

aerification, this technique reduced (not eliminated!) standard core aerification while increasing the total number of aerifications. The greens were smoother, yet the perennial *Poa annua* still possessed inconsistent characteristics. It was time to introduce the concept of green rolling. With monthly aerification to relieve compaction, Superintendent Gump began a program of rolling greens on Wednesdays and Saturdays. The results were instantly positive as far as the membership was concerned and produced the following changes:

1. Reduced mowing frequency from 7 days per week to 5 days per week.
2. Discontinued all double-mowing practices.

3. Decreased labor time spend on greens.

4. A virtual halt to player complaints. These positive results benefitted the overall golf course maintenance operation. The growth and playing characteristics of the greens, however, have also changed:

1. An increase in mowing height from .15" (between 9/64" and 5/32") to .17" (11/64").
2. A consistent increase in overall average speed from 8'6" to 9'6".
3. An overall improvement in surface smoothness and a reduction in foot-printing.
4. Improved daily consistency and surface firmness.

5. An apparent increase in rooting depth.

6. A slight reduction in pesticide use and a slight increase in bentgrass.

The program described here has been used for approximately one year and continues to produce outstanding results. Are you faced with similar problems? One point that definitely rings true is that any program that can potentially minimize pesticide usage, produce healthier turf, and provide a desired putting green speed with good surface smoothness is worth a demonstration. It may well be worth the effort to do what the song says: "Shake, Rattle, and Roll!"

A Tall Tale from the Great White North

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TOO MANY OF US have faced the predicament of convincing well-intentioned golfers that a particular tree, although pretty and valuable, should be removed because of its negative effect on turf quality or play. Superintendents, informed Green Chairmen, and yes, even Green Section agronomists have been psychologically bloodied after recommending the removal of a mature tree that, in the golfer's eye, could not possibly be responsible for all those nasty problems.

Perhaps there is a light at the end of the tunnel, at least for those golf courses in the northern latitudes of the United States and Canada. No longer does the recommendation have to only be to remove a tree. Instead, it might sound more like "move it or lose it." This new option is a result of work completed by Jean Payette, retired superintendent, and Norman Hunt, golf professional, at the Mount Bruno Country Club, in St. Bruno, Quebec.

Payette and Hunt have devised a transplanting technique which they have successfully used to move large 30' to 40' trees at Mount Bruno Country Club. The transplanting technique was first used at the club to replace several strategic and aesthetically important elm trees lost to disease. It enabled the club to replace those trees with mature

trees found on the property. The operation has been used to move red and white pine, and red, sugar, and silver maple trees that were considered too large or too costly to move with the more conventional tree spade technique.

The procedure is not complicated, but it does require a dozer in the D-8 class and an experienced operator. A backhoe also is helpful for trenching work and excavating the new planting hole. The ground must be frozen to minimize disruption of the root ball and allow for effective transport of the excavated tree. Excavation work is initiated in late fall while the soil is still workable.

The first step is to roughly trench around the tree with a backhoe or trenching machine, taking care not to damage the root ball. Two sides of the trench are then further excavated to provide access for the dozer blade to reach the root ball. Roots severed during the excavation should be cut cleanly around the edge of the root ball, and the final excavation and undercut work should be completed by hand.

The planting hole at the new site is executed to the same depth and dimensions. The sides of the new hole also are excavated to form a gentle grade that will permit easy access for the incoming transplant. Finally, several

stakes are implanted around the hole to serve as anchors for the future transplant.

The size of the root ball is obviously dependent on the size of the tree, and more specifically, the trunk diameter at breast height (DBH). A general recommendation given by arborists is to size the root ball diameter approximately 10 times the tree's DBH. Since most roots are in the upper soil profile, the root ball should be sized about 30" deep. This is a general recommendation, and successful transplants have been completed at Mr. Bruno Country Club in which the root ball dimensions were below the recommended size. Generally, Payette sizes the root ball so that it can be conveniently moved with the available dozer.

