Maximizing the Planter Pass

Types of Liquid Fertilizer

- **Conventional:** Polyphosphate based

- **Specialty:** Generally considered a low-salt, chloride free, liquid fertilizer that is higher in orthophosphates
  - Can be safely used in close proximity to the seeds, roots and foliage for better fertilizer efficiency

How Efficient are Soil Applied Fertilizers?

Fertilizer	Efficiency
Nitrogen Fertilizers*	30-70%
Phosphorus Fertilizers**	5-30%
Potassium Fertilizes**	30-60%
Micronutrients***	0-70%

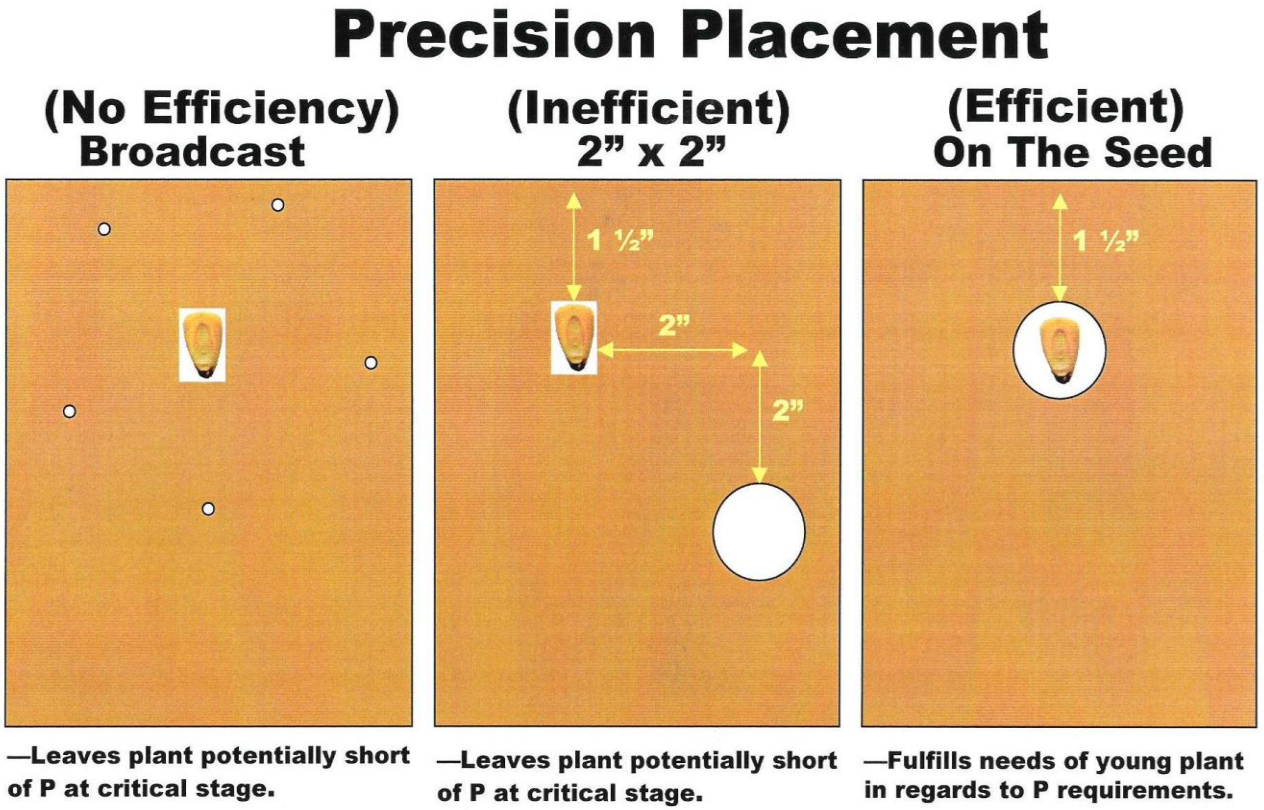
** Based upon publications from Iowa State University*

*** Based upon studies from the Phosphorus and Potash Institute*

**** Data from Micronutrients for Agriculture – American Society of Agronomy*

Phosphorus placement

- Dr. Wilcox of Purdue University reported that 5lbs/acre of phosphorus banded with the seed was equivalent to 20lbs/acre of phosphorus two inches under the seed



