

(if equally fine-ground) but the farmer needs a much greater quantity and as a result may actually pay more for the same result. Mg-limestones have a higher CCE but they react slower in soils and are harder to crush to desired fineness.

b. FINENESS RATING

Fineness of the liming material will greatly modify its chemical effect. This can be checked by sieving the material through a range of screens. To be really effective all limestone material should pass the 100-mesh sieve. In practice, ground limestone is considered "fine" and of good quality if all of it passes a 10-mesh sieve, and 50 percent passes the 100-mesh sieve. However, in calculating limestone effectiveness, it is usually assumed that all material smaller than 60-mesh is considered 100 percent effective. Limestone with a high neutralizing power can only be effective if it is finely ground, so these two factors should be considered together. Also, dolomitic limestone reacts somewhat more slowly than calcitic and needs to be ground finer to give the same effect on soil acidity in a given time. State Departments of Agriculture have set standards or fineness guarantees for agricultural limestones, which vary among states. ASCS in a large number of states specifies for standard ground limestone that 40 or 50 percent must pass the 100-mesh sieve. In West Virginia, more than 95 percent must pass the 20-mesh sieve, 50 percent the 60-mesh, and 40 percent the 100-mesh sieve. The efficiency rating (ER) for standard ground limestone in West Virginia would be calculated as follows:

50% passing 60-mesh sieve (100% effective)	50% x 100 = 50
40% passing 20-mesh but not 60-mesh (40% effective)	45% x 40 = 18
5% larger than 20-mesh (no significant effect)	10% x 0 = 0
	<u>ER = 68</u>

A farmer would require 1.5 tons of this limestone grade to get the same result as 1 ton of the same material with effectiveness rating of 100 (100% passing 60-mesh sieve).

West Virginia regulations also recognize "pulverized limestone" which must have 100% passing 20-mesh and 70% passing 100-mesh. And "coarse ground limestone" which has 90% passing 10-mesh and 40% passing 60-mesh. The efficiency rating of pulverized limestone is at least 70, while ER for coarse ground lime is no higher than 55.

The two main criteria for grading agricultural limestones can be combined in a common quality score called ENV (effective neutralizing value) by multiplying calcium carbonate equivalent (CCE) and the efficiency rating (ER). The minimum score for standard limestone in West Virginia would thus rate (CCE = 85) X (ER = 68%) = 58 ENV. There is justification to press for higher minimum standards of agricultural limestones so that vendors and buyers are guaranteed a better product of which a smaller quantity is needed to do a given job in a shorter period of time. A desirable minimum standard would be a material with a CCE of 90% and an efficiency rating (ER) calculated as follows: