# Supplementary Materials: Influence of Nitrogen Availability on Growth of two Transgenic Birch Species Carrying the Pine GS1 Gene

**Vadim G. Lebedev, Nina P. Kovalenko and Konstantin A. Shestibratov**

```
   1 TTCCCTTCCTCTGGTTTGTTTTGGAGAGTGGCCATGTCGAGCGTATTAACAGACCTTCTC
  61 AACCTTGACCTGAGCGACGTGACAGAGAAGGTCATTGCAGAGTATATATGGATTGGAGGA
 121 TCAGGAATGGATATGCGCAGTAAAGCCAGATCTCTGTCAGGACCTGTGAGTAGCGTTAAA
 181 GAGCTTCCCAAATGGAACTATGACGGCTCCAGCACTGGACAGGCTCAAGGACATGACAGC
 241 GAAGTCATTCTATATCCACAAGCTATCTTCCGTGATCCATTTCGCAGAGGAAAGCACATT
 301 TTGGTAATCTGTGATGCCTACTCTCCTAATGGGACTGCTATTCCTTCCAACAAGAGGGCT
 361 GCAGCAGCGAAAATTTTTAACGAAAAGGCGGTTAGTGATGAAGAGACATGGTACGGGCTT
 421 GAACAAGAATATACACTGTTGCAAAAGGACGTCAAATGGCCTCTTGGCTGGCCAATTGGT
 481 GGCTACCCCGGTCCTCAGGGCCCATATTACTGTGGAGTTGGAGCTGACAAAGCCTGGGGA
 541 CGAGACATTGTTGATGCCCATTATAAGGCTTGTCTCTATTCAGGAATCAATATCAGTGGC
 601 ATCAATGGAGAAGTCATGCCAGGGCAGTGGGAATTTCAAGTAGGTCCGTCAGTGGGTATC
 661 TCAGCAGCAGATGAGCTGTGGTGTGCTCGTTTTATTATGGAGAGGATTACAGAAAAGGCG
 721 GGTGTCGTTCTGTCCTTTGATCCCAAGCCAATTGAGGGGGACTGGAATGGTGCTGGATGC
 781 CACACAAATTACAGCACCAAGTCCATGCGCAAGGAGGGAGGCTTCGAAGTAATTAAGAAA
 841 GCAATAGAAAAACTGAAGTTGAGGCATAAGGAGCATATTTCTGCCTATGGGGAGGGAAAT
 901 GAGAGACGCCTCACTGGTCGGCACGAGACAGCAGACATGAATACCTTTTCCTGGGGTGTT
 961 GCAAATCGAGGAGCTTCAGTTAGAGTGGGCCGGGACACAGAAAAGAAGGAAAAGGTTAT
1021 TTTGAGGACCGTCGACCTGCTTCAAACATGGATCCATACATAGTGACTTCTATGATTGCT
1081 GAGACGACCATTCTATGGAAACCTTAAATTACAAAGTGGAGGCCAGTTACACGCGTGGTC
1141 GTGGTGCTTTGCTTTGGAGGCCAGCGTCACTGATAAGCTAATATGTATGTAAATGTGATG
1201 CCAATGTTTAAGTAGGTTGGTAACTTTGCTTTGGTTGTGGGTAGACCTGAACTTTGGTCA
1261 AACAATTTCCTCTTGCTATATGGATATATATATATTTTTGTATTTGTTCTACTTGTAATA
1321 TGGCGAGGGCTTTAAAAGACTCTCTTTTACCTTTATTTATTCCGTTGTGGAAGATGTATT
1381 CGACAAATTGTTTAGAATGTTTGAATATGATATATTCTTTGTG
```

