

TABLE 9-continued

List of 11 Transcription Factor Genes Responsive to T1 and T2						
ProbeName	Fold chang	Response to	Comparison	Regulation	Gene Symbol	Description
A_84_P20728	1.63	T1 & T2	T2 vs control	down	ABR1	ABR1 (ABA REPRESSOR1); DNA binding/ transcription factor [AT5G64750.1]
A_84_P20728	1.67	T1 & T2	T1 vs control	down	ABR1	ABR1 (ABA REPRESSOR1); DNA binding/ transcription factor [AT5G64750.1]
A_84_P21874	2.02	T1 & T2	T2 vs control	down	STZ	STZ (SALT TOLERANCE ZINC FINGER); nucleic acid binding/transcription factor/zinc ion binding [AT1G27730.1]
A_84_P21874	2.69	T1 & T2	T1 vs control	down	STZ	STZ (SALT TOLERANCE ZINC FINGER); nucleic acid binding/transcription factor/zinc ion binding [AT1G27730.1]
A_84_P21931	1.88	T1 & T2	T2 vs control	down	ATERF11/ERF11	ATERF11/ERF11 (ERF domain protein 11); DNA binding/transcription factor/transcription repressor [AT1G28370.1]
A_84_P21931	2.58	T1 & T2	T1 vs control	down	ATERF11/ERF11	ATERF11/ERF11 (ERF domain protein 11); DNA binding/transcription factor/transcription repressor [AT1G28370.1]
A_84_P21970	1.82	T1 & T2	T2 vs control	down	AT2G22200	AP2 domain-containing transcription factor [AT2G22200.1]
A_84_P21970	2.55	T1 & T2	T1 vs control	down	AT2G22200	AP2 domain-containing transcription factor [AT2G22200.1]
A_84_P232439	1.59	T1 & T2	T1 vs control	down	WRKY18	WRKY18 (WRKY DNA-binding protein 18); transcription factor [AT4G31800.1]
A_84_P232439	1.70	T1 & T2	T2 vs control	down	WRKY18	WRKY18 (WRKY DNA-binding protein 18); transcription factor [AT4G31800.1]
A_84_P786490	1.55	T1 & T2	T2 vs control	down	WRKY46	WRKY46 (WRKY DNA-binding protein 46); transcription factor [AT2G46400.1]
A_84_P786490	2.35	T1 & T2	T1 vs control	down	WRKY46	WRKY46 (WRKY DNA-binding protein 46); transcription factor [AT2G46400.1]

1. A method of improving stress-response in a plant, the method comprising contacting a part of a seed, a plant, or the locus thereof with a composition of matter, the composition of matter comprising an agriculturally acceptable complex mixture of dissolved organic material characterized by natural organic matter that is partially humified.

2. The method of claim 1, wherein said composition of matter up regulates a receptor of the plant.

3. The method of claim 1, wherein the composition of matter down regulates at least one plant gene selected from WRKY element, an ethylene-responsive element, ABA repressor, salt tolerance zinc finger motif, high light responsive element, a putative disease resistance gene, putative chitinase protein, calcium ion binding proteins, zinc ion binding proteins, phosphate induced protein, ABC transporter family protein, cation/hydrogen exchanger (proton antiporter), glycolipid transporter gene, calmodulin-related protein, protein kinase/sugar binding, protease inhibitor genes, pectinesterase family protein, oxidoreductase, transmembrane receptor gene, heat-shock protein gene, or senescence associated protein.

4. The method of claim 1, wherein said composition of matter up regulates at least one plant gene selected from plant regulator production or responses, auxin-responsive family proteins, gibberellin 20 oxidase genes, encoding amino acid transporters, carbohydrate transporters, purine transporters, genes encoding enzyme, defense-related genes, genes encoding transcription factor or transcription regulators, or genes encoding ATPase/ion movement.

5. The method of claim 1, wherein said composition of matter up regulates at least one plant gene selected from genes encoding transcription factors, genes encoding enzymes, protein kinases or hydrolases.

6. The method of claim 1, wherein said composition of matter up regulates at least one plant gene selected from plant regulator production or responses, auxin-responsive family proteins, gibberellin 20 oxidase genes, encoding amino acid transporters, carbohydrate transporters, purine transporters, genes encoding enzyme, defense-related genes, genes encoding transcription factor or transcription regulators, or genes encoding ATPase/ion movement; and down regulates at least one plant gene selected from transcription factors, transcription regulators, growth, defense, metabolism, or ion transport.

7. The method of claim 1, wherein said composition of matter comprises two or more of:

- a mixture of condensed hydrocarbons, lignins, and tannins and/or condensed tannins;
- a oxygen-to-carbon ratio for the dissolved organic matter of greater than about 0.5;
- a total number of tannin compounds greater than about 200, the tannin compounds having a hydrogen to carbon ratio of about 0.5 to about 1.4, and an aromaticity index of less than about 0.7 as measured by mass spectroscopy; or
- a mass distribution of about 55-60% lignin compounds, 27-35% tannin compounds, and about 8-15% condensed hydrocarbon as measured by mass spectroscopy.

8. The method of claim 1, wherein the composition of matter comprises a mixture of condensed hydrocarbons, lignins, and tannins and/or condensed tannins, wherein at least 10% of the total % of compounds of the composition are tannins and/or condensed tannins

9. The method of claim 1, wherein the composition of matter comprises a mixture of condensed hydrocarbons, lignins, and tannins and/or condensed tannins, wherein at