

CROP.POP

LIQUID POP-UP FERTILIZER

9-24-4-2S- 25ZN- 11B- 1MN- 1CU

UTILIZING ELEMENTS OF
 CROPLUTION
POWER SYSTEM

Crop-Pop liquid pop-up fertilizer is a low-salt solution that can be applied safely in-furrow, 2x2 band, or foliar without the risk of damaging crops. When placed in-furrow, essential nutrients are provided as an immediate supply of NPK; this provides seedlings with easy access to nutrients in the early growth stages, which enhances root development. The accessibility to the supply of NPK is especially beneficial, as this is the stage at which young crop's requirement for Phosphorus is most critical. Crop-Pop is formulated with a high ortho-to-polyphosphate ratio that is efficient in supplying phosphate for a crop's uptake.

The true need is for a material that can be applied in-furrow with minimal detrimental effects on the germinating seed & that is compatible with fungicides & insecticides. Fertilizers best suited for in furrow applications have:

- Low salt index
- Chloride Free
- Neutral pH
- High water solubility
- Contain NPK with relatively high P content
- Minimize content of compounds that liberate NH₃
- Use potassium phosphate instead of KCl as the K source

A major concern of in-furrow application is the possibilities of decreased seed germination or seedling injury caused by high salt concentrations in the soil solutions. Selection of the proper starter fertilizer is the best way to minimize this occurrence.

SALT INDEX (SI):

Salt content is one of the most critical characteristics of fertilizers used for in-furrow placement. Salt Index is the measure of the salt concentration induced by the fertilizer in the soil solution. Recommendations for fertilizer placement in direct seed contact vary by crop. Crop tolerance to increased osmotic pressures (salt content) of the soil solution in the vicinity of the seed varies considerably. General rules state maximum recommendations range from 10-20 lbs./acre in direct seed contact. The salt index of a mixed formulation containing NPK is the sum of the salt index values of its components. Salt Index does not predict the exact amount of fertilizer material that could produce crop injury in a soil; rather, it is used to compare fertilizer formulations to other fertilizers with regard to the salt effects. Or more simply to show that a fertilizer with high salt-content is more likely to cause injury to germinating seeds.



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ORTHOPHOSPHATE vs. POLYPHOSPHATES:

Plants only uptake phosphorous in an orthophosphate form. Polyphosphates convert to orthophosphates in the soil by hydrolysis (reaction with water). Those who promote orthophosphate products say that the hydrolysis of polyphosphate is too slow, and not available to the seedling. However, they fail to mention that most research shows the hydrolysis of polyphosphates to orthophosphate happens in a short period of time. In fact, most of the polyphosphates will be converted to orthophosphate by emergence. Typically, a very conservative estimate is that 50% of polyphosphates are converted within 1-2 week(s), but this varies depending on soil conditions and temperatures. Below is a chart from Chang & Racz that show approximate polyphosphate hydrolysis % by soil temperature.

SOIL TEMPERATURE	24-HOUR POLYPHOSPHATE HYDRDOLYSIS (%)
41°F	30% - 40%
68°F	50% - 60%
95°F	80% - 90%

Chang & Racz, 1977

Maintaining phosphorous availability during the growing season can be a significant challenge due to calcareous soil. When high-orthophosphate fertilizers are applied to calcareous soils, much of the phosphorous that was intended for the plant quickly reacts with cations in the soil to form insoluble compounds: These insoluble compounds are not plant available. Unfortunately, the plant unavailable compounds can still erode into bodies of freshwater, contributing to negative environmental health consequences. Polyphosphates are initially protected from reacting with cations in soil because it is a longer, less-reactive chain. Polyphosphates are also more compatible with many micronutrient products- especially Zn- for application at planting. We believe in formulating different grades that offer varying ratios of ortho-to-polyphosphate content to allow our growers to choose the product that fits their nutrient needs at the most cost-efficient price.



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