

AGLIME: Why Quality Counts



AGLIME is used to neutralize soil acidity, reduce certain toxicities, increase fertilizer efficiency, and improve soil physical and biological conditions.

Aglime quality depends on three factors:

- Chemical reactivity, purity and neutralizing value.
- Particle size or fineness of grind.
- Moisture content.

Purity or Neutralizing Value

Neutralizing value defines aglime purity and is given as a percentage of calcium carbonate (CaCO_3) equivalent, CCE, when pure CaCO_3 is set at 100 percent. **Table 1** gives the CCE for several common aglime materials.

Table 1. Acid neutralizing values for aglime materials.

Aglime material	Calcium carbonate equivalent, %
Calcium carbonate	100
Calcitic limestone	85 to 100
Dolomitic limestone	95 to 108
Marl (Selma chalk)	50 to 90
Calcium hydroxide (slaked lime)	120 to 135
Calcium oxide (burnt or quick lime)	150 to 175
Calium silicate	86
Basic slag	50 to 70
Ground oyster shells	90 to 100
Cement kiln dusts	40 to 100
Wood ashes	40 to 50
Power plant ashes	25 to 50
Gypsum (land plaster)	none
By-products	variable

Particle Size or Fineness

Smaller aglime particles have greater surface area to contact and react soil particles, as shown in **Figure 1**.

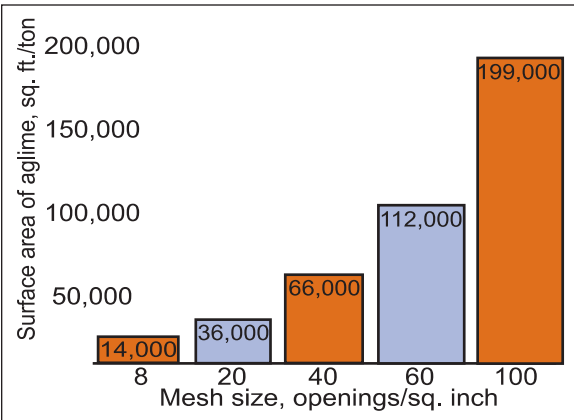


Figure 1. Aglime is not very soluble in water, so it must be finely ground to effectively neutralize soil acidity.

Fineness of grind is determined by sieving aglime through a series of screens. The higher the screen mesh number, the smaller the opening. For example, openings in a 10 mesh screen are larger than those in a 50 mesh screen.

Table 2 compares how rapidly aglime particles of different sizes dissolve. Particle sizes 10 mesh and larger are of little value as a liming material.

Table 2. Effectiveness of different size lime particles.

Particle size	Dissolved in three years
Larger than 10 mesh	Less than 15 percent
10 to 50 mesh	50 percent or less
Smaller than 50 mesh	90 percent

Figure 2 shows that particle size affects both rate of reaction and acidity neutralized.

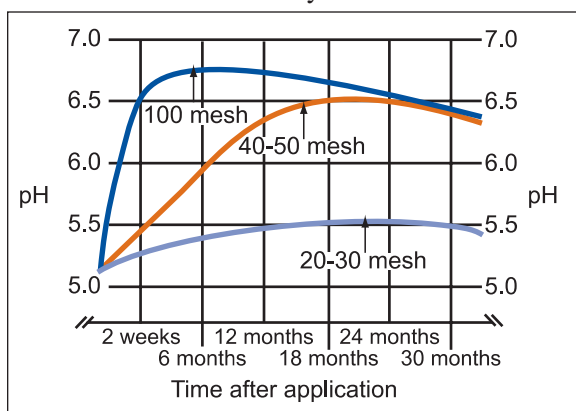


Figure 2. Reaction time and duration of activity depend upon particle size of aglime. Smaller particles react quickly, but do not last as long as larger particles. A mixture of fine and larger particles is optimum to give a rapid and sustained reaction.

Moisture Content

Moisture content is important because water replaces an equivalent weight of aglime. The more water, the lower the content of reactive

material per ton of product. For example, if an aglime had a CCE of 90 percent and a moisture content of 10 percent, then the CCE would be 81 percent $[90 - (0.1 \times 90) = 81]$, compared to a moisture-free material.

Know What You Buy

Buy aglime materials that meet specifications included in the state law or regulation that governs aglime materials. This will insure that the aglime will have a high CCE and a mixture of particle sizes to produce a rapid reaction with the soil acidity and extend this reaction over a 3- to 5-year period. Note: Not all states or provinces regulate all components of aglime quality.

Technical information in this publication prepared by agronomic scientists of the Potash & Phosphate Institute (PPI).

For more information about aglime for profitable crop production, check ***Aglime Facts***, a 16-page booklet available from the National Stone Association.

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