



2018 UCCE N stabilizer product trial in silage corn – preliminary results

Michelle Leinfelder-Miles, Delta Farm Advisor

Nitrogen (N) stabilizers are fertilizer additives intended to improve crop N use efficiency and reduce N losses to the environment. In this trial, we evaluated two N stabilizers for improvements in corn silage yield and plant N status. These products were Vindicate (Corteva Agriscience) and Agrotain Plus (Koch Agronomic Services). Vindicate is used to delay the nitrification process by inhibiting the *Nitrosomonas* bacteria that converts ammonium (NH_4^+) to nitrite (NO_2^-), the first step in the conversion of NH_4^+ to nitrate (NO_3^-). The active ingredient of Vindicate is nitrapyrin. Agrotain Plus is used to reduce ammonia volatilization and delay nitrification. Ammonia volatilization is the conversion of NH_4^+ in the soil to ammonia gas (NH_3) in the atmosphere, and it is reduced by inhibiting the urease enzyme. Ammonia volatilization is most problematic when the N source is urea-based and not incorporated or watered into the soil. The active ingredients of Agrotain Plus are Dicyandiamide (DCD), which delays nitrification, and N-(n-butyl)-thiophosphoric triamide (NBPT), which reduces volatilization. DCD has bacteriostatic activity, which means it slows the metabolism of *Nitrosomonas*.

The trial took place in San Joaquin County on a DeVries sandy loam soil. Sidedress fertilizer application occurred on June 21, 2018 and provided approximately 105 lbs N per acre (UAN 32). Four treatments were applied at sidedress, when plants were at V3-4 stage of development. The N stabilizers were applied at the label rates, and the treatments were: 1) Vindicate at 35 fluid ounces per acre, 2) Agrotain Plus at 3 pounds per acre, 3) combination of Vindicate and Agrotain Plus at the aforementioned rates, and 4) no stabilizer product (“untreated”). Treatments were randomly applied in three replicate blocks, across fourteen 30-inch rows that were 900 feet long.

Data collection included pre-plant, mid-season, and post-harvest soil N status, mid-season (R1) leaf N content, silage yield, and feed N content. Preliminary results of fresh weight silage yield ranges from 30.6 to 34.6 tons per acre. The average fresh weight yields (tons per acre) were: 32.5 (Vindicate), 32.8 (Agrotain Plus), 33.6 (Vindicate plus Agrotain Plus), and 32.8 (untreated). Data for soil, leaf, and feed N content will be forthcoming. Previous research has indicated higher leaf N content with the use of N stabilizers even when no yield differences were detected.

The aforementioned information on products and practices is for educational purposes only and does not constitute an endorsement or recommendation by the University of California.