THE USE OF PREFORMED PAPER MILK CARTONS FOR CONTAINERIZED BLACK WALNUT SEEDLINGS, GRAFTS, AND ROOTED CUTTINGS 1/

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Abstract .--The use of preformed milk cartons for propagation, transportation, and field planting of black walnut has increased field survival of seedlings, grafts, and rooted cuttings.

The first planting of walnuts in the seed and clone orchard near Milford, Kansas (1969), consisted of bareroot seedlings for future topworking, grafts from superior ortets that had been made on potted seedlings growing in a greenhouse, and seedlings from seed of superior trees grown in one quart preformed paper milk cartons. Grafted trees were removed from the container and planted with the ball intact. Containerized seedlings were planted leaving the roots and soil ball in the hole but the carton was pulled up until only 1/3 of the container remained underground. The above ground portion served as a wind and light barrier for the developing shoot. Holes were made with a soil auger or post hole digger. High temperatures and drying winds caused high mortality (over 90 percent) among grafted trees and seedlings that had been planted bareroot, but 90 percent of the containerized seedlings survived.

In 1970 bareroot seedlings were again planted along with seedlings growing in one quart milk cartons and grafts and rooted cuttings in one gallon preformed paper milk cartons (Shreve and Miles 1972). Mortality was again high among seedlings planted bareroot, but survival of containerized grafts and rooted cuttings was quite satisfactory (above 80 percent).

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Subsequent experimentation has shown that walnut bench grafts can be cultured in preformed milk cartons under mist (Shreve 1974), and walnut cuttings can be rooted under mist in the same type container (Shreve 1972).

Container-grown grafts and rooted cuttings can be transplanted to the field without transplant shock with a survival rate equal to similarly containerized seedlings. Developing roots of grafted, rooted, or seedling walnuts grown in milk cartons grow downward and do not form girdles as they often do when grown in other types of containers. Preformed milk cartons are not expensive even at today's inflated prices (quarts, 3 cents each; 1/2 gallons, 5 cents each).

PROCEDURE

The preformed milk cartons are placed in plastic trays having enough holes in the bottom for sufficient drainage (figure 1).

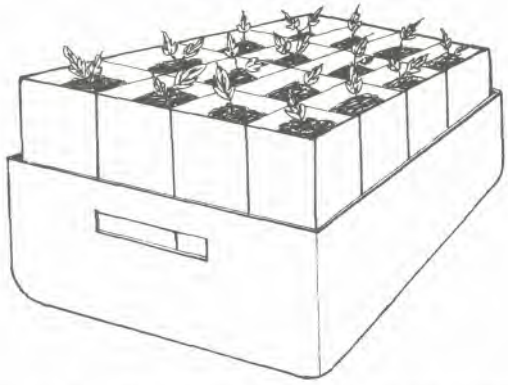

Figure 1.--Preformed milk cartons in a plastic tray which has enough holes in the bottom for sufficient drainage.

The container is filled with 1:1 peat-perlite mixture before planting nuts or sticking cuttings. Bench grafted walnuts are potted in the containers using the same peat/perlite mixture.

Containerized seedlings are hand watered in the greenhouse bench until six to ten inches of shoot growth has developed before planting in the field. Grafts and cuttings are cultured under mist (figure 2). One or two fertilizer pellets (slow dissolving, 5-gram, 20-10-5) should be added to each graft or cutting during the first two weeks under mist. Grafts are planted outdoors when five to six inches of new shoot growth has occurred, and rooted cuttings may be planted outdoors after new shoot growth is two to three inches in length.

