# Trial Seven (A) Equipment Trial: Drill vs. Planter—Year 2 (Project 1)

## River Crest Farms

**Project Goal:** To compare a Planter vs. Drill in a side by side replicated comparison, seeding canola for a second year. *For additional information, see "Trial 7 Equipment & Fertility Trial Summary".*

**Equipment Description:**

**Planter: CASE 1245 Early Riser Planter - 38.6 ft Width on 15-inch Row Spacing (31 Rows)**

*Cost Per Acre:* $30

The Case 1245 Early Riser Planter is an advanced agricultural machine designed for efficient and precise planting of crops. It is specifically engineered to optimize the planting process, ensuring accurate seed placement and uniform seed spacing for optimal crop growth.

The Early Riser Planter utilizes technology features to enhance productivity and performance. It incorporates a high-speed planting system that allows for rapid seed delivery while maintaining accuracy. The planter includes advanced seed meters that ensure consistent seed singulation and spacing, minimizing the risk of skips or doubles during planting.

This planter is equipped with adjustable row units that enable farmers to customize the row spacing according to their specific crop requirements. It offers flexibility in planting various crops and accommodates different field conditions. Additionally, the Early Riser Planter incorporates advanced depth control mechanisms, allowing farmers to precisely set the planting depth for each seed.

The Case Early Riser Planter only offers liquid starter fertility placed on top of the seed row. This is very seed available which limits the rate of fertility that can be put down with the seed.

Case 1245 Early Riser Planter is a reliable and efficient planting solution, designed to help farmers achieve higher yields through precise and consistent seed placement.

**Drill: Bourgault 3720 Seed Drill 60 ft Width on 10-inch Row Spacing**

*Cost Per Acre:* $18

The Bourgault 3720 seed drill is a highly efficient and versatile agricultural implement designed for precision seeding. It is commonly used for large-scale farming operations. The drill consists of a frame that supports multiple rows of seeding units, typically ranging from 30 to 60 feet in width.

The Bourgault 3720 incorporates advanced technology and features to ensure accurate seed placement and optimal seed-to-soil contact. To ensure proper seed depth, the drill features depth control wheels or discs that create furrows in the soil. These furrows guide the seeds into the ground at the desired depth. Additionally, the drill may have press wheels or packer wheels that follow behind the seeding units, providing firm soil contact to optimize germination. The Bourgault 3720 seed drill is often used for seeding a wide range of crops, including cereals, oilseeds, and pulses. This drill's high capacity gives the ability to cover large areas in a timely manner.

## The Advantages and Disadvantages

Equipment upgrades on any farm are difficult and even after decision has been made, on-farm comparisons of the two implements are valuable. Growers Tobin and Amias Dirks said it was valuable to compare over multiple years to continue evaluating the two implements. As this farm not only grows grain but also fine seeds such as perennial ryegrass & fescue, the ability for seeding equipment to accommodate for sod is important. The Dirks said when comparing an air drill and a planter for seeding canola, there are several key factors to be considered:

***Seeding Mechanism:*** An air drill typically uses an air delivery system to distribute seeds uniformly across the field. It uses a series of narrow tubes and air pressure to release seeds into the soil. On the other hand, a planter employs a mechanical mechanism, such as a vacuum metering system, to precisely place seeds at a predetermined spacing.

***Seed Placement Accuracy:*** A planter generally offers more precise seed placement compared to an air drill. With a planter, you can typically control the spacing between seeds and the depth at which they are planted, resulting in more consistent germination and potential yield. However, air drills have improved over the years and can also achieve relatively accurate seed placement.

***Field Conditions:*** As Rivercrest Farms includes fine seed growing in their production system, the ability for seeding equipment to handle sod soil conditions is top of mind. Air drills are often favored in no-till or minimum-till farming systems, as they can handle residue and provide good seed-to-soil contact. Their design allows for better penetration in challenging soil conditions, which can be beneficial when seeding canola. Planters, on the other hand, may struggle in heavy residue or tough soil conditions and are more commonly used in conventional tillage systems. Dirks did specify that both pieces of seeding equipment (due to the design of the openers) do preform well in sod soils post grass production which was a big consideration in the equipment selection process.

