

# Institute for Business & Home Safety®

## Steps for Reducing the Risk of Agricultural Fires and Property Losses

Agriculture is risky business. Farmers and ranchers frequently use financial tools, such as hedging, crop/hail insurance and agricultural technologies to minimize the risks of adverse weather conditions, disease, insect infestations, and unexpected price swings. Property risks can be just as damaging. The result of natural or man-made hazards can be significant replacement costs for buildings and equipment, production interruptions with attendant revenue losses, workforce disruptions, and even loss of life.

Among the common risks facing farms and ranches is fire. According to the U.S. Fire Administration, on average, 20,000 agricultural-related fires cause \$102 million in direct property losses and result in 25 fatalities each year. These types of fires typically are slightly more expensive than all other industrial fires, on average 9 percent higher, because the commercial value of crops is affected along with the property. Two-thirds of agricultural fires occur in fields or orchards, with the other one-third occurring in livestock or poultry operations. More than half of agricultural fires involve brush or grass, while about one-third are equipment fires that involve vehicles, processing equipment, fixed wiring, heaters and torches.

This combination of increased risk and high-value assets makes fire protection at farms and ranches a high priority. The first step in minimizing the fire risk is increased knowledge and awareness. This white paper produced by the Institute for Business & Home Safety (IBHS) is intended to provide an overview to help identify common fire hazards in agricultural operations, recommend measures that should be employed to minimize the accompanying risks and outline some of the basic steps in preparing a fire prevention plan.

Fire risks vary significantly depending on the crops or livestock being raised, the size of the operation, and geographic location. Some of the necessary techniques require special technical assistance, which often is readily available at no cost, to help develop and implement detailed fire prevention plans. Expert advice and guidance can help ensure that a fire prevention plan not only matches your specific needs and economic circumstances, but also meets recognized standards and codes, and incorporates the latest fire protection technologies. Suggested sources for materials, advice and guidance in designing and implementing fire prevention plans are included at the end of this document.

### Basic Fire Prevention Preparation

- Develop a fire prevention and response plan to:
  - \* Identify and minimize the risk of possible fire hazards in your operations and residence.
  - \* Remove highly flammable and combustible materials and accelerants where possible.
  - \* Document the location and nature of those that cannot be removed.
  - \* Train and conduct fire drills for employees and family members to define who will do what in the event of a fire.
  - \* Facilitate fire service response by working with your fire department to make certain that adequate water supply is available, and that obstructions are removed from aisles, walkways, driveways, and doors in order to provide fire service with a clear path. Provide a list of stored hazardous materials to your fire department and update regularly.
  - \* Stress the importance of everyday maintenance and housekeeping in preventing fire.
- Prohibit smoking around flammable and combustible materials.
  - \* Post signs and enforce “No Smoking” bans in barns and around machinery and combustible and flammable materials.
  - \* Install, inspect and maintain appropriate warning and extinguishing systems in residences, farm buildings, on tractors, combines and around mechanized equipment.
  - \* This should include fire extinguishers, smoke alarms, fire alarms and, ideally in some locations and circumstances, sprinklers.

### Electrical Hazards

- When constructing new buildings or repairing existing buildings, meet requirements of the latest National Electric Code (NEC) or local codes if more stringent. Use qualified electricians who meet state and local licensing and certification requirements.
- Where a problem is suspected, have electrical installations and wiring inspected and approved by a licensed professional.
- Periodically inspect all wiring and electrical motors and appliances for exposed wires, broken insulation, fraying, and indications of wear or rodent damage, proper grounding and installation.
- Make certain electrical panel boxes have clear access, are put in areas free of excessive dust and moisture, remain at a safe distance from any combustibles, are weather-proof and are constructed with corrosion-resistant materials where required by the NEC.
  - \* Protect wiring by encasing it in metal or PVC

conduit pipe where required by the NEC.

- \* Use extension cords only for temporary wiring. Make sure extension cords are listed by Underwriters Laboratories® (UL) or another recognized product safety testing/certification laboratory, that they are appropriate for the intended use, and that insulation is not damaged or frayed.
- Cover light fixtures with dust and moisture resistant covers, and incandescent bulbs and heat lamps with globe cages as appropriate for the environment where placed.
- Use only UL or other listed and grounded appliances.
- Use only electric motors that are designed for the tasks and conditions in which they are used.
- Make certain overhead lines are sufficiently high if using tall farm equipment such as combines and grain augers.
- Install and maintain lightning rods and grounding cables under the supervision of a professional contractor.
- Make certain family members and employees know how to disconnect power in the event of an emergency.

## Farm Buildings And Residences

- When building or remodeling, identify and meet of the most recently approved requirements of your state and local building, electrical, and fire codes. Where possible, use ignition resistant or noncombustible building materials.
- Install smoke detectors and fire alarms. Consider sprinkler systems and carbon monoxide detectors where appropriate.
- Locate new buildings a safe distance from others to prevent the rapid spread of fire.
- Where barns or other farm buildings are 50 feet or less from one another, regularly cut vegetation between them and maintain a cleared area of five feet from these buildings.
- Use approved fire doors on farm buildings.

