

**MANUAL FOR ESTABLISHMENT OF NEW “GROW-OUT”
SCHOOL TREE NURSERIES
(BASED ON THE JOHN BOWNE HIGH SCHOOL MODEL)
Flushing, Queens
New York City**

MARCH, 2008

**INTRODUCTION AND BACKGROUND: WHY AND HOW DID THE JOHN
BOWNE HIGH SCHOOL PROJECT COME ABOUT?**

As part of the reauthorization of the 1990 Farm Act, Congress provided \$20 million to begin a national tree-planting initiative. The National Tree Trust (NTT) was created to invest and use these funds; as its program was developed, a partnership was established with a number of large forest products companies, such as Georgia Pacific and International Paper. Through this partnership, millions of small tree seedlings were distributed to thousands of locations across the country. Volunteers in rural and exurban areas were able to use the seedlings and successfully execute planting projects; however, in urban areas, this system did not work well because the seedlings were too small to be successfully out-planted in most cities.

The grow-out station tree nursery system was established by NTT in the late 1990's to provide an opportunity for volunteers to create planting projects in urban communities. A three-way partnership was put in place for each chosen project:

- NTT provided professional guidance and funding, through a contract with a local not-for-profit organization.
- A group with a site where the nursery could be successfully established agreed to provide planning and volunteer labor in caring for the seedlings planted at the site, until they were large enough to be successfully out-planted. All trees were required to be distributed for free and planted on publicly owned land.
- A local not-for-profit organization agreed to sponsor the project, taking on the responsibility to be the link between NTT and the school. Sponsorship included receiving and dispensing NTT funds, raising and receiving possible other project funds, regular reporting, and providing information and publicity about the project. The sponsoring group also agreed to link the nursery with out-planting sites, including schools, community gardens and parks. Much of the out-planting has occurred as part of annual Arbor Day activity.

Grow-out Nursery Manual

John Bowne High School in the Queens Borough of New York City became the first such nursery site in New York State in the late 1990's. The project was sponsored by Manhattan-based Environmental Action Coalition (EAC), an environmental education not-for-profit organization. This sponsorship was assumed by the New York State Urban and Community Forestry Council in 2001; the Forestry Council remained the sponsor until January, 2007. It is currently being managed by a local Steering Committee under the sponsorship of Trees New York, a not-for-profit organization. This is believed to be the only high school-based grow-out nursery project in the country.

John Bowne was an ideal choice for establishing a grow-out nursery because it contains a special agriculture and forestry program as part of a larger high school. Its plant and animal science programs attract students from all over the city and it has a 9-acre farm or "Land Lab" where space is available for the nursery. It also has a ready supply of student volunteers and the nursery trees provide enrichment of the curriculum by providing the site for "hands-on" activities. The offering of free trees each year helps the school connect with other schools, community garden groups and public agencies where the nursery trees are eventually planted.

NOTES FOR NEW PROJECTS:

- 1) An appropriate school must be recruited, with willing faculty and a curriculum that can be enhanced by activities in caring for a tree nursery.**
- 2) A local not-for-profit or other appropriate sponsor must be willing to take on the responsibilities of raising/receiving funds for the project, paying bills, and providing links to schools, governmental agencies, other not-for-profit organizations and the private sector.**
- 3) A distribution system must be devised by the partners so that trees that are ready to be out-planted will be picked up or delivered to those involved in this part of the project.**

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HOW HAS THIS GROW-OUT NURSERY PROJECT HELPED THE SCHOOL AND THE COMMUNITY?

THE SCHOOL:

John Bowne High School has benefited from the partnership by being able to create a new component for study in its existing farm or “Land Lab.” This facility already provided a large area for crop cultivation, beds for flowering plants and shrubs, an orchard, greenhouses and animal pens, and a composting site. The added nursery has given Bowne students and faculty the opportunity to plant and tend approximately 1,000 containerized trees (in 3 size classes) each school year, with one-third distributed for out-planting each spring while a new batch of seedlings arrives at the same time. Thus, the study of a variety of species and examination of the regular growth of trees can be a “hands-on” part of the ongoing plant science curriculum.

Through its ongoing partnership with EAC and later the Forestry Council, Bowne received yearly financial assistance in maintaining and upgrading the nursery, such as the receipt of funds for new planting pots, special soil and a hoop house to protect the trees in winter. This assistance will continue via the local Steering Committee that has taken over its sponsorship.