Source: Solutions Magazine, September/October 1988

Most Starters Concentrate on Phosphorus

- Phosphorus is second in importance to nitrogen
- Nitrogen is mobile, phosphorus is not
- Phosphorus requires different placement and management
  - Put it where the roots will be
- Phosphorus may become fixed and unavailable in conventional fertilizers
- High orthophosphate starters have more usable P at the start
  - 10-34-0 is 30% orthophosphate = 10.2% usable P
  - 3-18-18 is 100% orthophosphate = 18% usable P
  - 9-18-9 is 100% orthophosphate = 18% usable P

Phosphorus uptake

- Phosphorus is taken up by plants in the orthophosphate form
  - HPO_4 in calcareous soils
  - H_2PO_4 in acidic soils
- The process by which polyphosphate molecules are broken down by water into the orthophosphate forms is known as ***hydrolysis***
- Temperature and microbial activity are the primary drivers – the warmer the soil temp, the quicker the conversion.
  - Estimated to take 7-10 days

High Orthophosphate vs High Polyphosphate

	High Ortho Starters (orthophosphate)	High Poly Starters (70/30 Blends)
Orthophosphate Content	• 100 % • 80% ortho /20% Poly • 50/50 • Phosphorus is immediately available to the plant	• 70% polyphosphate, 30% orthophosphate • Phosphorus availability dependent on conversion of polyphosphate to orthophosphate
Potassium Content	• Contains potassium • Desirable when using no-till, even when K tests may show adequate • Potassium from potassium phosphate which is seed safe	• No potassium • Any environment that reduces root growth may cause potassium deficiency such as cool temperatures, hot temperatures, dry soil, saturated soil, or compaction
Salt Index	• Lower salt index for added safety to the seed	• When applied in-furrow, there is a risk of burn to the seed and emerging seedling
Stability	• Products with higher relative amounts of orthophosphate store better and have a longer shelf life	• Higher polyphosphate fertilizers are expected to have more settling at the bottom of the tank
Best Use	• Best for cold and wet soil conditions common during spring planting due to better nutrient availability • When used at planting, best in an in-furrow placement direction on the seed	• Best for deep or dual placement for utilization in the season • When used at planting, best in a 2x2 placement away from the seed

Benefits of Applying “Specialty”

- Uniform and early growth
- Builds bigger root system earlier for better foraging of soil nutrients and water
- Larger leaves in corn (solar panels)
- Easy to handle
- Higher yield
- Lower moisture at harvest

Starter Fertilizers Work Best

- Soils that remain wet and/or cold before and after planting
- Low to medium soil test levels
- Reduced till situations with high residue
- Early planting or very late planting
- High or low pH, excessive calcium

Root Growth: Effects of Soil Temperature

- When soil temperature was reduced from 70 to 58 degrees Fahrenheit:
  - Corn root growth decreased 5-fold
  - Phosphorus uptake by corn roots decreased 4-fold

(Mackay and Barber, 1984 Purdue)

Salt Index

- The measure of the salt concentration a fertilizer will induce into a solution
- Seed germination and plant damage can occur two different ways:
  - Too much salt concentration in the soil solution
  - Using a fertilizer source which liberates free ammonia (NH_3)
    – DAP, Urea, UAN, & Ammonium Thiosulfate

