

2000 Farmer/Grower Grant – Progress Report – November 2000

Project Title: Using straight-growing Black Locust in On-Farm Agroforestry Production

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PROJECT GOALS:

The Black Locust Initiative is a NY State citizens not-for-profit group dedicated to preserving straight varieties of black locust (*Robinia psuedoacacia*), encouraging their cultivation, and teaching sustainable forestry through hands-on workshops. We are attempting to develop the straight varieties of black locust, with its natural rot-resistance, as an alternative to pressure treated lumber, which is being viewed with increasing public skepticism as awareness of the problems associated with chemically treated wood mounts. As a 501(c)3, the Black Locust Initiative has the mission of: "Action toward a sustainable future through education, community awareness, and involvement in forest management." As part of our program, we teach the public, particularly children, about sustainable forestry and natural ecosystems, through a series of hands-on training/educational events. We stress exceptional stewardship when managing, harvesting, and replanting sites. The principles behind our practices include on-site value added processing, conservation by design, progressive forestry, and community involvement.

The goals pertaining to the SARE farmer/grower grant, which we were awarded in 2000, were more specifically to develop innovative production practices for the shipmast variety of black locust (*Robinia psuedoacacia* var. *rectissima*), a straight black locust variety that was identified in NY State in 1936. We proposed collecting rootstock from superior trees at a site in Burdett, NY, propagating seedlings from root cuttings using bottom-heated nurseries, and establishing a new locust plantation on an organic farm in Trumansburg, NY, with an eye toward producing posts and lumber in the future. We accomplished many of these goals, and more, in 2000, although we encountered difficulties at one nursery, and decided to shift our focus from planting a field site to replanting a forest site, as will be described below.

FARM INFORMATION: The Black Locust Initiative, run by Dave Gell, a tree farmer, has had a very successful year in 2000. Following on successful projects at the Arnot Teaching and Research Forest, run by Cornell University, and at the Finger Lakes National Forest, we have been given the responsibility of managing two 2-acre sites at the Arnot Forest, a 3-acre site at the National Forest, and a 65-acre wood and pasture site belonging to the Fingerlakes Grassroots Festival of Music and Dance. We have produced sustainably harvested lumber, processed on-site, to supply various projects this year, cutting locust, pine, and catalpa logs.

COOPERATORS: The cooperators working directly on this farmer/grower project include: Dave Gell, a forest farmer and leader of the Black Locust Initiative, who has overseen and organized the project, Suzy Gell and Tony Potenza, who established nurseries for seedling production from collected root cuttings, Chris Tate, who has worked as a field technician and trainer, Andy Hilman, City Forester of Ithaca, who has advised the project, and Dean Hively, Cornell Natural Resources PhD student, who has provided scientific consultation, supervised data collection, record keeping, and soil sampling, and assisted as a technician at the educational events.

PROJECT ACTIONS, 2000:

1. Identification and collection of superior genetic material:

We are continuing to identify stands of shipmast locust in the Fingerlakes area of NY, and now in West Virginia and Virginia as well. At each site trees are labeled, and bark characteristics are measured to identify the variety as shipmast, according to Swingle (1936). In the past year we have mastered the bark-characteristic methodologies, and developed a data sheet for use by helpers (see attached), and the data should soon be available at our website. We have a fair amount of data compiled, which indicate that the stands we have identified in NY State can be classified as the shipmast variety according to bark characteristics. Interestingly, the black locust stands that our collaborator, Chris Tate, has identified in West Virginia, while lovely and straight, are not easily classified as shipmast by bark characteristics, perhaps because they are a different variety of straight black locust which does not have the bark characteristics of the *rectissima* variety (initially identified on Long Island, NY), for which the bark character classification scheme was developed.

For each identified stand of shipmast locust we map tree locations, species composition, landscape location, and collect a composite soil sample for lab analysis. Once identified and characterized, superior trees can have a portion of their roots harvested for propagation. We have developed a prototype landowner contract for root harvest in an economically and environmentally sound manner (see attached). We will be expanding our root collection program this winter, using a newly developed technique that utilizes a compressor and airhose for excavating intact roots from promising trees. We will be collecting roots at sites in NY State and West Virginia in the spring of 2001. The roots will be 'heeled-in' in a stool bed, which we are constructing at the Grassroots site, and will be propagated, or sold directly to the public, from there. We will also be obtaining or producing seedlings of other species such as catalpa, red spruce, chestnut, native tamarack, etc... for planting within locust groves, because we encourage the establishment of diverse plantations for greater ecological benefit.

Throughout our root collection activities, we maintain extremely accurate records that include the characteristics of the source tree, size and location of the root cutting, photos of source tree and cuttings, etc..., so that our seedlings can be precisely identified, and their growth success monitored. Because sprouting of the root cuttings is somewhat difficult, we also plan to conduct a pot trial in the Spring of 2001, to determine which potting medium produces the greatest number of healthy seedlings. We have also undertaken a review of black locust literature available through the Cornell University library, and have obtained numerous articles that have influenced our methods of locust selection and propagation.