***Seed Capacity & Flexibility:*** Air drills generally have larger seed hoppers compared to planters, allowing for greater seed capacity. At 60ft, the Dirks drill is also significantly wider than the 38ft planter which is advantageous when: seeding large areas, planting multiple crops simultaneously, or if there is difficulty finding multiple skilled equipment operators. Planters, however, offer more flexibility in terms of seed type and spacing adjustments, making them suitable for various crops and planting configurations. Being a mixed grain/cattle operation, the ability to utilize the planter to seed corn for grazing adds additional uses for the planter but also a more cost-effective feed source for the cattle operation (*See Grazing corn information).*

***Seeding Rate & Cost:*** When using a planter for canola, it is possible to cut back on seeding rates due to the improved precision and accuracy of seed placement. Planters are designed to distribute seeds evenly and at optimal depths, ensuring better seed-to-soil contact and reducing competition among plants for resources. By using a planter, you can achieve more consistent seed spacing and reduce the risk of overcrowding. Canola plants that are spaced appropriately have access to sufficient nutrients, sunlight, and water, which promotes healthier growth and higher yields.

Lowering the seeding rates with a planter can also help manage input costs by reducing the amount of seed required per acre.

**The Dirks estimated that on average (depending on seed characteristics) they can use *50% less seed @ a 2.5lb/ac seeding rate and a cost of $12/lb for a seed cost savings of $30/ac.***

# The Advantages and Disadvantages Continued ...

It's important to note that the optimal seeding rate can vary depending on various factors such as environmental conditions, soil fertility, hybrid characteristics, and management practices.

When cutting back on seeding rate when seeding canola, there are several risks to consider:

***Reduced Plant Population*:** Lower seeding rates can lead to reduced plant populations, which may result in lower overall yield potential. Canola plants need sufficient spacing to develop a healthy root system, access nutrients, and compete with weeds effectively.

***Increased Weed Competition*:** Lower plant populations can result in increased weed competition. Weeds can outcompete canola plants for nutrients, water, and sunlight - leading to decreased yields. Adequate seeding rates help establish a dense crop canopy that suppresses weed growth.

***Vulnerability to Environmental Stress*:** Insufficient plant populations make canola crops more susceptible to environmental stresses such as drought, heat, and disease. Higher seeding rates provide a buffer against these stresses by ensuring a more robust stand and better overall crop health.

***Maturity:*** Decreased plant stands can causes plants to branch out which can prolong maturity.

***Cost & Maintenance:*** Air drills tend to be more cost-effective compared to planters, making them the most popular choice for many BC Peace Region farmers. They are typically easier to maintain and require less frequent calibration. Planters, with their more complex mechanisms and precision systems, can be more expensive to purchase and maintain. There is also an increased level of mechanical knowledge that is also need with the planter. Amias stated *"With the planter you get precision, but with that you need the to maintain the equipment to ensure accuracy".* When asked about how the planter equipment purchase decision was made, Tobin and Amias said their farm was at a point where they need to upgrade their drill/ tractor (at an estimated cost of $700,000 +) or multipurpose utilize a tractor they already had (for running their grain cart at harvest) to also be used on a planter for spring seeding.

Ultimately, the choice between an air drill and a planter for seeding canola depends on factors such as farm size, tillage practices, desired seed placement accuracy, and budget. Tobin and Amias both agreed that it was important to evaluate what their specific needs were and consult with agricultural experts or local farmers to make an informed decision.