Additionally, through previous funds, Bowne students have been able to take a variety of special field trips that help to illustrate different aspects of forestry:

- New York State Nursery at Saratoga, where “North Country” trees were viewed, creating a greater understanding of the effects of climate, upstate and downstate;
- NYS forest land in the Hudson Valley, where traditional forestry was demonstrated;
- NYC Parks Department’s Staten Island Native Plant Nursery and GreenBelt Nature Center, where students gained understanding of the Department’s efforts to protect and enhance natural area parts of City parkland;
- Princeton Nursery in New Jersey, where students learned about the private nursery business.

Grow-out Nursery Manual

Bowne students also have gone on special field trips to the State University at Farmingdale, with which the school has a strong relationship. The F. A. Bartlett Tree Expert Company, as part of its connection to Bowne through the nursery project, has established a scholarship to Farmingdale for one Bowne student each year. Funds for future trips will be raised by the Steering Committee, under the leadership of Trees New York.

Through the nursery project, Bowne has become a critical component of New York City's Arbor Day Tree-planting project. Over the past 5 years, approximately 1,500 trees in 5-gallon containers have been distributed to schools, community gardens, senior centers and parks. This has given the students a better understanding of the importance of their work in the Bowne overall program.

An Advisory Committee was also established for the Bowne project, thus bringing the school faculty together with non-school professionals for mutual assistance. The Advisory Committee has helped to locate and promote appropriate field trips, has advised on new projects such as the Green Futures environmental career day held at Bowne, and has arranged for free supplies to be donated to the project. The original Advisory Committee included representatives of private "green" industry, NYC Parks & Recreation, NYS Department of Environmental Conservation and private horticultural and educational professionals. The present Steering Committee has been formed from this group.

THE COMMUNITY:

The distribution of trees from the Bowne grow-out nursery has reached every borough of New York City, through the outreach of the volunteer NYC Arbor Day Committee, which has been in existence since the 1980's. The Arbor Day Committee, whose members are primarily formal and non-formal educators, has long sponsored teacher workshops and tree plantings for Arbor Day and was instrumental in the re-establishment of Arbor Day as a special day in New York State: the last Friday in April. Its widespread network has helped make it possible for the Steering Committee to effectively do its job of notifying the New York City Community of the existence of free trees. The Science Division of the New York City Department of Education has also become a major partner in outreach directly to schools.

Via a special grant from NTT, the Arbor Day Committee was able to revise and update "Plant a Tree for Arbor Day," a 3-lesson curriculum guide on planting and establishing Arbor Day trees. Funds for printing the guide were supplied by NYS Department of Environmental Conservation. Free copies of this publication have been distributed to New York City teachers and others and remain available from NYS DEC. This publication has now been selected to be further edited and expanded as part of the

Grow-out Nursery Manual

Million Tree Initiative coordinated by the NYC Department of Parks and Recreation and the New York Restoration Project. It will be available after April 15, 2008 at the MillionTree website, www.milliontreesnyc.org.

The school community has been the sector most positively affected by the free trees from Bowne's nursery. In the past, even when teachers received planting instructions and other information from the Arbor Day Committee, there was an almost insurmountable problem: where would trees come from? And how would they be transferred to the far-flung schools within a big city? With the establishment of the Bowne nursery, the problem of available trees was solved. Approximately 300 trees are available each year; most of them go to participating schools. The distribution is done by the NYC Department of Parks and Recreation.

Other sectors of the community that have benefited include community gardens run by local volunteers, the NYC Parks Department's Natural Areas division working in the forested parks, and the NYC Housing Authority, which is in charge of landscaping at the City's many public housing projects.

While it has been logistically impossible to track every small tree distributed, anecdotal evidence shows that a large percentage of the containerized trees do survive and the City's environment is greatly enhanced through this project. As new trees are planted under the Million Trees Initiative, tracking of the trees will become more systematized via the Million Trees website.

HOW CAN THE GROW-OUT NURSERY PROJECT HELP OTHER COMMUNITIES AND SCHOOLS?

The John Bowne school nursery project is a proven success. Therefore, its structure and activities can be a model for other such projects around New York State and other parts of the country. Each project will have its own local parameters, though knowledge of the experience of the original project and the activities of the sponsors in its development will be helpful.

NOTES TO NEW PROJECTS:

Due to changes at the national level, new projects will not have all of the exact components of the original model, particularly a contract with a national not-for-profit organization providing consistent funding. The National Tree Trust has been dissolved and its assets have been transferred to The National Arbor Day Foundation. Though the ADF has committed to helping with fund-raising in any way that it can, representatives have stressed that it is not a source of annual grants.

