

AgriCal[®]

by  AgriGro

HEALTHIER SOILS ♦ STRONGER PLANTS ♦ HIGHER YIELDS

DOES YOUR SOIL REALLY NEED LIME?

The importance of calcium as an essential plant nutrient in the soil is often overlooked. Too many times, when soil tests show a low pH the immediate reaction is to spread more lime. However, ag lime tends to be insoluble and can take years to break down and show its effectiveness. In fact, the odds are good that your soil may already contain more undissolved, unused limestone than soil tests are calling for.

QUITE OFTEN, LIME IS APPLIED WHEN WHAT THE SOIL TRULY NEEDS IS CALCIUM!

OR, IS **CALCIUM** THE MISSING ELEMENT?

Rather than just looking at soil pH, an effective soil test should also include the quantity of soluble calcium (measured in ppm or %) and the Calcium % Base Saturation in the soil. The pH alone is not a valid indicator of soluble calcium levels in soils. For example, when pure sand is analyzed it has a neutral pH but has no available calcium.

CALCIUM IS CRITICAL

Calcium is required in larger quantity in the soil than any other essential nutrient and should occupy 60 to 70 percent of your soil's base saturation of cations.

Calcium is a direct nutrient to growing plants and is essential for proper nutrient transportation into the plant. It is often referred to as the “**trucker**” of all plant nutrients. When calcium is deficient, crops suffer not only from a lack of calcium but from other essential nutrients as well. When calcium levels are in balance, oxygen is increased within the soil profile which allows for better drainage and root growth. Beneficial microbial activity also improves with increased oxygen in the soil.

While calcium has traditionally been supplied to acidic soils through the applications of limestone, the limestone particles often have to be broken down over time before they can be of benefit to the soil and plant life. However, Agri-Cal's chelating effect increases the availability of cal-

cium already in the soil, and makes the calcium in lime particles more soluble and available to the crop. In the meantime, the soluble calcium contained in Agri-Cal® is used by the plant to maintain an uninterrupted supply of available calcium.

Agri-Cal® liquid calcium is a product that carries a 10 percent guaranteed analysis of soluble calcium. However, unlike other calcium products, Agri-Cal® is formulated with a proprietary, organic chelating agent that gives Agri-Cal® the unique ability to release insoluble calcium from the soil while providing **immediate calcium** to the plant. Up to five hundred pounds per acre of additional soluble calcium has been measured from the application of just one gallon of this formulation.

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Working Together: Calcium and Nitrogen

Research* has shown that applying soluble calcium with urea can improve crop production. In the soil, urea converts to ammonium, and calcium increases the uptake of ammonium, potassium and phosphorus. Calcium also stimulates photosynthesis and increases the size of sellable plant parts. It also makes the use of nitrogen more efficient, improving the economics of production and reducing nitrogen contami-

nation of the environment. Incorporating Agri-Cal® into liquid nitrogen applications has secondary benefits as well. In irrigated soil, sodium may build up, so continually adding Agri-Cal® helps improve soil structure near plant root zones. In acidic soils, soluble calcium will move rapidly to the lower root zone, increasing calcium uptake, and can help offset the toxic effects of aluminum.

► Calcium and Nitrogen Rates

Less nitrogen may be required when calcium is applied with it. Research* has shown the optimum application of calcium to apply is 1/2 to one pound of liquid calcium per pound of urea. In studies, this rate of calcium increased yields by 14% to 50%!

Agri-Cal® improves the uptake of ammonium nitrogen. When plant roots absorb ammonium, they release hydrogen and organic acids which help to dissolve insoluble calcium in the soil. This calcium combines with the soluble calcium in Agri-Cal® to stimulate plant growth.

*Research conducted by Professor and Extension Soil Environmental Specialist Sam E. Feagley; and Professor Lloyd B. Fenn, Texas Agricultural Experiment Station, The Texas A&M University System.

CALCIUM.

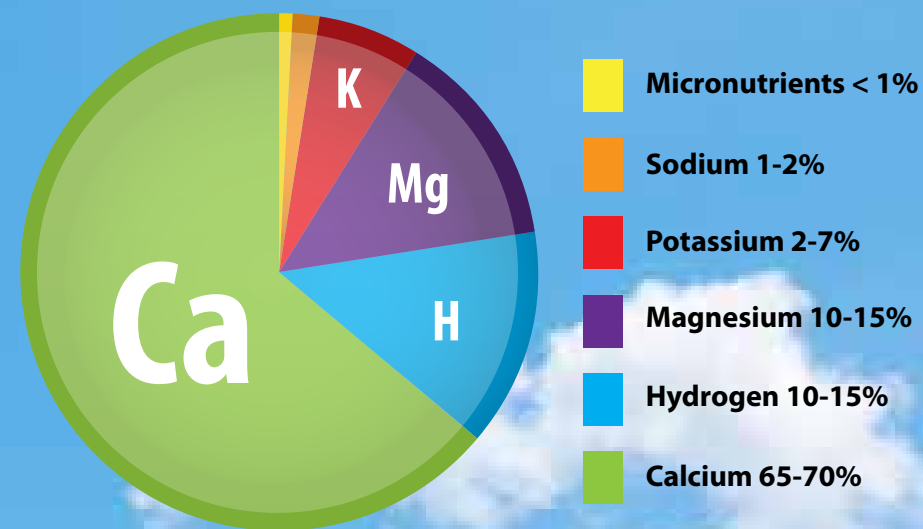
MORE IMPORTANT THAN YOU MAY REALIZE

- Calcium is the **King** of essential nutrients in the soil.
- **Calcium is required in larger quantity in the soil than any other essential nutrient.**
- Calcium increases the movement of N-P-K into the plant.
- Calcium should make up at least 60% (preferably 70%) of your soil's base saturation of cations.
- Calcium helps in the plant's production of proteins, which will increase feed values.
- Calcium strengthens cell wall structure in plants.
- Calcium promotes nitrogen fixation by legumes.
- Calcium improves soil texture and reduces compaction.
- Calcium increases water penetration and improves soil drainage.
- Calcium neutralizes soil acidity.
- **Calcium improves the activity of favorable soil bacteria.**
- Calcium promotes root development.
- Calcium improves the efficiency of fertilizers and chemicals.

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AVAILABILITY IS THE KEY TO RESULTS

OPTIMUM NUTRIENT LEVELS IN SOIL



The CHLORIDE FACTOR

Agri-Cal® is derived from a non-synthetic Calcium Chloride Brine. Chloride is an essential plant nutrient and plants require only small amounts of Chloride but can use larger amounts if available. The reason chloride is classified as one of the 16 essential plant nutrients is because all plants cannot complete their lifecycle without it, and no other nutrient can replace it.

Chloride serves a number of important functions:

- It chemically balances the potassium cation concentration during the opening and closing of the stomata.
- Aids in the water splitting system of photosynthesis.
- Helps cation balance and transfer within the plant.
- Diminishes the effects of fungal infections.
- Competes with nitrate uptake which may factor into disease suppression (since the severity of disease is connected to high plant nitrates).

Most soil chloride is highly soluble, directly affecting its availability in the soil. Deficiencies can occur in areas of high rainfall, where internal soil drainage is (too) good, or where chloride is not regularly applied. These deficiencies can cause wilting, often presenting stubby tips, leaf mottling and leaflet blade tip wilting with chlorosis. In cabbage, a deficiency is often marked by the absence of odor.

THE AGRI-CAL ADVANTAGE

- ☑ **Agri-Cal® is a source of chelated calcium with a guaranteed analysis of 10% calcium.** Unlike many other calcium sources, a chelated calcium will not become readily tied up with other minerals in the soil, but will remain available.
- ☑ Agri-Cal® is totally and **immediately** available to growing plants.
- ☑ Agri-Cal® is **100%** water soluble and does not have to go through biological breakdown.
- ☑ Agri-Cal® will show **first season results** instead of waiting six to twelve months for dry lime to begin working.
- ☑ Agri-Cal® aids in the breakdown of insoluble or “trapped” calcium which is already in the soil, converting it into an available form the crops can utilize. **The increase in available calcium improves the availability and uptake of other important crop nutrients** as well as making it easier to work with the soil through improved tilth. This also allows for better soil aeration and water movement.