**Drill Roots**


**Planter Roots**

# 2023 Comparison Data

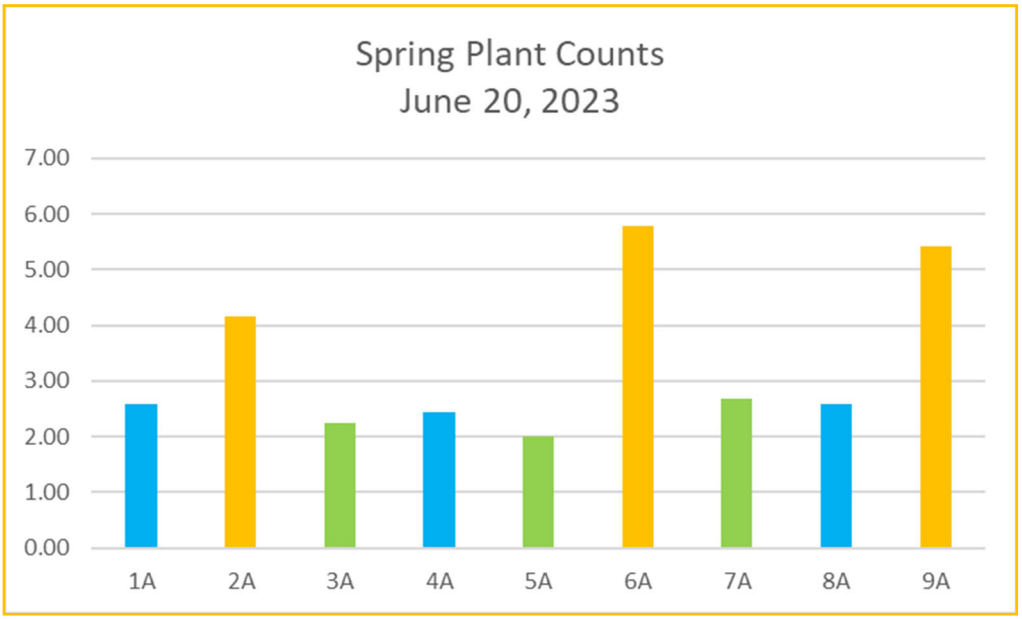
## Spring Plant Counts

**Plant Stand Counts Planter Vs. Drill Comparison**

Taken: June 20, 2023

| Trial # | Description | Row Spacing cm | plants per sq/M | Plants per sq/ft |
|---|---|---|---|---|
| | | | plants per sq/M | Plants per sq/ft |
| 1A | Planter 10-34-0 Liquid Fert | 38.1 | 27.82 | 2.59 |
| 2A | Drill 11-52-0 dry phos | 25.4 | 44.88 | 4.17 |
| 3A | Planter TNT OMEX fert | 38.1 | 24.15 | 2.24 |
| 4A | Planter 10-34-0 Liquid Fert | 38.1 | 26.25 | 2.44 |
| 5A | Planter TNT OMEX fert | 38.1 | 21.52 | 2.00 |
| 6A | Drill 11-52-0 dry phos | 25.4 | 62.20 | 5.78 |
| 7A | Planter TNT OMEX fert | 38.1 | 28.87 | 2.68 |
| 8A | Planter 10-34-0 Liquid Fert | 38.1 | 27.82 | 2.59 |
| 9A | Drill 11-52-0 dry phos | 25.4 | 58.27 | 5.42 |

*Each plot plant counts taken 5 samples in a W sample pattern
Spring plant stand counts only taken in foliar applied fertility
counts taken by meter of row and converted target plant stand 5 plant sq/ft

