CELLOTHERM "BOTTOM HEAT"

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The concept of generating heat with electric power by the device known as Cellotherm was discovered by accident. It is said to have grown out of an attempt to formulate a ski wax. Somewhere along in the preparation of the ski coating, it was discovered that when an electric current travels across a film of colloidal silica and graphite, heat is generated.

To put this principle to practical use, the graphite-colloidal silica film is made up as a sandwich. The graphite-silicia is the meat and the asbestos, two thin layers, is the bread. If the sandwich is to come in contact with moisture it must be made water tight. Laminated plastic films accomplishes this. The electric power is introduced into the sheet by the way of two embedded copper electroides along the edges of the sheet. In September, 1965, the manufacturers' field man contacted us regarding Cellotherm's possible application in hotbed heating. Out of this contact our trials developed with greenhouse propagation.

The tests consisted of duplicate open and plastic enclosed benches. The lead coated electric cable was used in all the tests as a comparator for the Cellotherm. The bottom heat was controlled by thermostat, set at 72 degrees.

The media for narrow leaved evergreens, Taxus and Juniperus, were sand and sand/perlite mix. The media for broad-leaved evergreens, Ilex and Rhododendron, were peat and peat/perlite mix.

The Ilex and Rhododendron were wounded, hormone treated and either inserted in mass media or the medium in #3″ square plastic pots.

The narrow leaved evergreens were hormone powder treated but not wounded.

The tests were made in a 55-60 degree house with no hot water coils under the benches. The open bench trials with narrow leaved evergrees presented no heat-dry out problem. The rooting percentages were excellent with both bottom heat systems.

In the enclosed plastic case heated by cable we had trouble with excess heat. The excess heat did not develop in the Cellotherm. Rooting of cuttings was excellent in both sources of heat but high temperture caused excessive plant loss. The plant loss with the enclosed case, cable heat, might have been prevented if the micro-hydrologic cycle within the case could have been favorably cotrolled.

Our conclusions based on one test are —

1. Cellotherm appears to be a perfect source of heat for bottom heat
2. Lead coated electric heating cable may cause excessive heat

3. Cellotherm may be used in ground or raised beds
4. Power consumption is 2.7 less with Cellotherm than with electric cable

CHIKO HARAMAKI: Next, we have something special, a symposium on unusual techniques. Our leader will be Mr. Ray Halward.

UNUSUAL TECHNIQUES

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Through the years at these meetings, many and varied techniques have been explained by fellow propagators. Many of us returned home full of ideas how we were going to adapt these innovations to our own particular propagating facilities.

Let us briefly review some of the earlier techniques that inspired many of us to change our old ways for new. In 1953 *The Phytotektor Method of Rooting Cuttings* by Harvey Templeton explained the rooting of cuttings in soil using mist controlled by a humidostat and timer. He related at that time that the techique was an attempted union of the English sunframe and new mist humidification. An idea he obtained from an article he had read on mist, by James Wells.

A Simple and Inexpensive Time Clock for Regulating Mist in Plant Propagation Procedures by Charles Hess and William Snyder was the title of a paper that aroused a great deal of interest in electrical and mechanical controls in mist propagation.

In contrast to these techniques, Leslie Hancock described the rooting of cuttings in soil in raised beds under burlap, supplying the necessary moisture manually.

In 1954 Vincent Bailey explained their propagating facilities and the use of the Binks system of humidity control for propagating softwood and coniferous cuttings. Excellent results were obtained by varying the percentage of humidity from 90 to 70 during the rooting period.

From these and other similar systems many techniques have been developed. The system I use is a good example. I started using mist in 1956 and at that time various electronic leaf controls were in use. Being undecided which one to use I began experimenting with different materials for a leaf control in conjunction with a Humidomist controller. More by chance than deliberation I tried Bee's wings suspended between two carbons from flashlight batteries. These were inserted through a piece of plastic and wired to the controller. This is used under a double layer of plastic. It has provided excellent control for intermittent misting and the wings last all season.

Last winter I heard about an unusual technique. The