the concave clearance and cleaning shoe sieves fully open and the cleaning fan set to the maximum speed. Drive the combine over the end rows or other rough ground to dislodge biomaterial.
- Shut the combine off and use an air compressor or leaf blower to clean the feederhouse, rock trap and head. Use of a two-strap dust mask and eye protection is highly recommended when using an air compressor or leaf blower.
- Remember to close the doors on the rock trap, elevator and unloading auger sump when finished.

## Complete, top-to-bottom and front-to-back cleanout:

While the self-cleanout procedure outlined above will help reduce the quantity of biomaterial carried from field to field, it will not be as effective at reducing the spread of weed seeds as a thorough top-to-bottom and front-to-back cleanout. The steps for a complete, top-to-bottom and front-to-back cleanout of all the combine parts including the head, feederhouse, rock trap, rotor/cylinder/concave, cleaning shoe, tailings/elevators, grain tank, unloading auger, chopper, rear axle and chassis are listed below:

- Tools required: shop vacuum, high-pressure compressed air, flathead screwdrivers, and pocket knives
- Personal protective equipment required: two-strap dust mask and eye protection.
- Vacuum the inside of the grain tank starting at the top. Thoroughly vacuum all ledges, steps, lights, sensors, wiring and around the window to the cab.

- Vacuum around and inside the bubble-up intake auger. Lower the bubble-up auger if possible to several different positions to access and remove the biomaterial from underneath it.
- Vacuum all biomaterial from the floor of the cross augers.
- Attach a smaller flexible hose to the vacuum and remove the biomaterial from the grain tank sump.
- Use a smaller hose to clean the sump from below using the access door.
- Clean the unloading auger by packing 1.5 ft<sup>3</sup> of pine wood chips (0.5 in long) into the sump. Power-up the unloading auger to scour and remove biomaterial.
- Vacuum remaining wood chips and biomaterial from the sump, cross augers, and the exit end of the unloading auger.
- Remove the head, lower the feederhouse to the ground and use compressed air to blow out the interior. Remove biomaterial from all joints, crevices and feederhouse chains. Shake chains to loosen material. These areas may require repeated blowing and vacuuming.
- Raise the feederhouse and lock it in place using the hydraulic cylinder stop. Open the rock trap door and loosen existing biomaterial. If present, pull down the rubber seal between the feederhouse and the rotor to dislodge additional plant material. Use compressed air and the vacuum to remove the dislodged material.
- Remove access panels and rotor/cylinder concaves and clean the rotor/cylinder and threshing area. Vacuum first and then use compressed air.
- Pry out lodged plant material from the front rotor/cylinder section and remove it with the vacuum.
- Clean the concaves and the remaining rotor/cylinder cage.
- Use compressed air directed to the back side of the rasp bar sections to remove residue behind them.
- Attach the concaves and vacuum any remaining residue from the rotor/cylinder area.
- Remove residue from the clean grain augers or shaker pan below the rotor/cylinder.
- Clean the chopper by removing the plant material from both ends of the rotor/cylinder and then rotating the rotor/cylinder to get additional residue out of the chopper blades.
- Open the sieves to their maximum width and remove the covers of the bottom cross augers. Force compressed air through the sieves. Inspect lower cross augers and vacuum any remaining debris before replacing the cross-auger covers.
- Clean the elevators by opening the lower doors and shaking the conveyor chains to dislodge any material.
- Open and empty the moisture sensor and reassemble.
- Clean corn heads by removing all ears and large residue from the exterior. Raise the snouts, and shielding between rows and remove the safety shields. Then use the vacuum and compressed air alternately to remove residue around gathering chains, deck plates, and snapping rolls. Clean the auger, feed-pan and other areas at the rear of the head. Replace all covers, snouts and safety shields.
- Clean grain platforms by first removing all large amounts of residue from the exterior. Then clean the reel, auger or belt and the cutterbar areas. Remove auger inspection cover and safety shields for additional inspection and cleaning. Clean the outside and the inside of the crop dividers. Replace all covers and safety shields.
- Finally, clean the exterior areas of the combine. Use compressed air to remove residue from the spreader assembly and rear axle. Also remove residue from the combine chassis (ledges behind access panels, above the fuel tank, all standing platforms and around the outside of the feederhouse including guards and shields).