

# **NNY Agricultural Development Program 2006-2007 Project Report**

## **Improving growth of sugar maples in Northern NY**

### **Project Leader(s):**

- Brian Chabot, Cornell University,
- Michael Farrell, Uihlein Forest, Lake Placid, NY

### **Collaborator(s):**

- Peter J. Smallidge, Dept. of Natural Resources, Cornell University,
- Stephen Childs, Dept. of Natural Resources, Cornell University

### **Cooperating Producers:**

- Burnham Family (Jefferson County)
- Jason and Barbara Zehr (Lewis County)
- Jim and Christine Mueller (Franklin County)
- Joeseeph and Irene Schork (Franklin County)
- Kim LaDuke (Essex County)
- Art Person (Essex County)
- Parker Family Maple (Clinton County)
- Northwood School (Essex County)

### **Background:**

The two objectives of this project are 1) to evaluate ways to improve the growth of maple trees in order to increase yield of sap sugar, and 2) to improve sugarbush/forest management practices in NNY. Maple sugar is a high value crop in all counties in NNY and is a sustainable use of the natural resource base for this area.

Even though fast growing trees are known to produce more sugar, recommendations on how to manage trees for fast growth in the NNY environments are poorly developed. Also, the relation between sugar yield per tree and sugar yield per acre under different tree stocking densities has not been established anywhere. Developing this relationship is essential in being able to recommend forestry practices that maximize syrup production per acre.

The success of any maple operation begins with the ability of trees to produce sap, remain healthy, and sustain production over a long period of time. We intend for this research to lead to better recommendations about how manage the NNY maple resource to maximize sugar yield and net income to the producer. We also will seek ways to improve tree health and sustainable sap yields.

### **Methods:**

Research on the effects of thinning on maple growth and sap sweetness is underway at the Uihlein Forest and 8 producer locations throughout Northern NY. Many other locations were visited and rejected either because of forest condition or because there was

not enough uniformity to have replicated plots. We added the Northwood School as a new cooperator. In addition to participating in the forest management research, students will be involved in learning about maple sugar production.

Three plots were established at each location representing two levels of thinning and one control. The thinning produced two levels of residual basal area, one representing a light thinning and the other a heavier cut. The forests are reasonably close in age and structure. Prior to undertaking thinning, the project leaders were trained in chain saw safety and use in directional felling through the Game of Logging program. The benefits of directional felling techniques became evident to the cooperating maple producers.

Participants measure sap volume and sugar concentration along with tree growth and tree health each year. We are in the early stages of a long-term research project, so the data being collected now will be used for comparison purposes in 5-10 years.

### **Results:**

We learned there is a wide range of forest management practices from those undertaking regular thinning based on a documented management plan to many who are not doing any regular forest management. Most NY sugarbushes are over-stocked with too many trees having minimal growth. Thinning in most forests should have happened years before we arrived. Many trees below the 10 inch dbh limit are being tapped and many trees are being over-tapped. Density management works best if started when trees are less than 10 inches in diameter.

Measuring sap sugar content and volume was done in the 2007 sap season. Producers were given the necessary instrumentation and took measurements that will serve as baseline data. Acquiring this baseline data on individual trees is essential when making comparisons with the same trees several years from now, after the effects of thinning are realized. Some adjustments will be made for the 2008 season to make the data collection process easier.

In 2007, we developed and tested a method of quantifying taphole closure that provides a reasonable low cost/low effort assessment of tree growth and health. It will be used in 2008 to assess all of the experimental treatments and to engage additional producers in assessing forest management practices.

### **Conclusions/Outcomes/Impacts:**

Results addressing the primary objective of the research will not be known for a few years at least. However, we learned quickly during the implementation that many maple forests in NYY are not well managed and that the owners were not particularly knowledgeable about approaches and methods of proper management. So the immediate impact was with the maple producers involved in the project where they were able to learn proper management techniques in their own woods. Subsequent workshops have built on these initial experiences to extend information to a broader group of producers.

## **Outreach**

At each location we educated the producers about techniques of forest inventory, tree measurement, selecting trees for removal, and using the thinning tables to reach target residual basal area. What we learned from these activities has been incorporated into presentations for larger audiences in winter maple schools. Forest management presentations were made in January 2007 at three NNY workshops in Lewis, St. Lawrence and Warren Counties, for maple producers.

The following workshops and presentations occurred:

Smallidge, P.J. 2007. Sugarbush management basics. Lewis County Maple Workshop. Western NY Maple Workshop.

Smallidge, P.J. 2007. Sugarbush Thinning. Lewis County Maple Workshop

Farrell, M. 2007. Sugarbush Thinning. Maple Expo-St. Lawrence County

Smallidge, P.J. 2007. Strategies for sugarbush thinning. CUCE Franklin County and NYFOA woodswalk, Garth Steven's property, Franklin County.

Smallidge, P.J. and M.L. Farrell. 2007. Strategies and considerations when thinning your sugarbush. NNY Maple Meeting, Plattsburgh, NY. Parker Sugarbush.

## **Next steps:**

This is a multiyear project. During 2008, we will be monitoring tree response to thinning treatments along with sap sugar and volume. This will be done using the producer cooperators so as to give them additional experience with research techniques.

Workshops on forest management will occur in 2008 at the Maple Schools in NNY. We are planning three forest management workshops at producer cooperator locations. Thinning workshops are being scheduled for Essex County in August, Lewis County in September, and Franklin County in October 2008. Direct engagement in the woods is the most useful learning technique, so we hope to reach over 50 producers through these hands-on workshops.

## **Acknowledgments:**

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## **Reports and/or articles in which the results of this project have already been published.**

Farrell, M. 2007. Increasing maple production through landowner cooperatives. Pipeline 4(3):4

Farrell, M. 2007. Sugarbush Thinning Project Well Underway. Appeared in CCE newsletters of the 6 county NNY region in January 07.

## **Person(s) to contact for more information:**

See project leaders, collaborators, and participants above

