

## **2007 MycoTech Stump Treatment Evaluations**

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### **Introduction**

This trial was sponsored by the Vermont Pesticide Advisory Council to explore alternatives to chemicals for treating cut stumps to prevent sprouting. Treatment was done under a state Agency of Agriculture experimental use permit (EUP-01-04) issued to Ronald Kelley, chair of the MycoTech committee. Principal cooperators were Central Vermont Public Service Forestry department and Norbert Major, Myco-Forestis Corp.

### **Methods**

Ten 1/40 acre blocks were laid out beneath a transmission line in Stockbridge, Vermont that belongs to Central Vermont Public Service Corporation. This was predominately a wet site, with standing water in the first 5 blocks and a wide variety of tree and shrub species. Twenty-five different species were recorded; alder, willow and birches predominated. Blocks were identified by wooden corner stakes and GPS coordinates were obtained for the center of each block with a hand-held Garmin 12XL, using the NAD83 map datum. Blocks were staggered slightly, with a minimum of 10 feet between blocks. Most blocks had a southwest aspect.

Pretreatment data was obtained August 18, 2004 by laying a measuring tape on the ground diagonally across each plot from corner stake to corner stake and establishing a milacre plot every 7.5 feet along the tape, beginning at the 4 foot mark, resulting in 5 plots per diagonal line. The normal order of milacre plot measurements was NE to SW, followed by NW to SE, unless otherwise noted. If fewer than 100 stems were tallied along the first diagonal line, the second one was established. If there were still fewer than 100 stems, additional milacre plots were taken in unsurveyed gap areas. In some cases, there were fewer than 100 stems in the entire block and crews discontinued sampling when this became obvious. Diameters of stems down to 0.5 inches were measured and recorded by species at a stump height of 2 inches. Stems smaller than this were recorded as less than 0.5 inches in diameter.

Five blocks were randomly selected for treatment and the other 5 were used as untreated controls. Treatments took place on August 26, 2004. Blocks 1 and 7 were cut with a brush saw equipped with an attached MycoTech delivery system, while blocks 4, 5 and 9 were cut by chainsaw, followed by an application of the product by a second person. Myco-Tech gel containing *Chondrostereum purpureum* strain HQ1 was applied to stumps at a rate of  $10^6$  CFU per ml. within minutes after each stem was cut. Untreated blocks were cut by chainsaw the next day. Cut brush was laid down on the ground on the site, mostly just outside of the blocks along the edges of the Right-of-Way.

Temperatures on the day of treatment ranged from 75 to 84 degrees F. and averaged 81.5 degrees F. (27° C.). Winds were light, averaging 1.2 MPH, and relative humidity averaged 57%.

Post-treatment evaluations were conducted for 5 milacre plots per block in 2005 using one diagonal tape line and 10 milacre plots per block in 2007, using both diagonal tape lines and the same layout as in 2004. Number of stems per plot were recorded by species and maximum height of that species to the nearest tenth of a foot. Data was analyzed for all hardwood species, excluding shrubs and conifers.

## Results

The initial evaluation one year after treatment showed that stem densities in the untreated blocks had more than quadrupled while stem densities in treated blocks were relatively unchanged. Some trees in treated plots were observed to be in the process of dying. Average maximum height of hardwoods in untreated blocks was 4.1 feet compared to 2.5 feet in treated blocks.

Three years after the Myco-Tech applications, treatment effects were more pronounced. There were significant differences (0.05 level) in stem density and height between treated and untreated blocks. Stem density of all hardwoods in untreated blocks had decreased some from 2005 due to competition but averaged 11,991 stems per acre in 2007 compared to 5,882 stems per acre in 2004. Stem density in treated blocks fell from 10,678 stems per acre before treatment in 2004 to 4,465 stems per acre in 2007 (Figure 1).