2. Seedling production and Arnot Forest site management in 2000:

Two seedling nurseries of black locust were established in the spring of 2000, using somewhat different techniques. The nursery operated by Suzy Gell, using a raised tray of soil with an electrical heater underneath (see photo), produced fine seedlings. The nursery established at Tony Potenza's farm, using tree sacks and an electrical mat heater for bottom heat, failed, because locally available compost was used as the rooting medium, and the compost turned out to be full of weed seeds, which overwhelmed the nursery. Tree sacks would probably work fine, if a sterile potting soil were used. This was a lesson learned, and fortunately we were able to produce sufficient seedling at the Gell site to proceed with outplantings this fall. Root cuttings were planted in the nurseries in the spring, sprouted roots were repotted in mid-summer, and seedlings were planted out beginning in early November. Plantings will continue at the Arnot and Grassroots sites when weather allows, between now and April 2001.

Our original plan in the grower grant application was to plant the locust seedlings in a field area on the Potenza organic grain farm. However, we became concerned about land tenure on the rented land, and were also uncertain about the projected success of weed control methods at the site. We therefore decided to concentrate our efforts on a 2-acre site at the Arnot Teaching and Research Forest, operated by Cornell University. The site had been planted to black locust in 1961, but the variety was common locust – crooked, and not very useful as timber. We were given permission to harvest the site, and replant it with superior shipmast locust. In September 2000 we logged the site, using a horse to drag the logs, and processing the wood into beams on-site, using a portable Wood Miser sawmill. These methods were exemplary: the horse logging technique left little residual damage to the soils on the site, and all non-usable wood and mill residue was left on-site, improving nutrient cycling and providing wildlife habitat. Several snags were left standing on the site, and the students involved with the project also built and installed bird nesting boxes, in an effort to promote bird foraging on the locust borer beetle, which opens growing trees to potential infection by heart rot fungus.

The harvest took three days, and provided the opportunity for a variety of profitable interactions between Black Locust Initiative staff, the manager of the Arnot Forest, the operator of the Wood Miser, eight 3rd-5th grade Cooperative Extension students, and various members of the public that stopped by to observe. Lumber cut at the site was transported a few miles to Connecticut Hill, where Cornell Engineering students constructed a bridge from the locust beams, as part of a class project. Using the theory of conservation by design, under Dave Gell's recommendation, the engineering students designed a truss bridge, to make use of the short beams that could be milled from the crooked stand of common locust. The Cornell engineers and students taught beam-deflection to middle-school students, built the bridge using the truss design, and will later teach engineering at the finished bridge site, loading students onto the bridge and measuring deflection.

Following harvest, the Arnot project site was replanted with superior shipmast locust seedlings that were grown in the Gell nursery. This genetic stock had been collected in the spring from a stand of superior trees in Burdett, NY. The seedlings were hand-planted throughout the site. We developed methods for constructing deer-exlosures that were as sustainable as possible, using cut locust branches from the site, with the addition of twine and plastic deer netting. Protection from deer browsing is important in the first two years of seedling development, because the tree will not produce a straight trunk if the lead bud is eaten. Our method was designed to be low-impact, and will hopefully be successful. Weed control was achieved by mulching the area inside the deer enclosure. Planting began at the Arnot site at an event on November 4, 2000, and will be completed by spring 2001.

Our project at the Arnot Forest reflects the principles of: **sustainability** (replanting the harvested site with genetically superior replacement trees, monitoring the site over time, rot-resistant bridge construction, involvement of youth in tree planting); **progressive forestry** (using horse logging to preserve soil structure, liming the soil to increase nutrient availability, leaving all residue on-site, providing wildlife habitat); **diversity** (replanting with a mixture of trees); **biological control** (providing bird habitat for control of the locust borer); **value added close to the resource** (on-site milling of boards); and **conservation by design** (identifying a nearby market for the wood, designing a truss bridge, rather than a beam bridge, to make use of the logs that could be cut from the crooked locust). Managers of the Arnot Forest have been so pleased with our activities, that we have just been given a second two-acre site at the forest, to manage beginning in 2001.

