



AVIATION Technology Series

Agricultural Aviation Security

Robert E. Wolf
Extension Agricultural Engineer
Kansas State University

Dennis R. Gardisser
Extension Agricultural Engineer
University of Arkansas

Aircraft, facilities, support equipment, and chemicals represent an enormous investment that must be safeguarded. Safeguards should provide resistance to theft, vandalism, fire, weather, and now terroristic manipulations. The events of September 11, 2001 have heightened our awareness for the need to enhance security measures. Proper planning may also help address all general security needs.

Good security measures are your best insurance against problems resulting from accidental or intentional damage by unauthorized personnel at your facility. A modest investment of resources and effort can prevent a substantial loss to your operation. Common sense and a general heightened awareness about security should allow you to implement these and other ideas to enhance safety and security.

Facilities

- Post contact numbers: Police, Fire, Emergency, Poison Control, Management, and others.
- Make sure that there is an accessible phone in case of emergencies.
- Install a security fence, locked storage building, and other means of preventing unauthorized public access to your property.
- The main entrance to the facility should have a sign indicating that all persons must check in at the main office immediately upon arrival. This will allow you to know who is on the site and proper assistance can be provided.
- Lock all gates and doors when your facility is unattended.
- All valves on bulk product tanks should be secured with locks.
- Equip sight gauges on bulk storage tanks with bottom valves that are normally turned off and locked.
- Lock all sump pumps from containment areas.
- Application equipment containing product that is stored overnight should be parked on a rinse pad, secured and equipped with locked discharge valves.
- Install adequate lighting in all product storage and handling areas.
- Seal or eliminate containment drain lines. Septic systems with leach fields should never be used for disposal of any liquid that may contain agri-chemical contaminants.

- Provide automatic proximity sensor activated security lights for worker protection and to minimize vandalism at containment and mix-load facilities. These proximity sensors may also be used to trigger some type of alarm in needed.
- Utilize security alarms for facilities, equipment, and offices.
- Utilize local law enforcement
- Periodic patrols of airport
- List of activity times and people involved
- Provide list of employees and associates
- Transient (non-based) pilots register aircraft with airport/Fixed Base Operator (FBO) upon arrival and notify at departure.
- Post contact information to report suspicious activity and/or emergencies.
- Limit keys and document who has each key with accurate and up to date accounting.
- Airports with combination lock access points will help control who is allowed on the property during all hours. Combinations should be changed often and access given on to those with a real need.
- Post all signs and emergency instructions in dual languages as appropriate.

Aircraft

- Use of anti-theft devices and lockable control surface devices.
- Utilize prop and/or tail wheel locks.
- Lock hopper gate or hopper door in the open position.
- Locks on hangars to prevent unauthorized entry.
- Secure aircraft — remove keys when unattended.
- Encourage pilots to escort visitors at all times.
- Block passages with trucks or other items.
- Aircraft departing for an extended period of time should notify airport manager/FBO.

Airport Businesses, Flight Schools, Flying Clubs

- Utilize photo ID to identify.
- Use key lock boxes with limited access and distribution.
- Aircraft should remain locked and secure when unattended.

- ❑ Refueling vehicles should remain locked and secure when unattended.

Airport community watch program

- ❑ Coordinated locally by pilots and airport officials.
- ❑ Establish a community monitoring network.
- ❑ Encourage proactive participation in:
 - ❑ Aircraft security
 - ❑ Facility security
 - ❑ Heightened awareness
- ❑ Post signs promoting the program, warning that the airport is watched.
- ❑ Provide training to employees for recognizing suspicious activity and appropriate response tactics.
- ❑ Utilize law enforcement personnel for airport community education.
- ❑ Periodic meetings of airport community.

Fuel Storage

- ❑ Put locks and consumption recording devices on all fuel outlets.
- ❑ Locate all on-site fuel tanks above ground in a secondary containment, or utilize tanks with built in secondary containment.
- ❑ All underground storage tanks should be registered and appropriate procedures and records maintained according to state and federal laws.
- ❑ All new underground petroleum tanks must be equipped with leak detection and corrosion protection systems. The design specifications and periodic fuel volume reconciliation must be documented and maintained in a permanent file according to state and federal regulations.
- ❑ Fuel and chemical product tanks and piping should be protected from vehicle collision damage.
- ❑ Appropriate NFPA Fuel Warning and No Smoking placards must be posted at fuel storage facilities.
- ❑ Employees must be instructed not to smoke or eat while handling pesticides or fuels.
- ❑ Material Safety Data Sheets (MSDS) for all hazardous materials (pesticides, ammonia, or acids) used at the facility must be readily available for worker access.

Pesticide Storage and Security

The appearance of your operation is a direct reflection of your professional business management to customers, neighbors, the general public, and regulatory officials. Good housekeeping creates a positive impression while disorganized, unclean, or generally sloppy appearances may be an indication of other potential problem areas. Use the following practices:

- ❑ Clean mixing/loading and storage areas daily or after each use.
- ❑ Use collection containers to catch drips when connecting or disconnecting hoses.

