

Supplementary Data

Overexpression of *STARCH BRANCHING ENZYME II* increases short-chain branching of amylopectin and alters the physicochemical properties of starch from potato tuber

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Table S1. Primers used for PCR amplification.

Name	Sequence (5'-3')
FW3	CCGACGACCTTAAGTCTTTG
RW10	CAATGATAACCACGAGCTCC
SBE-A	AAAACCATGGTGTATACACTCTCTGGAGTTCG
RW11	CAAAGACTTAAGGTCGTCGGG
F4	GGAGCTCGTGGTTATCATTGG
SBE-B	AAAACTCGAGCAACGCGATCACAAGTTCG
GBSS-A	AAACTCGAGGCCTAGGATACTAGCGTTGCGGTTGAG
GBSS-B	AAACTGCAGAAGCTCCTAAGCCCAATAGC
GBSS-C	AAATCTAGAGGCCTGTTGCGGTTGAGGTCAAAG
GBSS-D	TTTCTGCAGACATTGAATTTGCCACTCC

NcoI
 CCATGGTGTATACACTCTCGGAGTTCGTTTTCTACTGTTCCATCAGTGTACAAATCTAATGGATTGAGCAGTAATGGTGATCGGAGGAATGCTAATATTTCTGTATTTCTGAAAAA
 ▶ M V Y T L S G V R F P T V P S V Y K S N G F S S N G D R R N A N I S V F L K K

BglII
 CACTCTCTTTACGGAAGATCTTGGCTGAAAAGTCTTCTTCAATTCGGAATCCCGACCTTCTACAATTGAGCATCGGGGAAAGTCTTGTGCTGGAATCCAGAGTATAGCTCTC
 ▶ H S L S R K I L A E K S S Y N S E S R P S T I A A S G K V L V P G I Q S D S S S

NheI
 ATCTCTCAACAGATCAATTTGAGTTCGCTGAGACATCTCCAGAAAATCCCGAGCATCAACTGATGTAGATAGTTCAACAATGGAACACGCTAGCCAGATTAACCTGAGAACGATGAGC
 ▶ S S T D Q F E F A E T S P E N S P A S T D V D S S T M E H A S Q I K T E N D D
 TTGAGCGCTCAAGTGTCTTACAGGAAGTGTGAAGAGCTGGATTTTCTTCACTACTCACTACAAGAAGTGGTAACTGGAGGAGTCTAAACATTAATCTCTGAAGAGACA
 ▶ V E P S S D L T G S V E E L D F A S S L Q L Q E G G K L E E S K T L N T S E E T

HincII
 ATTTATGATGAATCTGATAGGATCAGAGAGAGGGGATCCCTCCACCTGGACTTGGTCAGAAGATTATGAAATAGACCCCTTTTGACAACTATCGTCAACACCTTGATTACAGGTA
 ▶ I I D E S D R I R E R G I P P P G L G Q K I Y E I D P L L T N Y R Q H L D Y R Y

HindIII
 TTCACAGTACAAGAACTGAGGGAGGCAATTGACAAGTATGAGGGTGGTTTCTGCTGGTTATGAAAGAATGGGTTTCTCTGATGCTACAGGTATCACTTACCGTG
 ▶ S Q Y K K L R E A I D K Y E G G L E A F S R G Y E R M G F T R S A T G I T Y R

PvuII
 AGTGGGCTCTGGTCCAGTCAGCTGCCCTCATTGGGGATTCAACAATTTGGGACGCAATGCTGACTTATGACTCGGAATGAATTTGGTGTCTGGGAGATTTTCTGCCAAATAAT
 ▶ E W A P G A Q S A A L I G D F N N W D A N A D F M T R N E F G V W E I F L P N D
 GTGGATGGTTCTCTGCAATTCCTCATGGGTCCAGAGTGAAGATACGATAGGACCTCCATCAGGTGTTAAGGATTCATTCTGCTGGATCAACTACTCTTTACAGCTTCTGATGA
 ▶ V D G S P A I P H G S R V K I R M D T P S G V K D S I P A W I N Y S L Q L P D E
 AATTCATATAATGGAATATATTATGATCCACCCGAAGAGGAGGTATATCTTCAACACCCACGCCAAAGAAACCAAGTCGGTGAGAAATATGAAATCTCATTTTGAATGAGTA
 ▶ I P Y N G I Y Y D P P E E E R Y I F Q H P R P K K P K S V R I Y E S H I G M S

