CLAIMS

1. A transgenic and/or transplastomic plant comprising (a) a double stranded RNA (dsRNA) molecule comprising a nucleic acid sequence complementary to 21 to 2000 contiguous nucleotides of a target gene sequence, wherein the target gene sequence includes at least one of the protein coding region, the 5' untranslated region (UTR), the 3' UTR, and any combination thereof, of a target gene and wherein the double stranded RNA molecule silences the target gene when ingested by an insect, and wherein the target gene is a microbe-induced gut specific gene-insect RNA target gene (MIGGS-IRTG) involved in gut microbe recognition, clearance and/or containment induced by microbes ingested during feeding and/or active feeding, and the target gene comprises a nucleic acid sequence of SEQ ID NO: 1; (b) an siRNA molecule derived from the processing of the dsRNA molecule; and/or (c) polynucleotide, a construct or a dsRNA encoding segment encoding the dsRNA molecule, or a seed, part, tissue, cell, or organelle thereof wherein said seed, part, tissue, cell or organelle comprises the dsRNA molecule and/or the siRNA molecule,

optionally wherein at least one cell of the plant expresses the dsRNA molecule and/or produces the siRNA.

2. The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof, of claim 1, wherein the dsRNA molecule comprises a single RNA strand comprising an inversely repeated sequence with a spacer in between, and wherein the single RNA strand can anneal to itself to form a hairpin loop structure; or wherein the dsRNA molecule comprises two separate complementary RNA stands annealed together.

3. The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof of claim 1 or 2, wherein the construct encoding the dsRNA comprises a gene silencing sequence operably linked to one or more promoters for the expression of a dsRNA molecule that silences the target gene when ingested by an insect, optionally wherein the recombinant DNA construct further comprises an additional transcription regulatory region or an additional transcriptional regulatory element.

4. The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof of claim 3, wherein the construct encoding the dsRNA is an expression vector and the expression vector can target single or multiple insect RNAi target genes or chimeric RNAi target genes.

5. A method of producing the transgenic and/or transplastomic plant of any one of claims 1 to 4, the method comprising transforming the plant with a polynucleotide encoding the dsRNA molecule, and/or the construct or a dsRNA encoding segment, wherein the plant expresses the dsRNA molecule and/or produces the siRNA, and wherein the plant has resistance to an insect pest of the plant.

6. A method for producing the transgenic or transplastomic plant of any one of claims 1 to 4, the method comprising:

a) transforming a plant cell and/or organelle with a polynucleotide encoding the dsRNA molecule and/or a construct or a dsRNA encoding segment thereof;

b) regenerating a plant from the transformed plant cell and/or organelle; and

c) growing the transformed plant under conditions suitable for the expression of said double stranded RNA molecule, wherein said transformed plant of (c) is resistant to a plant pest insect compared to an untransformed plant.

7. A method of improving crop yield, the method comprising growing a population of transgenic or transplastomic plants of any one of claims 1 to 4, wherein the population of transformed plants produces higher yields in the presence of pest insect infestation than a control population of untransformed plants

8. A method of silencing: (i) an insect immune response gene and/or (ii) an insect gene encoding for structural components of the insect midgut, the method comprising providing for ingesting the transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof of any one of claims 1 to 4, wherein the dsRNA is ingested by the actively feeding stage of the insect and (a) ingestion of the dsRNA induces a melanotic response; and/or (b) ingestion of the dsRNA results in perturbation of gut microbial homeostasis; and/or (c) ingestion of the dsRNA results in defective clearance of opportunistic microbes; and/or (d) ingestion of the dsRNA results in defective containment of gut microbes.

9. The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof or the method of any of the above claims, wherein the silencing of the target gene results in reduced appetite and/or developmental defects resulting in incomplete development and/or mortality and/or decreased reproductive success of the insect, optionally wherein the reduced appetite and/or developmental defects and/or mortality and/or reduced reproductive

fitness of the insect is observed after sustained feeding for at least 24 hours.

10 The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof or the method of any of the above claims, wherein the insect is of the order *Lepidoptera*, *Coleoptera*, *Hemiptera*, *Blattodea*, or *Diptera*.

11. The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof or the method of any of the above claims, wherein the insect is *Manduca sexta* (*M. sexta*) (tobacco hornworm), *Spodoptera frugiperda* (fall armyworm), *Ostrinia nubilalis* (European corn borer), *Plutella xylostella* (Diamondback moth), *Leptinotarsa decemlineata Say* (Colorado potato beetle), *Diabrotica spp.* (Corn rootworm complex), *Tribolium castaneum* (Red flour beetle), *Popillia japonica* (Japanese beetle), *Agrilus planipennis* (Emerald ash borer), *Diaphorinacitri* (Asian citrus psyllid), *Cimex lectularius* (Bed bug), a cockroach or termite, or insect pests such as mosquitoes and flies.

12. The transgenic and/or transplastomic plant or seed, part, tissue, cell, or organelle thereof or the method of any of the above claims, wherein the plant is selected from the group consisting of *Zea mays L* (corn), *Sorghum bicolor* (sorghum), *Setaria italica* (fox tail millet), *Pennisetum glaucum* (Pearl millet), *Solanum tuberosum* (potato), *Oryza sativa* (rice), *Lycopersicon esculentum* (tomato), *Solanum melongena* (eggplant), cultivars of the *Brassica oleracea* family, *Citrus sinensis*(Orange), trees of the *Oleaceae* family, and crops of *Rosaceae*.