that different moths have different flight habits and premating behavioral patterns.

The goal of this pheromone research is to develop an inexpensive trap containing synthetic sex attractant that can be purchased by producers, consumers, and pest control operators to trap male moths. If enough males can be captured before they mate, reproduction will be curtailed, and the infestation will be reduced. At the very least, it is hoped that pheromone traps can be employed to catch males, thereby signaling the time when insecticidal sprays should be applied to most effectively reduce the borer population. This technique is now being implemented in tree-fruit orchards to improve insect control while reducing the number of sprays and amount of insecticide needed to produce quality fruit.

During the course of these pheromone studies we have also accumulated insecticide evaluation data to support a label for Dursban 2E for control of lilac and ash borer. This usage has been approved by the Environmental Protection Agency (EPA) and awaits implementation by the insecticide industry. This insecticide has proven safe and effective against turf pests and should be a valuable new tool for controlling clearwing moth borers. When it is labeled and pheromone traps are available to time its application lilac and ash borers should no longer be serious problems in nurseries or the landscape.

Another potential application for pheromone is to permeate the mating atmosphere (tree canopy and surrounding air space) with pheromone so males are unable to locate a point source of attractant (i.e. the calling female). Other researchers working with agricultural and forest insect pests are trying to perfect this technique.

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TRANSPLANTING LARGE TREES[1]

by E. Ed Irish

My remarks today will be on the transplanting of trees in a 15 inch diameter range. Trees of this size are not available from most nurseries. It then becomes necessary to scout for native trees in the rural areas, vacant lots, old estates, etc. This limits the varieties you have to select from to offer your clients for potential plantings. As we travel throughout the year, we keep an eye peeled for suitable transplantable trees. We also have let it be known to other people in the landscape field that we are always interested in a good, sound, full, well-shaped tree.

The week before Christmas (December, 1972) we moved a 17 inch dbh sugar maple from Fairfield, Indiana to Grosse Pointe Farms, Michigan for a client. This tree was called to my attention by John Duling of Muncie, Indiana in the late spring. We examined this maple, took pictures of it, and showed these pictures to the client. She liked the tree, so it was moved.

In Michigan it has become difficult to move large trees due to road restrictions and permit requirements. The present restrictions allow 13½ feet high, 12½ feet spread, and 65 feet long. We do not haul these trees on our own mover on the road due to weight restrictions per axle and tires, so we load the mover and tree onto a lowboy.

This lowboy has a detachable gooseneck and with a few planks used to build a slight ramp, we can pull the tree mover up onto the trailer. The tree is pulled on top first so the branches overhand the rear of the trailer. Once the tree mover is on the trailer far enough to permit reattaching the gooseneck, the mover is secured with chains to the trailer. The plant ramp is piled on the trailer and the gooseneck is reattached. When the red flags are tied on the sides and ends of the tree, and the tractor hooked to the trailer, the tree is ready for the road.

[1] Presented at the 51st Annual International Shade Tree Conference in Detroit, Michigan in August 1975.

We use 9 to 10 inches of ball for each inch of trunk diameter as a basis for ball size. When we can go larger, we do so. A 15 inch tree at 9 inches gives a 135 inch ball. We may go 144 to 150 inches, which would be almost 10 inches of ball per inch of trunk diameter. Ball depth is approximately 34 to 36 inches depending on root growth and soil conditions.

The ball is dug somewhat egg-shaped. The side the mover fits on is slightly flattened, and the opposite side will be cut off at 13½ feet to allow for road clearance of wires, bridges, etc.

Most of the trees of the larger sizes that we have moved have been red maple, sugar maple, locust, and beech. We are mostly limited to using native trees. It is advantageous to find the trees as close to the job site as possible to minimize road time and hauling problems.

The State of Michigan has a law permitting the movement of 14 feet-wide house trailers, but this will not cover trees at this time. We requested such a permit for our Indiana tree but were refused.

On oversize permits, the State provides the routing. The route traveled may be a roundabout-way to move the tree to its final destination. The load can travel only between 9 a.m. and 9 p.m., must be properly flagged, and must have a flag car following the load by 500 feet but not more than 600 feet. The load must be of legal weight per axle, unless an overweight permit is obtained. Then the weight, number of axles, number of tires and size, all have to be considered. The data are submitted to the Highway Department permit section for the permit which may or may not be granted. Permits usually are good for three days.

