



**Buffer Zone
Copperblock Nursery : Harvest**

INTRODUCTION

Seedling harvest from a Copperblock Buffer Zone Nursery can be conducted as a “hot lift” to meet demand. Conditions in the container will not dictate harvest timing – in the Southeast USA.

The traditional planting season can be extended with Copperblock tray seedlings so there are good reasons not to overlap with the bareroot lift – e.g. to utilize the same harvest and packing building and the same labor force.

Copperblock loblolly can be dispatched in the container (sold as “bench-run”) with the Copperblock tray returned but this system is seldom used due to logistics.

The system common to bareroot nurseries is superior – i.e. extraction of seedlings, visual grading, packing and shipment.

EXTRACTION



CUSTOM BUILT TRAILERS FOR MOVING COPPERBLOCKS TRAYS ON CUSTOM PALLET

Copperblock Trays are first moved from the growing area to the harvest building – where conditions for high productivity can be provided.

STARTUP **Plug moisture** – dry plugs will not extract easily – and the seedling requires plug soil moisture for roots to grow to reach the field soil moisture after planting. Avoid wet foliage at harvest – this can promote *Botrytis spp.* mold in storage.

Manual extraction – is suitable for small operations and for irregular seedlots in larger operations. This is both an arduous task and a skilled task – the individual pulls the seedlings from the Copperblock tray, visually grades and wraps a bundle of plants.

**Productivity
= ~700
Copperblock
trays/worker/hr**

Workers should be rotated to avoid personal injury (e.g. carpal tunnel syndrome) – though use of a Plug Popper will loosen plugs before pulling.

A modular manual harvest line can utilize much of the bareroot handling equipment – and remain portable to not obstruct bareroot operations.



MANUAL EXTRACTION STATION (PULL & WRAP)

ENDUP

Machine extraction – automatic popping (pushing) of plugs will raise productivity 50% and eliminate repetitive action injuries. The machine operator conducts primary grading (which may be sufficient), followed by a wrapper, with two wrappers supplying one packer. The team can be as small as 3 (inside workers).



VISUAL GRADING

Shoots – of Copperblock loblolly seedlings are graded the same as bareroot seedlings – to the specification selected.

Roots – of Copperblock seedlings are not the same as roots of non-copper treated containers:

- there is no cage of roots running down the outside of the plug.
- growing medium is easily brushed off the surface of the plug.
- the root plug will not be solid.
- there is no knot of roots ending at the drainhole.

But – the root plug should:

- have roots to the drainhole
- show live root tips throughout the plug
- retain most of the growing medium



**COPPERBLOCK LOBLOLLY (LEFT),
NON-COPPER LOBLOLLY (RIGHT)**

PACKING

Copperblock loblolly seedlings are tallied in bundles after grading. The bundles are a convenient size for a worker to hold with two hands around the rootplugs.

Hot-lift for machine planting :

The bundles of seedlings can be placed, unwrapped, standing upright in a waxed box of appropriate dimensions.



Hot lift for manual planting :

The rootplug bundle is stretch-wrapped (using a modified meat wrapper) – the wrapped bundles are placed standing upright in a waxed box of appropriate dimensions.

STORAGE

Cool storage of Copperblock loblolly seedlings is required if the harvest is a week or more ahead of planting. Seedlings can be held in coolers or refrigerated vans at 40° to 70°F

(4° to 21°C) for a week. Non-dormant seedlings (tops and roots) will continue to respire and consume available oxygen.

Plug	Bundle size
310	15
410	10
415	10
512	6
615	3

Stretch-wrapped bundles are open top and bottom, and can be watered on site.

Copperblock loblolly seedlings can be held, under shade, for a week at the planting site – if the boxes are opened (within one day of arrival) and the plugs are kept moist.

Long term storage should be avoided as it requires close attention to seedling physiological condition and storage conditions. The reasons for long term storage of bareroot seedlings do not directly apply to Copperblock loblolly seedlings – unless the Buffer Zone Nursery location is prone to extended freezes.



**SEEDLING WAXED BOX
– NO STAPLES**

Boxes require a plastic liner for long term storage and bundles can be laid flat. The temperature of the seedlings must be reduced to:

	Period	Temperature
Cooler storage	2 - 8 WKS	33 - 36°F
Freezer storage	> 8 WKS	25 - 30°F

Frozen seedlings must be thawed (± 50°F) before planting.

BLOCK WASHING

Immediately after harvest the Copperblock trays should be cleaned (see Tech.Bull."Containers").

The objective is:

- to remove remaining growing medium while wet – to facilitate the next filling.
- to remove sources of disease contamination for the next crop.
- to prepare for pasteurization.



LAMINAR FILTER – PERMITS WATER REUSE IN BLOCKWASHING.