BspEI
 GTCCGGAGCCTAAAATTAACCTACATCGTAATTTAGAGATGAAAGTTCTTCTCGCATAAAAAAGCTTGGGTACAATGCGGTGCAAAATGATGCTATTCAAGAGCATCTTATTATGCT
 ▶ S P E P K I N S Y V N F R D E V L P R I K K L G Y N A V Q I M A I Q E H S Y Y A

HindIII
 AGTTTGTGTTATCATGTCAACAATTTTTCGACCAAGCAGCCGTTTGGAAAGCCGACGACCTTAAGTCTTTGATTGATAAAGCTCATGAGCTAGGAATTTGTTGCTCATGGACAT
 ▶ S F G Y H V T N F F A P S S R F G T P D D L K S L I D K A H E L G I V V L M D I

HincII
 TGTTCACAGTattaatataatcttttactattgcaactgtgttagaaaagctatgtaggggtttttgtgtcatttctgtttttgattgttgacgtctaattcataaatgaagaa
 ▶ V H R

XbaI
 atgggtgtttcattctagaaatcataatcataatggttagaccttttttttttactggcacttattttctattgacatgctttactttgtccttaactcactggaattatgcaaccttt

SacI
 tgCAGCCATGCATCAAAATAACTTTAGATGGACGAACATGTTTGACGGCAGAGATAGTTGTTACTTTCACTCTGGAGCTCTGGTGTATCATTGGATGTGGGATcCCGCTCTTTAA
 ▶ S H A S N N T L D G L N M F D G T D S C Y F H S G A R G Y H W M W D S R L F N
 CTATGGAACTGGGAGGTACTTAGTATCTCTCTCAAcTGCAGATGGTGGTGGATGAGTTCAAATTTGATGGATTTAGATTTGATGGTGTGACATCAATGATGtGtCTCACCACG
 ▶ Y G N W E V L R Y L L S T A R W W L D E F K F D G F R F D G V T S M M Y A H H

HincII
 GATTATCGGTGGGATTCAGTGGGAATACGAGGAATCTTTGGACTCGCACTGATGGATGCTGTTGTGTATCTGATGCTGGTCAACGATCTTATTCATGGGCTTTCCAGATGCA
 ▶ G L S V G F T G N Y E E Y F G L A T D V D A V V Y L M L V N D L I H G L F P D A

NdeI
 ATTACCATTGGTGAAGATGTAGCGGAATGCCGACATTTGTattCCCGTTCAAGATGGGGTGTGGCTTTGACTATCGGCTGCATATGGCAATGCTGATAAATGATTGAGTTGCT
 ▶ I T I G E D V S G M P T F C I P V Q D G G V G F D Y R L H M A I A D K W I E L L
 CAAGAAACGGGATGAGGATTGGAGATGGGTGATATTGTTACACTGACAAATAGAAGATGGTCGGAAGTGTGTTTCATACGCTGAAAGTCATGATCAAGCTCTAGTCGGTGATA
 ▶ K K R D E D W R V G D I V H T L T N R R W S E K C V S Y A E S H D Q A L V G D

HincII
 AAACATAGCATTCTGGCTGATGGACAGGATATGTATGATTTATGGCTCTGGATAGCCGCTCAACATCATTAAATAGATCGTGGATAGCATTGCACAAGATGATTAGGCTTGTAACT
 ▶ K T I A F W L M D K D M Y D F M A L D R P S T S L I D R G I A L H K M I R L V T