It is important to realize that, in keeping with the principles of the Black Locust Initiative, every activity that takes place in the field is also an educational event where children, students, or the public are there, gaining hands-on, kinetic experience with sustainable forestry and use of forest products. The recent planting at Arnot, for example, happened on a Saturday, and was attended by 8 children from the Enfield 4H Ecoforestry group, and 6 children from a local foster home. These kids, supervised by 4 members of the Black Locust Initiative and a few adult volunteers, greatly enjoyed themselves while also accomplishing a great deal of work, planting 11 trees (which were tagged with their names, so that they could return to follow the success of their individual labors) and constructing deer exclosures, while also testing the soil, learning about pH and soil nutrient levels, and liming ½ acre of the site. Likewise, youth groups were involved with the horse-logging, and will continue to be involved in all activities. We think that getting outdoors and learning first hand, through kinetic activities, really helps the kids to learn about responsible management and ecosystems, while also teaching them job skills and respect for the environment. In 2000, the Black Locust Initiative conducted approximately 30 workshops where kids were involved in forestry activities, woodworking, tree identification, bark characteristic measurements, etc..., and we really feel that the direct involvement of kids is one of the great strengths of our program. Every activity is a teaching event for us, and we plan to continue this philosophy, even as we expand our activities into root collection in West Virginia, in the upcoming year.

OUTREACH:

Our outreach program is extensive, primarily because we interact with the public at many of our educational events and activities. Involvement with Cornell Cooperative Extension and 4H youth groups, as well as workshops at the Grassroots Festival and National Forest, has been extensive, well attended, and popular. This summer, our largest educational events were at the Grassroots and National Forest workshops, where hundreds of people had an opportunity to learn about straight black locust production, as well as environmental and ecoforestry issues, through participation in kinetic activities such as collection of bark characteristic data, building birdhouses, woodworking, ecotheatre, etc... It quickly becomes clear at the workshops that people are much more likely to learn and think about ecological issues if they are working their body through kinetic activities, as well as working their brains through listening and problem solving.

We are currently updating our internet site, and expect that by the end of the year it will include project photos, planting diagrams and instructions, summarized data regarding bark characteristics of the shipmast locust stands, and announcements of upcoming events. The

computer work is partially funded by AmericaOnLine, who have taken an interest in our activities. The site can be found at <http://www.blacklocust.org>

We continue to interact with Cornell University, through involvement of students from the Department of Agricultural Engineering (bridge construction, locust beam stress testing) and the Cornell Student Farm (workbench construction, seedling planting). Students from an Introductory Field Biology class visited the Arnot Forest site in October, to compare conventional and horse-logging methods. And Dean Hively, one of our collaborators, has had many informal discussions regarding the Black Locust Initiative with faculty and students within the Natural Resources Department, where he will be giving a more formal presentation on the project this November 15th.

In Ithaca, NY, this year, there has been considerable controversy over the use of pressure treated lumber in school playgrounds, and Dave Gell was quoted in a local paper describing problems inherent with the use of arsenic and chromium as a playground wood preservative. The Black Locust Initiative program was described in the article, and for a while now we have had quantitative chemistry of pressure treated wood posted on our website. We were also cited in the Watkins Review and Express in an article covering our activities at the National Forest workshop (see attached).

ECONOMICS: During the Arnot project, careful records were kept of inputs, and output of lumber by the Wood Miser. While the project did not pay for itself with direct income from lumber sales, that was because it was run experimentally, on a small scale, and as a teaching event. The accountant for the Black Locust Initiative has the mission, over the coming year, of developing an accounting system in red, black, and green, not just red and black – ie: she is attempting to develop 'green' accounting techniques to evaluate forest management operations, taking into account issues of environmental stewardship, as well as profit and loss.

FUTURE WORK:

This winter we will continue to replant the Arnot Forest site, and draw up plans for the second site at Arnot. We have scheduled a training/development session for use of the air-powered root harvester for early December. (Air tools will allow more harvest, with less damage to the collected roots and source tree). Once we master the technique we plan to make a trip to West Virginia, in the early spring of 2001, to collect root cuttings for transport back to our NY site, with the collaboration of foresters, landowners, and youth in West Virginia. This stock will be propagated at our permanent workshop site in Trumansburg, NY, on the land owned by the Grassroots Festival of Music and Dance. The 65 acre site includes 30 acres of woodland which will be managed by the Black Locust Initiative, and also includes two stands of shipmasi locust which we have identified, and are in the process of characterizing, before we begin to collect root cuttings for propagation. Black Locust Initiative is also working with the Grassroots Festival to design permanent structures and windbreaks on the site, which is being developed by the festival as an area for parking, camping, and educational activities. We will also be working with the National Forest to run educational workshops over the course of the summer, and to manage the 3-acre site which forest site which they have recently placed in our care. Web site development will continue, and we will continue to explore 'green accounting.' And, of course, we will continue to involve youth in educational events, continuing our average of 20

events per year. We will continue toward our goal of replacing pressure treated wood with naturally rot-resistant timber, and will continue to support the construction of locust pavilions, picnic tables, bridges, and playgrounds. We have a lot to do, and I think that we all have been excited about how well the past year's activities have gone. Our current momentum, and the enthusiasm of the many people who are involved with our projects, is perhaps attributable to our consistent involvement of youth, and to the high degree of environmental stewardship that we apply to our work. We'd like to thank the SARE farmer/grower program for your support of this year's activities, of which we are proud, and we hope to continue a dialogue about future funding for our projects.