- ❑ Inspect tanks regularly for cracks, leaks, sludge, and rust.
- ❑ Clean pesticide leaks and spills immediately.
- ❑ Keep sumps covered when not in use to keep out trash, dirt, and debris.
- ❑ Use collected storm water as makeup water or dispose of properly.
- ❑ Keep a spill cleanup kit readily available near the mixing-loading area for quick, efficient cleanup of spills.
- ❑ Use dry break connectors on hoses that are connected frequently.
- ❑ Mix only the amount of pesticide that will be used.
- ❑ Segregate rinse water by crop commodity or label restrictions so that it can be used as diluent in future loads.
- ❑ Store triple-rinsed empty containers neatly in a secured dry area before disposal.
- ❑ Rinse container caps and outside of containers to remove pesticide residues.
- ❑ Do not allow rain water to run off containers on to the ground – there may some undesirable residuals washed off.
- ❑ Regularly log, inspect, and inventory chemicals on hand to be sure of exact amounts.

Storage and Handling

Prevention of air, surface, and ground water contamination should be a top priority in the operation of your facility. This should be accomplished while enhancing the overall efficiency of the facility.

- ❑ Store pesticides and fertilizers in separate containments.
- ❑ Storage areas must be well ventilated using explosion proof electrical control wiring and fan motors with **at least 6** air exchanges per hour.
- ❑ Make sure storage facilities are placarded with the appropriate warning and hazard signs.
- ❑ Place appropriate fire extinguishers outside near storage entrances.
- ❑ Store dry pesticides above liquid pesticides or in separate areas.
- ❑ Use corrosion proof metal shelving with a retainer lip at the front of each shelf.
- ❑ Maintain an inventory of type and quantity of each chemical at the local fire department. This should be updated when there are significant changes in quantity and/or type of chemical.
- ❑ Manually operate all containment sump pumps unless authorized otherwise by state regulation.
- ❑ Place each small volume container (up to 5 gallons) in a separate “*rubber tub*” containment.
- ❑ A detailed diagram of inventory storage locations should be on file with appropriate local emergency police and fire fighting personnel.

- ❑ Use tarps, plastic sheeting, or catch pans under fertilizer conveyor transfer points to contain leaks and spills.
- ❑ Keep all pesticide containers closed.
- ❑ Use closed transfer handling of pesticides for worker safety.

Dry Fertilizer

By law, fertilizers and pesticides **must** be stored in separate containments. Fertilizer containment overflows may drain into pesticide containment, but pesticide containment overflows cannot drain into fertilizer containments.

- ❑ Store all dry fertilizer products under roof.
- ❑ Divert rainwater away from the fertilizer storage area.
- ❑ Contaminated rainwater should be collected and applied as product.
- ❑ Recover and use any spilled product immediately.
- ❑ Fugitive dust from storage and transfer areas should be contained and used.
- ❑ Dry fertilizer handling areas should have containment diking.
- ❑ Clean storage areas daily or after each use.

Liquid Fertilizer

- ❑ Liquid fertilizer tanks should have secondary containment. Containment sizes should be the same as outlined in the pesticide section below.
- ❑ Tank outlets should be locked.
- ❑ Storage areas should be fenced with controlled access.
- ❑ Tank bottoms should be kept dry if possible. This may be accomplished by placing the tank on 6 inches of loose pea gravel in a containment ring and then keeping the main floor pumped dry.

Pesticides

All pesticides must be stored in a separate, isolated area to prevent possible contamination of animal feed, grain, fertilizer, or other materials.

- ❑ Keep flammable and/or combustible materials segregated from all ignition sources.
- ❑ Store all bulk chemicals inside a diked containment area under roof.
- ❑ Store collected rainwater from diked areas for use in future application blends or mixes, or pump it out if it is clean and is allowable by regulations in your area.
- ❑ Pesticide secondary containment tanks under roof should hold a containment volume at least 110 percent of the largest tank in the containment area, including the displacement volume of all tanks and equipment in the area.
- ❑ For a containment area not under roof, the containment volume should hold 125 percent of the volume of the largest tank in the containment area, including the displaced volume of all tanks in the area, plus freeboard (6 inches is typical), plus rainfall

amounts as prescribed by your state regulations, usually a 25-year storm (see MWPS-37 Handbook for 25-year storm graph for your region of the United States).

