

Potassium, Magnesium, and Sulfur for Organic Row Crops



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The primary goal of any [organic](#) operation is to produce food that is safe, wholesome, and nutritious while maintaining and improving the land. How do we effectively supply plant nutrients in this system?

“I've been 'organic by omission' - how do I start incorporating nutrients back in?”

“I apply manure and compost, how much MOP should I add to make up the rest of my K units?”

“I've been organic for 40 years and I've never tested my soil or added fertilizer other than manure - I have average yields but know I can do better. What's a starting place?”

The basics remain the same.

The principles of plant nutrition are the same for organic and conventional crop production. Plants uptake potassium and magnesium as positively charged cations, K^+ and Mg^{2+} , and sulfur as sulfate, SO_4^{2-} , regardless of the fertilizer source. The plant nutrients in OMRI Listed [Intrepid Trio](#)[®] (also called langbeinite, potassium-magnesium-sulfate or sulfate of potash magnesia) and OMRI-Listed [Intrepid Potash](#) (MOP, 0-0-60) are immediately available to the plant for easy uptake.

The difference lies in the *execution* of plant nutrition.

Organic soil fertility management can differ greatly from conventional production for nutrients like nitrogen and phosphorus where there are not many similar choices to their conventional counterpart. Manure sources like chicken litter, swine, dairy, or beef are likely meeting your crops' nitrogen and phosphorus requirements. The quantity and availability of potassium, magnesium, and sulfur can vary considerably between sources, breeds, and time of year. Thankfully, there are widely used OMRI-Listed options like MOP and Trio[®] that provide an easy win to meet your crops' potassium, magnesium, and sulfur requirements at the time the plant needs it.

What are these nutrients doing to increase yield and quality?

Plant cells need almost as much potassium as nitrogen in their tissues. Potassium is most known for water regulation within the plant. It shepherds water into cells leading to hydration and cell elongation. This is what causes stomata to open, allowing CO_2 into leaves to trigger photosynthesis and carbohydrate production. Potassium nutrition improves stalk

strength – this is especially important to deter lodging and green snap in the age of pushing [corn](#) yields with improved hybrids.

While potassium is opening the leaf to bring in CO₂, magnesium contributes to fundamental plant growth by being the central atom of chlorophyll – the pigment that harnesses energy from light to power photosynthesis. Magnesium will improve nutrient uptake and increase protein formation.

Sulfur, like nitrogen, is an important building block for proteins, and sulfur nutrition will increase nitrogen uptake and recovery efficiency of plants. Crops continue to need and assimilate sulfur through maturity, but sulfur is not mobile in the plant. It is imperative the crop have enough resource of soil S to maintain growth throughout the entire season.

Balance is Important!

Your soil test may show adequate magnesium levels, and you may still see magnesium deficiency, but why? An overabundance of potassium may occupy the majority of the limited cation exchange sites in this soil, making other macronutrients like magnesium and calcium more susceptible to leaching. A more balanced fertilizer has the benefit of retaining the availability of nutrients in the soil. Therefore, blending OMRI-Listed [Intrepid Potash](#) with OMRI-Listed [Intrepid Trio](#)[®] provides the added benefit of sulfur and magnesium for more complete crop nutrition and soil nutrient availability.

Chloride: Friend or Foe?

What do you need to know about chloride? First and foremost, *chloride* (Cl⁻) is an essential plant nutrient and is not the same as *chlorine* (Cl₂) the volatile gas used to sanitize your pool.

1. What crops are you growing? Typical midwestern row crops like corn and soy are chloride tolerant. Wheat is categorized as ‘Chloride Loving’ and often shows deficiency!
2. Chloride, an anion that is subject to leaching and not held in the soil via CEC, is unlikely to accumulate in the well-drained soils of the Midwest.
3. Being so far from the coastline, there is low chloride deposition via rain in the Midwest.

How Do I Meet Crop Needs with Intrepid Potash or Intrepid Trio[®]?

Testing your soil and manure source to determine the nutrients you are missing is a key first step. Make up for the remaining potassium, magnesium, and sulfur deficit by supplementing your fertilizer program with [OMRI-Listed Intrepid MOP Potash](#) or [OMRI-Listed Intrepid Trio](#)[®]. These fertilizers can be custom blended with other nutrients, making for easy and precise application to your field. Intrepid Potash and Trio[®] have guaranteed nutrient analyses, are soluble, and are immediately available to the plant. Visit IntrepidPotash.com/Organics to learn more about nutrition for your crops!