Equipment considerations: anhydrous ammonia

H. Mark Hanna
Iowa State University, hmhanna@iastate.edu

John E. Sawyer
Iowa State University, jsawyer@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/cropnews

Part of the Agricultural Science Commons, Agriculture Commons, Agronomy and Crop Sciences Commons, and the Bioresource and Agricultural Engineering Commons

Recommended Citation
http://lib.dr.iastate.edu/cropnews/1885

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit https://crops.extension.iastate.edu/.
Equipment considerations: anhydrous ammonia

Abstract
Because of abnormal nitrogen fertilizer production, import, and supply this year and with perhaps a short spring application season, some crop producers may use a form of nitrogen fertilizer with which they are unaccustomed. A review of application equipment considerations can help ensure that your nitrogen fertilizer is properly applied. This article focuses on anhydrous ammonia and is the second in a series of three articles about nitrogen fertilizer application and equipment.

Keywords
Agricultural and Biosystems Engineering, Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Bioresource and Agricultural Engineering

This article is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/cropnews/1885
Equipment considerations: anhydrous ammonia

Because of abnormal nitrogen fertilizer production, import, and supply this year and with perhaps a short spring application season, some crop producers may use a form of nitrogen fertilizer with which they are unaccustomed. A review of application equipment considerations can help ensure that your nitrogen fertilizer is properly applied. This article focuses on anhydrous ammonia and is the second in a series of three articles about nitrogen fertilizer application and equipment.

Anhydrous ammonia contained in a field application tank is a high-pressure liquid that converts to a liquid-gas mixture as pressure drops while traveling to the knife outlet.

Safety when using anhydrous ammonia is a primary consideration. Direct exposure to skin can cause caustic burns because ammonia bonds with water. Long sleeves and pants, lined rubber gloves, and unvented goggles are standard personal protective gear. Exposure to eyes can result in blindness, and inhalation that damages lung tissue can be fatal. A properly fitted respirator with ammonia cartridges is recommended for operators who frequently work with valves and other connections. Because ammonia is under pressure inside hose lines, fittings, and knives it is important to inspect equipment and keep it in good repair. A 5-gallon water supply should be readily available and a 6-ounce plastic squeeze bottle carried on the operator for immediate treatment of an accidental exposure.

Know wind direction and stay upwind when operating valves. When working with hoses, minimize exposure to a hose filled with ammonia. When connecting hoses, first make all connections, tighten bleeder valves, and then open valves beginning with the furthest downstream and work upstream. The last valve opened should be the one releasing ammonia into the hose. When disconnecting a hose, first close the valve supplying ammonia to the line and then successive valves downstream to the disconnect. This approach should help avoid trapping a large amount of ammonia in the line. Next open bleeder valves in the same order valves were closed before finally disconnecting the line.

Ammonia should be injected deeply enough to avoid surface vapor losses, and below the crop seed zone to reduce the potential of seedling injury. Application direction that is diagonal to subsequently planted crop rows is common to avoid toxicity to seed. Telltale ammonia odor or the white vapor trail of water condensing in air that is cooled by escaping ammonia gas indicates deeper placement or more aggressive sealing with covering discs or "beaver-
tail" tabs is required. Hoses from the distribution manifold to injection knives should be of
equal length. Hoses that need to be coiled, such as those stretching a short distance from the
manifold to a nearby knife, should be coiled in a horizontal plane.

Recent research at Iowa State University indicates that hoses from adjacent applicator
shanks should be connected to different regions around the manifold outlet ring to improve
rate distribution across the swath. Plan to adjust the regulator setting if tank pressure varies
through the day. A heat-exchanger flow controller can be used instead of a regulator to
improve rate control of total flow through the applicator.

This article originally appeared on page 34 of the IC-486 (4) -- April 9, 2001 issue.

Source URL: