

THIRD QUARTER 2004

**CALCIUM**

Feed-grade calcium products are available in a wide variety of particle sizes, from liquid suspendable products to large particle products for laying hen diets.

**DICALCIUM PHOSPHATE**

Both 18.5% and 21% phosphorus products are available.

**SODIUM BENTONITE**

Bentonite products are available in a wide variety of particle sizes suitable for any purpose.

**POTASSIUM**

ILC Resources has both potassium chloride (KCl) and potassium magnesium sulfate (K/Mg/S) available.

All products are available in both bag and bulk.



## History Provides Prelude to a Bright Future

Time is on our side at ILC Resources.

Time has provided us with a core product that is millions of years old. The deposits from which we harvest are marine limestone, found in rock layers laid down during the geological Mississippian Period (325-360 million years ago). This prominent Burlington Formation was first recognized in the mid-



1800s. The Mississippi Valley was covered by a clear, shallow, warm inland sea that advanced from the south. During this period, limestone was deposited by sedimentation of marine life. Limestone in the Burlington Formation is unusually coarse-grained, crystalline, crinoidal limestone. It is made almost entirely from the remains of various fossils, and by far the most important are the *crinoids*.

Soon after dying the entire skeleton of the crinoid disintegrated into small separate plates, composed of a form of calcium carbonate known as calcite. From this comes the term *calcitic limestone* for a limestone high in calcium carbonate, the core product of ILC Resources. Crinoids flourished because they were filter feeders, and most of the particles in the clear inland seas would have been bits of food for their survival. The crinoids also needed warm water to produce their elaborate skeletons, since warm water can hold more dissolved calcium carbonate than cold, making it easier to precipitate out, forming their skeletons.

The Burlington Formation contains more species of crinoids than any other formation in the Mississippi Valley, and resulted in limestone deposits rich in purity of  $\text{CaCO}_3$ .

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## CaCO<sub>3</sub> is a Soil Amendment

Just as it is vital to provide proper nutrition to livestock and poultry for optimum performance, health, and thriftiness, the same principles apply for lawns and gardens and just plain *soil* in general. We are approaching autumn — the end of the growing season in the Midwest. But it actually is the start of the next growing season. How can we help our lawns and gardens get ready for next year? We need to consider properly conditioning the soil, or amending it. By definition, a soil amendment is an *improvement to the soil*.

Karen Brooker, of *Erosion Control* (leading publication in the field of erosion and sediment control), stated, “When considering the use of fertilizers and soil amendments, what we are really talking about is soil health. What we add or don’t add to the soil in terms of fertilizer or amendments can determine the success or failure of a project.”

The application of ILC Resources’ **Lawn & Garden Limestone** is a proven, sound practice that can enhance lawns and gardens. This is accomplished by two very basic reactions. First, calcium carbonate reacts with

conditions in the soil to neutralize acidity. How does soil become acidic in the first place and why do we need to neutralize it? Heavy fertilization with nitrogen releases hydrogen ions when fertilizers are applied. Hydrogen ions are *acid* and thus, reduce soil pH. Root systems do not absorb nutrients well in acidic conditions. Calcium carbonate reacts with acid to raise soil pH. Proper nutrient uptake occurs in a soil pH range of 6.2 to 7.0 for good plant growth and 5.6 to 6.5 pH for optimum root development. Secondly, in this reaction with acidic soil, calcium is ionized as well, which makes it available for nutrient uptake, which plant life also requires.

An additional benefit of soil neutralization is proliferation of beneficial bacteria in the soil. These bacteria speed up the rate of decay of plant residues and reduce thatch build-up in lawns. Plus, improved soil structure and better moisture penetration will result with application of ILC Resources’ **Lawn & Garden Limestone**. Aeration of root zones by applying CaCO<sub>3</sub> further aids root development. Toxic effects of certain compounds are reduced by CaCO<sub>3</sub> application too. The high purity of ILC Resources’ CaCO<sub>3</sub> eliminates

contaminants found in poor quality limestone. Consequently, fertilizer efficiency is improved by applying **Lawn and Garden Limestone**. By conditioning the soil, more plant nutrients are released, thus, reducing the amount of fertilizer needed. Plus, liming aids in making the nutrients provided by fertilizer more effective.

ILC Resources **Lawn & Garden Limestone** will not burn grass or other plants, nor is it harmful to children or pets. It can be applied anytime. Certainly, fall application for a good start next spring would be appropriate.

For many of the same reasons, recommendations of limestone can be made for crop soil conditioning and the fall application of pelletized lime. Made from finely ground high calcitic CaCO<sub>3</sub> and then pelletized, this product resists the negative effects of wind erosion and allows for excellent uniform application on fields. With today’s GPS technology, specific application is ensured for optimum results with no waste. Test for soil pH, apply pelletized lime accordingly, and your next year’s crops will be well prepared for increased yield and very possibly lower fertilization rates too.

