



# CROP INPUTS

## The Vocabulary of Crop Inputs: Sul-Po-Mag and Muriate of Potash

**Sul-Po-Mag / Langbeinite.** Described in 1891 by A. Langbein in Leopoldshall, Germany, **langbeinite** is an evaporite mineral that formed a few hundred million years ago from marine salt deposits during the Permian Period.

The Association of British Scrabble Players offers “langbeinite” as a valid Scrabble word derived from a proper name (14 points!). A brittle, translucent looking mineral with the chemical formula  $K_2Mg_2(SO_4)$ , langbeinite can be tinged yellow, pink or orange. It dissolves slowly in water, especially if you apply a coarse grain size. The langbeinite we use comes from mines in New Mexico owned by the Intrepid Mining Corporation <http://www.intrepidpotash.com/>.

MOFGA farmers know langbeinite best as Sul-Po-Mag, and the elements Sulfur (S), Potassium (K) and Magnesium (Mg), all of which are plant macronutrients, are evident in langbeinite’s chemical formula. Langbeinite’s relatively low levels of chlorine salts and lower solubility makes it a valuable fertilizer for farmers. Farmer could give their crops Potassium (K) by applying the natural mineral fertilizer Muriate of Potash, but this material input could result in unwanted levels of soil chloride accumulation.

The natural, crushed mineral form of  $K_2Mg_2(SO_4)$  that organic farmers must choose is rarely sold as langbeinite. There was a time, not too long ago, when Sul-Po-Mag was the popular proper name of the approved input langbeinite. That does not appear to be the case anymore. Sul-Po-Mag seems to have become a common name for versions of  $K_2Mg_2(SO_4)$ , not all of which can be permitted. Be careful. As an organic grower, you need to use the material that is natural and free from synthetic additives and processing aids, and, you need to have documentation on hand for your inspector to verify that this is case. Unfortunately, our research indicates that the packages of Sul-Po-Mag that are readily available at farm & garden centers and hardware stores are probably not the right stuff for organic growers. Some of the companies that supply these stores with bags of Sul-Po-Mag, like Green Mountain, can get you the approved stuff, but you need to special order it. Fedco has a version of langbeinite, called K-Mag from Mosaic (manufacturer name), which is also approved. The other name you may encounter when shopping for approved langbeinite is Trio™ by Intrepid (the aforementioned mining company) or as Intrepid Trio™ Sulfate of Potash Magnesia. On OMRI’s list ([www.omri.org](http://www.omri.org)), it appears as Intrepid Potash Granular Trio® 0-0-22 +11(Mg) +22 (S) or Intrepid Potash Standard Trio® 0-0-22 +11(Mg) +22(S).

**Organic Farm Plan.** With as many as half a dozen aliases, the acquisition of the correct langbeinite by you and the verification of your action by us can be a little daunting. That is why we really need growers to provide very complete, detailed information in their farm plans (application paperwork) about the inputs intended to be used, to always get documents from your sources that describes the materials (supplier, manufacturer,

OMRI status, etc), and to check with us when you change inputs or are not sure about the status of inputs you want to use. We’ve been doing quite a bit of detective work on inputs and we are ready to help.

**Muriate of Potash / Potassium Chloride/ Sylvite.** Potassium is an important plant macronutrient, essential to the movement of water and other nutrients within plants, to crop growth and maturity, and to disease resistance. Sylvite is a common mineral form of “potash” or KCl, and it, along with langbeinite, are ores that coexist in those ancient sea beds in New Mexico, where they are now mined for use as fertilizers, among other applications. Muriate of Potash is very soluble, which is not a desirable attribute for inputs in organic systems, and supplies a chloride ion. In solution in the soil, the chloride ion can be toxic to many plants. Salad greens, strawberries, peppers and potatoes are examples of crops that respond poorly to higher levels chloride. So, when you find an approved Muriate of Potash, use it conservatively to avoid chloride accumulation. Once again, you should not be purchasing potash on a whim if you haven’t done your homework and checked in with us. We haven’t reviewed all the brands available in local stores. OMRI lists three approved versions of Muriate of Potash 0-0-62 (Untreated) from Mosaic Crop Nutrition LLC. OMRI also lists several Potash options that are Potassium Sulfate ( $K_2SO_4$ ), including Trio™ by Intrepid (a.k.a., langbeinite). By using an approved Sulfate of Potash, you avoid the problems associated with the chloride ion in Muriate of Potash.

**Organic Farm Plan.** If you write “potash” in your farm plan, we will need more information. What type of potash? Is it Muriate of Potash (KCl) or Sulfate of Potash ( $K_2SO_4$ )? What is the source/brand name? Is it OMRI listed? If it isn’t, we are going to have to research the product to determine if it can be approved. Organic farmers must not use inputs that are not approved. Application rates for all inputs should be noted in the field histories and documents (detailed receipts, labels, OMRI certificates) need to be shown to your inspector.

**Need help understanding what nutrients you should add to your soil?** Determining the nutritional needs of your organic crops can be challenging. Applying materials you don’t need can be expensive.

It is also not in line with organic management, especially if the nutrients are prone to leaching. Getting regular soil analyses is an important first step. Increasing soil organic matter, building soil structure, and maintaining a proper soil pH are essential to keeping nutrients in your soil and making them available to your crops. Crop rotation and green manures are important organic management tools to achieve these goals. Discussing your cropping system and soil or tissue analyses with an organic crop expert like MOFGA’s Eric Sideman is another terrific option. You can contact Eric for a consultation by phone at 603-269-6201 or by email [esideman@mofga.org](mailto:esideman@mofga.org).