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Conservation System Management Considerations

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Conservation System Management Considerations

Abstract

Managing conservation systems at the right field moisture is a critical factor to ensure successful outcomes. Plants showing a delay in growth may be explained by improper planting depth, soil surface or side-wall compaction due to planting in wet soil conditions, or nutrient deficiencies such as phosphorus or potassium. Seedbed preparation along with tillage or planting equipment settings, have a combined effect on plant performance.

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Conservation System Management Considerations

By Mahdi Al-Kaisi, Department of Agronomy

Managing conservation systems at the right field moisture is a critical factor to ensure successful outcomes. Plants showing a delay in growth may be explained by improper planting depth, soil surface or side-wall compaction due to planting in wet soil conditions, or nutrient deficiencies such as phosphorus or potassium. Seedbed preparation along with tillage or planting equipment settings, have a combined effect on plant performance.

It is very difficult to isolate the exact cause of poor plant performance when soil conditions and management practices are not at their best. While scouting fields and evaluating soil conditions, producers need to check soil moisture below the soil surface at the seed depth as well as where the nodal root system gets established – at a depth of three-fourths to 1 inch deep under normal conditions. Adequate soil moisture with adequate nutrient availability, friable seedbed without sidewall compaction, can provide a good growth environment for root systems.

To ensure the successful transition from conventional to no-tillage or minimum tillage systems, nutrient management considerations including starter fertilizer and timing of nutrients application are critical. A proper fertilizer program is necessary. Plant needs for N, P and K are basically the same regardless of the tillage system. Current research shows that the tillage system has little effect on N, P and K crop needs. However, the timing and method of application are vitally important to no-tillage success, especially in cold-wet soil conditions where mineralization of soil nutrients is much slower compared to conventional tillage.

Conservation tillage systems such as no-tillage have a positive impact on soil productivity and profitability, especially under extreme weather events of wet or dry conditions. These systems protect soil, conserve energy, improve soil tilth and soil organic matter, and can reduce the capital costs associated with the tillage equipment used in conventional tillage. Conservation decisions made now can affect soil erosion over the next several years.

Research on soybean production after corn shows [no yield or economic return advantages](#) for any conventional tillage system over no-till. Studies show that no-till economic returns for corn on well-drained soils are much greater than other conventional tillage systems. Even in cold and wet soils with adequate drainage, both no-till and strip-tillage performed very well compared to conventional tillage systems.

In summary, tilling corn residue for the soybean crop year does not improve soybean yield. There may be some challenges in managing corn residue, but simple modification of the planter to include residue cleaners, heavier down pressure springs, or other residue management attachments are far more cost effective than the expense associated with conventional tillage.



Soybean planted in no-till.

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