CLOSING SYSTEMS FOR NO-TILL CORN PLANTERS
2005
THE DAKOTA LAKES STAFF

INTRODUCTION;

One of the most important attachments needed for converting standard corn planters for use in no-till is the trench closing system. The seed needs to be pressed into firm, moist, soil and then covered with loose material. The standard rubber wheels common on most corn planters are designed to do both of these things in dry tilled soils. In no-till soils (especially when conditions are wet) the pressing and covering operations need to be separated. One of the reasons strip tillage produces better stands in some trials is that the planters have not been modified to work properly in untilled soils. The "tillage" done with strip tillage allows standard closing wheels to work better. It would be much cheaper to modify the planter than to buy strip tillage equipment. Numerous after market closing systems designed for use on corn planters have become available in the last 10 years. Some of them like the May-Wes poly closing wheel, the Martin Spader, and the Thompson Wheel have gained substantial market share but little comparison testing has been done.

METHODS

In 2005 the station designed seed openers on the concept seeder were replaced with standard John Deere XP Pro openers. The station made fertilizer and parallel linkage system remained the same. The reason for this change was primarily to allow testing of after-market options for seed pressing and covering and to also allow some work with developing designs for use on producer's planters. Most row crop planters in use today have designs very similar to this standard JD unit.

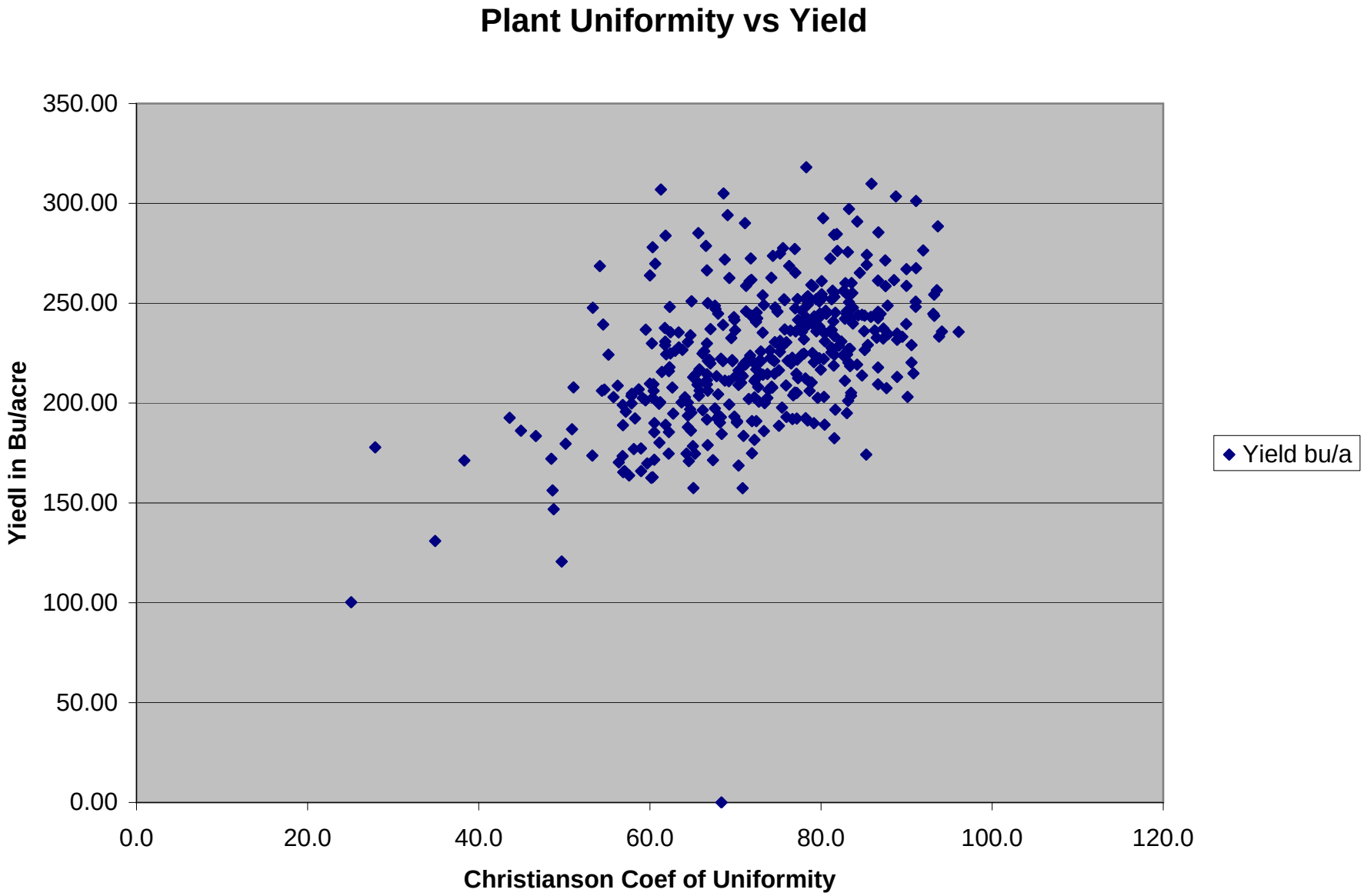
The twelve row concept seeder was equipped with several closing options. It was then operated under both irrigated and dryland conditions planting corn, soybeans, pinto beans, and sorghum. Digital photographs were taken of the operational performance of each closing system across a range of conditions. The above images show the number 2 row equipped with a station designed closing system operating in wet soybean stubble and wet wheat stubble. During the growing season, replicate plot areas within several corn fields were selected for further analysis. Stand counts were taken for each closing system. Stand spacing measurements were gathered at the same time. These areas were hand harvested for yield at maturity.

RESULTS;

It would be premature to dwell too long on the 2005 results because this was an exploratory year. That means it was designed to give us some indication on how to narrow the study in coming years. The entire set of samples produced and average corn yield of 224 bu/acre. The average Standard Deviation on the row spacing was 4.4 inches.

The Christianson's Coefficient of Uniformity averaged 73%. The range of the CCU was from under 30% to over 96%. There was also an indication that there was a relationship between CCU and Yield. An R squared value of 0.87 was produced when CCU and population were used together to predict yield. The attached chart shows the scatter chart for CCU vs Yield.

Much more will be done with some of the designs in 2006. The work in 2005 allowed us to narrow the field. For instance, the HCS (high camber system) from Exapta technologies worked very well at closing the trench in the proper manner. The issue we had with the system was residue clearance. In our high-yield corn residue it consistently plugged. This might not be an issue in lower-residue situations or in the South where more decomposition has occurred. Maybe wide rows (we use 20 inch) would help also. But in our conditions this was a fatal error. A photo of the HCS is below.


Plant Uniformity vs Yield
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Yiedl in Bu/acre
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Christianson Coef of Uniformity
Yield bu/a