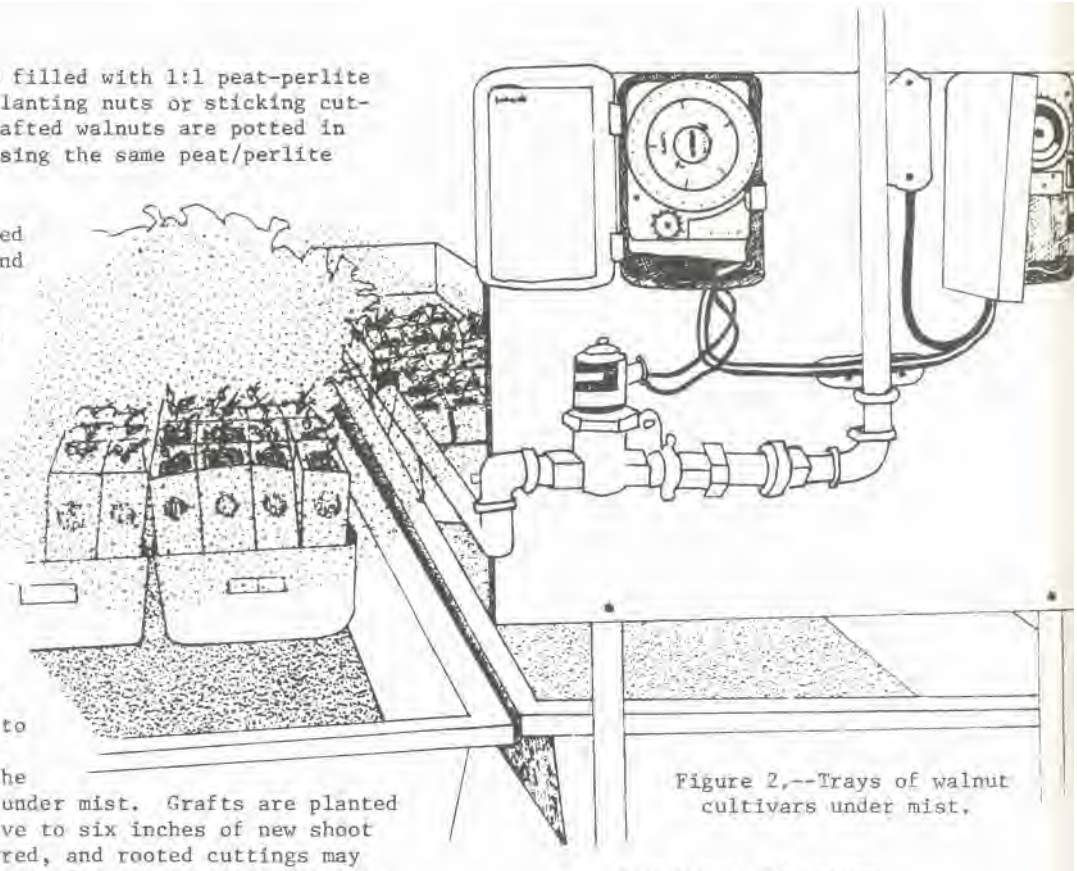

Figure 2.--Trays of walnut cultivars under mist.

If the greenhouse is of glass construction rather than fiberglass or polyethylene, plants must be conditioned to ultraviolet light a week or so before field planting.

A soil auger or post hole digger is used to make holes two to three inches deeper than the length of the milk carton containers (figure 3). After the containerized tree is placed in the hole loose earth is filled in around the sides. The container is pulled up with a series of quick jerks, leaving roots and soil ball in the hole, until only one-third of the container is under ground.

Clean cultivate or mulch a two-foot radius around the tree. Mulching with either wood chips or walnut bark is preferred. A small amount of nitrogen fertilizer may be required to compensate for nitrogen taken from soil by decaying organic materials added as mulch.

Figure 3.--Planting milk carton containerized walnuts in the field:

Hole dug with post hole digger or with soil auger	Loose earth is filled in around the carton	Carton is pulled up with a series of quick jerks, leaving soil ball in the ground	One-third of carton remains underground

LITERATURE CITATIONS

Shreve, Loy W.
1972. Propagation of walnut, chestnut, and pecan by rooted cuttings. Eight Central State Forest Tree Improvement Conference--publication pending.

Shreve, Loy W.
1974. A black walnut, bench grafting procedure that reduces stock suckering. Accepted for publication by Tree Planter's Notes.

Shreve, Loy W. and Neil W. Miles.
1972. Propagating black walnut clones from rooted cuttings. Plant Propagator 18 (3), 4-7.