

## Agronomy Newsletter: Winter 2017

Merry Christmas and a Happy New Year from: Max and Cheryl; Dane, Nicole, Kreigh, and Jake; and Alex. God Bless! – Alex Emenhiser

### Topics:

- Soil Compaction: How it happens, its effects, and how do we fix it?
- Pioneer Encirca Platform: Field Planner, Yield Explorer, and other capabilities
- Hybrid Selection: Sorting through win % of multiple locations and years
- High Yields and Nutrient Removal: Where does that leave us for next year?
- Product Highlight: P0825AM and P1197AM

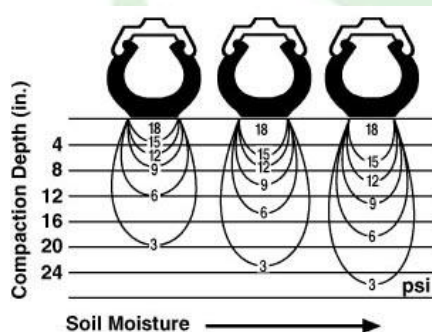
### Soil Compaction:

As farm machinery has grown larger and heavier, soil compaction has become an increasing problem. The soils here in Northeast Indiana can sometimes compound that problem as well. Eastern Allen County and Dekalb County in particular have been blessed with what many would call “soils with high water holding capacity.” That is a nice way of saying that our soils are poorly drained heavy clays. This means that many of our field operations are done at times when the soil is either marginally fit, or not fit at all to be on it. As a result, many local farmers struggle with compaction issues, and finding ways to reduce or manage it.

### How it Happens

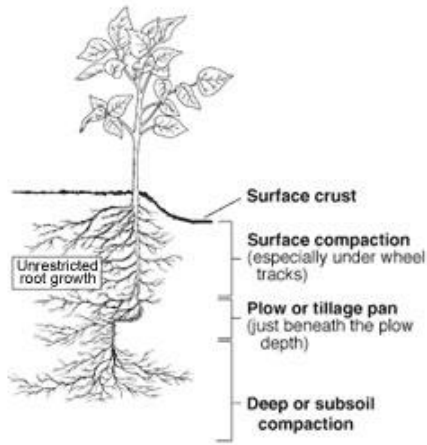
Soil is made up of three basic things; the soil particles, air, and water. Compaction occurs when a force, sometimes natural but normally man-made, presses the soil particles together reducing the pore space in between and ruining the soil structure. Smaller pores make a more dense soil, which reduces root penetration and water infiltration. The most common causes are

due to machinery (tires, tracks, tillage equipment, etc.) interacting with the soil. The main types of compaction are; surface compaction, tillage compaction, and subsurface compaction. Total soil compaction depth and severity is greater with higher axle loads, and as soil moisture goes up. The figure to the left shows the depth of compaction with different soil moistures.



### Effects on Crop

Even though soil compaction is a severe threat towards yield, the effects are not seen every year. In ideal growing conditions, a crop can show few signs of compaction. In years of high stress, whether that is drought or heavy rains, the effects are seen in greater magnitude. The main problems for the plant are reduced water infiltration and restricted root growth. These two things lead to many secondary problems. In heavy rain years, reduced water infiltration leads to ponding of water and saturated soils. This can cause crop damage, and can also result in nitrogen loss depending on the time of the year. In dry years, restricted root growth limits the area that the crop's roots will explore. The roots



have less ability to bring in water and nutrients, which can cause water stress and nutrient deficiencies. A poor root system can be severely limiting to yield. The picture to the left shows unrestricted roots on the left side of the plant, and stunted roots on the right side of the plant affected by the different kinds of compaction.

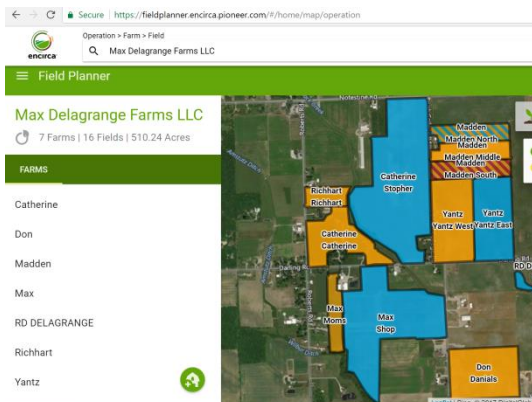
### Ways to Manage and Repair Compaction

There are several common ways that farmers try to manage compaction including; prevention, deep tillage (subsoiling and deep ripping), cover crops, improving drainage, and controlled traffic. The best way to prevent crop damage from compaction is to prevent it from happening in the first place. The best way to do that is to avoid any field work when the soil is too wet. However, due to increasing acreage and seemingly smaller windows of working conditions, that is not always practical. Once it occurs, it is hard to get rid of. Deep tillage is one of the most used practices. The most important thing to consider is that deep tillage passes should be made when the ground is in great condition, otherwise more severe compaction or soil structure damage can occur as an unintended consequence. Many will argue that long term no-till and cover crops is the best way to mitigate compaction. Deep rooting from cover crops can help to break up compaction layers and build soil structure. An improved drainage system will dry out soils faster, leading to more days with good working conditions. Controlled traffic involves matching implement widths to decrease the portion of the field that is compacted. While some areas may receive more traffic, overall field compaction can be lessened if done correctly.

