The answers reflect local requirements. A winter storage structure should accomplish the following:

1. Raise the soil and air temperature.
2. Maintain high humidity.
3. Prevent sudden fluctuations in temperature, probably by use of shade.
4. Enough light should be provided to prevent defoliation.
5. Should not encourage early growth.

If these items and a few others are dealt with properly, healthy live plants will result.

As mentioned in the beginning this is the first requirement for making storing inexpensive.

Efficient handling of the material, and speed in completing the storage operation in the limited time between dormancy and freeze-up are also important.

Only after the foregoing items are taken care of, can the actual cost of material used in the structure be considered. This in itself is complicated by whether depreciation or obsolescence occurs first.

A good way to reduce costs is to get more than one use from the material. We are using the old poly for weed control and packing. The snow fence can be used for conventional shade.

If we change our minds, we may bend the pipe into arches to make some of Harvey Templeton's 13 foot wide houses and the concrete blocks can be used for permanent frames. However, we have not yet decided to go into the paving business with the old reinforcing mesh! In closing, I would like to suggest that the need for additional information is endless. All the tolerances of all the varieties of plants should be known. A comprehensive review of the availability and use of new material needs to be made every few years.

Presently we are preparing for severe winters.
Will these preparations be detrimental in a mild winter?

MODERATOR HOULIHAN: Thank you very much, Zo, for a very informative paper. Our final speaker of the morning is Mr. Ray Halward, Royal Botanical Gardens, Hamilton, Ontario, Canada.

LEAF-BUD CUTTING TRIALS 1963

RAY E. HALWARD
Royal Botanical Gardens
Hamilton, Canada

It was pointed out in a brief summary in the March issue of the Plant Propagator under the heading "Field Trials for 1963," that some plants had been propagated successfully using the leaf-bud cutting technique. It was hoped that the field trials this year would add to the knowledge already available.

In answer to the request for participants I received two replies, one from Paul E. Case of Pleasant Grove Nursery, Peach

Bottom, Pennsylvania. The other Robert L. Ticknor, Associate Professor of Horticulture, Oregon State University.

Paul Case reported the following: the cuttings were stuck in a greenhouse bed with a depth of 5 inches of sharp, washed sand. A heat cable maintained a temperature of 72° - 75° F. The cuttings were under a tent of plastic supported 10 inches above the sand by a wire frame. A 50 percent slat shade plus the usual whitewash shading covered the glass. The greenhouse temperature was generally under 75° with a night temperature 10° lower. The cuttings were watered heavily when stuck then checked every 7 - 10 days and watered at each inspection. The cuttings were dipped in 'Panodrench' prior to the 'Hormodin I Power.' The cuttings were again sprinkled with Panodrench after being stuck.

The following results were recorded:

Leaf-bud cuttings made 7/10/63 - 7/30/63

Date Stuck	Name of Plant	No	No Rooted	Remarks
July 10	*Magnolia stellata* 'Royal Star'	100	86	Date removed 8/30/63
	Prunus subhirtella pendula	100	0	
	Prunus persica (Amygdalus)	100	0	few callused
	Pieris axillaris	25	0	
	Oxydendrum arboreum	100	0	few callused
	Hydrangea petiolaris	25	0	
	Ginkgo biloba	100	0	few callused
	Syringa persica	100	0	few callused

All not rooted by 9/30/63 were discarded.

The experience gained this summer led Paul Case to draw a few conclusions:

(1) Leaf-bud cuttings were top heavy and time spent adjusting them was not justified according to the results obtained.

(2) The resulting plant from a leaf-bud cuttings is about one year behind a stem cutting.

The following is the report of Robert L. Ticknor — the cuttings were taken on June 28, 1963 and all were treated with Hormodin #3. Fifty cuttings of each species were inserted in perlite and in peat perlite.

Species	No rooted Perlite	Peat Perlite
Acer rubrum	3	6
Acer saccharum	18	2
Cercis silquastrum	0	0
Clerodendron trichotomum	18	11
Gleditsia triachanthus	4	0
Liquidambar stryraciflua	13	25
Platanus acerifolium	19	14
Quercus borealis	0	0
Quercus palustris	0	0

The plants were removed from the bench on September 23, 1963 with the following exceptions — 11 *Clerodendron* from peat perlite, 17 *Clerodendron* from perlite, and 15 *Platanus* which were removed on 7/31/63. Of the 15 *Platanus* cuttings removed on 7/31/63 only two appear alive at present.

It is questionable whether the maple cuttings will be alive in the spring but the sweet gum look like they will be alive. The *Clereodendrons* have shoots 4-8″ tall so will probably survive. All cuttings came from young four to five year old trees.

The leaf-bud trials at the Royal Botanical Gardens were carried out in a closed intermittent mist bed with cuttings stuck in boxes in a 3-sand 1-peat mixture. The results were very poor. 50 cuttings of each of the following were tried, half of them were treated with Seradix #1, and half no treatment.

Date Stuck	Name of Plant	No. rooted Seradix #1	No. rooted No treatment	Remarks
June 10	*Syringa 'Frank Patterson'*	2	3	
21	*Prunus avium*	0	0	Leaves dropped
July 4	*Liquidambar stryaciflua*	0	0	some callused
4	*Sorbus hybrida*	0	0	some callused
9	*Quercuh macrocarpa*	0	0	leaves rotted
9	*Quercus coccinea*	0	0	Some leaves stayed green until October some callused
9	*Quercus imbricaria*	0	0	
9	*Tilia cordata*	0	0	some callused
9	*Fagus sylvatica*	0	0	leaves rotted
17	*Magnolia acuminata*	0	0	leaves rotted
17	*Cercis canadensis alba*	0	0	

I am indeed indebted to Paul E. Case and Robert L. Ticknor for their time and effort contributed to the Field Trials 1963.

MODERATOR HOULIHAN: Thank you very much, Ray. Are there any questions?

VOICE: Mr. Warner, have you tried any white polyethylence for winter protection?

MR. WARNER: No, we have not. However, we are interested in any polyethylene which has a percentage of reflecting or shading material.

MR. JIM WELLS: Zo, when do you begin to remove the winter protection?

MR. WARNER: In the case of saleable material, when somebody comes to get it. For the other plants, in our particular part of the country, from the 1st of March to the end of April, depending upon the season.

MR. PAUL BOSLEYS As to uncovering, we usually wait until there is a general warming trend. We then open one side

of the beds, the side away from the prevailing wind. This still gives quite a bit of protection. We are trying, this year, the white plastic made by the Dow Chemical Co. At present we do not know what the cost will be.

MR. ED DAVIS: We were curious about the amount of heat which would build up under a frame covered with white polyethylene. The temperature under the plastic was often 1 or 2 degrees cooler than in the shade on the north side of a building. We feel that this will help in decreasing the large amount of fluctuation of temperature you normally experience under clear polyethylene.

MR. WARNER: We are going to try spraying clear plastic with aluminum paint, putting it on heavier at the top of the quonset frame and tapering off at the side. In this way we will cut down on direct sunlight. but allow indirect light at the sides.

MR. GERRY VERKADE: Did the 5 gallon containers which were laid on their side receive any moisture?

MR. WARNER: No, but it is very important that a porous medium which holds a lot of moisture be used. After the plants are laid down, it is important to get the cover on right away, before any moisture is lost.

MR. LESLIE HANCOCK: Our experience with a plastic house was that there was little difference in the low temperatures. If it was 0° F. outside it would be 5 to 10° F. inside, but usually no warmer. But during the day, when the sun was out, the temperature shot way above the outside temperatures. We then covered the house with reed mats to get a better balance between light and temperature. The reed mats cut the light to about ⅓ full light and the temperatures were much more reasonable and we carried the crop through the winter.