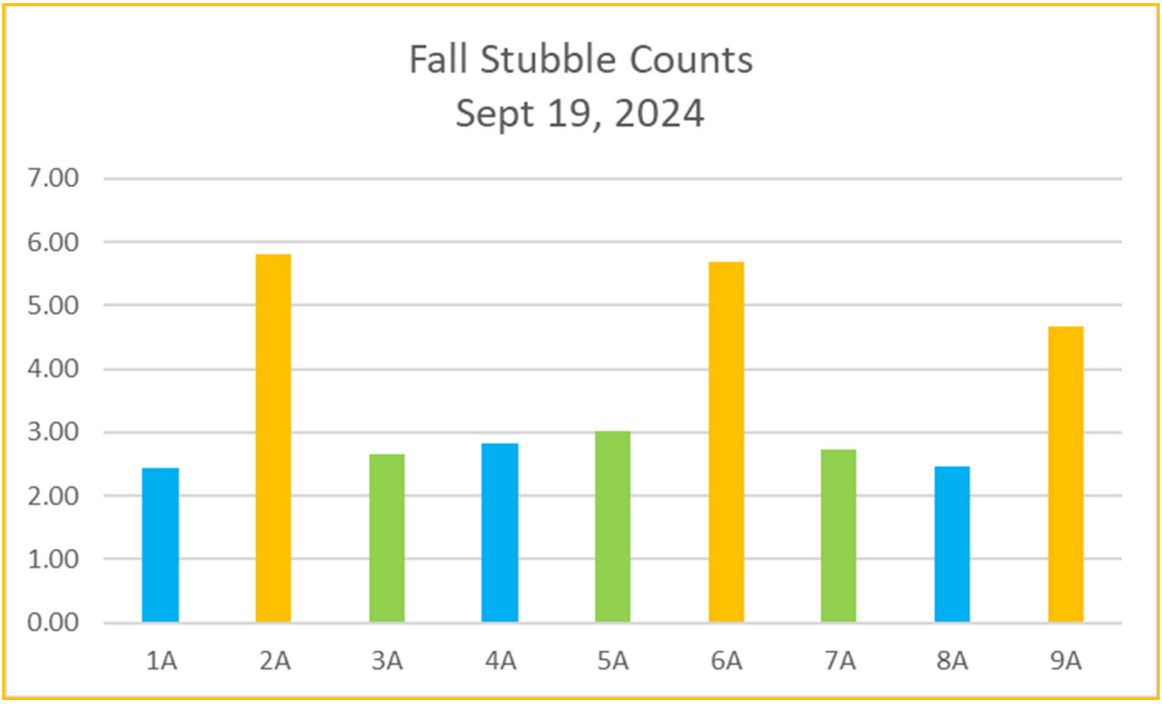


# Post Harvest Stubble Counts

**Plant Stand Counts**
**Planter Vs. Drill Comparison**
Taken: September 19, 2023

| Plot # | Description | Row Spacing | Plant Count Average | plants per sq/M | plants per sq/ft |
|---|---|---|---|---|---|
| | | CM | per meter of row | plants per sq/M | plants per sq/ft |
| 1A | Planter 10-34-0 Liquid Fert | 38.1 | 10.00 | 26.25 | 2.44 |
| 2A | Drill 11-52-0 dry phos | 25.4 | 15.89 | 62.55 | 5.81 |
| 3A | Planter TNT OMEX fert | 38.1 | 10.89 | 28.58 | 2.66 |
| 4A | Planter 10-34-0 Liquid Fert | 38.1 | 11.56 | 30.33 | 2.82 |
| 5A | Planter TNT OMEX fert | 38.1 | 12.33 | 32.37 | 3.01 |
| 6A | Drill 11-52-0 dry phos | 25.4 | 15.56 | 61.24 | 5.69 |
| 7A | Planter TNT OMEX fert | 38.1 | 11.22 | 29.45 | 2.74 |
| 8A | Planter 10-34-0 Liquid Fert | 38.1 | 10.11 | 26.54 | 2.47 |
| 9A | Drill 11-52-0 dry phos | 25.4 | 12.78 | 50.31 | 4.68 |

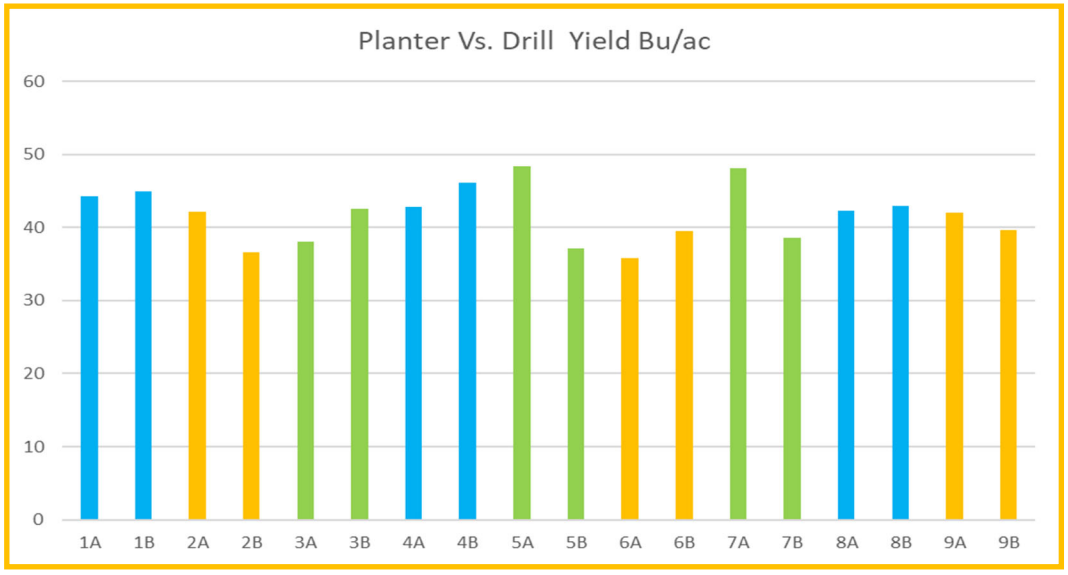
*Each plot plant counts taken 9 samples in a W sample pattern
counts taken by meter of row and converted target plant stand 4-5 plant sq/ft