## Heating Equipment

- Keep all heating devices and equipment clean and in good repair.
- Use only heating devices and equipment which is designed for the environment in which it is placed.
- Do not store paper, rags, or trash near heating devices.
- Use portable electric, LP gas, or oil heaters only if listed by UL or another recognized product safety testing/certification laboratory.
- Make certain that anyone operating the equipment knows and follows applicable safety and maintenance procedures.
- Place heaters out of traffic flows and areas where paper, rags or trash is stored, and be sure they are equipped with tip-over protection and thermostats and are properly vented.
- Take care that kerosene and oil burning heaters are properly and safely refueled.
- Wood stoves used in residences or operations should be listed by UL or another recognized product safety testing/certification laboratory and properly installed and vented to meet National Fire Protection Standards.
  - \* Use appropriate wood, and never use a flammable liquid to start a fire.
- Protect heat tapes and tank heater cords so that pests and livestock cannot damage them.

## Machinery And Tractors

- Keep machinery clean and free of combustible materials, particularly engine compartments where machinery fires often start.
- Make certain exhaust systems including manifolds, mufflers and turbochargers, are free of leaks and in good working order.
- Follow instructions when installing and operating farm machinery and follow maintenance schedules.
- Replace worn electrical components, bearings, belts or chains.
- Keep appropriate fully charged fire extinguishers on tractors, combines, and near all farm machinery.
- Welders and cutting torches should only be used in clean areas at least 35 feet away from any flammable and combustible materials. Welding curtains should be used.
- Store vehicles and machinery, which present special hazards, in buildings separate from those used for other purposes.

## Flammable And Combustible Materials

- Clearly mark and store flammable liquids in approved containers in well-ventilated areas away from heat, sparks, combustible materials and other potential ignition sources.
- Keep all ignition sources away from combustible materials. Do not store materials such as hay, straw, grains, fertilizers or pesticides with machinery or near any type of electrical or heat source.
- Post and enforce “No Smoking” signs around hazardous or flammable material.
- Locate above-ground fuel tanks at least 40 feet away from buildings; liquid propane storage tanks should be placed according to NFPA 58.
- When transferring flammable liquids from metal containers, bind the containers to each other and ground the one being dispensed from to prevent sparks from static electricity.
- Store hazardous products such as, herbicides, insecticides, fungicides, and fertilizers according to manufacturer’s recommendations and applicable regulations.
- Clean up spills right away and keep oily rags in a tightly covered container.
- To prevent spontaneous combustion, cure hay to the proper moisture content before baling.
- Do not allow grass silage to become too dry.
  - \* Make certain upright silos do not have air leaks.
- Store compressed gases in upright cylinders away from heat sources and secure to a wall or buggy to prevent them from tipping over.

## Wildfire

- Remove highly flammable vegetation from within at least 5 feet of residences and farm buildings.
- Create noncombustible zones around spaces where equipment, fuel, hay and chemicals are stored.
- Create and maintain appropriate types and sizes of fire guards around pastures and crops.
- Keep roofs free of combustible debris and materials, and enclose eaves.
  - \* Do not store combustible materials under porches and decks, and enclose the areas under them with mesh screen.

- Develop an evacuation plan and conduct drills for you and your employees.
- Develop a plan to evacuate livestock.
  - \* Maintain an area where livestock can be moved such as a plowed or heavily grazed field or pasture providing water and shade.
- Construct and update farm buildings using ignition resistant and noncombustible materials, including siding, chimneys, roofs, doors and windows.
  - \* Consider installing sprinklers to protect residences, farm buildings and vegetation.
  - \* Provide adequate emergency vehicle access and water supply.

## Sources Of Help

There is wealth of assistance to help you identify and minimize fire risks, and much of this support is available at no cost. Detailed and hazard specific agricultural safety information covering the complete range of fire risks can be obtained from many places and at varying levels of technical specificity.

Your insurance company, local fire departments, U.S. Department of Agriculture cooperative extension offices and state agriculture departments can help you develop a fire prevention plan that meets your needs. Safety organizations, such as the National Fire Protection Association and the National Safety Council, provide information on common agricultural hazards. Some organizations focus exclusively on agricultural safety. For example, the Education Center for Agricultural Safety, the Childhood Agricultural Safety Network, AgSafety, the Farm Workers Health and Safety Institute, the National Institute for Agricultural Safety, the Canadian Agricultural Safety Association, and local farm bureaus are but a few organizations producing agricultural safety information.

The federal government is also active in publishing and disseminating agricultural safety materials and outreach. The National Institute of Occupational Safety and Health's Agricultural Centers and the National Agricultural Safety Database, as well state and local agricultural departments, are useful sources. Finally, safety information addressing specific risks unique to some operations is also available from trade associations representing the specific crop or livestock operation and farm equipment manufacturers or industries involving hazards such as pesticide application, storing hazardous chemicals, livestock breeding, or grain storage.

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