Moving the trees is not attempted until winter, when the ground has frozen thoroughly. At that time, the dozer and experienced operator are brought in to complete the operation. Payette stresses that it is most important to have an experienced operator carefully and slowly break the root ball free from the soil. Once free, the tree is pushed from the hole to the new planting site, where it is carefully pushed into the awaiting hole. If the new hole's dimensions are incorrect or if the tree is not straight, the transplant is pushed out

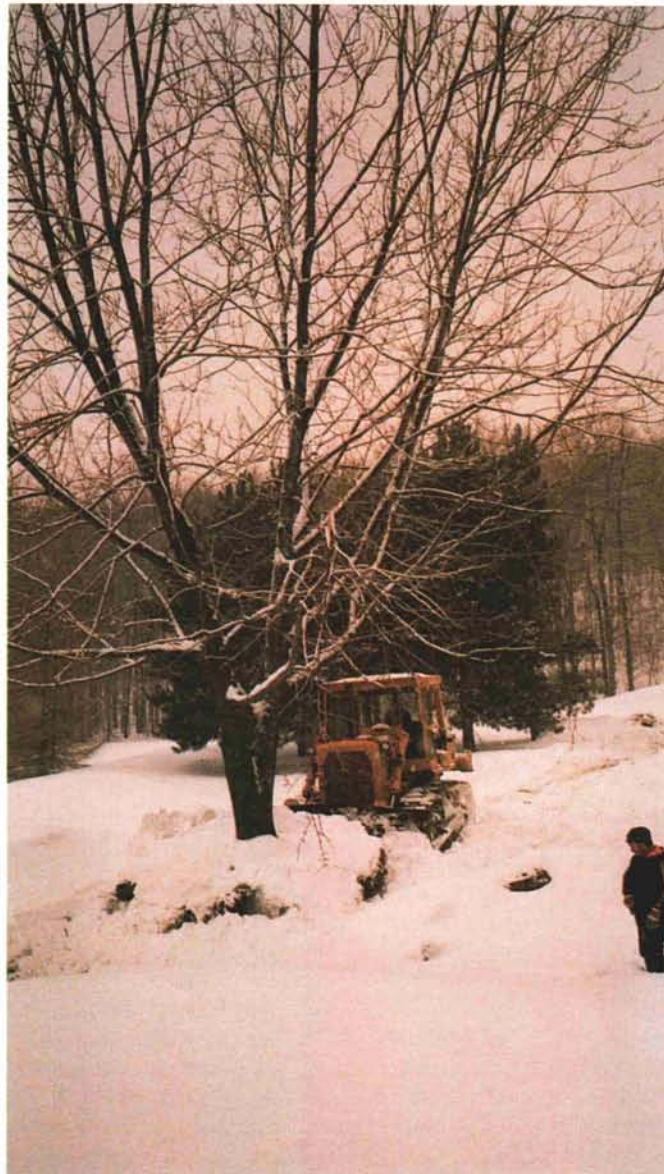
and the proper modifications are made. Staking is then completed to secure the tree.

Little more is done at Mt. Bruno Country Club until the soil is workable in the spring. At that time the hole is completely backfilled and a 1½' to 2' berm is constructed around the entire root ball to aid in irrigation. Several inches of shredded bark or wood chips is installed within the berm as a mulch. The berm is left in place for at least two growing seasons or until the tree is fully established.

The trees are treated like any other transplant, with care taken to maintain adequate moisture in the root zone. A well-balanced, agricultural-grade fertilizer can be broadcast within the berm at approximately 1 lb. actual nitrogen per 1,000 sq. ft. in winter or very early spring of the following year. The tree canopy can also be pruned lightly to remove damaged or weak interior branching and thus reduce the burden on the establishing root system.

A few additional tips might further improve a transplant's likelihood for survival. The first suggestion is to root prune around the tree one or two years prior to transplanting. This stimulates more vigorous rooting within the area that will constitute the future root ball. The chance of success also can be improved if the trees are moved to sites with similar soil texture and drainage. Finally, it is helpful to cover the exposed root ball with a light mulch or cover to buffer the drying winds and cold, especially if snow cover is absent. The backfill soils also should be covered to prevent freezing and allow for the completion of the backfill operation immediately after transplanting.

This operation has been successful in six out of seven attempts at Mt. Bruno Country Club. The single failure was thought to be related to inadequate site drainage. In any event, this transplanting technique is an economical alternative for moving larger valuable trees. Norman Hunt indicated that the operation's largest expense is associated with the dozer. The Club has found, however, that costs for the dozer are not excessive during the slow winter season. According to Hunt, an experienced operator can move several large trees in a day. Payette advises that, at least initially, you should start small when using this method to gain experience before tackling one of the giants. Once mastered, the technique can be used to move full-sized trees, with the only limitations being the size of the dozer, the contours of the land, and your tolerance of the elements.



(Left) Moving the transplant trees is accomplished during the winter, after the ground has frozen thoroughly. A D-8 class dozer is required to move larger trees.

(Below) Jean Payette (left) and Norm Hunt pose before one of the successful transplants. Note the berm height that is used to aid irrigation. Once the tree is established, the berm can be softened.

