

4-23-2007

UAN and preemergence herbicide applications on emerged corn

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Recommended Citation

Owen, Michael D.; Sawyer, John E.; and Hartzler, Robert G., "UAN and preemergence herbicide applications on emerged corn" (2007). *Integrated Crop Management News*. 1085.

<http://lib.dr.iastate.edu/cropnews/1085>

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UAN and preemergence herbicide applications on emerged corn

Abstract

Planting the Iowa 2007 corn crop is somewhat behind recent years, and in efforts to stay ahead of the game, many fields will be planted before being treated with nitrogen (N) and/or herbicides. Corn in some of these fields will emerge before applications of these materials are made, raising concerns over the safety of postemergence applications of urea-ammonium nitrate (UAN) solution, with or without herbicides.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

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UAN and preemergence herbicide applications on emerged corn

by Mike Owen, John Sawyer, and Bob Hartzler, Department of Agronomy

Planting the Iowa 2007 corn crop is somewhat behind recent years, and in efforts to stay ahead of the game, many fields will be planted before being treated with nitrogen (N) and/or herbicides. Corn in some of these fields will emerge before applications of these materials are made, raising concerns over the safety of postemerge applications of urea-ammonium nitrate (UAN) solution, with or without herbicides.

Broadcast application of UAN to growing corn has the potential to cause symptoms of leaf burn, loss of leaves, and reduced early growth. Burn symptoms will be visible within 24 to 48 hours after application. Depending upon the severity of damage, reduced plant growth may be visible for several weeks after application. Research conducted in Minnesota indicated that when corn plants are at the V3 growth stage (vegetative leaf stage defined according to the uppermost leaf whose leaf collar is visible--in this case, three leaf collars visible), phytotoxic effects were worse at N rates above 60 lb N/acre (rates applied were 0, 60, 90, and 120 lb N/acre), but damage was not permanent and did not adversely affect stand or yield. When plants were larger than the V3 stage, plant damage was worse and some yield depression occurred with the 120 lb N/acre UAN rate.

Conservative suggestions are to not exceed 90 lb of N/acre when corn is at the V3 to V4 stage, 60 lb N/acre at the V7 stage, and to not apply UAN to foliage if plants are larger than the V7 stage. Hot, dry weather conditions will increase leaf burn and plant growth reduction.

Most, but not all, preemergence herbicides registered for use in corn allow applications after corn has emerged. While labeled for delayed pre/early post applications, application of herbicides targeting grasses (Dual II Magnum®, Harness®, etc.) frequently results in reduced grass control since these products have little effect on emerged grasses. The rate of atrazine found in the premixes (i.e., Harness® Xtra, Bicep II Magnum®) usually is insufficient to provide consistent annual grass control. Some preemergence products (i.e., Balance® Pro) that have excellent post activity on weeds are prohibited for application after corn emergence due to the potential for crop injury.

The potential for crop injury attributable to all herbicides increases when corn is under stress due to cool, wet, and cloudy conditions.

Many preemergence herbicides are applied using UAN as the carrier to minimize trips across the fields. However, this strategy is only recommended prior to crop emergence. Almost all herbicides prohibit application in nitrogen solutions after the corn has emerged. This practice

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May 17, 1999

Effects of UAN or urea on growing corn

May 27, 1996

will result in severe crop injury and is prohibited on the herbicide label. An exception is the Degree Xtra® label; while the application of this herbicide in UAN is not specifically prohibited, the label cautions: "Postemergence application of this product in liquid fertilizer carriers can result in crop injury and is not recommended."

If the original preemergence treatment is desired, the application should be made as soon as possible since control of emerged grasses diminishes quickly with size. If emerged grasses are present, it may be worth considering a complete strategy change rather than forcing the issue with the previously planned preemergence program. Numerous postemergence options are available for controlling annual grasses. However, keep in mind the difficulty in obtaining both maximum yield and full-season weed control with a single post-emergence application in fields with heavy weed pressure. A combination of mechanical and chemical tactics is often the most economical and effective program in these situations.

Take home messages:

- Postemergence applications of UAN can damage corn—the risk increases as corn size and N rate increase.
- Do not apply herbicides in combination with UAN solutions if the corn has emerged.
- Consider changing from a preemergence herbicide treatment to an early postemergence herbicide treatment if weeds, particularly annual grasses, have more than two leaves.
- In most Iowa corn fields, a single herbicide application, regardless of application tactic or herbicide(s) included, will not likely provide sufficient "season-long" weed control. Know what options are available to supplement the first application.





Corn stressed due to cool, wet conditions.

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This article originally appeared on page 119 of the IC-498 (7) -- April 23, 2007 issue.

Updated 04/24/2007 - 4:39pm