

Harvester Sanitation Best Management Guidelines (version 1.2)

WHERE TO CLEAN?

- A designated area for equipment cleaning, within the field perimeter, should be assigned and solely utilized.
- This area will be an at-risk location for future broomrape emergence if there was seed in the debris removed from the equipment and should be monitored carefully in future crops.

TIME TO CLEAN?

- The time needed for effective cleaning may require restructuring of harvest schedules.
 - Effective cleaning requires removing ALL debris and THEN applying a sanitizer—a process which typically takes 3-4 hours with a standard crew.
 - 1-2 hours of cleaning, no matter how efficient your crew is, is not likely to effectively reduce your risk of pest spread.

CLEANING STEPS:

1. **Remove loose debris –**
 - a. Soil and plant debris should be removed from all equipment using compressed air, scrapers, and pressure washers. Any visible plant or soil debris has some risk of containing broomrape seed or fungal spores.
 - b. Pay particular attention to the areas that accumulate a lot of debris or are difficult to access.
 - Axles and frame members, suction fan, fan duct, and chipper are all areas that accumulate a lot of debris, are hard to clean, and are of high risk of moving seed or pathogens.
 - In high-risk fields, it may be necessary to remove the fan duct for thorough cleaning.
2. **Pressure wash –**
 - a. Remove fine debris, caked-on plant and soil materials, and greasy areas that can harbor seed and pathogens and also inactivate chemical sanitizers.
 - b. This is the most important step in the cleaning process. Areas that contain debris when the sanitizer is applied will not be sanitized, since debris deactivates the sanitizer.
3. **Sanitize –**
 - a. AFTER CLEANING, apply chemical sanitizers which can kill broomrape seed and fungal or bacterial pathogens.
 - b. Quaternary ammonium, NOT BLEACH, is the sanitizing agent which is proven to kill broomrape seed.
 - Locally this can be bought under the labels: Clorox Pro Quaternary, Chem quat, Flo San or MG 4-Quat.
 - A solution of at least 1% is necessary for efficacy and should be used to spray down the equipment after soil and plant debris has been knocked off and pressure washing is completed.
 - c. Apply sanitizers to surfaces still wet from pressure washing, or rewet the surfaces before sanitizing to increase contact time and improve efficacy.
4. **Do not rinse –** To provide maximum activity on seed or pathogens, washed and sanitized equipment should be left to dry, not rinsed with water or other cleaning agents.

REMEMBER:

- If seed is underneath or within soil or plant material no cleaning agent, including quaternary ammonium, will be completely effective in killing seed or pathogens.
- No amount, or % of active ingredient, will make up for poorly-cleaned equipment with significant amounts of plant debris and soil. Debris you can see is debris which can and will harbor pests and deactivate your sanitizer.