The need for calcium is universal within the plant and animal world. Regardless of the crop you are producing, if the calcium base saturation percentage is below your soil type's optimum level, then you will benefit from adding Agri-Cal® to this year's crop and crops to come.



APPLYING AGRI-CAL®

Agri-Cal® liquid calcium can be applied with standard sprayer equipment. No special nozzles or handling equipment is required. It can be adapted to a variety of farming systems and herbicide applications eliminating those extra trips across the field.

One of the most beneficial ways of applying the product also saves on nitrogen costs. When Agri-Cal® is added to liquid nitrogen a stabilizing effect occurs. Many growers have been able to reduce their nitrogen rates substantially while still seeing a boost in yields.

Agri-Cal® can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Agri-Cal® can be tank mixed with most soil applied herbicides and liquid fertilizer solutions that do not contain phosphorus. No extra trips across the field are generally needed. **Always do a jar test to ensure compatibility.**

IMPORTANT

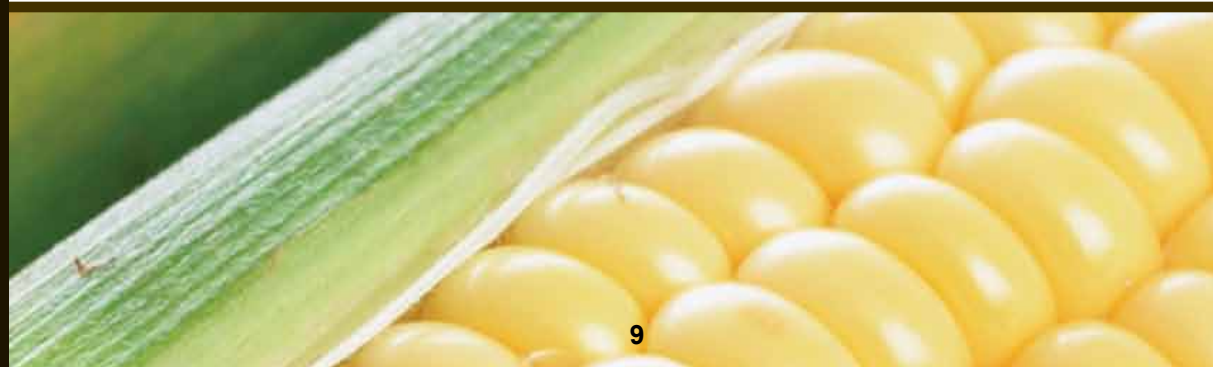
To avoid the formation of insoluble precipitates, do **NOT** mix with materials containing Phosphates or Sulfates. Do **NOT** mix with any Round-Up® type herbicides (Glyphosate based).

General Recommendations

Soil: 2-5 gallons per acre

Foliar: 1-3 gallons per acre

Liquid Nitrogen Solutions: Agri-Cal® should be used at 2-5 gallons per acre with all Liquid N applications.



RESEARCH RESULTS



CORN RESULTS

+31.6
BUSHELS / ACRE
AVERAGE INCREASE IN CORN

By applying three gallons of Agri-Cal® per acre behind the planter, dry land corn yields increased by an average 31.6 BPA (bushels per acre).

Research by Crop Production Services, Illinois

SMALL GRAINS

The addition of calcium with nitrogen to small grains resulted in an increase of:

- ✓ Nitrogen absorption
- ✓ Grain yield
- ✓ Tiller foundation
- ✓ Dry matter
- ✓ Grain weight per unit of dry matter



Research by Texas A&M University, L.B. Fenn



COTTON RESULTS

+93.0
POUNDS / ACRE
AVERAGE INCREASE IN COTTON

By applying three gallons of Agri-Cal® per acre behind the planter, cotton yields increased by an average 93 lbs of lint per acre.

Research by University of Missouri

For more information on additional products by
Agri-Gro Marketing, Inc., please visit www.agrigro.com.

For more information, contact your local distributor:



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