Know Your Sports Field Conditioner

In the past, there have been some misconceptions about sports field conditioners. The following definition of terms and clarification of product characteristics has been put together based on significant research and development to help you make informed decisions about which products will work best on your baseball and sports turf fields.

What are the most important characteristics to look for in a soil conditioning product?

Know your mineral! What is the base material of the product, because different minerals perform differently? Does the mineral's inherent characteristics enhance field conditions?
Absorption. How have the characteristics of the mineral been optimized for maximum absorption?
Color. Will the product help you meet the standards for a good-looking field? For example, on a baseball field a deeper red color provides maximum visual contrast for the white ball.
Liquid Holding Capacity (LHC). Measures the internal pore volume of a mineral. What sort of capacity for moisture does the product have? What is its ability to retain that moisture.
Stability. Will the product resist breakdown and deliver long-lasting performance?
Absence of Dust. Will the product go on cleanly and not blow away with the first breeze or blow back in an infielder's face?

What type of product meets these criteria?
The physical and chemical makeup of a mineral will directly impact its performance as a soil conditioner. Research shows the best available mineral for sports turf applications is montmorillonite clay. Unique deposits of Montmorillonite clay are found in northern Mississippi and southern Illinois. The internal pore size of montmorillonite is very small. This creates surface tension that absorbs and holds water tightly. Other minerals either do not absorb as much or do not hold water as tightly. In order to process montmorillonite clay into a high quality sports field conditioner, the manufacturing process must include super-heating.

What does super-heating mean?
Super-heating is a process (typically 1250-1500°F) which removes all moisture from montmorillonite clay. Super-heating transforms the clay into a hard, ceramic-like product. It fixes (or case hardens) the crystalline structure, optimizing the absorptivity of the pores and permanently hardening the granules.
Montmorillonite, when super-heated, absorbs and exchanges moisture in the soil. Also, because it has been case hardened, it is physically stable and will not break down in the field. In other words, super-heating optimizes montmorillonite for sports field applications.

Are other soil conditioners super-heated?
They can be. Super-heating is a manufacturing process ideal for montmorillonite. The term refers to the level of thermal treatment applied in processing. Super-heating optimizes the hardness and stability of montmorillonite without compromising its porosity,

making it a perfect soil conditioner. Super-heating other minerals may or may not optimize them for sports fields.

What is the best way to super-heat montmorillonite clay?
The best method of producing high quality soil conditioners is to utilize a *seven-step process.* The raw absorbent clay is mined, sized, dried, ground into specific particle sizes, dried again, super-heated, and de-dusted. Because the granules are ground and sized prior to the drying and super-heating processes, each granule receives the full benefit of these steps. In other *five-step processes,* drying is the first process, then grinding and sizing. The drying cannot drive out all the moisture in the larger granules. This results in lower liquid holding capacities and lower absorptivity.

Are there other important differences?
Yes. If the dust has not been removed from the product, you lose part of what you pay for at the first sign of wind. You also run the risk of the product blowing back in the face of your players. Also, a deep red color is inherent to clays found in northern Mississippi and southern Illinois.

What does vitrified mean?
Vitrification is a thermal process that involves higher temperatures than super-heating (typically 1800-2200°F) to transform minerals into a hard, glass-like material. Vitrification is not optimal for montmorillonite. It wastes heat and can destroy porosity. Vitrification may be optimal for other minerals, but none with the excellent sports turf attributes of montmorillonite.

Since vitrification processes hotter, does that make it better than super-heating?
Again, you have to know what mineral is being used. Vitrifying a montmorillonite clay will not provide any benefits. In fact, important performance characteristics such as absorption and the holding and releasing of moisture will be seriously degraded if higher vitrification temperatures are used with montmorillonite clay.

Is this a process used in sports field products?
Yes, but the mineral, that undergoes vitrification, lacks the absorbent characteristics of montmorillonite.

How can I tell the difference between vitrified clay and super-heated montmorillonite?
A simple test is to put a handful of both products on a plate or on your field right next to each other. Pour water in a puddle between the two products and watch the montmorillonite clay pull water away from the other material. The super-heated montmorillonite clay has a much stronger affinity for water due to its extensive network of small, thirsty pores.

What do professional groundkeepers use on their Major League ballfields?
Three quarters of the Major League groundkeepers choose montmorillonite clay to maintain their fields. In fact, the World Series champions for each of the last five years have used montmorillonite soil conditioners.

The use of properly super-heated montmorillonite clay on a ballfield will help prevent rainouts, break up compaction and improves the fields resiliency.