- ❑ If the pesticide containment area is outside, consider plans to roof the pad to eliminate storm water accumulation.
- ❑ Locate all transfer pumps, pipes, hoses, and valves within a containment structure, above the highest anticipated flood or spill level, for easy inspection and operation.
- ❑ Make routine inspections of the storage area to check for leaks and spills daily during the application season, then weekly or bi-weekly.
- ❑ Document primary inspection factors (time, date, place, conditions, etc.) in a log book.
- ❑ Repair leaks and clean contaminated pad area immediately.
- ❑ Clean spills immediately and properly dispose of the waste.
- ❑ Equip the containment area with a spill collection sump, sump pump, or transfer pump suction hose and holding tank. A transfer suction pump dedicated to each product type may be useful when product cross contamination is a concern.
- ❑ Store all pesticide mini-bulk tanks in a pesticide storage containment area to avoid accidental runoff or drainage into streams, ditches, or well heads.
- ❑ Use stored rinsate and storm water immediately in suitable product mixes -1 part rinsate to 4 parts clean water. Check state regulations regarding rinsate concentrations allowed.
- ❑ Keep packaged chemicals inside a secure building designed with at least 6-inch deep internal containment to hold water or other chemicals used in fire extinguishing.

Mixing-Loading Areas

- ❑ Properly ventilate inside mixing areas with at least 6 air changes per hour for pesticide handling.
- ❑ Prominently display appropriate warning signs regarding hazardous chemicals and non-smoking areas at all entrances and exits to a building.
- ❑ All product and rinsate storage should be properly labeled by content.
- ❑ Locate mixing and transfer tanks and pump systems within a containment area capable of holding 110 percent of its contents if under roof, or 125 percent if not roofed.
- ❑ Design the load pad containment system to handle 110 percent of the volume of the largest transport truck or applicator vehicle if under roof, or 125 percent if not roofed.
- ❑ Conduct all product loading over a containment load pad with a collection sump.

- Handle pesticide and fertilizer products using mix-load equipment in a common containment area but store them in separate containments.
- Secure all mix-load areas, drain valves, transfer lines, and pumps.

Personal Safety

- Proper personal protective equipment should be provided at each site for each employee as required by the Worker Protections Standard.
- All employees should receive adequate training in the use of appropriate protective gear and equipment for handling products.
- Proper use of safety equipment and clothing and laundry practices will protect you, your employees, and families involved. Use washer and dryer at site to prevent transporting possible contaminated clothing home and mixing with family laundry. Therefore, changing clothes before leaving work is suggested.
- Use closed mixing and/or transfer systems for pesticide handling safety.
- Use a separate washer and dryer. Do not mix pesticide contaminated clothing with family clothing. Hang clothing outside in direct sunlight and wind to dry when possible.
- Use strong detergents and hot water for washing. Run empty washer with detergent and hot water cycle to clean after washing contaminated clothing.
- Provide and use appropriate face shields or goggles, rubber aprons, long-sleeved shirts, rubber gloves and boots when loading and mixing pesticides.
- Office or non-storage areas must have separate exit doors from pesticide storage rooms.
- Storage areas must be well ventilated using explosion proof electrical control wiring and fan motors with at least 6 air exchanges per hour.
- Emergency shower and eye flush fountains should be easily accessible. These should only be used for emergencies and should trigger an alarm when used.
- A telephone should be installed near pesticide storage buildings with a list of appropriate emergence phone numbers.
- Do not store pesticides higher than 66 inches from floor level.

Rinsate Handling and Reuse

- Rinse hopper, plumbing, and boom equipment over the application site if possible, and apply rinsate to the target while at the site to avoid rinsing at the facility upon return from the field.
- If spray equipment is rinsed at the facility, collect rinsate and segregate in holding tanks that are dedicated and marked according to crop for reuse to avoid pesticide cross-contamination.
- Thoroughly clean rinsate tanks used for different crops and/or chemicals that are not compatible.
- Exterior equipment wash-down should be done on a clean mix-load pad, and the rinsate should be collected and sprayed on an approved target even though external rinse water has been defined as non-hazardous. Clean pad thoroughly after washing down.
- Apply the liquid collected from the mix-load pad sump immediately to an approved target (for the job the rinsate was generated from if practical), or temporarily store it in an aboveground tank for a short period of time until it can be used on another job requiring that chemical. Underground storage may not be allowed. Follow tank size and time allowances in your state.

Suspicious activities

Another important part of securing the safety of your agricultural aviation facility and business centers on general awareness of what is identified as suspicious activities. Suspicious activities could include, but are not limited to the following items. Recognizing such activities could provide opportunities for prevention. Be vigilant! Be observant!

- Beware of “copycats”!
- Attempts to purchase toxic materials – pesticides.
- Questions about operation of equipment.
- Lease or buy questions from unknown individuals.
- Anyone seeming unfamiliar with details of agricultural aviation asking questions.
- Acts nervous, seems uneasy or vague, and avoids eye contact.
- Demands immediate possession of purchased material instead of available future delivery.
- Asks for material in smaller, individual containers rather than in bulk.
- Insists on paying in cash rather than with a credit card or check.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Publications from Kansas State University are available on the World Wide Web at: <http://www.oznet.ksu.edu>

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Robert E. Wolf and Dennis R. Gardisser, *Agricultural Aviation Security*, Kansas State University, March 2002.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

EP-111

March 2002

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Marc A. Johnson, Director.