# Harvest Data Collection

| Plot # | Description | bu/ac | Moisture | Oil Content |
|---|---|---|---|---|
| 1A | Planter 1.9lbs/ac 10-34-0- Liquid Fert | **42.50** | 5.98% | 46.20% |
| 1B | Planter 1.9lbs/ac 10-34-0- Liquid Fert No in crop foliar | **43.29** | 6.24% | 44.50% |
| 2A | Drill 4.3 lbs/ac 11-52-0 dry fert | **40.63** | 6.11% | 45.80% |
| 2B | Drill 4.3 lbs/ac 11-52-0 dry fert No in crop foliar | **35.14** | 5.99% | 45.10% |
| 3A | Planter 1.9lbs/act TNT Omex Liquid Fert | **36.88** | 6.80% | 45.30% |
| 3B | Planter 1.9lbs/ac TNT Omex Liquid Fert No in crop foliar | **41.08** | 6.43% | 45.90% |
| 4A | Planter 1.9lbs/ac 10-34-0- Liquid Fert | **41.25** | 6.32% | 46.00% |
| 4B | Planter 1.9lbs/ac 10-34-0- Liquid Fert No in crop foliar | **44.32** | 6.05% | 46.10% |
| 5A | Planter 1.9lbs/ac TNT Omex Liquid Fert | **46.88** | 6.71% | 44.80% |
| 5B | Planter 1.9lbs/ac TNT Omex Liquid Fert No in crop foliar | **35.68** | 6.06% | 44.70% |
| 6A | Drill 4.3 lbs/ac 11-52-0 dry fert | **34.38** | 5.98% | 45.30% |
| 6B | Drill 4.3 lbs/ac 11-52-0 dry fert No in crop foliar | **37.84** | 5.56% | 44.70% |
| 7A | Planter 1.9lbs/ac  TNT Omex Liquid Fert | **46.88** | 7.38% | 43.40% |
| 7B | Planter 1.9lbs/ac TNT Omex Liquid Fert No in crop foliar | **37.84** | 7.88% | 43.80% |
| 8A | Planter 1.9lbs/ac 10-34-0- Liquid Fert | **41.25** | 7.46% | 44.20% |
| 8B | Planter 1.9lbs/ac 10-34-0- Liquid Fert No in crop foliar | **41.62** | 6.71% | 44.50% |
| 9A | Drill 4.3 lbs/ac 11-52-0 dry fert | **40.63** | 6.61% | 44.00% |
| 9B | Drill 4.3 lbs/ac 11-52-0 dry fert No in crop foliar | **38.38** | 6.57% | 44.20% |