Grow-out Nursery Manual

Emphasis will be placed on local funding, with perhaps help from a network that may be established among statewide grow-out nurseries.

Grow-out Nursery Manual

PLANNING AND LOGISTICS FOR A SCHOOL-BASED TREE NURSERY

Planning:

Establishment of a Partnership: Two Years

A school-based nursery, based on the Bowne HS experience, does not exist on its own. It is essential that a partnership between a local sponsoring group and a chosen school be established for both short-term and long-range planning. Assuming that trees for the school nursery will be containerized small seedlings, there will be at least two years before the trees are large enough to be distributed to other sites successfully. During that time, long-range plans for the project should be established.

The local sponsoring group may be a governmental agency or component thereof, a service club, an independent environmental or tree-related organization or any other group wishing to plant trees as part of its mission. In order to successfully fund-raise and receive project money, the sponsoring group must be a not-for-profit corporation with a 501©3 status from the Internal Revenue Service. This will make it possible for donors to receive a tax credit for any funds given to the project.

As previously mentioned, the duties of the two partners are:

- A. The local sponsoring group must review its mission, goals and objectives and make a conscious decision that the school-based nursery fits within its present and planned programming. If such a decision is made, it will be expected that the administrative and fund-raising functions will be executed within that organization's structure. The local sponsor should be ready to identify those who will receive the containerized trees when they are ready to be transplanted and should arrange for this network. In addition to out-of-pocket expenses, the local sponsor must allocate the time of one of its staff, or a dedicated and regular volunteer for the organization, to execute the project in an ongoing way. The local group will be the link to any other non-local entities that may want to be supportive of the nursery.

Grow-out Nursery Manual

- B. The chosen school must determine that the value of a nursery fits within its own goals and objectives and that activity at the nursery will fit into its ongoing curriculum. It will need to accept the physical responsibility of establishment and care of the seedlings, so that they will be able to be distributed to schools, parks, community gardens and other appropriate sites.
- C. Both partners should be ready to undertake the project as a long-range program, not a short-term event or project that would be expected to “peak” and then fade away. Above all, the successful nursery should not become the “pet project” of one particular person; if this happens, it is all too easy for the project to fall apart when that individual is no longer in charge. The ultimate responsibility from the local sponsor should rest with the Executive Director or other executive in charge. The responsible person at the school should be the Principal or his/her direct designee.

Logistics:

Physical Layout:

- A. The nursery should be laid out in a convenient, sunny area that is not too far from the school building or other buildings that may be used for the project. It should not be in a high foot-traffic area, both for the safety of the students and for the trees. It should be a clearly marked and designated area that is highly identifiable.
- B. The nursery should be conveniently located near a reliable water source, and preferably should be able to be watered with a hose. A drip irrigation system should be able to be put in place, if desired. (The original Bowne nursery was too far away from the main building and the water pressure was too low in the summer, causing the failure of the sprinkler system.)
- C. Adequate space must be made available for 3-gallon and/or 5-gallon containers to be placed in rows with walking space between for weeding, watering and pruning. For the approximately 1,000 containerized trees at the Bowne site, the nursery space is 75 feet x 70 feet.
- D. There should be room for trucks and other vehicles to be able to park adjacent to the nursery for unloading new seedlings and materials and for loading trees that will be distributed.
- E. The number of trees in the nursery should be carefully assessed. Too many trees may be overwhelming for the students expected to care for them; too few will not meet the needs of the Arbor Day program and other tree-planting activities. All

Grow-out Nursery Manual

trees should be labeled for easy inventory, either by tagging or labeling on the containers. The original Bowne nursery accepted 3,000 seedlings, which proved to be too many to be adequately cared for. The present level of 1,000 has proven to be a good number for that particular project, with approximately 300 trees distributed each year. However, numbers that are appropriate for each nursery site should be assessed.

Materials and Supplies:

- 1) Containers for the chosen number of seedlings to be planted for “grow-out” should be obtained. The Bowne model uses 3-gallon containers for the first year and re-pots the growing seedlings into 5-gallon containers during the second year. Trees are distributed in the 5-gallon containers to schools, parks and other recipients.
- 2) The soil used in the containers at Bowne is ordered specially from Brookside Nurseries in Norwalk, CT. It has been recognized as an important factor in the success of the growth of the nursery seedlings. The properties of this mixture create a growing medium that is intermediate in weight between a peat moss-based synthetic mix and natural topsoil. The mix is light and porous enough for the seedling roots to be easily established; on the other hand, it enables the trees to successfully grow for a number of years in their containers, due to its biological soil-like characteristics.
- 3) List of start-up materials in 1998 included the following:
 - osmocote fast start
 - labels
 - superphosphate
 - herbicide cosiron
 - herbicide devrinol
 - insecticide
 - spreadersticker
 - black plastic sheeting
 - tool shed
 - trowels
 - wheelbarrows
 - square point shovels
 - irrigation materials (no longer needed at Bowne, due to hose connection)
 - anchor pins
 - sprinkler heads

Grow-out Manual

The total cost, as of July 21, 1998, was approximately \$10,000.

- 4) Additional supplies were ordered in 2001, as the Bowne nursery was becoming better established:
 - tri-pod sprinklers
 - sprinkler timers
 - cart
 - hand trowels
 - hand cultivators
 - pruners
 - professional wheelbarrow
 - 2 cases/5 gallon pots

The total cost, as of June 20, 2001, was \$2,040.

- 5) Tree seedlings were initially supplied by the National Tree Trust from cooperating forest product companies. Later, cash donations from NTT enabled the Council and school partners to select trees and purchase directly. The primary sources for seedlings are the New York State Nursery and the New Jersey State Nursery (by special permission, since Bowne is out of state.) The NJ Nursery is able to grow many more species because of its location in a milder climate. Selections have been extensive and have involved both conifers and broad-leaf trees. From experience, the Council as sponsor and the leaders of the Bowne nursery have learned school needs and preferences. Small flowering trees are very popular, but many schools welcome major shade trees such as tulip poplars and oaks. In New York City, there are quarantine zones for some species, due to the Asian Longhorned Beetle infestation. See Appendix A for lists of trees ordered in recent years.
- 6) A hoop house was ordered from the Geiger Companies and has proven beneficial for over-wintering the seedlings. The original design called for the hoop posts to be buried in the soil, leaving only 2 to 4 feet of hoop above the ground. Metal posts were added that raised the shorter one to 4 feet and taller one to 6 feet. The plastic that is added to the hoops lasts about 3 years before needing replacement.

The total cost, as of May 2, 2002, was \$712.00

Grow-out Nursery Manual

- 7) Some estimated yearly costs, based on recent Bowne figures are:
- Seedlings: \$150 per year (from NJ and NYS nurseries)
 - Special soil: \$600
 - New 5-gallon containers: \$33, based on 2002 costs
 - Field trips via school bus: \$300 each

Arbor Day trees are delivered to schools and other sites in New York City, due to the difficulty most schools would have for pick-up at the nursery. The cost is approximately \$1,000 for 3 days of delivery to all boroughs. It is assumed that this cost would probably not be necessary in smaller communities. In New York City, the Department of Parks & Recreation has now assumed the responsibility of delivery.

APPENDIX A

**Tree Inventory at Bowne
Fall, 2006**

Three growing areas:

Two (2) 50' x 8'

One (1) 43' x 14'

Inventory: (all tagged)

Arborvitae – 47

White Pine – 225

Douglas Fir – 56

Scotch Pine – 95

Japanese Larch – 94

Willow Oak – 93

White Oak – 85

Red Oak – 140

Zelkova – 47

Serviceberry – 105

Crabapple – 50

Green Ash – 98

Tulip Poplar – 70

Bowne is located in a quarantine zone for the Asian Longhorned Beetle, so its inventory is affected by the “don’t plant” list from the NYC Department of Parks and Recreation.

Grow-out Nursery Manual

APPENDIX B

Relevant Bowne Plant Science Curriculum

**1st Year: Principles of Plant Growth & Reproduction
Principles of Plant Propagation**

**2nd Year: Principles of Plant Propagation
Internal Plant Structure
Media, nutrients and fertilizers
Plants and their Environment
Identifying Trees and Shrubs
Tree/Shrub Pruning**

**3rd/4th Years: Forest Management
Soil Conservation/Management and Fertility
Ecological Concepts and Principles
Tree/Shrub Pruning**

Funding

The original Bowne funding model is no longer in effect. Each nursery will need to establish its own funding model, based on local support.

Suggested funding initiatives:

- 1) Sponsorship by local not-for-profit via grants from foundations, corporations or government sources.
- 2) Funds supplied by partner schools.
- 3) Joint fund-raising via proposal developed by a new network of grow-out nurseries.
- 4) Special “member items” from state or local legislators.
- 5) In-kind contributions, such as free containers or trees from leftover supplies at nurseries.

