

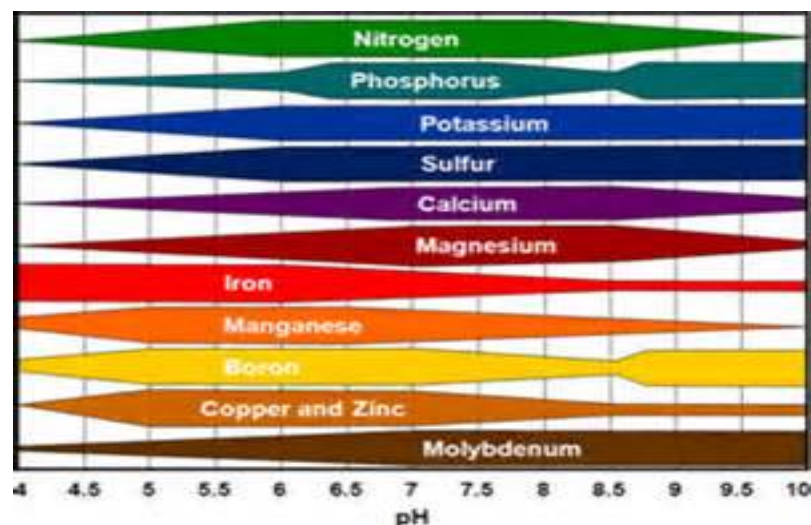


## ***Lime: Back to the Basics***

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Limestone is ground rock that contains mostly calcium carbonate and/or magnesium carbonate. Using limestone has long been a basic tenet of a good crop fertility program, yet it is often neglected. This **Ground Work** will focus on why liming is still one of the most important concepts of good soil fertility.

**The most recognized benefit of liming is the adjustment of soil pH.** As you can see in the following graph, a soil pH of 6.0-7.0 provides for the greatest availability of the most nutrients. That is why it is important that we strive to maintain a soil pH within that range.



**Limestone can be a very economical source of calcium and magnesium,** which are important secondary nutrients for crop production.

- **Calcium** plays a role in plant metabolic processes and utilization of other nutrients. It is important for cell elongation. It plays a vital role in cell wall structure and protecting plants against diseases.
- **Magnesium** is important for chlorophyll formation and the capture of sunlight energy.

**The amount of available calcium** and magnesium in soils plays an important role in soil structure and tilth.

- Calcium flocculates the soil more efficiently than magnesium and it is therefore important to have calcium in adequate quantities for good soil tilth.
- For most soils, you should strive to have at least a **70% base saturation of calcium** or 300# of water soluble calcium to help achieve this tilth.
- High calcium lime would be preferable to dolomitic (high magnesium lime) for soils that fall short of this criteria.

Often times it takes 3-5 years of lime applications before we see base saturations of calcium move much; but then they start to change rapidly. When this happens it's time to start reducing applied lime rates. (Example: If your goal is to have calcium levels in the upper-70%-range, start using caution when you reach the low-70%*s*.)

Excessive liming leads to high calcium levels. High calcium levels make it difficult for enough potassium to be available. So, applying too much lime may force you to compensate by spending even more money on high potassium applications!

**Please note: The fineness of grind of the limestone** greatly impacts how effective it will be in delivering the desired results. Only the particles that can pass through a 60 mesh sieve and finer are available within one year. The table on the following page is from the *NCSA Aglime Fact Book* and confirms this. For each lime particle size, the chart shows what percent of that lime is dissolved after one year, and after year four.

Size of Particles	1 Year after Application	4 Years after Application
Coarser than 8 mesh	5	15
8 to 30 mesh	20	45
30 to 60 mesh	50	100
Finer than 60 mesh	100	100

**Many growers appreciate the convenience of pelletized lime** which utilizes a finely ground limestone in an easy-to-spread granule. It can be applied at lower rates because it only contains finer particle sizes. Pelletized lime, which is typically applied at 200-500 pounds per acre, can be blended with other fertilizers, making it a convenient, economical way to lime. That can be especially appealing if you are looking for a quick return on your investment or if you want to fertilize for only one crop year because of cash flow constraints.

### **What are Biological Farmers doing and seeing?**

- Ideally, biological farmers make small, annual applications of lime, pelleted lime, liquid calcium, or amendments with calcium (such as rock phosphate).
- Some use layer manure, with caution. Layer manure is relatively high in calcium, so care must be taken not to over-apply it.
- Biological farmers are finding they don't need to lime as often. And in some cases they dramatically reduce rates as well.
- It appears that biologically alive soils provide buffering, resulting in the soil pH moving either up or down into the proper range. Also reported: It takes considerably less lime to maintain the pH in that range.
- Biological farmers report the tilth allows them to grow excellent crops with reduced fertilizer inputs. Reduced nitrogen rates are common, which also means less need for lime. (Nitrogen acidifies the soil.)

**Soluble calcium and good soil tilth are cornerstones of Biological Farming.** The porous soil allows oxygen into the soil to support aerobic bacteria. Proper liming can make the whole system hum. Give your [\*\*AgriEnergy Resources\*\*](#) representative a call to talk about your calcium needs and get liming recommendations for your farm.