

## Burnt earth for potted plants

Burnt earth, an old horticultural innovation for improving the properties of tropical clayey soil, is still relevant today.

By F.S.P. Ng

**S**oil in most parts of Malaysia is very high in clay content. Clay particles are extremely fine, much finer than fine sand. In wet weather, it absorbs and holds a lot of water, becoming plastic, stiff and sticky, forming clods and clogging up digging machinery and tools. Wet clay retards the free movement of water, starves the roots of the dissolved oxygen that is carried by fresh water, and impedes root



The production site



Loading the product for distribution

penetration. Wet clay is slippery and difficult to walk or drive on. In dry weather, clay hardens, shrinks and cracks, further damaging the roots. Vegetable farmers on clay soil have to break up the soil and pile it up into raised planting beds to improve drainage. This is done before planting a new crop.

Plants grown in clay soil in containers often react by



Waste wood to be used of fuel



The soil profile



Natural vegetation of wild bananas



Blocks of earth stacked on top of waste wood in a pyre

root proliferation at the sides and bottom of the container, avoiding the clay mass in the interior. Much of the mass of clay soil in a container is thereby under-utilised.

Native clay soil can be dramatically improved by burning. The process was first described in 1953 by R.E. Holttum, former Director of the Botanic Gardens Singapore. "The Chinese gardeners in

Malaya have developed a method of using burnt earth in pot culture which is very efficient, and we therefore attempt to give the essentials of the method here... Earth for burning should be on the heavy (clayey) side... The earth is broken up into fairly large pieces, and piled up on the top of some old wood... into a heap some four feet high and six feet or more across. A cover to keep off the rain is necessary. The stacking of



A pyre ready for burning



Burning in progress

the pile is of course a matter requiring skill. It must allow just enough circulation of air to keep a slow fire burning. The fire is allowed to burn for about two days or sometimes more. When the operation is finished, the earth is changed from its original condition of clay to a porous granular state. It will consist of a fair proportion of large pieces, which should not be broken up too small, grading down to dust. The dust

is not good for plants that require a particularly well aerated soil, and can be removed if necessary by a fine sieve.”

**“The essential qualities of burnt earth are that it will absorb water without becoming sticky, that the lumps do not readily break down when the soil is watered; and that it is sterilized, all pests and harmful micro-organisms being destroyed.”**

Holttum continues, “It might be thought that sand could be used just as well as burnt earth, but this is not so. Each grain of sand is quite impervious to water and the amount of water it will hold on its surface is very small. But a piece of burnt earth is like a sponge. It holds a considerable amount of water, and can give this up again slowly, maintaining a moist atmosphere in the soil for some time... There comes a time, however, when the burnt earth

loses its fresh condition. It is always desirable to repot with fresh burnt earth, not to use the old potting soil again; but such old soil may be very useful to lighten the earth in flower beds...”

The burnt earth of Holttum’s time is still being made and sold on a commercial basis in various parts of Malaysia using the same method as he described. In Sungei Buloh, just north of Kuala Lumpur, a producer operates several pyres in



After the burn, the burnt earth is sieved



Burnt earth packed in plastic bags

which waste wood from construction sites is stacked to about 18 inches high, to be set on fire. Air enters the wood pile by inlet pipes placed among the pieces of wood. Blocks of earth are

cut out skilfully from an exposed hill side with a spade and arranged on top of the wooden pile to form a stack several feet thick. Corrugated iron sheets form the roof of the pyre, to keep out rain. The fire is then lit and allowed to burn until all the wood is consumed in a couple of days. As the lumps of earth are heated up, they break up into small irregular-sized pieces.

After the burnt earth has cooled down, the larger pieces are sieved out and broken up manually. The burnt earth is then packed into plastic bags, each holding 5 or 6 kg, to be taken out by truck to the retail centres. Each bag is currently sold for about RM1.50 per bag. There is no label. You know it has been properly burnt if, when watered, the particles remain granular. If it has not been burnt, the particles will break down and turn into a muddy paste. Burnt earth may be used pure as a general-purpose soil medium or mixed with compost, charcoal (biochar), perlite or other ingredients. When used pure, the

burnt earth tends to lose its properties after about one year and become sticky clay again. Mixing with compost, charcoal, or perlite will help to keep it open and granular for many years. Such mixing is easily done with burnt earth but very difficult with unburnt earth.

### Bibliography

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