Optimizing Environmental Efficiencies with Precision Toolbars

(Interim Report)

Purpose:

This project was initiated to evaluate through on-farm demonstrations that spring strip tillage, combined with precision nitrogen applications provides significant opportunities to reduce fuel consumption and soil disturbance, increase fertilizer nitrogen use efficiency, and harmonize equipment needs in an effort to reduce greenhouse gas emissions from agriculture and the input costs of crop production. The project is to demonstrate the potential for various tools including: corn plant reflectance, the PSNT (Pre-Sidedress Nitrogen Test) and timing of sidedress N application and dividing fields into nitrogen management zones in order to more precisely target N application rates.

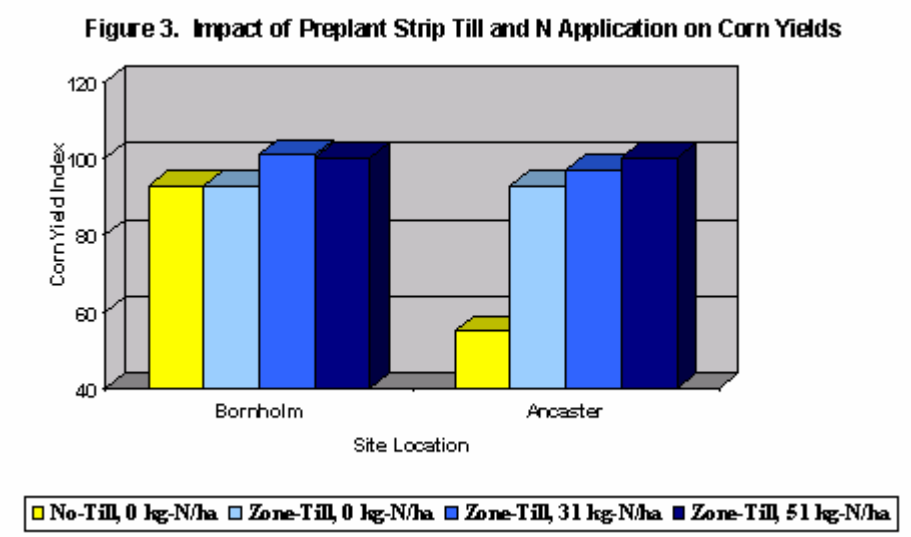
Methods:

Spring strip tillage was compared to conventional and no-tillage systems for optimizing planting and reducing

Recent research and producer experience has shown that spring zone tillage (6-12 hours prior to corn planting) can be a very cost-effective tillage system for corn production. This system works best on reasonably well drained ground when soybeans are the previous crop. It often provides a seedbed that is more favorable than strict no-till under a range of soil moisture conditions. Using this same (strip tillage) toolbar to precision-apply nitrogen in both the pre-plant and sidedress window provides an opportunity to reduce tillage and improve nitrogen use efficiency.

Results:

Figure 3. Impact of Preplant Strip Till and N Application on Corn Yields



Summary:

This project will continue to demonstrate that on medium textured soils, following soybeans or cereal crops were the straw is removed, very little tillage is required to optimize corn yields. A spring pre-plant strip tillage may improve planting timeliness and disturbs significantly less of the field than in a full width tillage system, which may contribute to building organic matter and reducing Greenhouse Gas emission. Further examinations of a strip tillage/N banding system will be carried out in 2004 with the aim of improving overall N use efficiency and reducing N losses into the environment.

Next Steps:

The demonstrations conducted in 2003 will be repeated in 2004 and 2005.

Acknowledgements:

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Location of Project Final Report: