Claims

1. A method for obtaining oil palm plants that have tolerance to *Ganoderma boninense*, for cultivation for agricultural use, the method comprising steps of:

(i) cultivating oil palm plants of a treatment group and oil palm plants of a control group together, the oil palm plants of the treatment group and the oil palm plants of the control group having been derived from a common lineage;

(ii) contacting roots of the oil palm plants of the treatment group with *Ganoderma boninense*, while not contacting roots of the oil palm plants of the control group with *Ganoderma boninense*;

(iii) further cultivating the oil palm plants of the treatment group and the oil palm plants of the control group together;

(iv) determining, individually in a subset of the oil palm plants of the treatment group, in comparison to the oil palm plants of the control group:

(1) a level of a transcript of a cell-wall-related-protein gene comprising one or more of:

(a) a level of a transcript 1 of a mannosyl-oligosaccharide 1,2-alpha-mannosidase MNS3-like isoform X1 gene, or

(b) a level of a transcript 2 of an alpha-1,3-mannosyl-glycoprotein 2-beta-N-acetylglucosaminyltransferase-like isoform X3 gene,

(2) a level of a transcript of a transcription factor gene comprising one or more of:

(a) a level of a transcript 3 of a WRKY transcription factor 40 gene, or

(b) a level of a transcript 4 of a WRKY transcription factor 53 gene,

(3) a level of a transcript of a disease-resistance-protein gene comprising one or more of:

(a) a level of a transcript 5 of a dirigent protein 5 gene,

(b) a level of a transcript 6 of a G-type lectin S-receptor-like serine/threonine-protein kinase gene,

(c) a level of a transcript 7 of a putative disease resistance protein RGA3 gene, or

(d) a level of a transcript 8 of a polyamine oxidase gene, and

(4) a level of a transcript of a jasmonic-acid-signalling gene comprising one or more of:

(a) a level of a transcript 9 of a putative lipoxygenase 5 gene, or

(b) a level of a transcript 10 of a 12-oxophytodienoate reductase 1-like gene;

(v) predicting tolerance to *Ganoderma boninense* of the oil palm plants of the treatment group based on (1) at least one of the levels of the transcripts 1 or 2 being higher, (2) at least one of the levels of the transcripts 3 or 4 being higher, (3) at least one of the levels of the transcripts 5, 6, 7, or 8 being higher, and (4) at least one of the levels of the transcripts 9 or 10

being higher, individually in the subset of the oil palm plants of the treatment group, in comparison to the oil palm plants of the control group; and

(vi) if the oil palm plants of the treatment group are thereby predicted to have tolerance to *Ganoderma boninense*, then transplanting, for cultivation for agricultural use, oil palm plants remaining from the treatment group, whereas if the oil palm plants of the treatment group are predicted not to have tolerance to *Ganoderma boninense*, then culling the oil palm plants remaining from the treatment group.

2. The method of claim 1, wherein the transcripts 1-10 are transcripts of (1) a mannosyl-oligosaccharide 1,2-alpha-mannosidase MNS3-like isoform X1 gene of SEQ ID NO: 1, (2) an alpha-1,3-mannosyl-glycoprotein 2-beta-N-acetylglucosaminyltransferase-like isoform X3 gene of SEQ ID NO: 2, (3) a WRKY transcription factor 40 gene of SEQ ID NO: 3, (4) a WRKY transcription factor 53 gene of SEQ ID NO: 4, (5) a dirigent protein 5 gene of SEQ ID NO: 5, (6) a G-type lectin S-receptor-like serine/threonine-protein kinase gene of SEQ ID NO: 6, (7) a putative disease resistance protein RGA3 gene of SEQ ID NO: 7, (8) a polyamine oxidase gene of SEQ ID NO: 8, (9) a putative lipoxygenase 5 gene of SEQ ID NO: 9, and (10) a 12-oxophytodienoate reductase 1-like gene of SEQ ID NO: 10, respectively.

3. The method of claim 1 or 2, wherein step (i) is carried out from germination of the oil palm plants of the treatment group and the oil palm plants of the control group.

4. The method of claims 1, 2, or 3, wherein the contacting of step (ii) is initiated when the oil palm plants of the treatment group are 4 to 8 months old.

5. The method of any of claims 1-4, wherein the contacting of step (ii) comprises contacting the oil palm plants of the treatment group with an inoculum block that is colonized with *Ganoderma boninense*.

6. The method of any one of claims 1-5, wherein the *Ganoderma boninense* comprises *Ganoderma boninense* PER71.

7. The method of any one of claims 1-6, wherein step (iv) is carried out when the oil palm plants of the treatment group and the oil palm plants of the control group are 12 to 24 months old.

8. The method of any one of claims 1-7, wherein the determining of step (iv) comprises determining the level of one or more of the transcripts 1-10 individually in roots of the subset