

# 4 Year Strip Till Study with **Transit Soil®** on Corn

**Mike Petersen** Lexington, Nebraska

## RESEARCH SUMMARY

Mike Petersen has conducted 10 trials over a 4-Year Period near Lexington, Nebraska across 10 varieties of Corn. **Transit Soil®** was applied at **10-16 oz/acre** in strip till application, split into two bands at different soil depths, with 13-13-3 in 2010, 2012 and 2013 while 15-15-2 was applied in 2011 using **1tRIPr® Strip Till Machine**.

## APPLICATION DETAILS

### Banded Application Placement

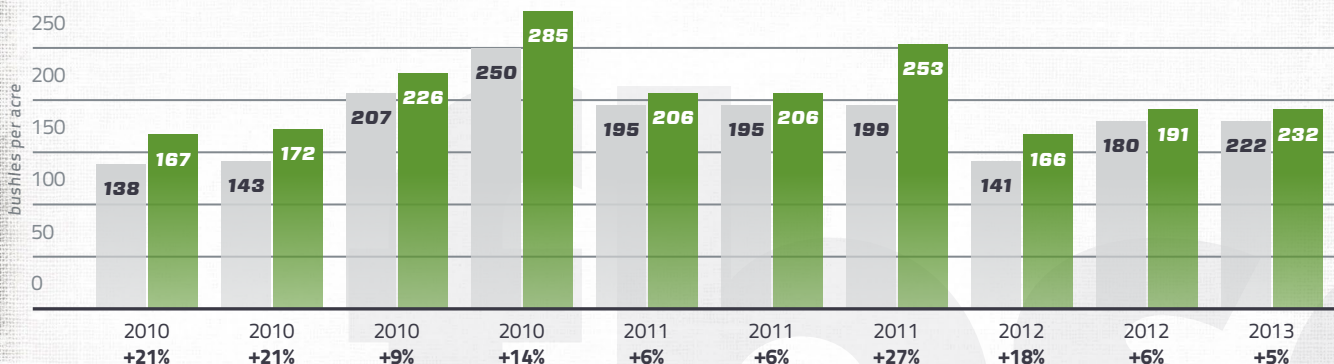
- » **Band 1:** placed at 4-5"
- » **Band 2:** placed at 9-10"

## RESULTS

- » **Average Yield Increase Over 4 Years of 24 Bushels Per Acre**
- » **Improved Root Production & Development In Young Corn (2-60 DAE)**



### CORN YIELD RESPONSE *Transit Soil Program*





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## Root Systems

- » More Roots
- » Deeper Roots
- » Wider Root Profile
- » More Access to Water & Nutrients
- » Higher Yield Potential

## CORN ROOT SYSTEMS

Corn has two root systems that are easily visible early in the year.

» **Seminal Roots:** Comprised of the radicle and lateral seminal roots; help anchor the young seedling and provide it with nutrients and water

» **Nodal Roots:** Develops about v2 at the base of the coleoptile; becomes the dominate root system by v6

