



A Rock Dust Primer

Remineralize  the Earth

What type of rock dust is best?

Feeding poor soil with mixed rock dust may be compared to feeding an ill person a varied diet of unrefined, natural food. If no one single food is a panacea, it might follow that no single rock type is “ideal.” Indeed, the virtue of glacial gravel is said to lie in its broad spectrum of rock types. The late John Hamaker advocated the use of glacial gravel dust, ideally followed by river and seashore gravels and mixtures of single rock types.



In the book *The Survival of Civilization*, John Hamaker suggests finely-ground glacial gravel because that is nature’s way throughout millennia to create fertile soils. Glacial gravel, which is a natural mixture of rocks, will create a broad spectrum of minerals in the soil in a natural balance.

Much of value can also be gleaned from Europe and the research and experiences there where single rock types and combinations of single rock types such as basalt are used.

Hamaker asserts that “Micro-organisms select what they need to make the compounds of life, and reject to the subsoil what is not needed, [such as] aluminum, silicon, iron, etc., which are generally in excess [in gravel dust],” further pointing to “the Kervran research on biological transmutations”, which suggests that biological organisms may play an active role not only in selecting specific elements, but also in modulating their elemental nature to create needed materials where they are in short supply. Hamaker says “As long as the soil is neutral [in pH] or close to it, microorganisms will control what goes into the plant roots. These controls are off when the soil is acid or acidic chemicals are added.”

Composting with rock dust

Combining gravel dust with organic materials in compost is a great way to solve application problems and speed up the process. Don't forget a handful of soil to inoculate with organisms. Gravel dust improves aeration and structure and therefore prevents rotting. Gravel dust is assimilated even more quickly in compost than in poor soils.

Compost and gravel dust are a symbiotic combination: the compost provides an excellent medium for the "microorganism population explosion" promoted by the dust, and the gravel dust will not only help create more organic matter, but will also help hold it in place, reduce odors and conserve it.

Add 2-20 lb. of rock dust per cubic yard of compost, if one is doing pile or windrow composting.

Soil pH should be measured annually. If the soil is acidic, agricultural limestone may be added together with the rock dust to bring the soil pH to neutral. Gravel dust will also neutralize soils to a great degree, but limestone is a quick remedy for agricultural soils. Limestone is not recommended for forests as it will destroy the humus-building complex in the long term.



Keep insects in natural balance in your garden

For short-term rescue, very fine dust sprayed directly on plants and trees has been shown in research in Germany to deter insect infestations very effectively. Trails of rock dust around the garden help keep slugs out. And healthy remineralized plants will not be plagued by insect infestations in the future as they become healthier and more insect resistant.

How to apply gravel dust?

There are many ways to apply dust to the soil; which method you use depends on the scale and your preference. It can be spread by hand out of a wheelbarrow using a shovel, or roto-tilled and disked in. You can use a wet agricultural lime spreader. If equipment is available that contains an agitator (to maintain particles in a suspended state), a wet spray can be used.

Organic farmer John Sundquist in Oregon applies it with a manure spreader, bander or an “E-Z Flow” type fertilizer applicator. He also uses rock dust in a potting soil made of compost, ashes and peat moss.

How much to use?

A grower of crops or a gardener needs a good response the first year after a fall application. The response in any one year depends on the amount of minerals available to the microorganisms, soil moisture and the amount of inert organic matter.

If the last two factors are satisfactory, as little as 3 tons of gravel dust per acre worked into the top 4 inches of soil should give good results.

However, I prefer about 10 tons per acre worked in about 8 inches, since one application will eliminate the cost of a number of more frequent applications and give high yields.

The Application Conversion Chart will help you to determine how much gravel dust to use: 3 tons/acre is considered the minimum application, 10 tons/acre is Hamaker's preferred long-term application, and 20 tons/acre is given as a major remedial application for especially dry, poor soil. Smaller amounts are recommended if the rock dust is finer than 200 mesh and larger amounts if much less fine than 200 mesh.

Approximate Application Rate Conversions

U.S.

3 tons/acre = 14 lb/100 sq. ft. = 1.25 lb/sq. yd.

10 tons/acre = 46 lb/100 sq. ft. = 4 lb/sq. yd.

20 tons/acre = 92 lb/sq. ft. = 8 lb/sq. yd.

INTL (Metric)

7.5 tons/ha = 750 kg/1000 sq.m = 75 kg/100 sq.m = 750 grams/1 sq.m

25 tons/ha = 2.5 tons/1000 sq.m = 250 kg/100 sq.m = 2.5 kg/1 sq. m

50 tons/ha = 5 tons/1000 sq.m = 500 kg/100 sq.m = 5 kg/1 sq.m

Finding local sources of gravel dust

To find gravel-grinding operations in your area, call your local gravel pit (look in the Yellow Pages under “Cement-Wholesale”, or “Sand and Gravel”) and ask if they have crushed gravel screenings made from mixed rocks, the kind that comes out of river beds – crushed and passed through a 1/4 inch or finer screen.

The gravel dust will probably cost from \$1-\$8.00 per ton plus the cost of transportation if the gravel pit delivers it to your garden. As most of the cost is in transporting the rock dust, having a truck or access to one is an advantage. A cooperative initiative with friends and neighbors would also cut costs down.

The Particle Conversion Chart shows various categories of “soil separates” (ground particles) listed with their diameters in microns (thousandths of a mm.) and their corresponding screen mesh sizes. “Mesh” simply refers to a screen with a given number of holes per inch.

