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Improving Water-Run N Applications in Furrow and Border Check Irrigation Systems

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Abstract Text:

Injection of N fertilizer in furrow and border check irrigation systems is common in row crop farming in the western U.S. In on-farm experiments in California in 2005-2007, we found that (1)distribution uniformity (DU) of injected anhydrous ammonia (AA) fertilizer N was lower than the DU for applied water in the same irrigation, (2) a contributing factor to the low DU was ammonia volatilization (10-50% loss), and (3) delaying injection for several hours after the start of irrigation improved fertilizer N DU for both AA and non-volatile solution N fertilizers.

Impact Statement:

Normally, the distribution uniformity (DU) of fertilizer injected in irrigation water is limited to the DU of the applied water, and in many situations (e.g., long irrigation runs with a low head of water) is quite low. Ammonia volatilization losses due to use of anhydrous ammonia as the N source can exacerbate this non-uniformity. This may encourage farmers to apply high N rates, leading to high nitrate leaching losses. Delaying the start of fertilizer injection until the water has advanced several hundred feet can improve fertilizer N DU, allowing lower N application rates and possibly leading to lower N leaching losses.