SIDEDRESSING CORN WITH LIQUID MANURE [1/]

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With spring and fall seasons becoming increasingly wet and unpredictable when it comes to the weather, farmers and commercial manure applicators are looking for alternative periods of time to apply livestock manure. Applying manure to corn (*Zea mays* L.) during the growing season, referred to as sidedressing, could provide farmers with a window of opportunity while maximizing nutrient uptake efficiency. The practice needs to be fine-tuned, however, to increase adoption by farmers in the region. Four studies have been conducted to evaluate different aspects of sidedressing manure, two involving the use of a drag hose system and two involving tanker application.

- An on-farm study in central Minnesota found that when applied correctly, side-dressed liquid swine manure produced yields comparable to sidedressed anhydrous ammonia and liquid urea-ammonium nitrate (Pfarr et al., 2020).

- At two research stations, corn was dragged at different growth stages with a filled, six-inch manure hose. We found that corn can be dragged at the first, second, and third leaf collar growth stages (V1, V2, and V3 stages) without any yield loss. One corn variety (Pioneer hybrid P0339R) also was able to be dragged at the fourth leaf collar stage (V4) more reliably than a second corn variety (Pioneer hybrid P0306AM). Regardless of variety, dragging corn at fifth and sixth leaf collar stages (V5 and V6) significantly reduced yield by approximately 45 and 69%, respectively (Wilson et al., 2021).

- An on-farm study in central Minnesota used a 4,200-gallon tanker to sidedress liquid swine manure at different corn growth stages (V4 and V7) and compared it to sidedressed anhydrous ammonia at the V4/V5 corn growth stage. Tanker application of manure reduced yield by 7% when applied at V7 and by 15% when applied at V4 compared to anhydrous ammonia sidedressed around V4/V5. It is thought that compaction from the tanker may have caused the yield reduction due to root restric-tion or because the compaction did not allow manure to infiltrate the soil as well which resulted in volatilization losses. Adjustments with the application equipment may be able to overcome some of these limitations.

- Small-plot studies were used to evaluate 1,500-gallon tanker application at different corn growth stages (emergence, or VE, and V6) as well as different application tech-niques (sweep injection, disk injection, and surface broadcast). These were compared with a sidedressed commercial fertilizer (urea with a urease inhibitor) at the same growth stages and a no-nitrogen control. Liquid dairy manure was used at one research station while

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liquid swine manure was used at a second research station. This study is on-going but after the first year we found no difference in sidedress timing or application method with swine manure, though all manured and com-mercially fertilized plots yielded better than the no-nitrogen control. We saw similar results with dairy manure, though no treatments were different than the no-N control, not even commercially fertilized plots. Drought conditions in this past year limited yield, however, especially at the site where dairy manure was applied. A second year of this experiment will be conducted in 2022.

References

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