

## PREPARING BINS AND EQUIPMENT FOR THE 2008 WHEAT CROP

Sam McNeill, Ph.D.  
Extension Agricultural Engineer  
Biosystems and Ag. Engineering Dept.

Doug Johnson, Ph.D.  
Extension Entomologist  
Entomology Dept.

University of Kentucky Research and Education Center  
Princeton, KY

Spring is a busy time for mid-South grain farmers and this year is no different. With delayed planting, wheat harvest will follow quickly for many folks and little time may be available to get grain bins, combines, grain carts, trucks and handling equipment ready for the incoming crop. However, completing appropriate pre-harvest chores is the first step towards protecting wheat from insect and mold infestations during storage. And with this year's higher wheat prices and potential for above average yields, motivation to prepare bins and equipment before harvest begins should be high!

### Harvest Equipment

All traces of old grain and trash should be removed from combines, grain carts, truck beds, augers, dryers and any other equipment used for harvesting, hauling, and handling grain. Bear in mind that a small amount of moldy or insect-infested grain left in any piece of equipment from last fall can contaminate an entire bin of new grain. If you plan to hire equipment from a neighbor to get the crop in more quickly, don't forget to thoroughly clean their equipment as well, especially if it's been idle or sitting in a shed where insect populations can thrive as temperatures warm. Wet-dry vacuum cleaners are preferred over high-pressure air or water systems, but all can help reduce time spent cleaning equipment.

Always adjust combines according to the manufacturer's specifications to reduce grain damage and improve cleaning. Be sure the straw spreader or chopper is working properly, especially for wide headers (> 20 feet), to avoid leaving windrows of residue that can interfere with planting double-crop soybeans. Once harvest begins, closely inspect wheat samples from the grain tank or truck frequently to see if rotor or cylinder speed or clearance, fan speed, or ground speed needs to be adjusted. To assess combine performance, use the rule of thumb that approximately 20 kernels per square foot are equivalent to one bushel per acre loss for medium size seed (14,500 seeds per pound\*60 pounds per bu /43,560 sq ft per acre = 20 seeds per sq ft).

### Grain Bins and System Components

Test-fire fans and (if drying) heaters and inspect air ducts and transitions for corrosion and air leaks. Before inspecting electrical wiring, disconnect the breaker/fuse at the service panel and remove cover plates to make sure all wire connections are tight. Inspect wiring for fans, switches, controls, and other electrical components for corrosion, loose, or broken wires and dry, cracked, frayed, or broken insulation and repair or replace as needed.

Move equipment away from grain bins and/or clean up the area surrounding them so they can be mowed easily. Remove spilled grain near the door, in the driveway and elsewhere to discourage insect and rodent activity. Fill in ruts or re-grade the site so that water will drain away from all bins.

Bins should be inspected ‘inside out’ for soundness and structural integrity, especially in light of the recent earthquake in southern Illinois. Cracks in the concrete foundation can be the result of uneven settlement or shoddy construction and can create a gap between the bottom ring and concrete base over time. In bins with perforated floors, a gap between the concrete foundation and bottom ring will allow air to escape, which can drive up energy costs for drying and/or cooling wheat. For bins without aeration floors, small gaps can provide an entry for water, insects, or rodents while large gaps can result in grain spilling from the bin. Small gaps can usually be filled with a high quality caulking compound, but if deterioration is extensive, the mastic seal may need to be replaced. While inspecting the foundation, also be sure that all anchor bolts are tight and not damaged.

After checking the foundation, be sure the outside and inside access ladders are intact and securely fastened to the bin. Inspect both sides of the bin wall and roof for leaks, loose or missing bolts, rust, or other damage. Check the seal around roof vents, access hatches, and temperature cables and repair as needed.

Thoroughly clean inside bins by removing all old grain, and debris/dust from the floor, ladder, and ledges with brooms and/or a wet-dry vacuum cleaner. Adjacent bins should also be thoroughly cleaned even if not used for wheat this year since insect populations can migrate from them.

Cleaning under perforated floors is the most challenging area, so fumigation of this space by a trained, certified pesticide applicator can be an alternative. It’s best to remove the fan and then tightly seal all openings (transition, unloading auger tubes, etc.) with heavy plastic sheeting and tape or twine prior to fumigation. A sheet of plastic large enough to seal the floor should also be cut, placed inside the bin, and rolled out of the way prior to fumigation. Otherwise, the pesticide applicator must seal roof vents, hatches, or other open areas and apply enough active ingredient to treat the entire bin volume. Holding a high temperature long enough to kill insects under sealed perforated floors is an effective alternative control for organic producers.

If storage through the summer is anticipated, consider treating the empty bin(s) after cleaning, with a protective insecticide, at least two weeks before harvest begins. Liquid sprays should be applied to the point of runoff to as many interior and exterior surfaces as possible, especially joints, seams, ledges, corners, doors, vents, ducts, fans, and the foundation. Insecticides such as Tempo (inside or outside the bin), StorcideII (inside only), or diatomaceous earth (in ducts, or under perforated floors) can be used for treating metal and concrete surfaces.

As always when applying insecticides read the label and comply with any use requirements. Because these applications are being made inside the bin there are restrictions on applicator location during application and on reentry time. Check with your county extension agent for specific guidelines.

If you choose to treat the grain directly, Storcide II and diatomaceous earth are labeled for use on wheat. A ‘cardinal PAT rule’ is to always treat grain with a compound other than one used to treat the empty bin. This provides broader protection and aids in preventing insect resistance. Also, be aware of your buyer’s requirements. For example, some grain processors will not accept grain treated with diatomaceous earth because it can damage their equipment.

More information on wheat drying and storage is available on the UK Grain Storage homepage ([www.bae.uky.edu/ext/GrainStorage/](http://www.bae.uky.edu/ext/GrainStorage/)). Insect control and specific insecticide recommendations for stored wheat are available on the UK Entomology Department’s web page (<http://www.uky.edu/Agriculture/Entomology/entfacts/fldcrops/ef145.htm>).