KpnI
 ATGGGATTAGGAGgGAAGGGTACCTAAATTTATGGGAAATGAATTCGGCCACCTCGAGTGGATTGATTTCCCTAGGGCTGAACAACACCTCTCTGATGGCTCAGTAATCCCGGAAA
 ▶ M G L G G E G Y L N F M G N E F G H P E W I D F P R A E Q H L S D G S V I P G N
 CCAATTCAGTTATGATAAATGCAGACGGAGATTTGACCTGGGAGATGCAAGATATTAAAGATACCGTGGGTGCAAGAAATTTGACCGGGCTATGCAAGTATCTTGAAGATAAATGAGT
 ▶ Q F S Y D K C R R R F D L G D A E Y L R Y R G L Q E F D R A M Q Y L E D K Y E
 TTATGACTTCAGAACACAGTTCATACGAAAGaATGAAGGAGATAGGATGATTGTTTGAAGaAGGAACCTAGTTTTTGTCTTAATTTTCTGACGCAAAAaGCTATTTCAGAC
 ▶ F M T S E H Q F I S R K N E G D R M I V F E R G N L V F V F N F W T K S Y S D
 TATCGCATAGGCTGCTGAAGCTCGAAATACAGGTTGCCCTGGACTCAGATGATCACTTTTGGTGGCTTCGGGAGAAATGATCATAATGCCGAATATTTCACTTTGAGGATG
 ▶ Y R I G C L K P G K Y K V A L D S D D P L F G G F G R I D H N A E Y F T F E G W

SpeI
 GTATGATGATCGTCTCTGTTCAATTATGGTGTATGCACCTAGTAGAACAGCAGTGGTCTATGCACTAGTAGACAAAGAAGAAGAAGAAGAAGTACGAGTAGTAGAAGAAGTAg
 ▶ Y D D R P R S I M V Y A P S R T A V V Y A L V D K E E E E E E E V A V V E E V

junction marker (2898)
 TAGTAGAAGAAGATGAACGAATCTGTGATCGCTGTGcga
 ▶ V V E E E •

Figure S1. Sequence of the hybrid cDNA/gDNA SBEII-intron construct. PCR fragments consisting of an upstream region of the coding sequence amplified from cDNA (dark blue), a central coding region amplified from genomic DNA (light blue) interrupted by an intron (black, lower case), and a downstream region of the coding sequence amplified from cDNA (magenta) were ligated together using internal *Afl*III and *Sac*I restriction sites. The sequence was inserted into an expression vector between the *GBSS* promoter and *GBSS* terminator.

