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Anhydrous Ammonia Applicators Have New Safety Issue

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Abstract

High nitrogen fertilizer prices have producers and ag-input suppliers searching for ways to reduce costs and gain efficiency. Some anhydrous ammonia applicators have responded by modifying equipment to allow control of flow to individual sections of an applicator, or even to individual knives. These modifications are being made in order to avoid unwanted N application on overlapping rows, near field boundaries, or into waterways.

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Anhydrous Ammonia Applicators Have New Safety Issue

By Mark Hanna, Department of Agriculture and Biosystems Engineering

High nitrogen fertilizer prices have producers and ag-input suppliers searching for ways to reduce costs and gain efficiency. Some anhydrous ammonia applicators have responded by modifying equipment to allow control of flow to individual sections of an applicator, or even to individual knives. These modifications are being made in order to avoid unwanted N application on overlapping rows, near field boundaries, or into waterways.

Although this is a sound strategy to limit unwanted fertilizer application, individual section or knife shutoff valves on an anhydrous ammonia toolbar can trap pressurized ammonia at various locations within the system. Operators should take care to bleed all lines including those to individual soil injectors that may still be under pressure before attempting any servicing or work on or around the system.

Additional care needed when working around equipment

Installing a small bleeder valve upstream of any section or knife shutoff valve allows an operator to bleed off trapped, pressurized ammonia before working on those sections or lines. Because these systems are relatively new, and bleeder valves may not be present, it is important to empty all lines before working around the equipment.

To bleed pressure from the applicator, operators should:

1. Shut off ammonia flow first at the supplying field nurse tank.
2. Then open individual knife or section valves farthest downstream in the plumbing system.
3. Follow this by opening any upstream section-control valves.
4. Finally, open the main flow valve.

This procedure opens valves successively upstream in the plumbing system allowing system pressure to be released.

Wear appropriate gear

In addition to bleeding pressure from hoses and fittings, individuals working around the equipment should always wear appropriate personal protective equipment (PPE), gloves and vented or splash-proofed goggles to prevent injury from minor amounts of ammonia that still may be present in the system. Having readily available water is especially important to flush tissue that may be affected by an ammonia release.

Even if the ammonia plumbing system has been properly bled, openings in hoses, lines, or valves should be treated as exit points for ammonia. Heat from surroundings or sunlight can vaporize small amounts of liquid ammonia still contained in the system and cause unexpected release as hoses or

equipment is moved. Caution is always of paramount importance.

Working with maximum pressure

Hoses on applicators upstream from shutoff valves must be capable of handling maximum expected pressure within the system at that point. Maximum pressure is often supply (tank) pressure or that delivered by a supply pump along with an added safety factor. All ball valves should be rated for use with anhydrous ammonia and vented to the inlet side. If not properly vented, liquid ammonia can become trapped in the valve's closed position and later release when the valve is opened.

Mark Hanna is an extension agricultural engineer in agricultural and biosystems engineering with responsibilities in field machinery.

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