Executive Summary:

150,000 hybrid poplar tree slips were purchased from Ostlie Nursery and are being stored in a commercial freezer until planting time. The purchase price of the tree slips was $15,000. A John Deere tractor model 8130 equipped with a 60 gpm hydraulic pump and GPS auto-steer was purchased. The tractor is a larger model than originally planned because smaller tractors did not have built in GPS auto-steer nor sufficient hydraulic power needed for the slip planter. The tractor was purchased outright by EPS rather than renting it because this offered the least overall cost to the project.

Technical Progress Deliverable 3a: Completion of purchase of 99,000 tree slips and storage in a commercial freezer.

150,000 tree slips were purchased from Ostlie Nursery at a cost of $15,000. The slips are hybrid poplar NM6, 10 in. long and from 3/8 in. to 7/8 in. diameter. 150,000 slips rather than 99,000 slips were purchased to allow for the planting on 5 ft centers rather than 6 ft centers as indicated in the proposal. Currently the slips are stored in a commercial freezer. EPS will pick up the slips a few days before planting and transport them to the project site.

The hybrid poplar clone NM6 "Nigra x Maximowiczii” is a proven fast-growing tree that has been researched in Minnesota until commercialized in 1989 - 1991. It is one of only four hybrid poplar clones that are commercially available in Minnesota that have proven to be resistant to one of the common diseases of hybrid poplars, Septoria canker. It is currently being planted on large acreages in the state of Minnesota by a fiber company to use for pulp or fiberboard. It can be expected to grow 6 to 10 feet per year under favorable climate conditions on selected soil types assuming excellent weed control, pest control (if needed) and fertilization (if needed). Requirements for fertilization depend on initial soil conditions and soil type, but in all cases, will be less than 10% of that applied to corn. Within 5 years, it is anticipated that the trees planted on the leased site will be in the range of 35 to 45 feet tall and 4-5 inches in diameter. At the spacing planned, the trees will be ready for harvest at that time.
Technical Progress Deliverable 3b: Lease of tractor for planter development, planting and tending:

The Tractor
A John Deere Tractor Model 8130 (see attachment 1) was purchased by EPS. This tractor has a rated engine power of 225 hp at 2,100 rpm, four-wheel drive, infinitely variable transmission, 60 gpm hydraulic implement flow at 2,900 psi, 60 in. tread spacing, a front loader attachment (needed to load and unload the planter), and has a total weight of 23,300 lb. The tractor is needed for tree slip planting, land tending and tree harvesting.

The Selection Process
In the original proposal a smaller John Deere tractor (60 series), that was to be leased, was proposed. The tractor requirements were 1) GPS auto-steer, 2) 60 inch tread spacing, 3) variable speed transmission, and 4) 60 gpm hydraulic flow. At the time the original proposal was submitted J-D said they could meet these criteria in a 60 series tractor by 2006. However this turned out not to be possible by 2006 and thus a larger tractor was needed. Four different tractor manufacturers were investigated; John Deere, Case-New Holland, Caterpillar, and McCormick-Massey Ferguson-White. Case-New Holland and Massey Ferguson could not make delivery until late 2006 and would need an after-market GPS steer system that involved separate electrical, mechanical and manufacturing companies and would not give the necessary GPS accuracy. Caterpillar could not meet the requirements. Used tractors were also investigated but did not meet the requirements, especially the GPS auto-steer. To provide the GPS auto-steer and 60 gpm hydraulic power without an auxiliary pump, a larger J-D model 8130 was selected. The J-D auto-steer system provides an accuracy of +/- 3 inches. EPS decided to purchase rather than lease the tractor because this offered the least overall cost to the project.

Additional Milestones:

M1-Annual Land Rental: A five-year lease for 80 acres of farmland near Glencoe, Minnesota has been signed. Completed 4/14/2006; milestone summary report #1 has been submitted separately.

M2-Design & Test Planter Injection System: The design of the tree slip injector ram, crossbar, injection straps, shock absorber and trigger mechanism is progressing. Each tree slip injector consists of a ram, ram crossbar, injection strap, impact absorber, ram reset cylinder, and trigger mechanism. High strength steel for the ram and crossbar have been obtained and machining started. Three injection straps have been molded. A manufacturer for the shock absorbers was located. A unique trigger mechanism has been designed. The test setup to test the performance of the ram is being built in the EPS shop.

M3-Tree Slip Purchase & Tractor Rental: Completed 4/14/2006 as discussed in this report.

M4-Basic Planter: Component parts for the six-row planter are being acquired.

M5-Test Planter: The tractor has been purchased. The injector system for the planter is progressing. Parts for the basic planter are being acquired. The mold for the rubber strap injectors has been made. The EPS shop now has all the machine tools installed to build the planters.

M6-First 80 Acre Planting: The land and tree slips have been purchased and planning is under way. A web search on planting no-till crops indicates that the soil temperature should be above 55°F and soil compaction not excessive. A soil compaction probe was purchased. Web search on
weed and herbicides information was made. A draft of "Best Management Practices" document on planting poplars in Minnesota was reviewed. International Paper poplar plantings were toured last fall and discussions with IP poplar production staff and UM Natural Resources Research Institute staff were held. Useful information on current experience with poplar production in Minnesota as well as contacts that may be useful in future work was obtained. Planting is scheduled between the period of mid-May to early May, with the exact date depending on weather and progress of planter.

Project Status:

All effort is focused on preparation for planting hybrid poplar tree slips in June on the 80 acres now leased by EPS near Glencoe, Minnesota. This partially involves getting local agronomist lined up to apply herbicides, do soil testing and any other pre-plant amendments necessary. The largest effort is completing the six-row planter. Work is progressing but much remains to be done.

Progress payment 3:

The contract calls for progress payment #3 of $28,847 for tree slip purchase and tractor rental for the first year of the project. In addition, Xcel progress payments #10, #16 and #23 includes in part payments for the use of a tractor. Progress payment #11, to be completed in the second year, includes in part payment for the auto-steer system and automatic in-row spacing. These payments will be requested in the future upon completion of the entire milestone and in sequence with the proposed timeline. At this time EPS requests a progress payment of $28,847.

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Appendix: Tractor Specification sheet

12510 Fletcher Lane, Suite K, Rogers, MN 55374 • 763-428-0646 • FAX 763-428-0647
Attachment 1: Tractor Specification sheet

<table>
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<th>Transmission</th>
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Check your options for more detailed specifications.