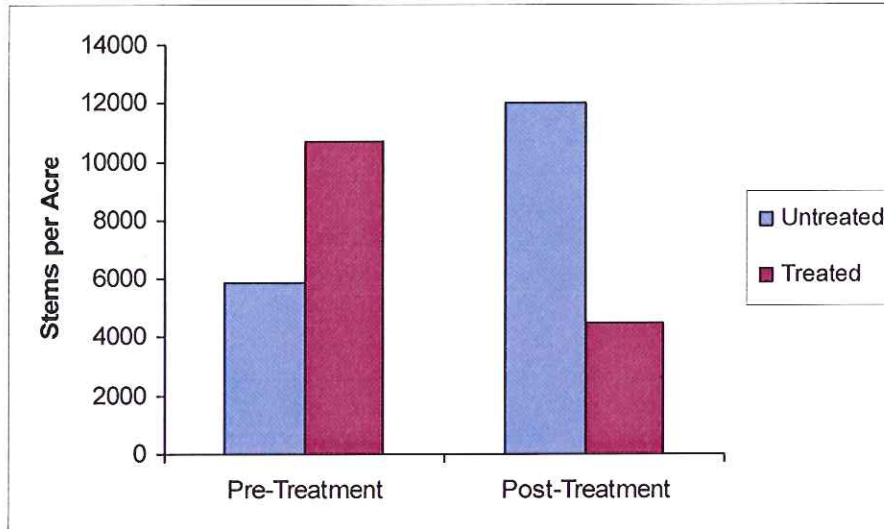


Figure 1. Stem densities for all hardwoods before and three years after treatment with Myco-Tech.

Average maximum height of untreated hardwoods rose to 7.2 feet in 2007 compared to 4.0 feet for stump-treated hardwoods (Figure 2).

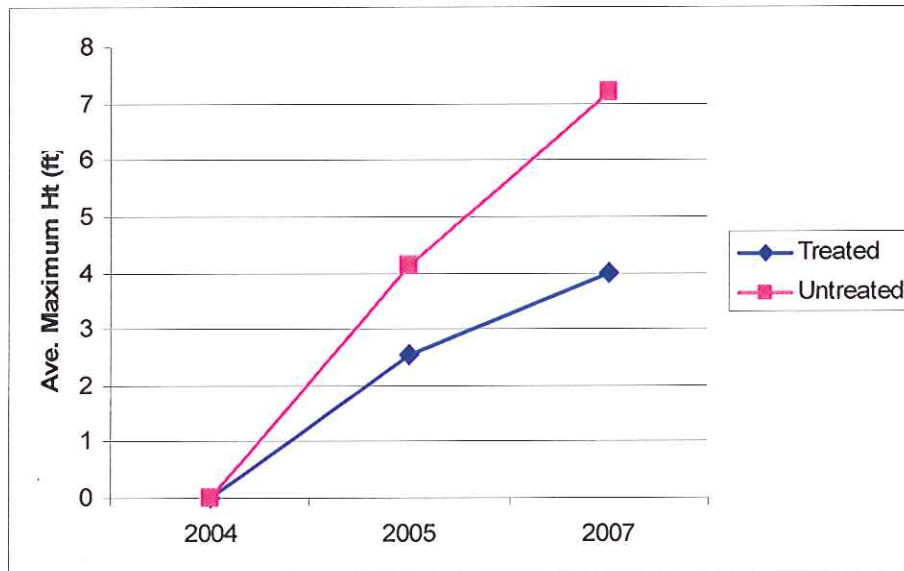


Figure 2. Average maximum height of hardwoods in 2005 and 2007 in treated and untreated areas.

Treatment with Myco-Tech was more effective on some species than others. There was no speckled alder in treated blocks in 2007, while significant reductions of willow and birch occurred in some of the treated blocks where these species had been abundant (Figure 3). Red maple showed little change in density but its height in treated blocks was significantly shorter than in untreated blocks.

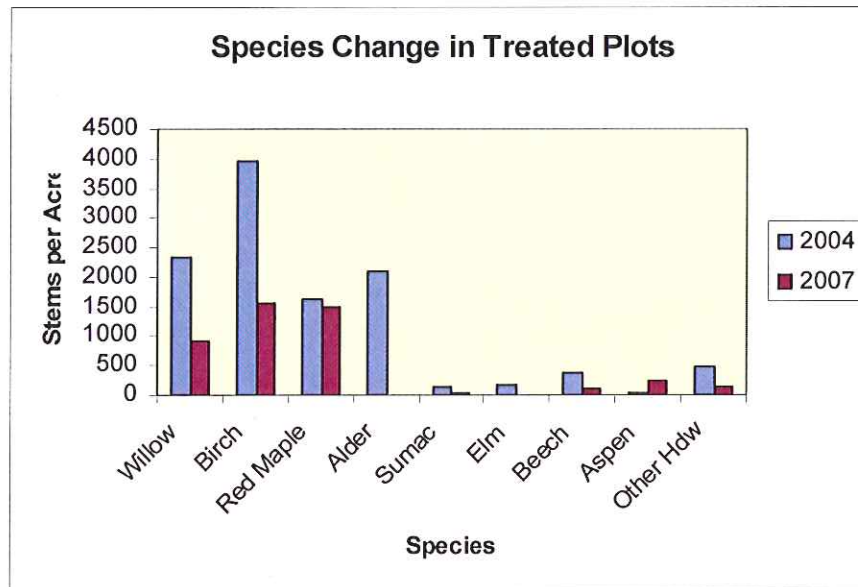


Figure 3. Density of hardwood species before and three years after treatment with Myco-Tech.

Stem densities arising from untreated stumps increased dramatically or stayed about the same for most hardwoods. Birches increased nearly three-fold over the three years, while sumac also showed a significant increase (Figure 4).

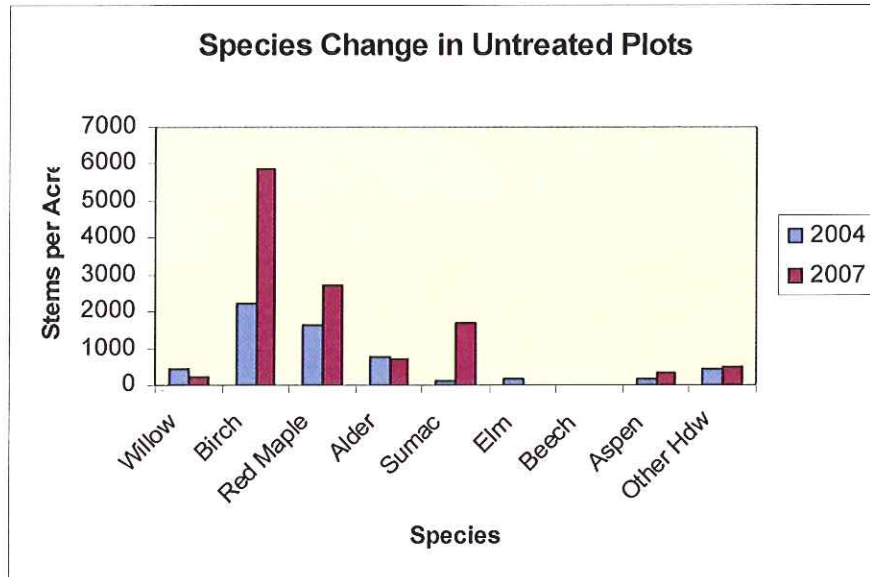


Figure 4. Density of untreated hardwood species at time of cutting and three years later.

### Summary

Three years after treatment, stem density decreased in treated blocks to less than half the pre-treatment level, while increasing in untreated blocks to more than double the initial level. Average maximum stem height in treated blocks was 4.0 feet compared to 7.2 feet in untreated blocks. This height difference was noticeable in all treated blocks when compared to untreated blocks, as shown in Figure 5. Treated alder, birch and willow significantly decreased in stem density in one or more blocks. No alder was detected in treated blocks after three years. Red maple density did not significantly change but its height in treated blocks was significantly shorter than in untreated blocks.



Figure 5. A treated block (left) compared with an adjacent untreated block (right), showing the vegetation height difference indicated by the 10-foot pole.

## **Acknowledgement**

We thank Norbert Major, Myco-Forestis Corp., for supplying the treatment material and equipment and Lance Tabor, Trees, Inc. for supplying the cutting crews. We also thank Jason Lyver, Bert Stewart, Steve Shaw, CVPS and Jeff Disorda, VELCO for assisting with the treatments and evaluations.

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