Pesticide mixing, loading and application

By Stephen H. Futch and Ryan Atwood

The mixing, loading and application of pesticides is a work-related task that may expose the pesticide handler to hazardous materials (pesticides) if not done with the correct personal protective equipment (PPE). To understand what protection is required, the first step before the purchase of the pesticide is to read the applicable sections of the pesticide label for any task that may bring the handler or others into contact with the material or residual pesticide on treated plants.

The pesticide handler, as described in the Worker Protection Standards (WPS), is any person that is employed by an agricultural establishment to mix, load, transfer or apply pesticides, or do other tasks that bring him/her into direct contact with pesticides. The pesticide handler is exposed to the greatest risk while handling the concentrated pesticide during the mixing and/or loading operations. A higher level of PPE is generally required during handling, mixing and loading pesticides than when applying pesticides. Additional PPE can be worn than required by the label during these tasks, if you choose, but less than that required on the label is prohibited.

Reducing pesticide exposure risks can be accomplished by following a few simple steps:

1. **Mixing or Loading Site:** Select an appropriate area in which to mix or load the pesticide. This area should be well ventilated and separate from people, animals, food and other pesticides that could become contaminated from incorrect handling or applications. This mixing site should be well lit, especially if the application could occur during the night, early evening or morning when light is limited. Special care should be exercised if the mixing operations are conducted in an enclosed area and only conducted if adequate or supplemental ventilation is provided.

2. **Water Source Protection:** The water source you are using needs to be protected; only obtain water in a manner that will keep the water pipe or hose well above the level of the pesticide mixture. This separation or air gap between the spray mixture and source will keep any pesticides from back-siphoning into the water source. If you are pumping directly into the tank from the water source, be sure to use a check valve, anti-siphoning device, or backflow preventer to prevent spray material from being back-siphoned into the water source, if the pump were to fail. Additionally, these backflow prevention devices are required by law in Florida. Filling operations should be done in a manner to prohibit spills, leaks or overflowing tanks that may contaminate your water source. To achieve this goal, one should mix in areas that slope away from canals, streams or lakes. Companies should utilize mixing sites that are constructed of impervious materials or use a temporary mixing pad that would catch or contain any spilled material.

3. **PPE Selection:** Select the proper PPE for the operation you will be conducting. The PPE items should be put on prior to opening any pesticide container. PPE is not optional and is required by the law. The PPE could include face and/or eye protection, respirator, apron, gloves, coveralls, and will always require at least a long-sleeved shirt, long-pants, shoes and socks.

4. **Opening the Container:** When opening the paper pesticide container, always use a sharp knife and never tear the paper or cardboard container open. This knife should be used for no other purpose and clearly labeled for use only with pesticides. Tearing the container open could cause spills or dust to become airborne and contaminate the mixer or loader. When opening any containers, place them on a flat, level, and stable surface to avoid spills. If in the unlikely event you become contaminated with a splash or spill, immediately stop what you are doing and remove the contaminated clothing. Wash with a liquid soap and water as quickly as possible. After washing, put on clean PPE and then address cleaning up the spilled material. You should consider seeking medical attention if severely contaminated by a concentrated pesticide mixture.

5. **Triple Rinsing:** Handling empty pesticide containers is an important task as well. Even if the container appears empty, it may still contain traces of the pesticide and should never be used for any purpose other than the storage or transportation of a pesticide. The rinse process should take place as soon as the container becomes empty. If the container is allowed to dry, that dried material may become difficult to adequately remove with rinsing. Never take the containers home, use them for garbage containers or any other purpose.

Once you have removed all the pesticide from the containers, they should be triple-rinsed, unless otherwise required. To triple rinse, use a pressure system or fill the container to one-quarter full with water and shake or roll the container to dilute or remove as much of the chemical as possible. After shaking or rolling the container around, the rinse water and any rinse material should be placed in the spray tank to be used as diluent for future sprays to labeled crops. This process of rinsing should be conducted at least two more times — hence the name triple-rising. After triple-rinsing, if the container is still visually contaminated with pesticides, rinse again. For containers that are not returnable, the rinsed containers should be offered for recycling, if possible, or rendered unusable. These unusable containers should be stored in a secured location until proper disposal can be conducted.

6. **Disposal:** Paper and/or cardboard containers can be burned at the application site, unless prohibited by local regulations. You need to ensure that all material is removed from these containers before burning.

7. **Field Application:** When applying pesticides, make sure your methods of application do not pose a risk to others or the environment. Ensure the application is applied in compliance with the label. Pay special attention to the potential for the material to move off-site in the air. This off-site movement is usually referred to as drift and can create significant liability for the applicator.

8. **Storage and Cleanup:** After completing the mixing, loading or application, you should properly secure all remaining pesticide materials and equipment in a safe location to ensure the safety of others. After completing all application tasks, it is time for personal cleanup. While still wearing your gloves, they should be washed before removing them. It is advisable to

wear the cleaned gloves while removing any other PPE. After completely removing the PPE, use mild liquid soap and warm water to wash your face, hands, forearms and other areas that may have come in contact with pesticides if you cannot take a shower. All PPE should be kept separate from other work clothing and washed separately to minimize contaminating other items.

Remember the safe mixing, loading and application of all pesticides is your responsibility. Your actions reflect not only on your operation, but all of agriculture.

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