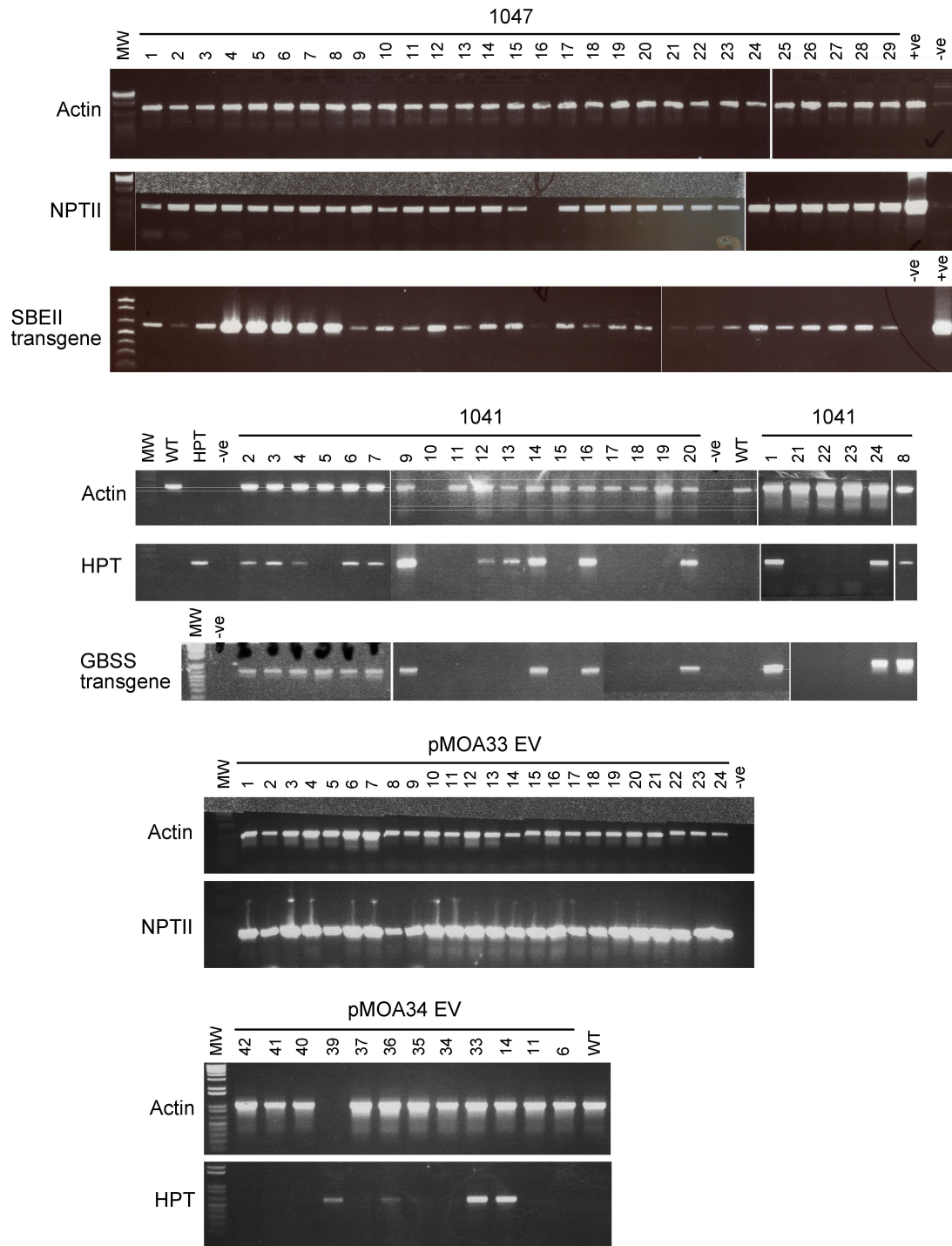


Figure S2. PCR screening of genomic DNA from primary transformants for the presence of the selectable marker gene and the transgene. The primers for the *SBEII-intron* transgene (construct 1047) spanned the *SBEII-GBSS_{term}* junction. The primers for the *GBSS* RNAi transgene (construct 1041) spanned the junction between the antisense arm of the inverted repeat and the *GBSS_{term}*. Empty vector (EV) control transformants were screened for the presence of the selectable marker gene only.

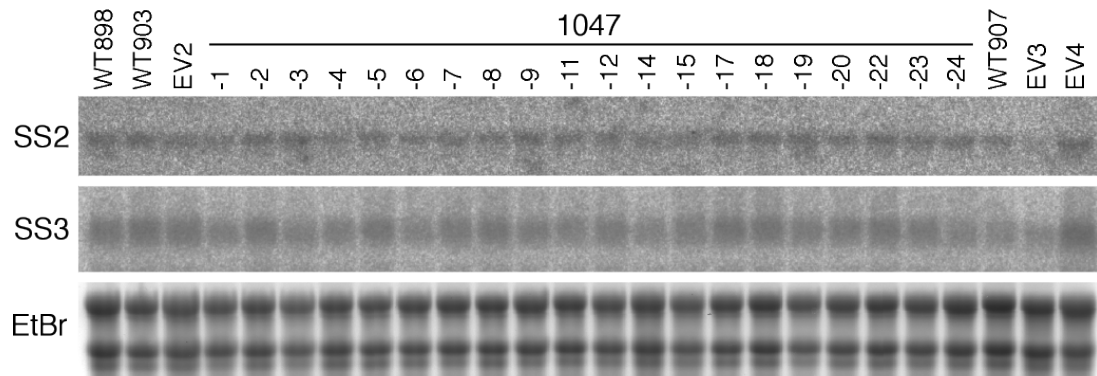


Figure S3. RNA gel blot analysis showing mRNA abundance of *STARCH SYNTHASE II* (SS2) and *STARCH SYNTHASE III* (SS3) in tubers from the 1047 population of plants, overexpressing *STARCH BRANCHING ENZYME II*. Wild-type (WT) and empty vector (EV) controls are included for comparison. Equivalency of RNA loading (10 µg per lane) was assessed by staining with ethidium bromide (EtBr).