Yield was adjusted for moisture content to 10%



# Grain Sample Results

| Plot # | Description | ADFRmeal (Acid Digestible | Chlorophyll | Iodine Value | Linoleic Acid | Linolenic Acid | Moisture | Oil | Oleic Acid | Protein | Saturated Acids | Total Glucosinolates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | Planter 1.9 lbs/ac count 10-34-0- Liquid Fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.9 | 7.2 | 114.5 | 18.2 | 10.8 | 6.1 | 48.4 | 62.8 | 18.1 | 6.5 | 16.6 |
| 1B | Planter 1.9 lbs/ac 10-34-0- Liquid Fert No in crop foliar | 19.7 | 7.5 | 115.4 | 18.3 | 11.2 | 6.6 | 46.1 | 62.1 | 20.4 | 6.5 | 20.0 |
| 2A | Drill 4.3 lbs/ac 11-52-0 dry fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.2 | 6.1 | 115.1 | 18.4 | 11.0 | 6.0 | 47.0 | 62.3 | 19.6 | 6.5 | 18.5 |
| 2B | Drill 4.3 lbs/ac 11-52-0 dry fert No in crop foliar | 19.9 | 6.4 | 115.7 | 18.6 | 11.4 | 6.0 | 46.6 | 61.7 | 19.8 | 6.5 | 20.4 |
| 3A | Planter 1.9 lbs/ac TNT Omex Liquid Fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.1 | 6.1 | 115.3 | 18.4 | 11.1 | 6.7 | 47.4 | 62.4 | 19.2 | 6.5 | 17.6 |
| 3B | Planter 1.9 lbs/ac TNT Omex Liquid Fert No in crop foliar | 20.3 | 6.3 | 115.3 | 18.8 | 11.0 | 6.4 | 47.6 | 62.1 | 18.9 | 6.6 | 18.5 |
| 4A | Planter 1.9 lbs/ac 10-34-0- Liquid Fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.7 | 6.5 | 115.1 | 18.2 | 11.1 | 6.5 | 48.2 | 62.6 | 18.5 | 6.4 | 17.0 |
| 4B | Planter 1.9 lbs/ac 10-34-0- Liquid Fert No in crop foliar | 20.0 | 7.4 | 114.6 | 18.6 | 10.8 | 5.8 | 48.0 | 62.8 | 19.0 | 6.5 | 19.0 |
| 5A | Planter 1.9 lbs/ac TNT Omex Liquid Fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.0 | 7.2 | 115.4 | 18.6 | 11.1 | 7.0 | 47.1 | 62.2 | 19.8 | 6.5 | 17.4 |
| 5B | Planter 1.9 lbs/ac TNT Omex Liquid Fert No in crop foliar | 19.7 | 7.1 | 114.9 | 18.9 | 10.9 | 5.9 | 47.6 | 62.3 | 19.3 | 6.5 | 19.3 |
| 6A | Drill 4.3 lbs/ac 11-52-0 dry fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.1 | 7.4 | 114.9 | 18.8 | 10.9 | 5.9 | 47.4 | 62.4 | 19.1 | 6.5 | 17.6 |
| 6B | Drill 4.3 lbs/ac 11-52-0 dry fert No in crop foliar | 19.5 | 6.4 | 115.7 | 18.9 | 11.2 | 5.8 | 46.1 | 61.6 | 20.4 | 6.5 | 20.8 |
| 7A | Planter 1.9 lbs/ac TNT Omex Liquid Fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 19.2 | 10.5 | 115.6 | 19.2 | 11.1 | 7.4 | 46.4 | 61.9 | 20.6 | 6.5 | 18.7 |
| 7B | Planter 1.9 lbs/ac TNT Omex Liquid Fert No in crop foliar | 19.1 | 8.4 | 115.2 | 19.2 | 11.0 | 7.0 | 46.6 | 62.1 | 20.7 | 6.5 | 20.0 |
| 8A | Planter 1.9 lbs/ac10-34-0- Liquid Fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 20.1 | 8.5 | 114.1 | 18.7 | 10.5 | 6.7 | 47.2 | 62.8 | 19.3 | 6.6 | 17.7 |
| 8B | Planter 1.9 lbs/ac 10-34-0- Liquid Fert No in crop foliar | 19.5 | 8.5 | 114.7 | 18.8 | 10.7 | 6.2 | 46.6 | 62.5 | 20.2 | 6.5 | 18.8 |
| 9A | Drill 4.3 lbs/ac 11-52-0 dry fert Foliar Fert: 10-10-10- Liquid Blend @ 1l | 19.5 | 8.0 | 115.3 | 19.1 | 11.0 | 6.4 | 46.8 | 62.2 | 20.0 | 6.5 | 19.3 |
| 9B | Drill 4.3 lbs/ac 11-52-0 dry fert No in crop foliar | 18.6 | 8.5 | 115.5 | 19.1 | 11.1 | 6.1 | 45.3 | 61.7 | 21.6 | 6.6 | 22.0 |

## Cost Analysis
## Planter Vs. Drill

| | Yield bu/ac | Seeding Rate lbs/ac | Difference from Check | Starter Fert Cost Per Acre | Seed Cost Per lb | Seed Cost per acre | Seed Cost Savings $/ac | Equipment $/ac | Fall 2022 Fertility | Total $/ac (Seed+ Fert +Equipment) |
|---|---|---|---|---|---|---|---|---|---|---|
| Planter TNT OMEX | 44.87 | 2.4 | 4.87 | $42.50 | $12.00 | $28.80 | $22.80 | $30.00 | $81.00 | $182.30 |
| Planter 10-34-0 | 43.1 | 2.4 | 3.1 | $24.51 | $12.00 | $28.80 | $22.80 | $30.00 | $81.00 | $164.31 |
| Drill 11-52-0 | 40 | 4.3 | 0 | $19.47 | $12.00 | $51.60 | - | $18.00 | $81.00 | $170.07 |

* Costs are based off producers information, All Trials received $25/ac fall applied P-K-S Blend & $56/ac of NH3
Yield Average Over whole trial and all replications and Adjusted to 10% moisture