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## ***CaCO<sub>3</sub> (continued from page 2)***

Why are we focused on plant and soil conditioning? We have consistently targeted animal nutrition in the past. Many within our customer base service or could potentially service urban customers with lawn and garden needs. At the same time, it takes healthy, good yielding crops to produce feed necessary for profitable animal production. Many producers of livestock also produce crops. This provides another good reason to consider additional products to offer. Adherence to quality and consistency, both in terms of products and service, are bedrock to ILC Resources. Whether we are talking feed-grade or soil amendment application, ILC Resources' calcium carbonate excels in delivering results.

### **For additional information contact**

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## ***History (continued from page 1)***

What took *Mother Nature* unfathomable time to produce has allowed our company to harvest a product rich in calcium. We began this harvest back in 1924 when our company was founded as Iowa Limestone Company. Throughout the ensuing eight decades we have maintained a *Solid as a Rock* performance in agri-business, adapting to the changing nutritional needs of animals as well as the evolving requirements of our valued customers.

Feed-grade calcium carbonate is the core product of ILC Resources. In 1924, neighboring farmers were asking for limestone fines at our original Alden, IA plant. They added the fines to the grain and silage fed to their cattle and other livestock. They found that the animals just performed better. At that same time, scientists were starting to uncover the essential role that calcium played in animal nutrition. Ninety-eight to ninety-nine percent of the body's calcium is found in bones and teeth. Certainly maintaining integrity of the skeletal system is essential for proper growth. Calcium plays a major part in this function. However, the other 1-2 percent is no less vital to health and sound performance. Calcium helps the body transmit nerve impulses. It plays a key role in maintaining

heart function and clotting of blood. Body muscle contractions also require calcium. Further, calcium plays a part in metabolism as a component of enzymes and hormones. In poultry calcium is vital for proper eggshell formation and quality. Of all the minerals necessary for good health, optimum performance, and proper maintenance, calcium is required in greater amounts than any of the other major or trace minerals. And, ILC Resources offers this natural mineral ingredient of great value at an affordable, cost effective price.

As one part of our company's commitment to quality control, ILC Resources maintains in-house laboratories at its plants at Alden and Weeping Water. Samples are collected and retained from every load for monitoring of quality standards. Production samples are tested daily to insure maintenance of quality. Our rigid operational standards, the inspections of our plants, and the clean out procedures we insist on for any vehicle transporting our products from our plant, eliminate contamination possibilities at ILC Resources. Plant safety is something we practice every minute of every shift. We provide products that customers trust to deliver results and that trust and confidence in ILC Resources will not be breached.

## Quality Control

There are two components to this issue. One is *quality*. The other is *control*. Let's explore each separately and then tie the two together in an understanding of what ILC Resources considers bedrock to success in business.

First of all, examine *quality*. Webster's Dictionary has four elements of definition for quality.

1. (noun) "that which makes something what it is; characteristic"
2. (noun) "basic nature; kind"
3. (noun) "the degree of excellence of a thing"
4. (noun) "superiority"

Secondly, let us define *control*. Again, consulting Webster's Dictionary, there are five elemental definitions to control.

1. (verb) "to regulate"
2. (verb) "to exercise authority over; to direct"
3. (verb) "to restrain"
4. (noun) "authority to regulate"
5. (noun) "means of restraint, check"

Combining these two words, we see that *quality control* basically refers to "***the means or authority to regulate the basic nature or characteristics of a thing.***" Further, a characteristic is a *distinguishing trait*.

ILC Resources' *Quality Control* program focuses efforts on holding certain distinguishing traits of calcium carbonate consistent and uniform and within acceptable guaranteed specifications. To accomplish this we monitor processing by measuring several key parameters. These are percent calcium, thus purity of calcium carbonate, and uniform particle size patterns of each of the different gradation products. We measure additional parameters such as product density and solubility. We include this information in our product database for monitoring processing and allowance for consultative information. This solidifies assurance of consistency and maintenance of quality standards in our calcium carbonate.

To meet the biological needs of animals or plants for either calcium as a required nutrient or pH control from CaCO<sub>3</sub> as a soil amendment or animal

digestive buffer, high standards that remain consistent are vital. ILC Resources' *Quality Control* of high calcitic limestone to allow for the marketing of superior calcium carbonate is bedrock to our commitment to agriculture. It has been for 80 years; it continues today and will into the future.

One final component to quality control needs to be addressed. What about color? (Especially from a quarry operation).

Does color validate purity or perhaps indicate low quality? Quite frankly, color is more of a *non-indicator* than anything else. In a quarry operation the face of limestone rock may possess a variety of different color shades from light to dark. The only true test for quality when considering color variation is testing for calcium content. If calcium is maintained at or above 38% Ca, then color can certainly vary without sacrificing purity and quality. Close monitoring of calcium content is bedrock in daily production processing. Therefore, regardless of occasional color changes, quality standards are maintained by daily confirmation of calcium content.