**Figure S1.** Nucleotide sequence of cDNA encoding the GS1a gene from *Pinus sylvestris* (X69822). The location of primers within the sequence is indicated by a straight line for the GS up1 primer and by dotted line for the GS low1 primer. Size of amplicon is 553 bp.

```
   1 CAATGAGCGTGACGCGTCATGGGGTCCGTAGATCAGATACTGAGAACCAACGGCCAAGAT
  61 CATTTCAAAGAAGATTTGAGGTTCATTTAAGCTGAATTTCATTTGAGGCTGAAATTTCAT
 121 TTCACATCTCCCCCTTTTTTAAAACTAGAGGGCGGGTACCTTGAACAGACGCCCACACAG
 181 AGATCGAATCCAGATTTCTAAACGGTATTTCATTTGAGTTTCATTATTTTCTTTGTTAAT
 241 CTGGGGTTAGCTTAGAATCCAGCATTATCGATTCAAACAATTAAAAGAATTTATCTTTAA
 301 ATGTGGGCCAATTCAGTTTTGTAATTCAGCATTGCTAAGGTCTTGATCTTTGATGTGATT
 361 TTATCAAAATGAATATTCAGATTTTGATTGTTACTTGTAAAAAGGAAATGGGATATTTT
 421 ATTTTGCTTTCTTCTTGGATGTTTTTTTGTCAAAATAGTACATTAGATTGTTGTGATTCC
 481 CTATTTTTACAGCATTTTAATGTAAAGTTGGCATTTTTAATGTGGCAGGTGAGAGGAAAT
 541 GGCAGAAAGTGAAGATATTCAGCCTCTTGTCTGCGACAATGGTACCGGAATGGTCAAGGT
 601 ATTAAGCTAGATTCATTTGTGATCTATTTTGGAGTTTAAAGATTCGATTCTTAAAGCGAT
 661 TTTGGTAGTGATTGCTGATTTGGGATGGAAATTTTGTAGGCTGGGTTTGCCGGAGATGAT
 721 GCACCAAGGGCTGTTTTCCCTAGCATTGTGGGTCGCCCACGCCACACCGGTGTGATGGTT
 781 GGTATGGGTCAAAAGGATGCGTATGTTGGTGATGAGGCACAATCAAAGAGAGGTATTTTG
 841 ACTTTGAAATACCCAATTGAGCATGGTATTGTTAGCAATTGGGATGATATGGAGAAGATT
 901 TGGCATCACACCTTCTACAATGAGCTCCGTGTGGCTCCTGAAGAGCATCCGGTTCTCCTT
 961 ACGGAAGCTCCTCTTAACCCCAAGGCCAATCGTGAGAAAATGACCCAGATCATGTTTGAG
1021 ACCTTCAACACTCCCGCAATGTACGTTGCTATCCAGGCTGTCCTTTCCCTTTATGCCAGT
1081 GGTCGTACAACTGGTAAGTGATACAATCCATTTAGTATCTGCTTTTTGATCAAATTCATG
1141 CATGTTAAAACGTTGTTATTGGTTTATTGCATTTGCGAGTTTTCAAAATAAAATGGAGTT
1201 GTACTAATTGATTGATAAACAAAATATTTGGGAAAAAAACACATCTAGATCATGAAAAAA
1261 AATGAAATGTGTTACTGGGAACTTGTCAAGCCCTCAATATTTCTAACTTGTAAGTTGGCA
1321 CAACGTATTTCACCCTTTGTCACAACCACAGTTCGTTTTGGAAATTTTATATGATATCTG
1381 CTGGGATCATGATCATGAAAACCAAAGAAGTTCCTTTAACAACGAAAACCAAAGAAGTTT
1441 CTTCAACAAGCATATAGTTTATCCAGCTTGGTGATTTCCATCTGGACTGTTTAATTATAG
1501 AGATAAATGATATGAATTGATACTTTTCACTATCAATGTGTTTTGGCTAGGTATTGTTCT
1561 GGACTCTGGAGATGGTGTGAGTCACACAGTTCCCATCTATGAAGGC<u>TATGCCCTCCCACA</u>
1621 <u>TGCCAT</u>TCTGCGTCTTGACCTGGCAGGCCGTGATCTCACTGATGCCCTAATGAAAATCTT
1681 GACTGAACGTGGCTACTCCTTCACGACCACTGCAGAGCGTGAAATTGTAAGGGACATGAA
1741 GGAGAAACTAGCCTACATTGCTCTTGATTATGAGCAAGAGCTGGAGACAGCAAAGACCAG
1801 CTCATCTGTTGAGAAGAGCTATGAGCTTCCAGATGGGCAGGTTATCACCATTGGAGCTGA
1861 AAGATTCCGTTGTCCAGAGGTCCTCTTCCAACCATCCATGATAGGGATGGAAGCTGCTGG
1921 CATACATGAAACAACATACAATTCTATCATGAAGTGTGATGTTGATATTAGGAAGGATCT
1981 CTATGGCAATATTGTTCTCAGTGGTGGCTCTACTATGTTCCCAGGCATTGCTGATAGGAT
2041 GAGCAAGGAAATTACAGCATTGGCTCCCAGTAGCATGAAGATTAAGGTGGTTGCACCACC
2101 AGAAAGGAAGTACAGTGTCTGGATAGGAGGCTCCATTTTGGCATCCCT<u class="dotted">CAGCACCTTCCA</u>
2161 <u class="dotted">GCAGGTA</u>CTGCGTCTATTTCTTATATATTTGGGCAGTAAACAGAAGCGGACTTTAAACCT
2221 GATTCTGCACATTTTGATGTCTTCATTGTTATGCCTGTGTTGTATTGTTTAGCATCATTA
2281 TGTGTTAAATGCTTAACAATATGAAATTTTAATTGCAATGATTGGAAGGAGTTACTAGAA
2341 TAATAGTGAAGCTTCAGATGGACATTAAGTAGTTAGAAGTTATATCTGAATTCATGATCA
2401 GGGACGACACTTTTGGACTGTGCTTTTCTAATATGGTTGGAGAAACTTGCTTTCTTTTGA
2461 GTGCAGATGTGGATTGCAAAGGCAGAGTATGATGAGTCCGGTCCATCAATTGTCCACAGG
2521 AAGTGCTTCTAATCGTGCAAAGCAAGAGGCTATTGGTCAAAAACATACTTTATACACTTT
2581 GTAGTACAAAAGGCTTCTAATCAAGTGGTTGCAAAACTATCTTCTGCATTTCGTTACCTC
2641 GTTTGCTCTTTCAACTTGTGTTTTGCTCTGTCAAAGTCTGGAC
```

**Figure S2.** Nucleotide sequence of cDNA encoding the actin gene from *Populus tomentosa* (GQ988367.1). The location of primers within the sequence is indicated by a straight line for the Actin 1 up primer and by dotted line for the Actin 1 low primer. Size of amplicon is 561 bp.