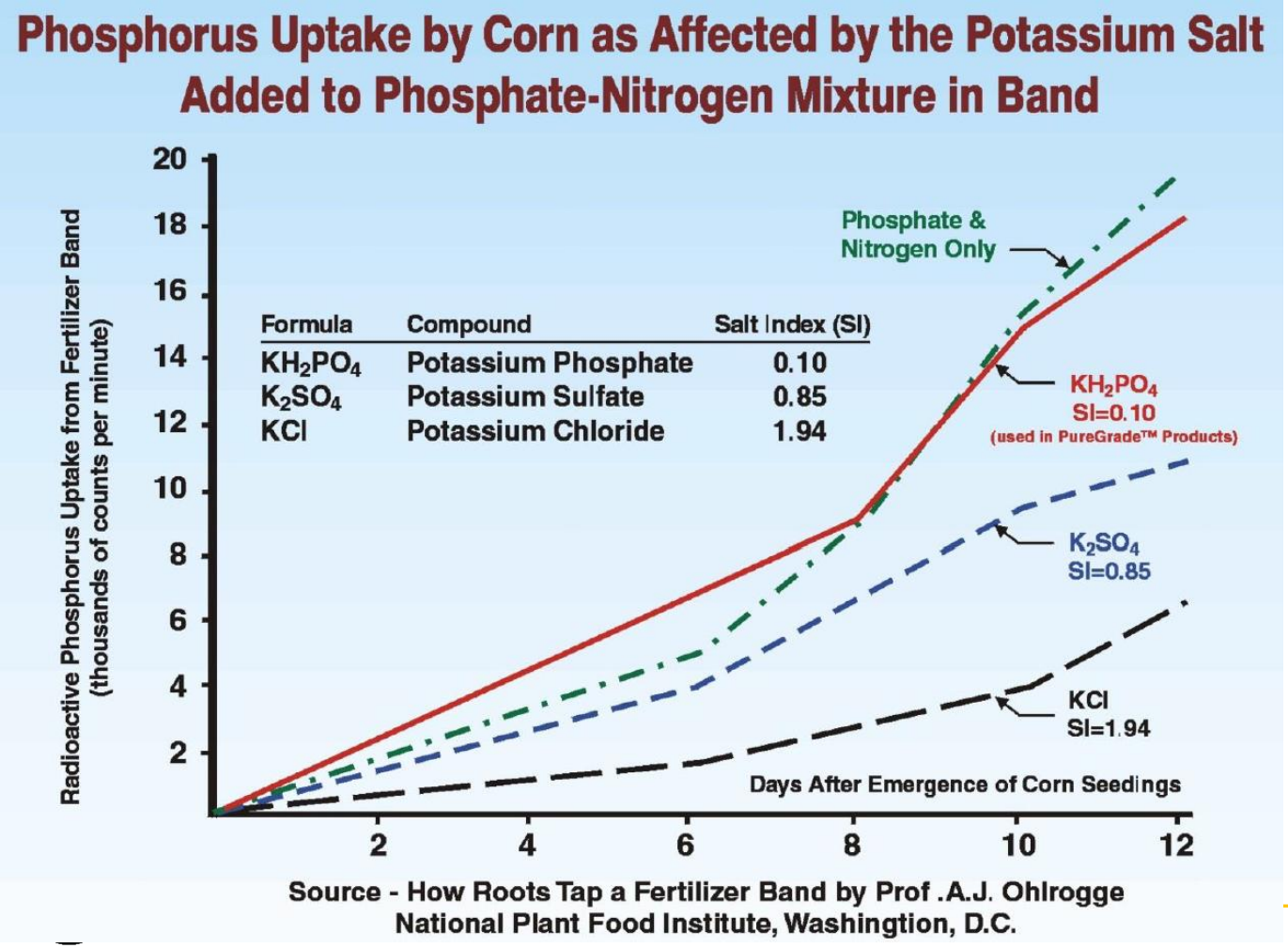
Salt Index

- For seed placement (and foliar) or very close to the seed, use low salt index products to protect seed and leaf tissue
- Use low salt fertilizer made from potassium phosphate to avoid corrosion on equipment

Salt Index of Common Liquid Formulations		
Formulation	**Salt Index**	**Salt Index per unit of plant nutrient (20lb)**
3-18-18	8.5	0.22
6-24-6	11.5	0.32
9-18-9	16.7	0.48
10-34-0	20.0	0.45
7-21-7	27.8	0.79
28% UAN	63.0	2.25

Form of Potassium

- KOH mixed with phosphoric acid reacts to create potassium phosphate



The Andersons Products for AgTek360

- Starter Blends:
  - Slap Shot 6-24-6 (80/20 ortho to poly)
  - Power Play 5-16-7-1S + Sweet N Eezy (80/20 ortho to poly)
  - Line Drive 8-29-2 (50/50 ortho to poly)
  - Full Count 6-24-5-1S + Sweet N Eezy (50/50 ortho to poly)
  - Assist 0-0-19-6S
  - GoldStart 6-22-2
  - Slow Release Nitrogen – Super 72 28-0-0 72% SRN
  - MicroBlends
    - BasesLoad 1.9Zn, 1.2Mn,.4Fe,.4Cu,.02B

Thank you!

Questions?