## Encirca Digital Platform

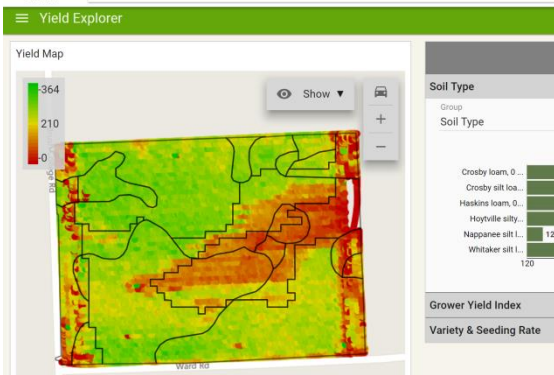
Pioneer has been a leader in the area of gathering farm data and putting it into a form that was useful to the customer. That began as printed maps, and has evolved into the current Encirca digital platform. As a free service to all Pioneer customers, they have access to a variety of online programs through their Pioneer Encirca account. Those programs include; Field Planner, Yield Explorer, and Weather Explorer. I will talk about a few of the great capabilities of each, and how they can help your farm.

### Field Planner



- All field plans we provide to customers are made through this program.
- Place products and crop zones on a field by field basis, as well as inserting seeding rates and other special notes
- Explore soil types and historical yield zones for each field
- Provides an easy way to view farms and fields

## Yield Explorer



- Allows growers to review farm and field yields, yield trends, and field details.
- Lists highest yielding farms and fields, and provides an overview map with color gradient to compare fields
- Examine yield levels by soil type, variety, seeding rate, drainage, as well as several other factors.
- Gives growers the ability to see farm productivity in a central platform

## Weather Explorer



- Allows growers to analyze weather data in detail across the farm and at field level
- Filter data to see precipitation, temperature, GDU, solar radiation, and more over any range of dates.
- Compare field details to help find differences in yield.
- Get detailed information on crop growth stages and maturity, including blacklayer dates.
- Compare weather details at growth stages to diagnose possible problems

As an existing Pioneer customer, you have access to all of these programs. If we are gathering your farm data for you, it is automatically processed into these programs so you can view it. If you have any questions about using these programs please feel free to let us know and we can help you get started!

## Hybrid Selection: Win % and Multiple Locations

**Probability of Selecting the Best Hybrid**

Number of Environments	Measured Yield Differences		
	3 bu/acre	6 bu/acre	12 bu/acre
1	51%	52%	60%
10	65%	75%	90%
30	75%	90%	95%

- When comparing hybrids to select the best one for your farm it is important to take into account the type of data you are looking at.
- Local data is the most relevant to your farm, however it can be hard to get multiple locations nearby. It is necessary to go over a larger area at times.

- The chart to the left shows how the number of environments and yield difference influence the percentage chance of selecting the best hybrid.

- This displays the importance of the quantity of data as well as the quality, and is why as Pioneer reps we always strive to get as many quality local comparisons as we can. This helps us to distinguish our leaders, as well as compare ourselves to the competitors. In turn, we are able to be transparent and share that data with the customer to let them make their own decisions.

## High Yields and Nutrient Removal

Higher than average corn yields in many areas this year have left growers with a good problem to deal with. Many have raised some of the best corn they have ever seen! Those high yields also meant there were greater levels of nutrient removal with the grain than normal.

Corn Yield	Nutrient Removal			
	150 bu/ac	175 bu/ac	200 bu/ac	225 bu/ac
P <sub>2</sub> O <sub>5</sub> (lbs/ac)	56	65	74	83
K <sub>2</sub> O (lbs/ac)	41	47	54	61

- The table to the left shows the differences in nutrient removal as corn yields increase.
- If you are currently on a removal based fertilizing plan, the high yields will be taken into account when spreading for the next several

years. However, if you are fertilizing based on historical averages, it is important to factor in the extra nutrients removed with a bumper crop. If not replaced, it will set the next several crops at a disadvantage from the start.

- Keep this in mind when you receive your fertilizer recommendations, or when you sit down to make your own.

## Product Highlights

- **P0825AM:** Exciting 108 day maturity corn with extreme top end yield potential!



### Strengths

- Excellent emergence, and great early growth. It is a very flashy hybrid in early growth stages
- Great disease scores, and staygreen is one of the best in the industry
- 2017 Competitor comparisons: 39 Locations, 76 Comparisons, **16.8 bu/ac advantage** across Northern IN, Northwest OH, and Southern MI

### Weaknesses

- Grain quality and test weight are below average for Pioneer lineup. Kernels have a pale color
- Poor stress tolerance, especially drought tolerance. Keep this hybrid on most productive soils.

- **P1197AM:** Industry leading 111 day maturity hybrid with world record potential!



### Strengths

- Strong emergence, and very uniform out of the ground
- Excellent plant health throughout the year, and especially late season staygreen.
- Deep kernels lead to exceptional top-end yields
- \*\*\*\***SET NEW WORLD RECORD YIELD IN 2017: 542.3 BU/AC\*\*\*\***

### Weaknesses

- Needs late season nitrogen to reach full potential
- Keep on highest yielding ground to avoid extreme stresses