## FUNCTIONS OF NODAL ROOTS

### Primary & 2nd Nodal Roots

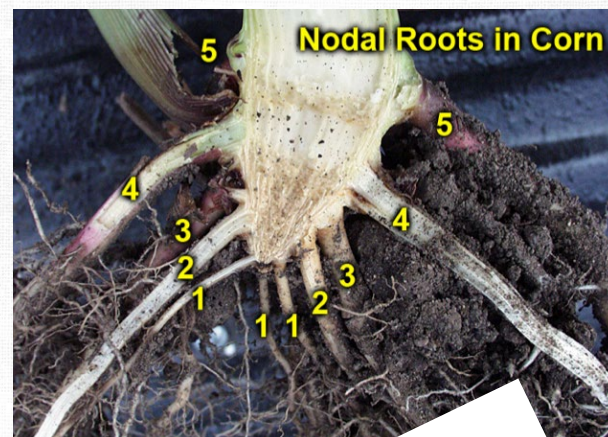
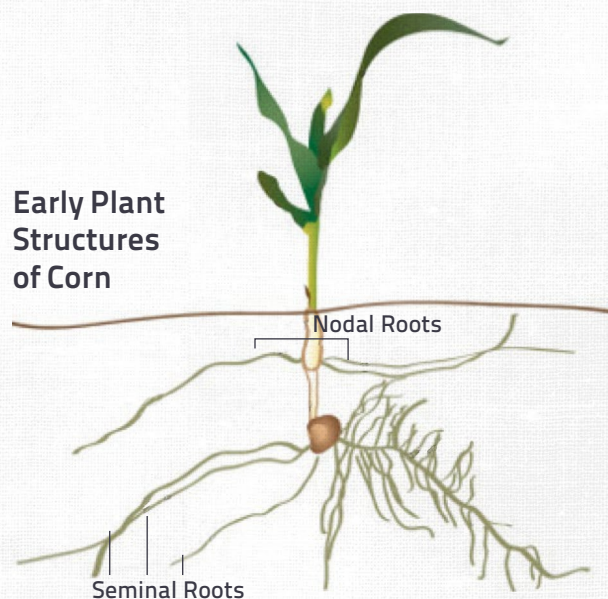
- » Most efficient in water and nutrient uptake
- » Roots most associated with uptake of ammoniac N, P and K

### 3rd & 4th Nodal Roots

- » Grow the largest number of lateral roots
- » Generally wider and deeper in profile
- » Associated with the uptake of water from deeper parts of the soil profile

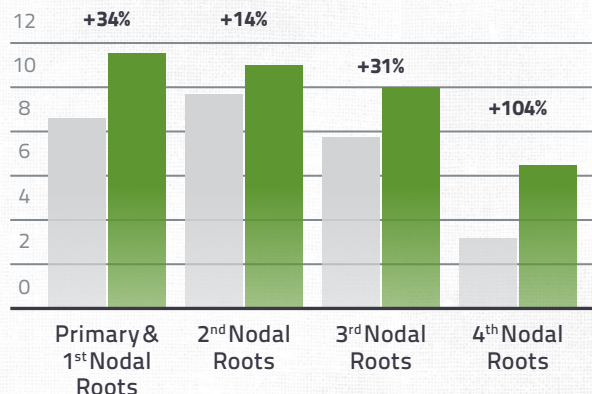
### Late 4th & 5th Nodal Roots

- » Spread out away from the plant then gravitropism pulls them downward





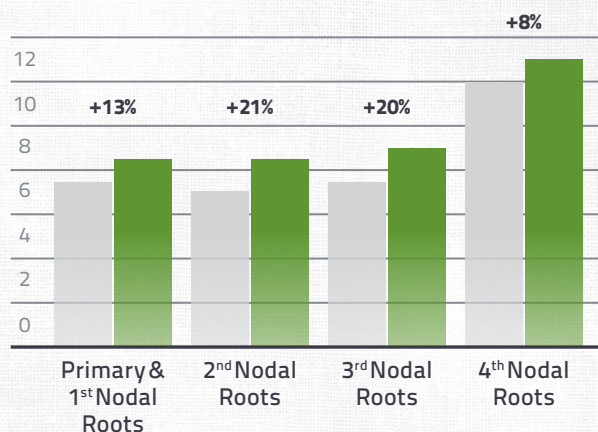
## Average Number of Roots per Node 25 Days After Emergence



### Implications

- » At 25 days after emergence, root observations give an early indication of plant potential
- » Early nutrient and water uptake critical to getting the plant started
- » This early start advantage provide benefits that last all season
- » 4-5<sup>th</sup> nodal roots are the major water channels to the plant above ground

## Average Number of Roots per Node 60 Days After Emergence

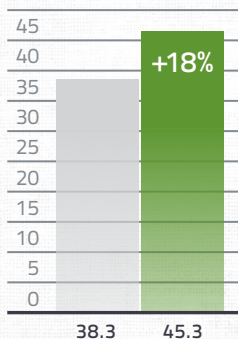


### Implications

- » At 60 days after emergence, corn plants have determined the ear development, including number of rows of kernels
- » Roots extended down into the soil profile take advantage of nutrients and give the plant a better chance to handle heat and drought stress in the late summer

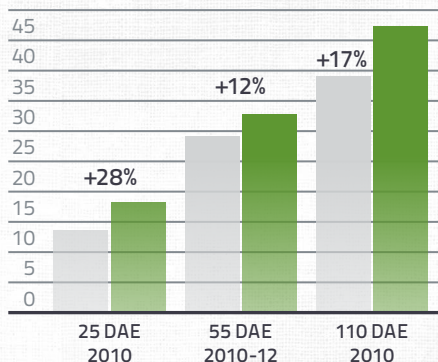
## TOTAL ROOTS AT 55 DAE

More Roots Overall Means  
Great Yield Potential



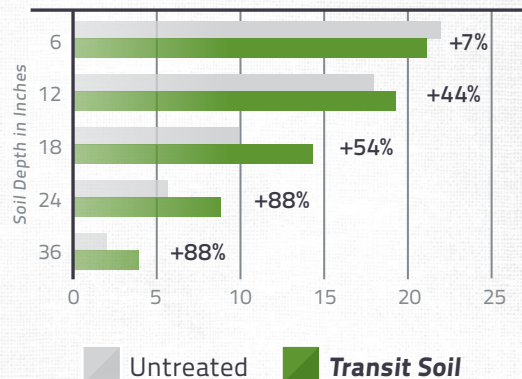
## MAXIMUM ROOT DEPTH

Greater Root Depth Means Access  
to More Water & Nutrients



## ROOT PROFILE WIDTH AT VARIOUS DEPTHS

Wider Root Profile Means Access to  
More Water & Nutrients



Untreated Transit Soil



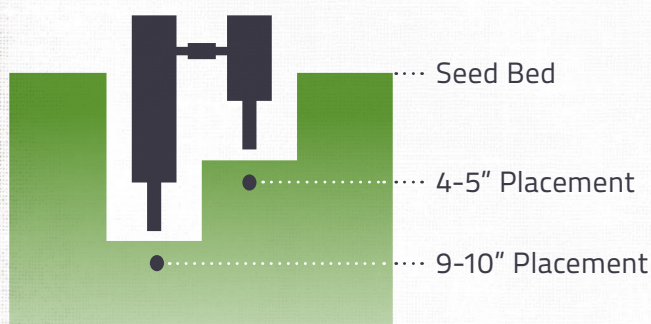
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## CONCLUSION

- » 4-year average yield increase: 24 bu/acre
- » More overall root mass
- » Greater maximum root depth
- » Wider root profile at increasing depths
- » Product placed at 4-5" has biggest effect on seminal (primary) roots and nodal roots 1-2
- » Product placed at 9-10" shows additional rooting response, especially for nodes 3-5

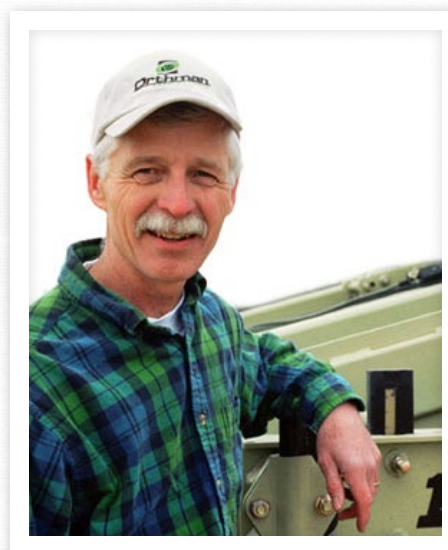
## 1tRIPr® The One Tripper



### Banded Application Placement

- » **Band 1:** placed at 4-5"
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The precision tillage shank is slightly offset laterally from the seed as illustrated above. With dual fertilizer placement capability, the fertilizer and **Transit Soil®** are placed at dual depths so the plant roots access doses of fertilizer through the growing season.



"30+ years experience digging over 1275 soil pits in several states tells me that more roots and more root-soil volume per plant will yield better. **Transit Soil** provides a large contribution throughout the year to help achieve optimal yield."

**Mike Petersen**, Agronomist  
Orthman Manufacturing

