

Bara Minerals

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The primary aim of Bara Mineraler is to develop and introduce inorganic products for plant production and landscape gardening. The company has its own production of clay granulate based on the specific clay occurring in the Bara region. Addition of clay granulate to horticultural peat means a considerable increase in its value. Most plant species grow better and get an improved quality in growth substrates with clay granulate from Bara Mineraler AB. There are, however, several mineral products other than clay which are of value for plant production. Within Bara Mineraler we are doing our utmost to provide Scandinavian growers with the most suitable qualities of pumice, perlite, and vermiculite. Furthermore, knowledge and equipment make it possible to develop a series of products for use in public environments as well as in home gardens. These include ornamental pebbles and other stone products for paths and plantations, anti-skid lightweight gravel ("Strävis"), and clay for waterproofing of ponds.

INTRODUCTION

Bara Mineraler produces clay granulate. The primary use is for mixing with peat for the production of plant growth substrates. There are also other applications, for example, as part of an additive to feedstuffs, as means for reduction of algal growth in lakes and ponds, for improvement of the water-retention capacity of sandy soils, and for waterproofing of ponds.

The clay is extracted from pits in the Bara Region, of Sweden. It is a geologically special plateau clay with a favourable mixture of clay minerals. Before extraction starts the topsoil layer is carefully removed and after the clay deposit has been exploited, the topsoil is brought back as a cover. The uncovered clay is loosened, air-dried, and transported to a storage area. During processing it is ground into small pieces, heated to a minimum of 80°C, and dried. The heating kills nematodes, viruses, and weed seeds. This heating procedure together with the favourable qualities of the clay has resulted in the approval of the product by RHP (Regeling Handelspotgronden, The Netherlands). After drying the clay the granules are sifted and sorted into two fractions: 0.1 to 2.0 mm and 2 to 6 mm; both fractions can be mixed and are mixed with peat. After mixing with peat even the smallest fractions remain in the pots and are never washed out of the containers on to the tables or to watering systems.

Tests with equal amounts per volume of the two dry clay fractions have shown that the fine fraction becomes moist faster than mixtures with coarser clay fractions.

The Bara Mineraler clay granulates contain silica (silicon). Cucumbers and roses grow better in substrates with 0.6 or 0.75 mmol silica liter⁻¹. Tests have shown that access to silica gives plants improved resistance against attacks by plant pathogens and vermin.

ARGUMENTS FOR ADDING CLAY TO PEAT

- Pot plants, both big and small, have a lower centre of gravity, which means better stability; they do not overturn so easily, an important fact during production as well as sales.
- Plants grown in peat mixed with clay have a better quality with respect to colour, shape, and keeping qualities.
- Watering is easier. The clay absorbs water and transfers it to peat and roots. After drying the clay immediately absorbs added water. Without clay it takes longer to get dry peat resaturated with water.
- The wilting point is not as distinct as in pure peat. During desiccation a plant's water absorption from a clay-peat mixture starts to slow earlier than from the pure peat. This results in a more gradual transition to wilting.
- The addition of clay gives more compact plants. The reduced access to water is a safe method to produce compact plants. Pure peat is not suited for this type of plant shape adjustment because the limit between access to and shortage of water is very sharp. Addition of clay makes it possible to govern the retardation in a much safer way.
- The clay slows the release of nutrients. Thanks to the ion-exchange capacity of clay colloids, added cations (positive ions) will be adsorbed to the clay granulates. This reduces the risk of leaching as well as root killing caused by high nutrient levels. It is, therefore, to some extent possible to raise the total concentration of nutrients which, in its turn, makes it easier to get compact plants.
- The clay content of a peat mixture stabilises the pH, which is favourable for a more balanced uptake of nutrients.

HOW MUCH CLAY IS NEEDED?

There is no simple answer to this question. It depends on the kind of plant (Table 1), on the cultivation method applied, and on the aim of the cultivation. Experiences collected from practical growing show that the following additions of the clay granulate fraction 2 to 6 mm results in advantages and quality improvements, which correspond to the expectations of the grower.

WHICH IS THE BEST GRANULATE FRACTION?

Both fractions have the same effect. The distances between the granules and the surface of the roots are of importance for the uptake of water and nutrients. The shorter the distance, the bigger the effect. When adding the same amount of clay, the smaller fraction is more effective which has also been confirmed in Dutch tests.

Table 1. Amount of clay granulate fraction 2 to 6 mm added per cubic meter of peat showing quality improvements in plant growth.

Kind of plant	Clay granulate (kg)
<i>Begonia</i>	50
<i>Campanula</i>	70
Poinsettia (<i>Euphorbia pulcherrima</i>)	50
Pot mums (<i>Dendranthemum</i>)	70
Pot roses (<i>Rosa</i>)	70
<i>Pelargonium</i>	100
Perennials	70
Pansy (<i>Viola</i> hybrids)	50
Nursery plants	70
<i>Primula</i>	100

SILICA

It is a common opinion among substrate researchers that silica improves a plant's defense against pathogens and, furthermore, results in a more stable growth. Bara Minerale clay granulate when mixed with peat increases the accessible silica content 15 to 20 times (Table 2).

Table 2. Availability of silica after mixing Bara Minerale clay with peat.

Growth substrate	Silica (mmol liter ⁻¹)	pH
100% peat	0.03	3.8
90% peat +10% Bara Minerale clay granulate	0.50	5.0
90% peat +10% Bara clay granulate, after 3 weeks	0.58	4.9
90% peat + lime+ 10% Bara clay granules, after 3 weeks	0.42	6.0