The more finely ground the rock, the more readily microorganisms will have access to the minerals. John Hamaker uses the term “gravel dust” to mean a dust “90% of which will pass through a 200-mesh screen.”

You can also contact your local state Aggregate Producers Association, your local county DPW (Department of Public Works), your state DOT (Department of Transportation) Materials Bureau and you can contact the National Aggregate Association (Tel: 1-800-622-1020).

Particle Conversion Chart

PARTICLE SIZE CONVERSION	PARTICLE SIZE CONVERSION	PARTICLE SIZE CONVERSION
Fine sand	250 – 100	50 – 125
Very fine sand	100 – 50	125 – 250
Silt	50 – 2	250 – 6000
Clay	2 or less	6000 or more

What does industry call the product?

It is referred to as pond settlings, rock dust, rock flour, classifier tailings, and minus #200 mesh. You should ask for minus #200 Mesh (-75 micron) material, pond settling, material that has gone over the weirs of a sand screw or the weir of a sand classification tank, or material obtained from the dust collection system. You should not use concrete sand, abrasive sand, filter sand, mason sand, blow sand (loess) screenings as they are too coarse.

What is the best material to use?

Glacial sand and gravel that contain a myriad or heterogeneous combination of various rock formation type or mineralogy is preferred.

Other metamorphic or igneous stone such as basalt, rhyolites, etc., are highly recommended. Most sedimentary rocks (limestone and dolomite) are used to balance pH and provide for calcium and magnesium deficiencies.

Testing your gravel dust

Several people have reported that gravel dust does not work or it will have [only] a temporary effect. They don't describe the dust in detail, but there may be very little dust in what they call 'dust.' Know what you are buying or you may be badly disappointed.

Here are three simple, quick tests you can perform at home:

POT TEST

A pot test will give you immediate, practical proof of what the product will do in the soil. It is a good idea to add the gravel dust to clay pots and plant radishes or other fast growing plants and observe their progress. As John Hamaker writes: "Doing a pot test is the most convincing argument I know of. Anybody can do it. There are testing laboratory grinders everywhere. There is no lag time. In 6 hours you can get a microorganism population explosion. Taking some 6" clay pots, I filled them with a 50-50 mixture of earth and peat and 3 heaped tablespoons of dust. The results were astonishing!"

You can compare different mixtures or samples of gravel dust depending on what's available in your area. Use a control without rock dust to compare as well. You can also begin with small plots in the garden. You can see the results of the gravel dust you've chosen and then add it in larger quantities to your garden. Work the gravel dust into the topsoil, if possible.

SEPARATE LAYER TEST

Purchasing a product based on its stated screen mesh alone still leaves room for error. A purchase of 90%, or even 100%, of minus #200 mesh screenings could contain only sand and silt, and no true dust. This test will tell you approximately how much of your “dust” is really dust and will be suspended in water.

Fill a clear glass half full with your sample and cover it with about two inches of water. Shake it up vigorously, then allow it to settle overnight. The dust, silt and sand will settle into three distinct layers with the dust at the top.

If the container is allowed to stand until the water has dried out, the dust [topmost] layer will shrink to about 1/3 the original measurement and give a more accurate percentage of the dust. Your first observation, however, will tell you if you are buying mostly sand. The coarser the grind, the less effective it will be in the soil, and the more you will need to use per acre.

MOISTURE TEST

If the material is bought by the yard, there is a probable increase in bulk when wet. The buyer needs to test so one can know the actual weight of dust one is applying to the land. Take a sample, weigh it, then dry it thoroughly in the oven [and re-weigh it]. This will tell you how much of the weight you are buying is moisture.

Chemical analysis

In some, but not all, situations, having a formal chemical analysis may not be necessary. A pot test and small-scale trials with fast-growing plants will give you more accurate information and with less expense. In cases where you have doubt about its source, you may wish to have a gravel dust analyzed to ensure that it is free of radioactive elements and toxic industrial by-products. In most cases your source will have already had to undergo such testing in order to get a license to operate. This is worth some homework. If you are not able to obtain documentation to your satisfaction, it might be wise to go ahead and obtain your own independent lab tests. Good testing labs are listed in Sources and Resources.

More tips from Hamaker

“One other thing might be useful. I put about 2 inches of sand on our garden before plowing. It will last a long time and give some yield after the dust is used up. I am sure it has been contributing to what we grow. Unscreened sand (preferably fine sand) from a local gravel pit is much more economical than shipping dust which is mostly silt and fine sand.

Sometimes the gravel pits have mesh screens and can measure the exact fineness of the gravel. Though it may be hard to find the ideal fineness – 90% passing through a minus #200-mesh screen – it may be practical to use even if only 20% or so passes through a minus #200-mesh screen and at least 50% passes through a #100-mesh screen. You will have the finer material immediately available to the soil and the rest will break down over time. If most of it passes through a minus #200-mesh screen, it will have a fine consistency like flour or cement. The gravel pit may have machinery to crush the rock finer and may crush it for you.”

Soil erosion is an effect of the shortage of minerals available to support the soil organisms. As Hamaker says, "That shortage can be made up on any piece of land in the time it takes to work ground gravel dust into the topsoil. When that is done, the soil microorganisms begin to multiply and it is they who prevent soil erosion by granulating the soil and holding it against both wind and rain."

For a more thorough understanding of SR, read *The Survival of Civilization* and order the Research Packets available through RTE, Inc.