The main purpose for digging a tree with a ball of earth is so that the dirt will protect and maintain a large enough portion of the tree's root system to keep it alive and re-establish the tree after it has been transplanted. It makes little difference whether the ball is dug by hand or by machine. If not enough root is preserved the tree won't make it.

We use a backhoe to rough out the ball, yet at the same time a man is present to watch for long roots. Large roots must be cut before they cause a long splitting tear back into the ball or loosen the ball itself when hooked by the backhoe bucket. The man immediately stops the hoe and cuts the root by hand.

Candid snapshots of certain phases of the moving operation follow:

Charles F. Irish Co.
Warren, Michigan

Fig. 1. The pan of the mover is being prepared prior to loading.

Fig. 2. A locust tree is lashed onto the pan of the mover.

Fig. 3. A maple tree is lashed onto the pan of the mover.

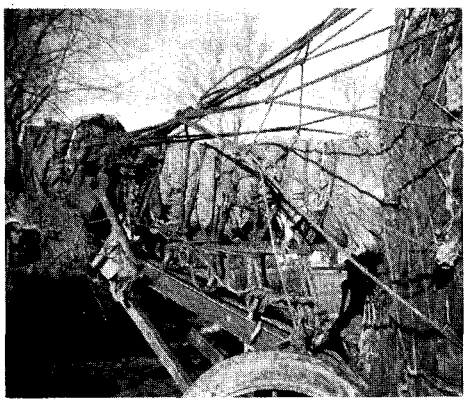

Fig. 4. Close-up of the lashing holding the maple tree onto the pan.

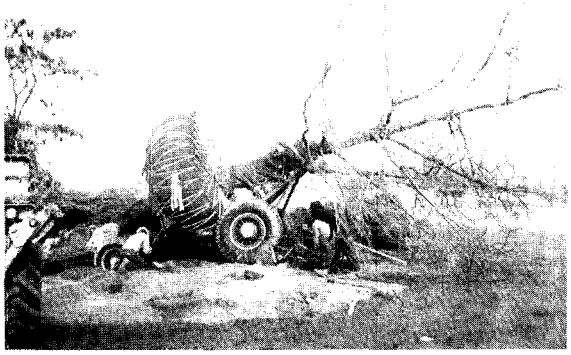

Fig. 5. A 14-inch honey locust lifted from the transplanting site.

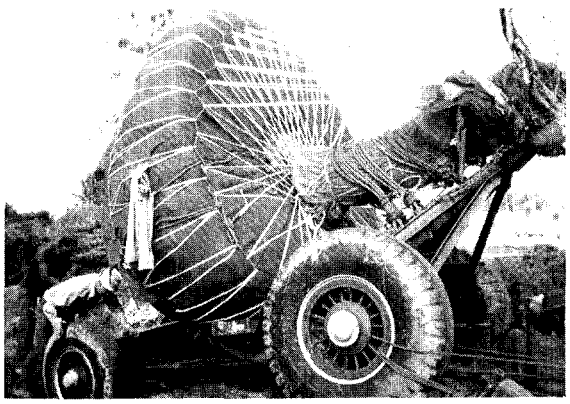

Fig. 6. Lashing of the honey locust in preparation for moving.

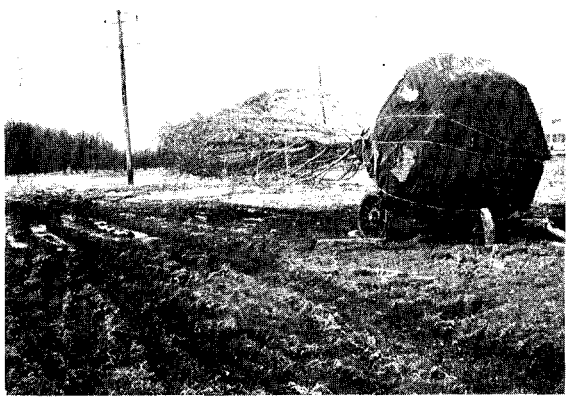

Fig. 7. A 10 x 12 foot ball resting on the tree mover.

Fig. 8. The tree mover loaded on a trailer for transporting over highways.